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An exploratory study on the relation between time perspective, positive mental health and psychological distress across the adult lifespan.

Master Thesis Psychology
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Preface

This master thesis lying in front of you is the result of a three a month research on the relation between time perspective and the complete mental health model across the adult lifespan. With this thesis I will finish my Master of Science degree in Psychology at the University of Twente, the Netherlands. A few years ago, I would never have thought that I would make my study till the end. Throughout my time at university I had to struggle with many setbacks and challenges on which I would almost despair. Also, in the last phase of my master's program I had to fight with several problems. Especially at the beginning of my master thesis I experienced some difficulties finding an interesting research topic. However, after several weeks of extensive literature review, I became interested in the relatively new research area of positive mental health. Particularly interesting for me was the fact that, despite its importance for the complete understanding of mental health, this research area remained yet relatively unexplored. Despite the numerous problems throughout my study time and especially in the last phase of my master's program, I am now even more proud of myself that I have persevered to the bitter end. At this point I would like to thank some people who have supported and motivated me throughout my study time and particularly during the writing of my master thesis. First of all I would like to thank my supervisors Dr. Gerben Westerhof and Dr. Ernst Bohlmeijer from the University of Twente for their support, opinions and critical review. Furthermore, I would like to thank my parents making it possible for me to study abroad. Thank you both for your support, motivation and believing in me during my whole study time. Then, I would like to thank my friends for helping and encouraging me all the time. In particular, I want to thank my roommates with whom I spent five wonderful years in the Netherlands. Last but not least, I would like to thank Anja Klein for improving my final draft on spelling and grammatical errors.

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Abstract

Purpose. The present study was designed to examine the relation between time perspective and complete mental health across the adult lifespan. It was also performed to further confirm the two continua model of mental health and mental illness by investigating whether time perspective was differently related to psychological distress and positive mental health.

Methods. The study was performed among 512 young, middle-aged and old adults between the ages of 17 and 92. They filled out questionnaires on positive mental health, psychological distress, time perspective and demographic information.

Results. A significant relation was found for age and complete mental health. Young adults experienced more psychological distress, middle-aged adults more positive mental health and old adults less psychological well-being. A significant relation was also found for age and time perspective. Young adults were more often classified as futurists and less often as reminiscers, middle-aged adults more often as time expansive (i.e., balanced) and old adults more often as both reminiscers and time restrictive but less often as futurists and time expansive. In addition, a significant relation was found for time perspective and positive mental health but not for psychological distress. The time expansive category had the highest and the time restrictive category the lowest scores on positive mental health. It was also found that time perspective was differently related to both continua of complete mental health. No relation was found for the interaction of age and time perspective and complete mental health.

Conclusion. The results of this study indicate that time perspective and age, separately, are both correlates of positive mental health. In addition, age is also a correlate of psychological distress and time perspective. The findings provide partially support for a balanced time perspective as one of the temporal orientation being most conducive for well-being. They further confirm the two continua model of mental health, and they also provide empirical evidence for the distinction between emotional, psychological and social well-being. These results have important implications for future research and public mental health care.

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1. Introduction

Positive mental health has long been a neglected area in psychological research. Most studies to date have mainly focused on the negative aspects of human life by trying to find out what is going wrong with people and whether and how mental illness can be prevented and treated. In contrast, relatively little attention has been directed towards questions such as what is going right with people and what makes them feel mentally healthy. Moreover, positive mental health has long been defined as merely the absence of mental illness. However, recently, there is empirical evidence showing that this assumption is incorrect. Many researchers have ascertained that positive mental health means much more than merely the absence of mental illness. According to Keyes (2005), mental health can be viewed much better as a complete construct in which both positive mental health and mental illness are related, but belonging to two distinct dimensions.

Since positive mental health is no longer seen simply as the absence of mental illness, it has become an attractive field of investigation. However, despite this burgeoning interest, it is still relatively unclear which psychological processes and attributes are associated with positive mental health. A better understanding of the underlying mechanisms of positive mental health as well as of mental illness is important first to be able to better define both continua of complete mental health and second to be able to better treat and prevent mental illness as well as to better promote and protect positive mental health. Therefore, the aim of the present study is to shed more light on possible correlates (underlying mechanisms) of positive mental health and psychological distress (mental illness). In this study, we will do this by focusing on age and time perspective (TP) as potential correlates of the complete mental health model. Several recent researchers have argued that the construct of time perspective has a powerful influence on virtually all aspects of human behavior and optimal functioning, optimal physical as well as psychological health and societal functioning (Boniwell & Zimbardo, 2004). In addition, Boniwell and Zimbardo (2004) have suggested

that especially a balanced time perspective (BTP) is most conducive for positive mental health. However, to date, there are relatively few empirically studies supporting these assumptions. In addition, there are also several researchers highlighting that age has an influence on both continua of the complete mental health model. Furthermore, some researchers have also suggested that age has a powerful influence on time perspective. However, until now, there have been relatively few empirical studies providing evidence for these developmental changes in time perspective as well as in both continua of complete mental health. Thus, in this study, we investigate the relation between age, time perspective, especially a balanced time perspective, positive mental health and psychological distress.

To our knowledge this is the first study of its kind. No studies to date have been carried out to investigate these interactions for the three core elements of positive mental health, i.e., emotional, psychological and social well-being. Furthermore, this is one of the first studies that directly compares the relation of time perspective to positive mental health as well as to psychological distress. And, finally, there are little to no studies examining these interplays for different age groups.

In the following paragraphs, we will first explain the two continua model of mental health and mental illness and we will present a current definition of positive mental health. Secondly, after explaining the concept of time perspective, we will focus on previous studies investigating the relation between age, time perspective and the complete mental health construct. Finally, we will define our research questions.

1.1 The construct of mental health

The two continua model of mental health and mental illness

For decades, mental health has been defined as merely the absence of mental illness. It has been hypothesized that both, mental health and mental illness, were opposite poles of a single dimension and that this in turn would indicate that the presence or absence of mental illness

implies the presence or absence of mental health, and vice versa. However, recently, this assumption is increasingly being called into question. Keyes (2007) has described it as "one of the most simple and inexplicably untested empirical hypotheses"(p. 95). For this reason, he has conducted several studies to determine whether and how mental health and mental illness are related. He has found that these two concepts are related, but belong to two distinct continua, and that mental health therefore should be seen as a complete state which can be best explained by a two continua model (Keyes, 2002, 2005). By contrast, the theory of a single factor model based on the assumption that mental health and mental illness reflect a single latent factor is not sufficient to explain complete mental health. Hence, complete mental health is not merely the absence of something negative but also the presence of something positive.

Recently, more and more researchers try to provide further support for this assumption, with increasing success. To date, there is growing empirical evidence for the two continua model of mental health and mental illness. In addition to the studies of Keyes (2002, 2005, 2006), there are an increasing number of studies yielding similar results. This also applies to studies using different instruments to measure mental health and/or mental illness (Greenspoon & Saklofske, 2001; Massé, Poulin, Dassa, Lambert, Belair & Battaglini, 1998; Suldo & Shaffer, 2008), and even for those examining the relations of these two dimensions with other criteria, such as healthcare consumption, work productivity, personality traits and demographic variables (Keyes & Grzywacz, 2005; Lamers, Westerhof, Kovács & Bohlmeijer, under review; Westerhof, under review; Westerhof & Keyes, 2010).

A definition of positive mental health

Since it has recently been found that mental health is not merely the absence of mental illness, but also the presence of something positive, the question to be answered is, what composes positive mental health and how can it best be defined? A few years ago, the World

Health Organization (WHO, 2005) has dealt with this question. According to them, mental health "is a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (p. 2). In other words, positive mental health includes three core elements, namely an individual's well-being, effective individuals functioning and effective social functioning (Westerhof & Keyes, 2010). Keyes (2007) has also recently directed his attention to find out what composes positive mental health. In his studies, he has highlighted that it requires a combination of different forms of well-being in order to be considered mentally healthy. These various forms of well-being are emotional, psychological and social well-being which together make up positive mental health.

These three dimensions of well-being nicely fit the three core elements of the WHO-definition of positive mental health (Westerhof, under review; Westerhof & Keyes, 2010). Emotional well-being comprises feelings of happiness and satisfaction with life (Diener, Suh, Lucas & Smith, 1999) and it equates to the term of "an individual's well-being" as applied in the WHO-definition of positive mental health. Psychological well-being, by contrast, includes aspects of individual fulfillment such as self-acceptance, personal growth, purpose in life and autonomy (Ryff, 1989) and it corresponds to the notion of "effective individual functioning" as mentioned in the WHO-definition. Finally, social well-being comprises a sense of belonging and of contribution to a community (Keyes, 1998) and it equates to the concept of "one's effective social functioning" as described in the WHO-definition. In addition, these three core elements fit also the two traditions of well-being research, the hedonic and eudaimonic tradition. Emotional well-being suits the hedonic tradition whose studies focus primarily on positive feelings and satisfaction with life. By contrast, psychological and social well-being fit the eudaimonic tradition whose studies in turn focus on the realization of one's own potentials and individuals' fulfillment (Lamers et al., under review; Waterman, 1993).

Since we now know that positive mental health composes different aspects of well-being, an important next question is whether these different aspects are related or distinct from each other. Similarly to the distinction of mental illness and positive mental health, the distinction of the different aspects of positive mental health is discussed vehemently. Some researchers have argued that emotional (hedonic) well-being is different from psychological and social (eudaimonic) well-being (Ryff, 1989; Waterman, 1993), whereas others have stated that they are related to each other (Deci & Ryan, 2008; Ryan & Deci, 2001). There are theoretical reasons for both assumptions. However, more and more researchers provide empirical evidence for the differentiation between hedonic and eudaimonic well-being. With factor analysis several researchers studying emotional and psychological well-being have found two distinct factors (Keyes, Shmotkin & Ryff, 2002; Ryff & Keyes, 1995; Waterman, 1993, Waterman, Schwartz & Conti, 2008) and other researchers focusing on emotional, psychological and social well-being have found three distinct factors (Keyes, 2006; Lamers, Westerhof, Bohlmeijer, ten Klooster & Keyes, 2011). There is also an increasing number of studies clearly showing that hedonic and eudaimonic well-being have different correlates (Joshanloo & Nosratabadi, 2009; Lamers et al., under review; Westerhof, under review).

To sum up, in spite of the many ambiguities in this research area, a variety of current studies have clearly demonstrated that it is important to distinguish among the different aspects of well-being, i.e., emotional, psychological and social well-being.

1.2 The construct of Time Perspective (TP)

For many years now, different aspects of time have been studied in a variety of ways by philosophers, scientists and psychologists, to name only a few. Since a long time, there has been much controversy about whether the concept of time can be seen as an internal, subjective phenomenon in addition to an objective, physical phenomenon. However, there are several well-known philosophers and more recent researchers arguing that the concept of time

is not just physical and measurable, but also open for subjective (psychological) interpretation (James, 1890/ 1950, as cited in Drake, Duncan, Sutherland, Abernethy & Henry, 2008, p. 47; Kant, 1781/ 1965, as cited in Zimbardo & Boyd, 1999, p. 1271). Within this subjective interpretation, there is one aspect of the various different facets of time which receives increasing attention, namely time perspective (TP).

Already, there have been several definitions of time perspective. Lewin (1951) was one of the first defining this construct. According to him, TP is "the totality of the individual's views of his psychological future and psychological past existing at a given time" (p. 75, as cited in Zimbardo & Boyd, 1999, p. 1271; Boniwell, Osin, Linley & Ivanchenko, 2010, p. 24). Somewhat later, Lennings (1996) has given a more specific definition of TP as "a cognitive operation that implies both an emotional reaction to imagined time zones (such as future, present or past) and a preference locating action in some temporal zone…' (p. 72, as cited in Boniwell et al., 2010, p. 24). Recently, Boniwell et al. (2010) have described TP as "an individual's cognitive way of relating to the psychological concepts of past, present and future, which affects decision making and subsequent actions" (p. 24).

Lewin (1948) was not only one of the first researchers defining TP, but also one of the first arguing that this construct plays an important role in human behavior. According to him, "Actions, emotions, and certainly the morale of an individual at any instant depends upon his total time perspective" (p. 104, as cited in Athawale, 2004, p. 2). Recently, Boniwell and Zimbardo (2004) have even gone one step further by claiming that "time perspective is one of the most powerful influences on virtually all aspects of human behavior" (p. 167). Indeed, even though very few, more and more researchers have supported these assumptions. Over the years, there have been increasing numbers of studies clearly showing that time perspective is an influential factor on a wide range of behaviors, attitudes, values and (mental) health (Boniwell & Zimbardo, 2004; Boniwell et al., 2010). For example, it has been found that TP is related to alcohol and drug abuse, academic achievement, risky driving, (mental) health and

delinquency, to name only a few (Keough, Zimbardo & Boyd, 1999; Mello & Worrell, 2006; Zimbardo, Keough & Boyd, 1997; Zimbardo & Boyd, 1999). Furthermore, many studies have demonstrated that especially a future orientation is associated with numerous positive aspects of human life, such as self-efficacy, academic achievement, and fewer health risk behaviors (Lennings & Gow, 1997; Mello & Worrell, 2006; Zimbardo & Boyd, 1999). A present orientation, by contrast, is mainly associated with negative aspects, for example addiction, crime, and mental health problems (Keough et al., 1999; Zimbardo et al., 1997; Zimbardo & Boyd, 1999).

However, there are several drawbacks to most previous studies investigating time perspective. Most research thus far has mainly focused on one temporal zone only, usually that of the future. In contrast, less attention has been directed to the present time perspective and little attention was devoted to investigate the past time perspective. In addition, there are only few studies focusing on a combination of these three dominant time zones (Boniwell & Zimbardo, 2004). A balanced time perspective (BTP) which has recently been hypothesized to have a powerful influence on optimal physical as well as psychological health and optimal societal functioning is also relatively unexplored (Boniwell & Zimbardo, 2004).

To sum it all up, there are many unanswered questions with regard to the construct of time perspective. In this study we try to gain more insight into the construct of time perspective by investigating the relationship of TP to both positive mental health and psychological distress across the adult lifespan. In the following paragraph, we will show that these interplays are also relatively unexplored until now. However, before we will focus on existing studies that have already dealt with this or similar themes we will first define the balanced time perspective and we will present a new measure of it.

The construct of a Balanced Time Perspective (BTP)

A balanced time perspective (BTP) has been defined as "the mental ability to switch flexibly among TPs depending on task features, situational considerations, and personal resources rather than be biased toward a specific TP that is not adaptive across situations" (Zimbardo & Boyd, 1999, p. 1285). A somewhat different definition is given by Webster (2011). He has recently defined it as "a frequent and equal tendency to think about both one's past and future in positive ways, enables individuals to use both the past and the future as sources of insight, strength, and happiness" (p. 6). Given these definitions one might think that individuals with a BTP will be happier and will have a much better general (mental) health than those who do not have a BTP. Exactly these opinions have been represented by several recent researchers. For example, Zimbardo and Boyd (1999) and Boniwell and Zimbardo (2004) have suggested that a BTP has a powerful influence on both optimal physical and psychological health, and also on optimal societal functioning. Furthermore, they have argued that focusing exclusively on the past, the present or the future will bring several major disadvantages. Such a biased focus may become dysfunctional, and even more it may limit optimal healthy functioning (Boniwell & Zimbardo, 2004). For instance, an excessive future orientation may bring academic and career success, but on the other hand it may create workaholics with limit social connections and little time for enjoyment (Boniwell & Zimbardo, 2004). Also, excessively focusing on the positive past has advantages and disadvantages, such as high self-esteem and happiness on the one hand and being conservative, cautions and avoiding change on the other hand. All in all, Boniwell and Zimbardo (2004) have stated that "the ideal of BTP comes into play as a more positive alternative to living life as a slave to any particular temporal bias" (p. 171). Furthermore, "learning to overcome our temporal biases that limit optimal, healthy functioning and discovering how to achieve a balanced time perspective should be a mandate for all of us" (Boniwell & Zimbardo, 2004, p. 165). However, despite this burgeoning interest in a balanced

time perspective and despite its suggested potential influence on optimal functioning, to date, there are relatively few empirical studies confirming these assumptions. In addition, until recently, there has been no good instrument to measure a BTP. Those few earlier studies examining a BTP have used the Zimbardo Time Perspective Scale (ZTPI). However, this scale has not been designed to measure this construct (Webster, 2011). Thus, further research and also a new measure making it possible to measure a BTP are needed (Boniwell & Zimbardo, 2004). In what follows, we will exactly present such a new measure of a BTP.

A new measure of time perspective

Over the years, there have been many different methods to measure the concept of time perspective. Since 1999, the Zimbardo Time Perspective Inventory (ZTPI), developed by Zimbardo and colleagues, can be considered as the leading measure of TP (Boniwell et al., 2010). This scale is both reliable and valid, and also easy to use (Boniwell, 2005). Recently, there have been several problems with using the ZTPI. This scale has originally been developed in order to detect three different time zones (the past, the present and the future) and their correlates (Webster, 2011). However, for some time, more and more researchers are not only interested in separate temporal zones, but rather in a combination of different time zones, especially in a combination of the positive past and the positive future, defined by Webster (2011) as a balanced time perspective. The ZTPI has not been designed to measure this construct and so, a new measure of time perspective, the Balanced Time Perspective Scale (BTPS) has been developed by Webster (2011). The BTPS contains 14 statements assessing thoughts and feelings about the future and 14 statements assessing thoughts and feelings about the past. By crossing the future- and the past-subscale and performing a median spilt of each, Webster (2011) has created a four category model including the time restrictive, the reminiscers, the futurists and the time expansive (i.e., balanced) category. Thus, individuals are classified into one of these categories. To which category they belong depends

on the median scores of both the past- and the future- subscale and several further criteria. In paragraph 2.2 we will fully describe these criteria and we will explain how the scores on the BTPS have to be interpreted.

Psychometric analysis has shown that the BTPS is both valid and reliable, and also easy to use (Webster, 2011). Moreover, this scale has several advantages over the ZTPI. For example, the BTPS is much better in measuring the concept of a balanced time perspective, it has higher face validity and the reliability of its subscales are much better than those of the ZTPI (Webster, 2011). However, the BTPS also has several shortcomings. One major drawback of this scale is that it cannot measure the present time perspective. Furthermore, the BTPS was very recently developed. To our knowledge, until now, there are no studies having used this scale. Thus further research is needed to evaluate the psychometric properties of the BTPS. In particular more studies are needed concerning the creation of the four categories, because they are not yet optimally created (Webster, 2011).

To sum up, despite its disadvantages the BTPS is a good new scale to measure the construct of time perspective, especially that of the balanced time perspective.

1.3 The relation between time perspective and complete mental health

Over the years, there has been an increasing interest to investigate the relationship between time perspective and complete mental health, especially between positive mental health (well-being). However, to date, it is still relatively unclear whether it is the past, present or the future orientation that is most essential for well-being.

Some researchers have argued that focusing on the present is an important condition for well-being (Boyd-Wilson, Walkey & McClure, 2002). There have been several studies providing empirical evidence for this assumption by investigating the relation between a present time perspective and different aspects of well-being, such as general happiness, satisfaction with life, and subjective well-being (Csikszentmihalyi, 1992, as cited in Drake, et

al., 2008; Diener, Emmons, Larsen & Griffin, 1985; Kammann & Flett, 1983, as cited in Boniwell & Zimbardo, 2004). However, Boniwell (2005) has found only low levels of correlations between the present time perspective and satisfaction with life. In addition, there are many studies clearly showing that if a present orientation starts to dominate then it is associated with several negative aspects, such as anger, anxiety and depression, addiction, and engaging in risky behaviors (Keough et al., 1999; Rothspan & Read, 1996; Wills, Sandy & Yaeger, 2001, as cited in Boniwell et al., 2010; Zimbardo & Boyd, 1999; Zimbardo et al., 1997). For this reason Boniwell et al. (2010) has argued that "it is questionable, however, whether risk taking and substance abuse associated with high present scores (PH) are conducive to well-being" (p. 26).

In contrast to those researchers who have argued that a present orientation is conducive for well-being, there are other researchers highlighting that focusing on the past, exclusively on the positive past, is fundamental to well-being. It has been found that a positive past orientation is positively associated with satisfaction with life, happiness, well-being, and self-esteem (Boniwell, 2005; Bryant, Smart & King, 2005; Drake, et al., 2008; Zimbardo & Boyd, 1999). A negative past orientation, by contrast, has been found to be correlated with depression, anxiety and low self-esteem (Zimbardo & Boyd, 1999). However, given the drawbacks of an excessive positive past orientation, such as being conservative, cautions and avoiding change, it is also questionable whether a positive past orientation is essential for well-being (Boniwell, 2005).

Most research thus far, however, has emphasized that especially the future orientation is fundamental to well-being and positive functioning (Kahana & Kahana, 1983; Kazakina, 1999; Wessman & Ricks, 1996; Wills, Sandy & Yaeger, 2011; as cited in Boniwell, 2005 and Boniwell et al. 2010). For example, it has been found that a future time perspective is positively associated with virtually all aspects of well-being, meaningful life, social self-efficacy, and realism (Zaleski, Cycon, & Kurc, 2001; as cited in Boniwell, 2005). In addition

a future orientation has also been connected with less psychopathy (Wallace, 1956). However, some researchers have argued, that there are several drawbacks of an excessive future time perspective. For example, it may create workaholics with limited social connections and little time for enjoyment (Boniwell & Zimbardo, 2004). Therefore, it is also doubtful whether a future orientation is essential for well-being. Indeed, several recent studies have found no correlations between the future orientation and various aspects of well-being, such as subjective happiness, satisfaction with past, satisfaction with life, satisfaction with future, positive and negative affect (Boniwell, 2005; Drake et. al., 2008).

Finally, very recently, some researchers have suggested that it is not the past, the present or the future; rather it is the balanced time perspective that is most conducive to well-being. Indeed, even though only very few, there are several empirical studies supporting this assumption. For example, Drake et al. (2008) have found that individuals with a BTP were significantly happier and more mindful than those individuals who do not have a BTP. Boniwell et al. (2011) have also discovered that a BTP is associated with the highest levels of well-being. Very recently, Webster (2011) has found that those individuals classified as time expansive (i.e. balanced) scored significantly higher on subjective well-being than those categorized as time restrictive. However, they scored not significantly higher than those individuals classified as futurists.

If we now consider all these different previous findings, then it still remains relatively unclear which of these different temporal perspectives are most conducive to well-being. As Boniwell and Zimbardo (2004) have highlighted "it is hardly surprising that findings are inconsistent and often contradictory" (p. 174), because earlier studies have numerous shortcomings. Thus far, most previous research examining the relationship between different temporal orientations and well-being has mainly focused on one temporal frame only, namely the future. In contrast, the other time frames and also a combination of them, in particular a combination of the positive past and the positive future (defined here as a balanced time

perspective) are relatively unexplored. The few earlier empirical studies exploring a BTP have used the ZTPI to measure it. However, this scale has not been designed to do this (Webster, 2011). Another major disadvantage of previous studies is that most of them have failed to provide a complete picture of positive mental health. Many researchers have mainly focused on specific facets of well-being, rather than on the totality of this construct. For example, most studies have investigated time perspective as a correlate of emotional well-being (happiness, satisfaction with life, positive and negative affect). Psychological well-being or social well-being, by contrast, are relatively unexplored within this research area.

All in all, further research and also better measures are needed to investigate the relation of time perspective, especially a BTP, to the complete mental health model, in particular to positive mental health.

1.4 The relation between time perspective, age and complete mental health

Similar to the relationship between time perspective and well-being, until now, it is also relatively unclear whether these interactions are the same or different for people in different stages of their lifespan, more specifically, for young, middle-aged and old adults. To our knowledge there are no studies to date which have examined this topic. Most studies have mainly focused on respondents from one age group only, and that are those of the young adults, predominately students. Those few studies recruiting participants beyond the student population and with a wider age range did not have enough respondents in each age group in order to investigate whether there are developmental changes in time perspective (Drake et al., 2008). Drake et al. (2008) have highlighted that "this would be an important next step for future research" (p. 58). Because there are no studies that directly compare the relation of TP to the complete mental health construct for young, middle-aged and old adults, in this paragraph we will focus separately on those studies that have investigated the relation of TP to age and the relation of age to both, mental illness and positive mental health.

Regarding the relation between time perspective and age, some researchers have suggested that TP is not a static aspect of personality. Rather, TP will change as individuals become older. Young adults are presented as future thinkers, whereas older adults are presented as reminiscers (Fingermann & Perlmutter, 2001). However, there have been relatively few empirical studies providing evidence for these developmental changes in time perspective. In addition, those few studies which have investigated these changes have shown inconsistent findings. For instance, several researchers have found that as people grow older they experience a shortening of their temporal perspective and their temporal orientation is shifting away from the future to the past (Lang & Carstensen; 2002; Lennings, 2000; Whitbourne & Dannefer, 1986, as cited in Hamilton, Kives, Micevski & Grace, 2003). Other researchers, however, have claimed that older adults mainly have a present orientation, rather than a past orientation (Lennings, 2000, as cited in Hamilton et al., 2003; Fingerman & Perlemutter, 2001). And still others have discovered that older people focus on the past more than the present (Giambra, 1977; Thomae, 1981, as cited both in Fingerman & Perlemutter, 2001). There are also several researchers arguing that both, the past and the future time orientation will increase or decrease as people grow older (Eson & Greenfield, 1962; Kornfeld & Marshall, as cited both in Fingerman & Perlemutter, 2001). A balanced time perspective has not yet been explored in this context.

Furthermore, there are also several studies focusing on younger adults. Some researchers have highlighted that the future orientation increases as young adolescents grow older (Wessman & Gorman, 1977, as cited in Mello & Worrell, 2006). In addition, there are also a few studies which directly compare different age groups with regard to different time perspectives. For example Fingermann & Perlmutter (2001) have found that old adults are just as future oriented as young adults. Only very little age differences have been discovered in the more distant future -this year, next year, 10 years from now- these are periods about which especially young adults do not think so often.

In summary, the very few previous studies investigating the relation between different temporal orientations and age have mainly focused on one age group and one temporal perspective only. In addition, they have failed to provide consistent empirical findings. Thus, up to now, it is still relatively unclear whether and how time perspective is related to age.

Regarding the relation of age to both continua of the complete mental health model several researchers found that old adults are somewhat less mentally ill than younger adults (Bijl, Ravelli & van Zessen, 1998; Kessler, Mickelson, Walters, Zhao & Hamilton, 2004; Westerhof, under review; Westerhof & Keyes, 2010), but that positive mental health does not differ much for people in different stages of their lifespan (Westerhof & Keyes, 2010). The findings for positive mental health generally also apply to the three components emotional, psychological and social well-being (Westerhof & Keyes, 2010). However, there are some studies that have shown that there are little age differences in the three core elements of positive mental health. Studies investigating the relation between emotional well-being and age, have found few age differences with regard to positive affect being somewhat lower in older than younger adults (Diener & Suh, 1998). Studies on psychological well-being, by contrast, have found that older adults experience somewhat less growth and meaning in life, but more autonomy and environmental mastery than their younger counterparts (Ryff & Keyes, 1995). In addition, researches on the relation between social well-being and age have found that older adults report more social acceptation and integration, but less social coherence and contribution when compared to younger adults (Keyes, 1998; Keyes & Shapiro, 2004). Those few studies directly comparing the relation of age to all the three core elements of positive mental health have found that older adults experience more emotional, similar social and somewhat lower psychological well-being than younger adults (Westerhof, under review; Westerhof & Keyes, 2010). However, most studies to date have found only few age differences in positive mental health. They have concluded that positive mental health does not differ much for people in different stages of their lifespan.

To sum up, there have been several studies investigating the relation between time perspective and age, and the relation between age, mental illness and positive mental health, but no studies to date have investigated age differences with regard to the relation of time perspective to both continua of the complete mental health model.

1.5 The present study

As mentioned in paragraph 1.2, recently, more and more researchers try to understand whether and how time perspective, especially a balanced time perspective, is related to positive mental health. However, despite the supposed powerful influence of TP on a wide range of behaviors and optimal functioning, most studies to date have failed to provide consistent empirical evidence for these assumptions. In addition, although it has been suggested that TP is not a static aspect of personality but rather changes as individuals' age, there are also relatively few empirical studies that provide evidence for this assumption. Particularly, until now, there a no studies examining the relation of TP to both positive mental health (i.e., emotional, psychological and social well-being) and psychological distress among young, middle-aged and old adults.

To sum up, there are a lot of unanswered questions with regard to the relation of time perspective to the complete construct of mental health. In addition, it is also relatively unclear whether these interactions are the same or different for young, middle-aged and old adults. Thus, the main goals of this exploratory study are first to shed more light on the relation between TP, especially a balanced time perspective, and the complete mental health model, and secondly to shed more light on potential age differences with regard to these interactions. In addition, we try to overcome the major disadvantages of previous studies. Therefore, we will use much better measures for both a balanced time perspective and positive mental health (well-being). Furthermore, whereas earlier studies included samples of young adults, predominantly students, our study also includes respondents beyond the student population

with a wider age range (17-92 years). In addition to the main objectives of the present study, this study also aims to further confirm the two continua model of positive mental health and mental illness. It also tries to provide additional support to the distinctiveness of the three different aspects of well-being (i.e., emotional, psychological and social well-being).

Thus, we first examine the relation of age to time perspective, psychological distress, overall levels of positive mental health, and to emotional, psychological and social well-being. Second, we investigate the relation between TP, psychological distress, overall positive mental health, and emotional, psychological and social well-being. Third, we examine the relation of time perspective and age to the complete mental health construct. Finally, we examine whether TP is differently related to psychological distress and positive mental health, and whether time perspective is differently related to emotional, psychological and social well-being.

To our knowledge this is the first study of it's kind. No studies to date have been carried out to investigate these correlations for the three core elements of positive mental health (i.e., emotional, psychological and social well-being). Furthermore, this is one of the first studies that directly compares the relation of TP to both positive mental health and psychological distress. And, finally, it is the first study examining these interactions for different age groups. In the following paragraph, we will define our research questions. Due to the exploratory nature of this study, we do not propose specific hypotheses.

Research questions

In the present study, one main research question and three sub-questions have been formulated. Our main research question is:

"What is the relation between time perspective, positive mental health and psychological distress among young, middle-aged and old adults?"

To be able to answer this question, the following sub-questions are established:

1. Are there differences in the time perspective, positive mental health and psychological distress among young, middle-aged and old adults?

2. What is the relation between time perspective, positive mental health and psychological distress and are the two continua of the complete mental health construct differently related to time perspective?

3. Are there differences in the relation between time perspective, positive mental health and psychological distress among young, middle-aged and old adults?

2. Methods

2.1 Procedure and participants

This exploratory study draws on data that were collected by first-year psychology students at the University of Twente. The students themselves have filled out a battery of questionnaires including measures of positive mental health, psychological distress, time perspective and demographic information. In addition, the students have conducted these questionnaires at one of their family members (parents, grandparents, etc.) or one of their acquaintances (friends, neighbours, etc.). Finally, a total of 512 (women = 326; men = 186) respondents have filled out the questionnaires.

In the present study, these participants were divided into three age groups: young adults between the age of 17 and 29 years (N = 175, mean age = 20.9), middle-aged adults from 30 to 60 years (N = 189, mean age = 50.0), and old adults above 60 years (N = 148, mean age = 72.1). Main demographics of the respondents stratified by age groups are presented in Table 1. The mean age of the total sample was 46.5 years (age range: 17-92 years, SD = 21.4). In all three age groups women were represented more than men (young adults: 62.9% women, middle-aged adults: 73.0% women, old adults: 52.7% women). Three-quarters of the young adults went to school or had studied (77.1%), whereas the majority of the middle-aged adults had a paid employment (83.6%) and most of the old adults were retired (73.0%). Almost all of the young adults (99.5%) and three-quarters of the middle-aged adults (80%) finished secondary and higher education, whereas half of the old adults (52.7%) reported lower education as their highest level of education. The majority of the young adults were unmarried (98.3%), whereas 85.2% of the middle-aged and 60.0% of the old adults were married. Subjective health was good within the age groups (young adults: M = 9.1, middle-aged adults: M = 8.7, and old adults: M = 8.1). The majority of the young (88.0%) and middle- aged adults (70.4%) reported to have 'none' health limitations, whereas 45.9 % of the old adults reported to have 'slight' health limitations.

2.2 Instruments

This study concerns variables measured in the sections of demographic information, time perspective, positive mental health and psychological distress. In the following paragraph we will describe the used questionnaires and explain how their scores have to be interpreted.

Demographic variables

Several questions were asked about age, gender, educational level, employment status, marital status, living circumstances, subjective health and health limitations.

Positive mental health

Respondents' positive mental health was assessed using the Dutch version of the Mental Health Continuum Short Form (MHC-SF; Keyes et al., 2008; Lamers et al., 2011). The MHC-SF is a 14-item self-report questionnaire that measures the three core elements of positive mental health, namely emotional (three items), psychological (six items) and social well-being (five items). The respondents answer on a 6-point Likert scale, where 1 = never and 6 = every day, to questions such as, "In the past month, how often do you feel happy?" (emotional well-being), "In the past month, how often do you feel that your life has a sense of direction and meaning to you?" (psychological well-being), and "In the past month, how often do you feel that you're a part of a community?" (social well-being). We computed mean scores for each of the three core elements and overall positive mental health, with higher scores indicating more feelings of emotional well-being, psychological well-being, social well-being and overall positive mental health. The Dutch version of the MHC-SF is a good, brief questionnaire for measuring positive mental health. It has shown good convergent and discriminaty validity and the subscales have a good internal reliability (Lamers et al., 2011). In the present study, Cronbach's alpha was .85 for emotional well-being, .75 for social well-being, .83 for psychological well-being, and .87 for overall positive mental health.

Psychological distress

Psychological distress was measured with a Dutch translation of the 12-item General Health Questionnaire (GHQ-12; Goldeberg & Williams, 1988; Koeter & Ormel, 1991). The GHQ-12 is a self-report instrument that assesses the severity of psychological distress experienced by an individual within the last few weeks. The 12-item GHQ consists of six positively as well as six negatively keyed items. The respondents answer on a 4-point Likert scale, where 1 = more than usual and 4 = less than usual (positive items), and 1 = not at all and 4 = much more than usual (negative items), to questions such as, "Have you recently been able to concentrate on whatever you are doing", "Have you recently been able to enjoy your normal day to day activities", "Have you recently lost much sleep over worry", and "Have you recently felt constantly under strain". We computed the mean total score with higher scores indicating more psychological distress. The Dutch translation of the GHQ-12 has shown good psychometric properties (Koeter & Ormel, 1991). It is a widely used instrument because of its brevity and ease of administration. In the present study, the reliability of the total scale was .87 (Cronbach's alpha).

Time perspective

As described previously, respondents' temporal perspective was assessed using the Dutch translation of the recently developed Balanced Time Perspective Scale (BTPS; Webster, 2011). The BTPS is a 28-item self-report questionnaire that contains a past-subscale (14 items) and a future-subscale (14 items) and measures individuals' thoughts and feelings towards their past and their future. The respondents answer on a 6-point Likert scale, where 1 = totally disagree and 6 = totally agree, to statements such as, "Reviewing events from my past helps give my life meaning", "Reflecting on earlier triumphs helps me identify personal strength", "I look forward to my future", and "I enjoy thinking about where I'll be a few years from now". The BTPS has shown good psychometric properties. This scale is reliable, valid

and also easy to administer (Webster, 2011). The Dutch version of the BTPS, however, has not yet been validated. Using exploratory factor analysis we analyzed whether the scale was empirically made up of two scales (factors), the future and the past. The factor analysis indicated three factors with an eigenvalue greater than 1. However, when looking at the scree plot and the factor loadings, we found that a two-factor solution rather than a three-factor solution might be preferable. We found that all future items load on factor 1 and that all past items load on factor 2. Factor loadings (rotated) were all high for factor 1 and somewhat lower for factor 2. Mean loadings for factor 1 was 0.78 (range = 0.68-0.86) and mean loadings for factor 2 was 0.66 (range = 0.44-0.77). Both factors together explained 57.16% of the variance, whereas factor 1 explained 40.72% and factor 2 16.45% of the overall variance. The internal reliability (Cronbach's alpha) for the two subscales in the present study was .95 for the future-subscale and .82 for the past-subscale.

Similar to Webster (2011), we also created a four category model including the time restrictive, the reminiscers, the futurists and the time expansive (i.e., balanced) category by crossing both the past- and the future-subscale and performing a median split of each. Thus, we first computed mean scores for the past- and the future-subscale, with higher scores indicating the items are more characteristic of the respondents and then we computed the total median scores of the past- and the future-subscale. After that we classified our respondents into one of the four categories using following criteria (as described by Webster, 2011): (1) Respondents scoring below the median on both the past- and the future-subscale belonging to the time restrictive category, (2) Respondents scoring above the median on the past-subscale but below the median on the future-subscale belonging to the reminiscers category; (3) Respondents scoring below the median on the past-subscale but above the median on the future-subscale belonging to the futurist category, and (4) Respondents scoring above the median on both the past- and the future-subscale belonging to the time expansive category (i.e., balanced).

2.3 Data analysis

We analyzed our data by using the Statistical Package for the Social Science (SPSS; version 18.0). First, with a frequency analysis on each study variable we checked the data for errors and missing values. There are complete data on all variables for 512 respondents and no errors and missing values are found. After that, a reliability test for all scales and subscales was performed to determine Cronbach's alpha and to test whether the scales were reliable. In addition, a factor analysis was done to analyze the underlying structure of the Dutch version of the BTPS. All scales and subscales are found to have good reliability. Cronbach's alpha and the results of the factor analysis are presented in paragraph 2.2. Then, with a Kolmogorov-Smirnov test we checked whether our tested variables had a normal distribution. The test was carried out for all age groups and TP categories apart. The results revealed that nearly all variables are not normally distributed for all age groups ($p < .05$), with the exception of the young adults' scores on overall positive mental health ($p > .05$). For TP categories, we also found that most of the tested variables are not normally distributed ($p < .05$), with the exceptions of the time restrictive and futurists scores on overall positive mental health ($p > .05$), the reminiscers' and futurists' scores on psychological well-being ($p > .05$) and the futurists' scores on social well-being. Furthermore, with Levene's tests for homogeneity of variance we analyzed whether the variance on all tested variables was equal across the three age groups and the four TP categories. Levene's tests are found to be significant for psychological distress ($F(2, 509) = 10.67$, $p < 0.05$), emotional well-being ($F(2, 509) = 5.18$, $p < .05$) and psychological well-being ($F(2, 509) = 3.84$, $p < .05$) indicating that the variance across the three age groups is not equal on these variables. For the TP categories, Levene's tests are significant for overall positive mental health ($F(3, 508) = 4.39$, $p < .05$), emotional ($F(3, 508) = 9.92$, $p < .05$) and psychological well-being ($F(3, 508) = 5.84$, $p < .05$), indicating that the variance across the four TP categories is not equal on these variables. Finally, we finished our preliminary analysis by performing a frequency and descriptive

analysis to get an overview of the demographic variables of the respondents and to show how they have scored on the questionnaires. Demographic information of the respondents were described in paragraph 2.1 and presented in Table 1. The performance of the respondents on the questionnaires were described in paragraph 3 and displayed in Table 2.

To examine our first research question, we first performed one-way analyses of variance (ANOVAs) with age groups as independent variable to determine whether there were significant differences in psychological distress, overall positive mental health, emotional, psychological and social well-being among young, middle-aged and old adults. Because the assumptions of normality and equality of variance are violated, we also performed the Welch's F tests, a more robust test for equality of means, and the nonparametric Kruskal-Wallis tests, a test that does not assume normality nor homogeneity of variance, to confirm the findings obtained via ANOVA. In addition, effect sizes (η^2) were calculated to examine the magnitude of the differences. Following Cohen (1992) effect sizes of .10, .30 and .50 were considered as small, medium and large, respectively. We then used Games-Howell post-hoc tests to assess which age groups were significantly different. This post-hoc test was chosen because it can be used in circumstances where the assumptions of normality and homogeneity of variance are violated and *N* varies between groups. To examine the second part of our first research question on the relationship between age and time perspective, we carried out a Chi-Square test to determine whether there were differences in time perspective between young, middle-aged and old adults. We also calculated the effect size to examine the magnitude (strength) of such differences.

To investigate our second research question, we also carried out one-way analyses of variance (ANOVAs) with time perspective as independent variable, to determine whether there were significant differences in psychological distress, overall positive mental health, emotional, psychological and social well-being across the four time perspective categories. In this case the assumptions of normality and homogeneity of variance are also violated.

Therefore we carried out the Welch's F tests and the Kruskal-Wallis tests to confirm the findings obtained via ANOVA. The effect sizes (η^2) were calculated and with Games-Howell post hoc tests we determined which TP categories were significantly different. To investigate the second part of our second research question, we carried out a repeated measures ANOVA with psychological distress and the three core elements of positive mental health as levels of a within subjects factor to determine whether time perspective was differently related to psychological distress, overall positive mental health, emotional, psychological and social well-being. The scores on the GHQ were reversed in this analysis so that they indicated less psychological distress and carried a similar meaning to the scores of the positive mental health scales. A Helmert post-hoc analysis was used to make comparison between the four repeated measures. We compared the relation of time perspective to (1) psychological distress versus overall positive mental health (i.e. emotional, psychological and social well-being), (2) emotional (hedonic) well-being versus psychological and social (eudaimonic) well-being, and (3) psychological versus social well-being.

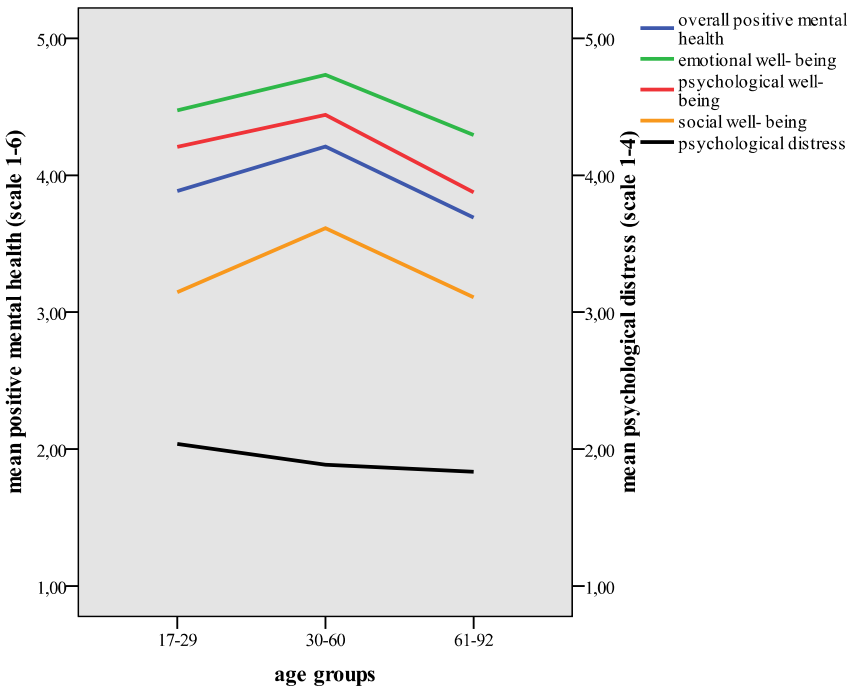
To examine our third research question we carried out a multivariate analysis of variance (MANOVA), with time perspective and age groups as the two independent variables, to determine whether there were differences in the relation of time perspective to psychological distress, overall positive mental health, and to emotional, psychological and social well-being between young, middle-aged and old adults. In other words, we analyzed whether there was an interaction effect of time perspective and age on psychological distress, overall positive mental health, and on emotional, psychological and social well-being. Where significant differences were found post-hoc tests were used to determine which interactions (groups) were significantly different.

We used an alpha level of .05 for all statistical tests.

3. Results

We were first interested in whether there are differences in psychological distress, overall positive mental health, emotional, psychological and social well-being between young, middle-aged and old adults. Table 2 and Figure 1 present our findings. It can clearly be seen that middle-aged adults had higher scores on all positive mental health measures than both young and old adults. Young adults, by contrast, scored higher on psychological distress than both of their older counterparts. In addition, young and old adults had nearly similar scores on all aspects of positive mental health, apart from psychological well-being, where old adults scored somewhat lower than young adults. It is also interesting that all age groups had the highest scores on emotional well-being, followed by psychological well-being and lowest on social well-being. Furthermore, all the three age groups had rather moderate psychological distress levels.

Figure 1. Mean levels psychological distress and positive mental health by age groups



The one-way analyses of variance (ANOVAs) provide statistical evidence for the age-differences found in both continua of the complete mental health model (see Table 2, fifth

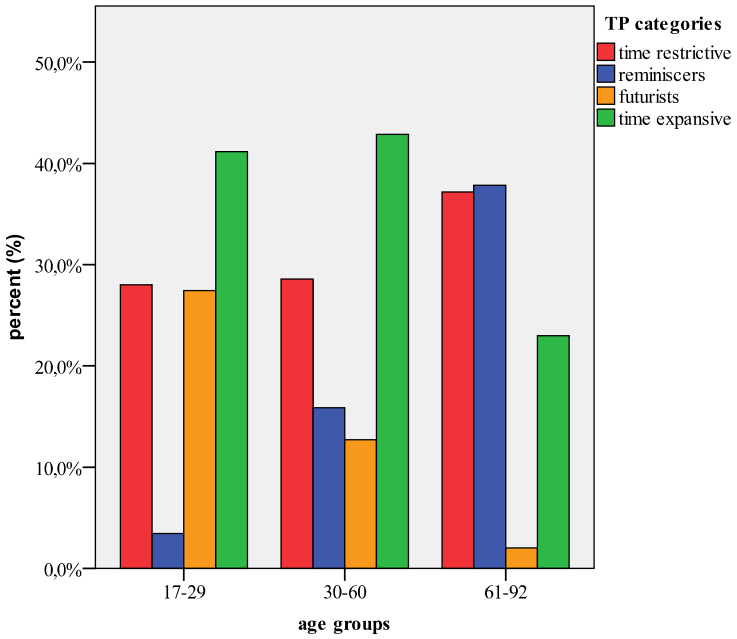
column of results). The Welch's F tests and the nonparametric Kruskal-Wallis tests confirm the findings obtained via ANOVA. Thus, although the assumptions of normality and homogeneity of variance were violated (see paragraph 2.3) the highly significant Welch's F and Kruskal-Wallis results indicate that our findings are robust. When looking at the Games-Howell post-hoc tests (see Table 2, sixth column of results), we can see that middle-aged adults had significantly higher scores on overall positive mental health and on emotional, psychological and social well-being than both young and old adults. In addition, young adults scored significantly higher on psychological well-being than old adults. And, they also scored significantly higher on psychological distress than both middle-aged and old adults. Regarding the effect sizes (η^2), we can say that age explains 4% of the variability in psychological distress scores ($\eta^2 = .04$), 6% of the variability in overall positive mental health scores ($\eta^2 = .06$), 3% of the variability in emotional well-being scores ($\eta^2 = .03$), 6% of the variability in psychological well-being scores ($\eta^2 = .06$) and 5% of the variability in social well-being scores ($\eta^2 = .05$). Following Cohen (1992), the effect sizes indicate that age had a small effect on psychological distress and all positive mental health measures.

If we summarize these results then is the answer to the first part of our first research question "yes" there are significant differences in psychological distress, overall positive mental health, emotional, psychological and social well-being between young, middle-aged and old adults. Middle-aged adults scored highest on all aspects of positive mental health, young adults scored highest on psychological distress, and old adults scored lowest on psychological well-being.

We were then interested in whether there are differences in time perspective between young, middle-aged and old adults (second part of our first research question). Table 3 and Figure 2 display the frequencies (counts and percentages) of each TP category stratified by age groups. It can clearly be seen that most of the young and middle-aged adults were categorized as time expansive (i.e., balanced), whereas most of the old adults were classified

as reminiscers and time restrictive. In addition, young adults were more often assigned as futurists but less often as reminiscers than both middle-aged and old adults. It is also interesting that old adults were somewhat more often categorized as time restrictive but somewhat less often as futurists and time expansive than both of their younger counterparts.

Figure 2. Time perspective categories by age groups



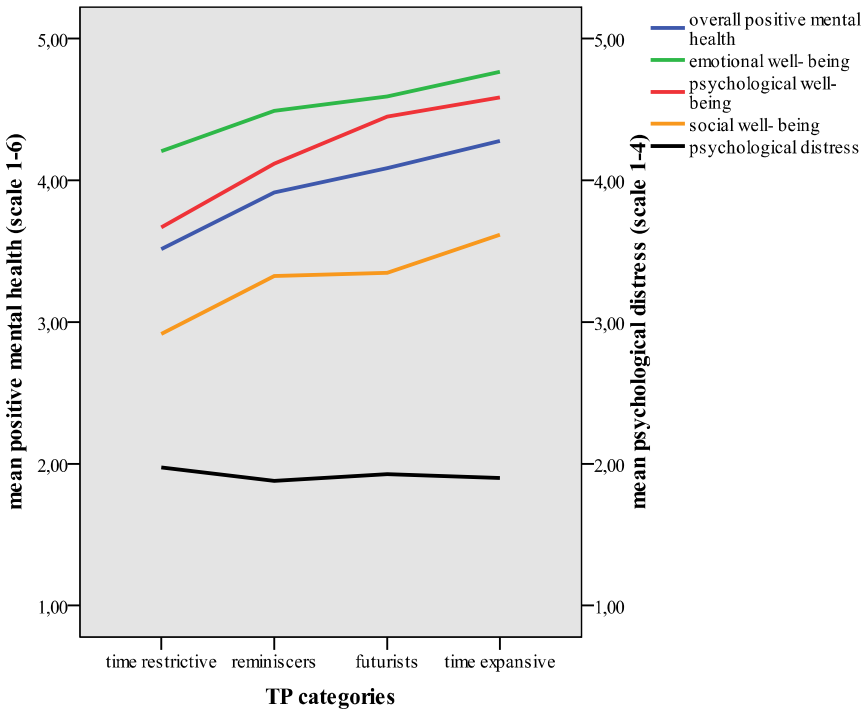
The Chi-Square test provides statistical evidence for the age-differences found in time perspective (X^2 (6, N = 512) = 102.90, p < .05). When looking at the effect size (Cramér's V = .32) we can say that age had a medium effect on time perspective.

Summing up these results then is the answer to the second part of our first research question "yes" there are significant differences in time perspective between young, middle-aged and old adults. Young adults were more often classified as futurists and less often as reminiscers. Middle-aged adults were more often categorized as time expansive (i.e. balanced) and old adults more often as both reminiscers and time restrictive but less often as futurists and time expansive.

To investigate our second research question, we first examined the relation of time perspective to psychological distress, overall positive mental health, and to emotional,

psychological and social well-being. Table 4 and Figure 3 present our results. It can clearly be seen that the time expansive category (i.e., balanced) had the highest and the time restrictive category the lowest scores on all positive mental health measures (i.e., emotional, psychological and social well-being). In addition, all the four TP categories scored nearly similar on psychological distress. It can also be seen that the futurists scored higher on all aspects of positive mental health than the time restrictive and they also scored higher on psychological well-being than the reminiscers. The reminiscers, by contrast, scored also higher on nearly all positive mental health measures than the time restrictive.

Figure 3. Mean levels psychological distress and positive mental health by TP categories



The one-way analyses of variance (ANOVAs) provide statistical evidence for the time perspective differences in overall positive mental health, and in emotional, psychological and social well-being (see Table 4, fifth column of results). No significant time perspective differences were found in psychological distress. The Welch's F tests and the nonparametric Kruskal-Wallis tests confirm the findings obtained via ANOVA. As described above, these results in turn indicate that our findings are robust. When looking at the Games-Howell post-

hoc tests (see Table 4, sixth column of results) we can see that the time expansive category scored only significantly higher on all positive mental health measures than the time restrictive category, and on overall positive mental health and on psychological well-being than the reminiscers category. They scored however not significantly higher on all aspects of positive mental health than the futurist category, and they scored not significantly higher on emotional and social well-being than the reminiscers category. The futurists in turn also scored significantly higher on all positive mental health measures than the time restrictive, and on psychological well-being than the reminiscers. Finally, the reminiscers category had significantly higher scores on overall positive mental health, psychological and social well-being than the time restrictive category. Regarding the effect sizes (η^2) we can say that TP explains 14% of the variability in overall positive mental health scores ($\eta^2 = 0.14$), 6% of the variability in emotional well-being scores ($\eta^2 = 0.06$), 16 % of the variability in psychological well-being scores ($\eta^2 = 0.16$) and 8% of the variability in social well-being scores ($\eta^2 = 0.08$). Following Cohen (1992), the effect sizes indicate that time perspective had a small to medium effect on emotional and social well-being and a medium effect on overall positive mental health and psychological well-being.

If we summarize these results then is the answer to the first part of our second research question "yes" there is a significant relation between time perspective, overall positive mental health and emotional, psychological and social well-being, and "no" there is no relation between TP and psychological distress. The time expansive category (i.e., balanced) had the highest and the time restrictive category the lowest scores on all positive mental health measures. However, in terms of statistical significance the time expansive category scored only significantly higher on all aspects of positive mental health than the time restrictive category.

We were then interested in whether time perspective was differently related to psychological distress, overall positive mental health, and to emotional, psychological and

social well-being (second part of our second research question). It can be seen in Table 4 that, compared to the time restrictive category, the time expansive and the futurists category are related to more emotional, psychological and social well-being, but all unrelated to psychological distress. Moreover, compared to the reminiscers category, the time expansive and the futurist category are related to more psychological well-being, but unrelated to psychological distress, emotional and social well-being. Compared to the time restrictive category, the reminiscers category is related to more psychological and social (eudaimonic) well-being but unrelated to psychological distress and emotional (hedonic) well-being.

Two of the three Helmert contrasts are significant ($p < .05$). They are significant for the comparison between psychological distress and positive mental health ($p < .05$), and for the comparison between psychological and social well-being ($p < .05$). For the comparison between hedonic (emotional) and eudaimonic (psychological and social) well-being, the Helmert contrast is slightly not significant ($p = 0.057$).

Therefore, the answer to the second part of our second research question is "yes" time perspective is differently related to psychological distress, overall positive mental health, and to emotional, psychological and social well-being. The relation of TP to psychological distress differs from that to positive mental health and the relation of TP to psychological well-being differs from that to social well-being. We can also carefully say that the relation of time perspective to hedonic (emotional) differs from that to eudaimonic (psychological and social) well-being.

Finally, we were interested in whether there are differences in the relation between time perspective, psychological distress, overall positive mental health, and emotional, psychological and social well-being among young, middle-aged and old adults. In other words, we were interested in whether there was an interaction effect of TP and age on psychological distress and positive mental health. Table 5 presents our findings. It can be seen that all age by time perspective membership interactions had nearly similar scores on

psychological distress as well as on all aspects of positive mental health. When looking at the multivariate analysis of variance (MANOVA) we can see once again that there was no significant interaction between age and time perspective membership ($F(24, 2000.00) = 0.95$; $p = 0.54$).

Therefore, the answer to our third research question is "no" there are no significant differences in the relation between TP, psychological distress, overall positive mental health, and emotional, psychological and social well-being among young, middle-aged and old adults.

4. Discussion

4.1 Main findings

The present study was the first attempt to investigate the relation between time perspective psychological distress, overall levels of positive mental health, emotional, psychological and social well-being among young, middle-aged and old adults. Moreover, the relation between age, TP and both continua of the complete mental health model was examined. In addition, the relation of time perspective to psychological distress, overall positive mental health, and to the three different aspects of well-being was analyzed. Finally, we also investigated whether TP was differently related to psychological distress and overall positive mental health, to emotional, psychological and social well-being, and to hedonic (emotional) and eudaimonic (psychological and social) well-being.

The three most important findings are:

(1) That there is a significant relation between age, both continua of the complete mental health model and time perspective. Young adults experienced more psychological distress, focused more on their positive future (futurists) but less on their positive past (reminiscers). Middle-aged adults experienced more positive mental health feelings and focused more on both their positive past and future (i.e., balanced), and old adults experienced less psychological well-being, focused more on their positive past and on both their negative past and future (time restrictive) but less on their positive future.

(2) That there is a significant relation of time perspective to positive mental health but not to psychological distress, and that TP is differently related to both continua of complete mental health and to the three core elements of positive mental health. The time expansive category (i.e., balanced) had the highest and the time restrictive category the lowest scores on all positive mental health measures (i.e., emotional, psychological and social well-being). However, in terms of statistical significance, the time expansive category scored only significantly higher on all aspects of positive mental health than the time restrictive category

and on overall positive mental health and psychological well-being than the reminiscers category. They scored however not significantly higher on all positive mental health measures than the futurist category.

Compared to the time restrictive category, the time expansive and the futurist category are related to more emotional, psychological and social well-being, but all unrelated to psychological distress. Moreover, compared to the reminiscers category, the time expansive and the futurist category are related to more psychological well-being, but unrelated to psychological distress, emotional and social well-being. Compared to the time restrictive category, the reminiscers category is related to more psychological and social (eudaimonic) well-being but unrelated to psychological distress and emotional (hedonic) well-being.

(3) That there is no interaction effect of time perspective and age on psychological distress and positive mental health.

Taken together, our findings indicate that TP and age, separately, are both, more or less, important correlates of positive mental health. Moreover, age is also a correlate of psychological distress and TP. In addition, our findings provide further support for the two continua model of mental health and mental illness. They also underline the distinctness in psychological and social well-being since some of the TP categories are differently related to these two aspects of well-being. The distinctness in hedonic (emotional) and eudaimonic (psychological and social) well-being was found to be just not significant. However, given the fact that the reminiscers category and the time restrictive category are related to both psychological and social well-being but not to emotional well-being, we can carefully say that hedonic and eudaimonic well-being are distinct from each other. Thus, similar to earlier studies as mentioned in the introduction, our findings also show that it is important to distinguish among the different aspects of positive mental health. Finally, our results provide also (partially) support for the construct of a balanced time perspective as one of the temporal orientation being most conducive for well-being.

In the following, we will first interpret our findings with regard to the results of previous studies investigating the relation of age, time perspective, positive mental health and psychological distress. However, since there are only few comparable studies in this research area, we can only relate our findings to these few investigations.

Regarding the relation of age to psychological distress, we found that young adults experienced more psychological distress than both of their older counterparts. This finding matches the results from earlier studies as mentioned in the introduction.

With regard to the relation of age to positive mental health, most of the previous studies have revealed that positive mental health levels do not differ much for people in different stages of their lifespan. However, studies from Westerhof (under review), and Westerhof and Keyes (2010) have clearly shown that there are age-differences in positive mental health even though these differences are relatively small. In the present study, we have also found little age-differences in positive mental health. We found for example that middle-aged adults experienced more emotional, psychological and social well-being than both young and old adults, and that young adults experienced similar emotional and social well-being, but slightly more psychological well-being than old adults. However, compared to the studies of Westerhof (under review), and Westerhof and Keyes (2010), our results are somewhat different. Both of them have discovered that young adults experienced not only more psychological and similar social but also less emotional well-being than old adults. Moreover, Westerhof and Keyes (2010) have not found that middle-aged adults experienced more positive mental health feelings than both young and old adults. Our somewhat different findings might be due to the fact that our sample, more specifically our age groups, varies from that of Westerhof (under review) and Westerhof and Keyes (2010). Differences in the samples might be the result of different procedures used to create a sample. In our study, most of the young respondents were recruited from the first year psychology class at the University of Twente. These students in turn have asked one of their family members or one of their

acquaintances to participate in the present study. Thus, most of our middle-aged and old respondents were parents, grandparents or friends of our young participants. Our non-random opportunistic and snowball sampling procedures might now have led to an overrepresentation of young psychology students, women, high educated, employed and relatively healthy respondents. Westerhof (under review) and Westerhof and Keyes (2010), by contrast, have used data of the LISS-panel consisting of individuals from 5,000 households in the Netherlands. The respondents of the LISS-panel were recruited via post, telephone or face-to face using a simple random sampling procedure. In comparison to our study, this sampling procedure might have led to a sample comprising individuals with more diverse sociodemographic characteristics, such as more men, more low educated and young adults beyond the (psychology) student population. These differences in the samples might now have resulted in different outcomes.

Even though we have found a relation of age to both continua of the complete mental health model, it should be mentioned that age explained only few of the variance in psychological distress and positive mental health. As discussed in the introduction, this is known from previous studies as well.

Regarding the relation between age and time perspective, we found that young adults focused more on their positive future (futurists) but less on their positive past (reminiscers) than both of their older counterparts. Old adults, by contrast, focused more on their positive past and on both, their negative past and future (time restrictive), but less on their positive future. Although a comparison with earlier studies seems rather difficult in this context since those few studies investigating the relation between age and TP have used different instrument for measuring the construct of TP and have shown rather inconsistent findings, we can, however, say that our results generally match the findings of most of the previous studies as mentioned in the introduction. Furthermore, our study added to the existing knowledge that we can also look for age-differences in a balanced time perspective. No studies to date have

investigated this interaction. We found that old adults were less often engaged in positive thoughts and feelings about both their past and their future (i.e., balanced) than young and middle-aged adults. A possible explanation for this might be that old adults are in the final stage of their life in which they are often confronted with several negative themes, such as death, diseases, fear and loneliness. Young and middle-aged adults, however, still have much more future, especially more positive future in front of them. Thoughts of death and disease seem to be far away. In these stages of life, positive themes, such as family, carrier, self-realization and enjoyment play a much greater role. Thus, given the often negative aspects of the final period of one's life, it seems rather not surprisingly that old adults are less often engaged in positive thoughts and feelings about their future. And, since it is not possible to achieve a balanced time perspective without a positive attitude towards the future, it seems also not surprising that old adults are less often categorized as time expansive (i.e., balanced).

Regarding the relation of time perspective to psychological distress, we found that none of the four TP categories were related to psychological distress. Even though a comparison with previous studies seems also difficult in this context since we have used completely different measures for both TP and mental illness, we can, however, say that these findings do not match the results of earlier studies. As discussed in the introduction, Wallace (1956) has found that a future orientation is connected with less psychopathy. Furthermore, Zimbardo and Boyd (1999) have discovered that a negative past orientation is correlated with depression, anxiety and low self-esteem. A balanced time perspective has not yet been explored in this context. The fact that we have not found a connection between TP and psychological distress might be due to our samples. As mentioned above, most of our participants were relatively high educated, employed, followed a (psychology) study or went to school, had a good subjective health and only few health limitations. They also experienced rather moderate psychological distress levels. The sample of Wallace (1956), by contrast, comprises several respondents with various physical diseases, such as arm and leg fractures,

hernia and nephritis, and in addition, several respondents diagnosed with schizophrenia. Accordingly, these participants experienced more physical and mental illness complaints than our participants. Furthermore, compared to the study of Zimbardo and Boyd (1999), we have not only examined the relation between time perspective and psychological distress among young psychology students but also among middle-aged and old adults. The fact that we have not found a relation between these variables, not even among the young psychology students, might be related to cultural differences. Our study was carried out in the Netherland, whereas the study of Zimbardo and Boyd (1999) was conducted in America. To sum up, differences in the samples, more specifically differences in the mental illness levels and/or cultural backgrounds, might now have led to different outcomes.

With regard to the relation of time perspective to positive mental health, we found that the time expansive category (i.e. balanced) had the highest and the time restrictive category the lowest scores on all positive mental health measures. In terms of statistical significance, we can, however, say that the time expansive category scored only significantly higher on positive mental health than the time restrictive category. In addition, we found no significant differences in positive mental health between the time expansive and the futurist category. These findings are known from the study of Webster (2011), which is currently the only study that has also used the BTPS as well. However, in comparison to this study, we also found that the time expansive and the futurist category scored significantly higher on psychological well-being than the reminiscers category. Furthermore, we found that the reminiscers category scored significantly higher on overall positive mental health, psychological and social well-being than the time restrictive category. Our different results could be due to the fact that we have not only investigated the relation of time perspective to emotional well-being, but also to psychological and social well-being.

Compared to other previous studies that have not used the BTPS for measuring the construct of TP, we can also say that our findings are somewhat different. As mentioned in

the introduction, some researchers have found that the future time perspective is not related to various aspects of well-being. However, we have found that the futurist category is related to different aspects of positive mental health. These lacking correlations found in earlier investigations might be due to the measures used for positive mental health. Boniwell et al. (2010) have used several different measures for nearly all three aspects of positive mental health. Drake et al. (2008), by contrast, have used only one measure for positive mental health, namely the Subjective Happiness Scale, an instrument that measures emotional well-being but not psychological and social well-being. However, none of these studies have used the MHC-SF, an instrument that measures emotional, psychological and social well-being. In addition, previous studies also found that individuals with a balanced time perspective had significantly higher well-being levels than those with other temporal orientations. As mentioned above, our study provides only partially evidence for these findings since in terms of statistical significance the time expansive category scored only significantly higher on all positive mental health measures than the time restrictive category and on psychological well-being than the reminiscers category. They scored however not significantly higher on all aspects of positive mental health than the futurist category, and they scored also not significantly higher on emotional and social well-being than the reminiscers category. Our somewhat different findings might be due to the different instruments used for both positive mental health and TP, especially for a balanced time perspective. It might also be due to the different samples examined in previous studies. Compared to our study, Boniwell et al. (2010) and Drake et al. (2008) have not only used different measures for positive mental health (as described above), they have also used a different measure for time perspective, namely the ZTPI. In our study, by contrast, we have used the BTPS, an instrument that has been developed very recently in order to better measure the balanced time perspective. The differences in the samples could be seen in the median age, numbers of respondents in different age groups or in different sociodemographic backgrounds. For example, Boniwell

and Zimbardo (2010) have recruited only respondents from the student population with a median age of 24 and 22 years. Moreover, Drake et al. (2008), even though they have recruited participants beyond the student population and with a wider age range, nevertheless don't have sufficient numbers of respondents in each age category. In our study, by contrast, we have sufficient numbers of participants in each age group and sufficient numbers of respondents beyond the student population with a higher median age.

Regarding the relation between time perspective and positive mental health, it should also be mentioned that we have found that, compared to age, as described above, time perspective explained somewhat more but still relatively few of the variance in positive mental health. However, until now, there are no studies that have dealt with this topic. Further research might be necessary to clarify this.

Our study, now, added to the existing knowledge first that we could also look for a possible interaction effect of age and time perspective on psychological distress as well as on positive mental health. However, we have found that there is no interaction effect of these two variables. An important question remains how the age and time perspective differences can be explained. One might think for example of gender or other sociodemographic variables, personality or life events. Future research might be important to look for other explanations of the individual differences in both psychological distress and positive mental health.

Finally, our study added to the existing knowledge that we could also compare the ways in which TP is related to psychological distress and different aspects of positive mental health. We found for example that, compared to the time restrictive category, the time expansive and the futurist category are related to more emotional, psychological and social well-being but they are all unrelated to psychological distress. A possible explanation for this might be that negative thoughts and feelings about one's past and future (time restrictive) might not be related to emotional regulation (emotional well-being) and it does not promote individual (psychological well-being) as well as social (social well-being) fulfillment. We also found

that, compared to the reminiscers category, the time expansive and the futurist category are related to more psychological well-being, but they are unrelated to psychological distress, emotional and social well-being. This might be explained by the fact that thoughts and feelings about one's positive past (reminiscers) might not be related to individual fulfillment, whereas a positive attitude towards one's future might be an important resource there. Finally, we found that, compared to the time restrictive category, the reminiscers category is related to more psychological and social well-being but unrelated to emotional well-being and psychological distress. Once again, we see clearly that negative thoughts and feelings about one's past might not be an important resource of individual as well as of social fulfillment. To sum up, a negative attitude towards one's past and future might not help in both individual and social fulfillment (psychological and social well-being) and it might also not be related to a good emotional regulation (emotional well-being). Positive thoughts towards one's future, by contrast, might be an important resource for especially individual fulfillment. Finally, both positive thoughts and feelings about the future and/or the past might be important for emotional regulation and social fulfillment.

4.2 Limitations and future considerations

The present study has several limitations that need to be taken into account when considering our results and its contributions. One of these limitations is the cross-sectional design. Therefore, we can merely examine the relation between age, time perspective, positive mental health and psychological distress but we cannot draw any causal conclusions. The obtained age and time perspective differences cannot be explained with such a study design. Even worse, such a design might have made our findings vulnerable for cohort-effects. For example, cultural historical changes might be related to the fact that young adults experienced more psychological distress feelings than both of their older counterparts and that they are also more future-oriented than middle-aged and old adults. A possible explanation might be

that today's young adults grow up in a world that is characterized by an increasing performance pressure, fast space, individuality, particularity and the need for a future orientation. In the present time, especially young women, who are predominantly represented in our study, have to fight with much higher and different expectations as both of their older counterparts. However, this might be just one of the different possible explanations for the obtained age and time perspective differences. Thus, with such a study design it is not possible to provide concrete explanations. Therefore, future research using a longitudinal study design might be an important next step.

The present study is also limited in view of the fact that we have not taken into account possible confounding variables that might have affected the relation between time perspective, age, psychological distress and positive mental health. Possible confounding variables for these interactions might be various sociodemographic conditions, positive and/or negative life events, coping mechanisms, or personality (Drake et al., 2008). Therefore, identifying and controlling potential confounding variables might be an important task for future researchers.

The extent to which our findings are generalizable must also be treated with caution even though, compared to previous studies, respondents were recruited beyond the student population and with a wider age range making it possible for us to look for developmental changes in time perspective as well as in complete mental health. The external validity of the sample might be affected due to the non-random opportunistic and snowball sampling procedures. These procedures might have led to an overrepresentation of young psychology students, women, high educated, employed, persons with good subjective health and few health limitations. Further studies are needed to determine whether our results are generalizable. Studies using samples with different demographical characteristics, such as more men, lower education, more unemployment, more health limitations and lower levels of subjective health, might be a prudent next step.

In addition, it should also be noted that our study was carried out in the Netherlands. Thus, our sample includes only Dutch individuals. The question to be answered is now whether our findings are specific for the Dutch society. To our knowledge, studies investigating cultural differences with regard to positive mental health, psychological distress, time perspective and their possible relationship to each other remained scant until now. Investigating cultural differences in this context might also be an interesting next step for future research.

It should also be mentioned that, compared to previous studies, we have not found a relation between TP and psychological distress. However, this might be due to the fact that our respondents experienced rather moderate psychological distress levels. To fully understand TP and its contributions to both psychological distress and positive mental health the use of other samples with individuals experiencing more mental illness complaints might also be a good contribution to the studies of the construct of TP.

Another limitation of the present study could be related to the instruments used for measuring time perspective and positive mental health. The selected BTPS has been developed very recently. For this reason, it has not yet been used very often, making comparisons with earlier studies difficult for us. In addition, its psychometric properties have not yet been sufficiently evaluated, and the creation of the four categories (the time restrictive, the reminiscers, the futurists and the time expansive) is rather conceptual in nature (Webster, 2011). The MHC-SF, by contrast, has been used more frequently, however, not within studies investigating the relation between TP and positive mental health. Thus, it might be useful to carry out more studies using the BTPS, and using both the BTPS and the MHC-SF. However, it should also be mentioned that the BTPS has a major disadvantage, namely that it cannot measure the present time perspective. Therefore, the current study is not able to provide a complete understanding of the whole construct of TP and its contributions to complete mental health. The ZTPI, by contrast, is a widely used instrument for measuring the past, the present and the future time perspective. However, compared to this scale, the BTPS is in turn a better

measure of the balanced time perspective. According to that, it could also be useful to replicate the present study using both time perspective scales.

Finally, the present study might be limited in view of the fact that time perspective and age, separately, explain relatively few of the variance in psychological distress and positive mental health. For age, this is known from earlier studies as discussed in the introduction. However, for TP, this has not yet been established. This might be an important next step for future research. Since our study explains only small parts of individual differences in complete mental health, it might also be important to look for other explanations of these differences. One could think, for example, of sociodemographic conditions (Westerhof, under review), personality (Joshanloo & Nosratabadi, 2009; Lamers et al., 2011), other psychological processes such as coping or psychological flexibility (Fledderus et al., 2010) and past positive and/or negative life events (Drake et al., 2008).

To sum up, the present study has several limitations. However, these limitations can be viewed as potentially fruitful avenues for future research. Replication studies using longitudinal designs, more diverse samples, the same measures and maybe in addition the ZTPI, taking into account possible confounding variables and looking for potential other explanations of individual differences in psychological distress and positive mental health might be important next steps for future research.

4.3 Conclusion and implications

Despite the above mentioned limitations of our study, we can now say that we have a much better understanding of the construct of time perspective, especially of a BTP, and of age, and their separate contributions to the complete mental health model. Although both explained relatively few of the variance, we can conclude that both factors separately are more or less important correlates of positive mental health. In addition, age is also an important correlate of psychological distress and TP. Furthermore, since we have found that the time expansive

category (i.e., balanced) experienced more positive mental health feelings than all the other TP categories (even though these differences were not statistically significant for all TP categories) we can carefully conclude that a balanced time perspective is one of the temporal orientations being most conducive for well-being. Finally, given the different relation of time perspective to both continua of complete mental health and to the different aspects of well-being, we can also conclude that positive mental health is more than merely the absence of psychological distress, and that it is important to distinguish among the three components of emotional, psychological and social well-being.

These findings have important implications. First, they have important implications for future research (see paragraph 4.2). Further investigations might be useful to replicate our study in order to find out whether there are cause and effect relations, whether our findings are generalizable and whether there are confounding variables. It might also be important to carry out further studies to look for other explanations of individual differences in both psychological distress and positive mental health.

Our findings are not only important for future research; they also have important implications for public mental health care. Similar to other correlates of both continua of the complete mental health model, such as background characteristics (Westerhof, under review) or personality (Lamer et al., 2011), we now know that time perspective is also differently related to both, psychological distress and positive mental health. Given this fact, in public mental health care it is therefore also important to use a differentiated approach, if one wants to promote and protect positive mental health and if one wants to treat and prevent mental illness (Westerhof, under review). For example, a differentiated approach should be adapted to groups with different temporal orientations.

Finally, our findings also provide potential for practical interventions in clinical psychology. For example Boniwell and Zimbardo (2004) have stated that an "understanding of TP can be a useful tool in counseling psychology" (p.175). Detecting clients' temporal

orientations and their possible temporal biases that might be compromises their well-being, could be a starting point in therapeutic explorations (Boniwell & Zimbardo, 2004). Temporal misbalances then might be changed given appropriate interventions. Considering the fact that a BTP seems to be most conducive for well-being, appropriate interventions might be those which make it possible to achieve such a time perspective. Possible approaches for this may be interventions that facilitate the reflective and self-awareness skills (Drake et al., 2008), help neutralize past-negative experiences or help discover hidden positive experiences in them (Boniwell & Zimbardo, 2004), facilitate positive future thinking, help to create new optimistic future scenarios and positive future goals, and finally enable the ability to use the positive past and/or future depending on the situation and/or individual needs.

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Appendix A: Table 1. Main demographics of the respondents, stratified by age groups (N=512)

		Age groups							
		17-29		30-60		61-92		Total sample	
		N	%	N	%	N	%	N	%
Age		175	34.2	189	36.9	148	28.9		
Gender	Male	65	37.1	51	27.0	70	47.3	186	36.3
	Female	110	62.9	138	73.0	78	52.7	326	63.7
Education[1]	Low	1	0.6	38	20.0	78	52.7	117	22.9
	Secondary	119	68.0	59	31.3	33	22.3	211	41.2
	High	55	31.5	92	48.7	37	25.0	184	35.9
Marital status	Unmarried	172	98.3	12	6.3	3	2.0	187	36.5
	Married	2	1.1	161	85.2	89	60.1	252	49.2
	Widowed	1	0.6	6	3.2	48	32.4	54	10.5
	Divorced			10	5.3	8	5.4	19	3.7
Employment[2] status	Paid employment	31	17.7	158	83.6	27	18.2	216	42.2
	Unemployment	9	5.2	27	14.3	12	8.1	48	9.3
	School/ study	135	77.1	3	1.6	1	0.7	139	27.1
	Retirement			1	0.5	108	73.0	109	21.3
Living circumstances[3]	Living alone	51	29.1	11	5.8	54	36.5	116	22.7
	Living with family	23	13.1	175	92.6	91	61.5	289	79.2
	Living other	101	57.7	3	1.6	3	2.0	107	20.9
Subjective health[4]	Low	1	0.6	4	2.1	1	0.7	6	1.2
	Middle	52	29.7	67	35.5	85	57.5	204	39.9
	High	122	69.8	118	62.4	62	42.0	302	59.0

Health Limitations	None	154	88.0	133	70.4	60	40.5	347	67.8
	Slight	19	10.9	48	25.4	68	45.9	135	26.4
	Considerable	2	1.1	8	4.2	20	3.5	30	5.9

[1]Education: low= primary school, lower vocational level, lower secondary school; secondary= higher secondary school, middle vocational level; high= higher vocational level, university
[2]Employment status: unemployment= unemployment, household/family, disabled
[3]Living circumstances: living with family= living with partner, living with partner and children, living with children
[4]Subjective Health: low= scores 1,2,3,4; middle= 5,6,7,8; high= 9,10,11

Appendix B: Table 2. Means and standard deviations of psychological distress and positive mental health stratified by age groups and ANOVA results

	Age groups						
	17-29	30-60	61-92	Total sample	One-way ANOVA		Group comparisons[1, 2,3]
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	F	*p*	
Psychological distress							
Psychological distress	2.04 (0.51)	1.89 (0.46)	1.83 (0.34)	1.92 (0.46)	9.42	<.05	1 > 2,3
Positive mental health							
Positive mental health	3.89 (0.82)	4.21 (0.77)	3.69 (0.88)	3.95 (0.85)	17.31	<.05	2 > 1,3
Emotional well-being	4.47 (1.04)	4.73 (0.85)	4.29 (1.00)	4.52 (0.98)	8.97	<.05	2 > 1,3
Psychological well-being	4.21 (0.95)	4.44 (0.85)	3.88 (1.04)	4.20 (0.97)	14.99	<.05	2 > 1,3 and 1 > 3
Social well-being	3.15 (0.97)	3.61 (1.01)	3.11 (1.03)	3.31 (1.03)	13.92	<.05	2 > 1,3

Notes.
[1]*Comparisons made using Games-Howell post-hoc test*
[2]*For all comparisons, p < .05*
[3]*1=age group 17-29, 2=age group 30-60, and 3=age group 61-92*

Appendix C: Table 3. Time perspective categories (N= 512)

	Age groups							
	17-29		30-60		61-92		Total sample	
	N	%	N	%	N	%	N	%
Time perspective categories								
Time restrictive category	49	28.0	54	28.6	55	37.2	158	30.9
Reminiscers category	6	3.4	30	15.9	56	37.8	92	18.0
Futurists category	48	27.4	24	12.7	3	2.0	75	14.6
Time expansive category (i.e. balanced)	72	41.1	81	42.9	34	23.0	187	36.5

Note: See Webster (2011) for the calculation of the TP categories

Appendix D: Table 4. Means and standard deviations by time perspective categories

	Time perspective categories					
	Time restrictive category	Reminiscers category	Futurists category	Time expansive category (i.e. balanced)	One-way ANOVA	Group comparisons[1,2,3]
	M (SD)	M (SD)	M (SD)	M (SD)	F *p*	
Psychological distress						
Psychological distress	1.98 (0.48)	1.88 (0.36)	1.93 (0.48)	1.90 (0.47)	1.15 >.05	
Positive mental health						
Positive mental health	3.51 (0.90)	3.91 (0.70)	4.09 (0.71)	4.28 (0.85)	27.83 <.05	4> 1,2; 3> 1 and 2>1
Emotional well-being	4.20 (1.15)	4.49 (0.92)	4.59 (0.89)	4.76 (0.81)	10.03 <.05	4> 1 and 3> 1
Psychological well-being	3.67 (1.03)	4.12 (0.89)	4.45 (0.72)	4.58 (0.81)	32.72 <.05	4> 1,2; 3> 1,2 and 2> 1
Social well-being	2.92 (0.97)	3.32 (0.92)	3.35 (1.00)	3.62 (1.04)	14.38 <.05	4> 1; 3> 1 and 2> 1

Notes.
[1]*Comparisons made using Games-Howell post-hoc test*
[2]*For all comparisons, $\rho < .05$*
[3]*1=time restrictive category; 2= reminiscers category; 3= futurists category; 4=time expansive category*

Appendix E: Table 5. Means and standard deviations of TP categories on psychological distress and positive mental health by age groups

Age groups	Time perspective category	Psychological distress	Positive mental health	Emotional well-being	Psychological well-being	Social well-being
		M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
17-29 years	Time restrictive	2.06 (0.56)	3.46 (0.85)	4.17 (1.13)	3.60 (1.05)	2.86 (0.83)
	Reminiscers	2.03 (0.60)	3.67 (0.77)	4.17 (1.87)	4.00 (1.11)	2.97 (0.59)
	Futurists	2.01 (0.47)	3.91 (0.72)	4.41 (0.96)	4.35 (0.75)	3.09 (1.00)
	Time expansive	2.05 (0.50)	4.18 (0.75)	4.75 (0.90)	4.55 (0.79)	3.39 (1.02)
30-60 years	Time restrictive	1.98 (0.51)	3.88 (0.82)	4.55 (1.04)	4.06 (0.89)	3.27 (1.00)
	Reminiscers	1.87 (0.35)	4.19 (0.57)	4.76 (0.77)	4.43 (0.72)	3.55 (0.90)
	Futurists	1.83 (0.45)	4.39 (0.59)	4.93 (0.67)	4.60 (0.65)	3.81 (0.83)
	Time expansive	1.85 (0.48)	4.38 (0.78)	4.79 (0.77)	4.66 (0.85)	3.81 (1.05)
61-92 years	Time restrictive	1.90 (0.35)	3.21 (0.89)	3.90 (1.18)	3.35 (1.04)	2.62 (0.97)
	Reminiscers	1.87 (0.34)	3.79 (0.72)	4.38 (0.84)	3.96 (0.92)	3.24 (0.94)
	Futurists	1.42 (0.38)	4.45 (0.49)	4.78 (0.38)	4.89 (0.38)	3.73 (1.14)
	Time expansive	1.72 (0.28)	4.24 (0.70)	4.75 (0.70)	4.50 (0.78)	3.63 (0.96)