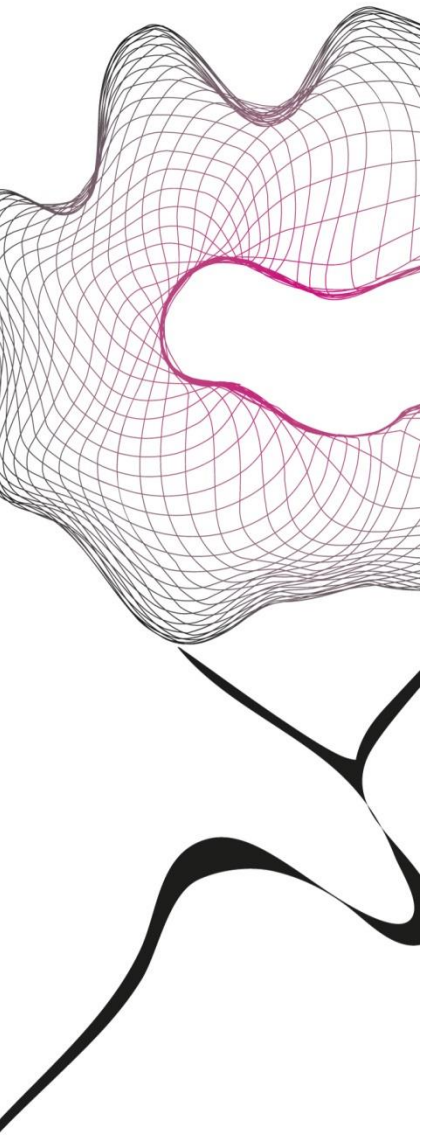

Changes in flourishing over time and the short term relation with psychopathology

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Abstract

Background: According to the promotion and protection hypothesis, gains in mental health will decrease the risk of future psychopathology, while losses in mental health will increase the risk of future psychopathology. People who score high on the mental health continuum are referred to as flourishing. The study investigates on how flourishing states change over a short period of three month. Furthermore, this study is interested in how these changes influence psychopathological symptoms in the near future.

Methods: Over a period of nine months, four different measurement occasions took place (at three month intervals). On each occasion, the MHC-SF was used to measure flourishing and the BSI was used to measure psychopathology. The data enabled to observe changes in flourishing over three month. Four different groups can be identified: 'stable in flourishing', 'stable in not flourishing' and 'changing to flourishing' or 'not flourishing'. Additionally, based on these groups, differences in psychopathology three and six months later were observed.

Results: 38,6% of the participants changed on at least one measurement occasion. Further, groups that are stable over time, either flourishing or not flourishing, are a predicting factor for low or high scores on psychopathology three month later. Changing groups, either reaching or declining in flourishing, show no differences in psychopathology. In the six month period none of the groups show differences in scoring psychopathology.

Conclusion: On short term flourishing seems to be sensitive to change. Given the results there is little indication for mental health as a reliable predictor for psychopathology in a short term period. The study reveals a rather changeful nature of flourishing on a short term aspect. Findings of long term studies and the short term changes found in this study, let assume a sort of baseline of mental health, were individuals tend to return to. This leads to new questions on how flourishing could affect psychopathology.

Samenvatting

Achtergrond: Volgens de promotion and protection hypothesis leiden winsten van mentale gezondheid tot een verminderde risico van mentale ziekten in de toekomst, terwijl verliezen van mentale gezondheid juist leidt tot verhoogde risico van mentale ziekten in de toekomst. Mensen die hoog op de mentale gezondheid scoren worden gezien als flourishing. De studie kijkt naar veranderingen in flourishing in de verloop van drie maanden. Verder wordt er gekeken hoe deze veranderingen psychopathologische symptomen (mentale ziekten) in de toekomst beïnvloed.

Methode: In een periode van negen maanden zijn er vier meetmomenten afgenomen (intervallen van drie maanden). Op elk meetmoment werd de MHC-SF voor het meten van flourishing en de BSI voor het meten van psychopathologie gebruikt. Met deze data is het mogelijk om veranderingen van de participanten over drie maand te bekijken. Vier verschillende groepen kunnen geïdentificeerd worden: stabiel in flourishing, stabiel in niet flourishing en veranderen naar flourishing of naar niet flourishing. Verder werd er gekeken naar de verschillen tussen deze groepen op het scoren van psychopathologie over een tijd van drie en zes maanden.

Resultaten: 38,6% van de participanten zijn op ten minste een moment veranderd. Veder blijken stabiele groupen die niet veranderen (stabiel flourishing of niet flourishing) hoge of lage scores op psychopathology drie maanden later te voorspellen. Mensen die veranderden van niet naar wel flourishing waren drie maanden later in hun psychopathologie niet te onderscheiden van mensen die van wel naar niet flourishing veranderden. Naar een zes maand interval was helemaal geen onderscheid in psychopathologie tussen de change groepen te zien.

Conclusie: Op korte termijn lijkt flourishing gevoelig voor veranderingen te zijn. Gezien de resultaten blijkt weinig indicatie for mental health als een betrouwbare voorspeller van psychopathology op korte termijn te zijn. De studie laat een eerder dynamisch proces van floursihing op korte termijn zien. Bevindingen uit lange termijn studies in combinatie met de short term veranderingen gevonden in dit studie, laten aan een soort baseline denken op die mensen lijken terug te vallen. Dit lijdt tot nieuwe vragen over hoe flourishing psychopathology affecteerd.

Contents

Introduction

The history of health has been primarily dominated by the pathogenic approach, where health is defined as the absent of disease, premature death and disability (Sigerist 1941; Keyes, 2007). Keyes (2005) argued there has been an epidemiological transition in health of changes in the causes of death and illness from acute and infectious to chronic and modifiable lifestyle causes. According to Keyes, this transition requires a change in the way health is understood. The pathogenic approach has been predominant in the specific field of mental health as can be seen by the history of published articles concerning positive and negative states. Until 1995, psychological articles on negative states have been outnumbering those examining positive states at a ratio of 17 to 1 (Diener, Suh, Lucas, & Smith, 1999). In the end of the last century, investigations supported the view that a purely pathogenic approach is no longer sufficient and that mental health is more than the absence of psychopathology (Ryff & Singer 1998). In 2004, the World Health Organization began to adopt this view and published a report on mental health in which it is stated that mental health is not merely determined by the absence of psychopathology, but also by the presence of "*a state of well-being in which every individual realizes his or her own potential, 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*" (WHO, 2004, p.12). In this context, Keyes (2007) stated that it is essential to study both positive and negative states of mental health in order to be able to achieve complete health in the population. Keyes approach is referred to as the *complete state model* and combines both the presence of positive states as well as the absence of disease or infirmity (Keyes, 2007).

Mental health / flourishing

According to the WHO's definition of mental health, being or not being mentally healthy depends on whether a person is experiencing a state of wellbeing. The concept of wellbeing comprehends two traditional approaches in research: The hedonic approach focuses on the subjective experience of being or feeling well and is also referred to as emotional wellbeing (Ryan & Deci, 2001). The hedonic approach can be differentiated between three components of emotional wellbeing: Life satisfaction, positive affect and negative affect (Deci & Ryan, 2008). The second approach is referred to as the eudaimonic approach and describes a person´s general functioning defined as the ability to live a good life and to overcome

personal challenges (Keyes, 1998). This approach consists two major parts, psychological and social wellbeing. Psychological wellbeing often refers to the extent to which a person fully functions and lives up to his or her full potential (Ryan & Deci, 2001). The construct is further subdivided into six subcategories: self-acceptance, personal growth, purpose in life, environmental mastery, autonomy and positive relations with others (Ryff 1989). The second component of social wellbeing sets its focus on how a person functions in his or her social world (Gallagher et al., 2009; Keyes, 1998). Social wellbeing can also be subdivided into five sub-categories: social coherence, social actualization, social integration, social contribution and social acceptance.

People vary in how they experience or feel wellbeing. Keyes (2002) therefore categorizes people into three different categories. The categorization ranges from languishing - via moderate - to flourishing mental health. A person who is flourishing scores high on all three factors of wellbeing (emotional, psychological and social). Being flourishing thus implies that a person experiences subjective wellbeing and also functions optimally in his or her everyday life on an individual and social level. Flourishing people have, according to Keyes, better physical health, psychosocial functioning and show less healthcare utilization and missed work days (Keyes, 2002; Keyes, 2007; Keyes et al., 2012). Languishing is understood as the opposite of flourishing and is defined by low scores on all three factors, indicating almost no experience of subjective wellbeing and poor functioning on an individual and social level. Moderate mental health is everything in between, meaning moderate scores on each factor as well as mixed scores (high on one or two factor/s; low on the other/s). People with moderate mental health consequently show mixed features of subjective experience of wellbeing and individual and social functioning (Keyes & Annas, 2009).

When it comes to flourishing and research, the percentage of people flourishing in a population seems to vary. In Keyes' study (2010), 20% of the participants were found to be flourishing. The sample of his study originated from the MIDUS study (Midlife in the United States) containing 3032 participants between the age of 25-74. In her study on flourishing in Europe, Huppert (2013) examined 23 countries with a total sample size of 43.000 participants aged 15 and above. She found strong variations between countries, with Nordic countries having the highest rate of flourishing. The eastern European countries were found to have the lowest rate of flourishing while results on the southern and western European countries were mixed (Huppert, 2013). The extreme variations in flourishing rates can be seen in the absolute numbers leaving Denmark at the far top with 40.6% followed by Switzerland (30.2%) and

Austria (27.6%). The three counties with the lowest rates were Slovakia (9.9%), the Russian Federation (9.4%) and Portugal (9.3%). Huppert (2013) identified low income inequality, developed social welfare and health care systems, low unemployment, high social trust and ethnic homogeneity as factors correlating with a high rate of flourishing. Countries with low rates of flourishing on the contrary were shown to be less wealthy, have high income inequality, perceived corruption low education and low social trust.

In addition, very few longitudinal studies concerning flourishing have been undertaken so far. Long term studies are essential to learn more about the stability and nature of this concept. In his longitudinal study, Keyes (2010) found that the rate of flourishing respondents stayed almost the same over a ten year period (19,2% in 1995 and 22,4% in 2005). Yet 49% of the people found to be flourishing in 2005 represented new cases in comparison to 1995. Thus, half of those who were flourishing in 1995 stayed flourishing over the period of ten years. This suggests a rather dynamic nature of flourishing (Keyes 2010).

The two continua model

In recent years, there has been an increasing interest in the state of flourishing as well as in possible effects of flourishing on psychopathological symptoms. This is mainly explained by the finding that mental health and psychopathology are not two sides of the same coin, but rather two separate continua (Huppert & Whittington, 2003; Keyes, 2002; Keyes 2005). Keyes (2002) developed the *two continua model* of mental health, wherein one continuum indicates the presence or absence of positive mental health, while the other continuum indicates the presence or absence of psychopathology (Keyes & Westerhof, 2012). The argumentation is based on the fact that people who are free of psychopathology are not necessarily mentally healthy and can still be languishing in life. The same holds for the opposite phenomenon: People who are mentally ill can still get along well and flourish in life (Keyes, 2007; Keyes & Annas, 2009). In a study on the two continua model, Lamers (2012) examined the connection between positive mental health and psychopathology. Data on four different measurement moments were collected over a time period of nine months. The impact of mental health on psychopathology as well as the impact of psychopathology on mental health was investigated. She found that although the courses correlated only weakly, changes in positive mental health were predictive for psychopathologies in the future, as well as changes in psychopathology were predictive for future positive mental health. This

supports the two continua model and contradicts the original view of positive mental health and psychopathology as mere opposites of the same continuum. The two continua can thus be thought of as complementary with reciprocal effects on each other (Lamers, 2014).

The promotion and protection Hypothesis

The finding that mental health and psychopathology are two separate continua with reciprocal influence, indicate that mental health could become an essential part of treatments in clinical therapy. The pathogenic approach, focusing on psychopathology and dysfunctionality, could be missing half of the picture. Seeing mental health as the end of the same continuum, it is treated more like a symptom or a result, created in the process of fighting psychopathology. Considering mental health as a separate entity it could become an important tool to enhance mental health care. If there would be a greater understanding of how changes in positive mental health can reduce psychopathology in individuals, the quality of treatment could be enhanced substantially. Besides treatment enhancement, another important feature of the reciprocal relation of the two continua is long term benefits. The enhancement of mental health in the general population could additionally lead to prevention of future psychopathology. In this case positive mental health would function as a sort buffer for psychopathology (Keyes 2002; Lamers 2014). This could lead to major cost benefits in the healthcare system. Besides these financial and clinical benefits, integrating mental health in society to prevent pathology would aim at the very noble goal to create a more happy and well-adjusted society.

The possible benefits of treatment optimization and prevention, led Keyes (2007) to formulate the promotion and protection hypothesis. “Promotion” states that gains in mental health decrease the risk of psychopathology in the future. Positive mental health therefore should be promoted in the population in order to prevent future illnesses. “Protection” on the other hand hypothesizes that a decrease in mental health would increase the risk of psychopathology in the future. Positive mental health should thus also be protected in order to prevent future illnesses (Keyes, 2007). Findings of a study investigating the long term effects of the two continua in a ten year longitudinal study support this hypothesis (Keyes, 2010). Keyes studied the predictive role of changes in positive mental health on psychopathology over the ten year period. He found that gains in mental health could in deed predict future declines in psychopathology and losses in mental health could predict future increases in

psychopathology. Wood (2009) also applied a longitudinal design in order to examine the impact of psychological wellbeing on depression. In his study, people scoring low on psychological wellbeing were twice as likely to be depressed ten years later than people with high or moderate psychological wellbeing. Wood (2009) concluded that the absence of mental health forms a great risk for depression in the future. He further claimed that the concept of wellbeing is of importance in order to understand disorder and supports interventions that aim at enhancing psychological wellbeing as a means of prevention. These findings support the promotion and protection hypothesis as stated by Keyes.

The aim of this study is to further explore changeability of flourishing and a possible impact on psychopathology over a short period of time. If flourishing turns out to be hardly changeable, comparable to a trait, it would make little sense to be integrated in therapy. It would make more sense to develop therapies focusing only on mental health besides the treatment of psychopathology. On the other hand, if changes are frequent it could be used to enhance therapy. The same is true for the consequences of changes on psychopathology. If changes in flourishing would have significant differences on psychopathology after a short period of time, it would indicate to be a useful tool in therapy. Former longitudinal studies on flourishing concern ten year time spans with just two measurement moments. One measurement took place at the beginning and one at the end of the ten year period. This is a wide span of time making the immediate and short term changes of flourishing and the effects of these changes on psychopathology hardly observable. The data set used in the present study concerns a period of just nine month instead of a longer, ten year period. Second, within this year of data collection, four different measurement occasions (3 month intervals) took place measuring flourishing as well as psychopathology. Hence, it is possible to observe changes in flourishing over time on different intervals. Participants can be grouped into four different groups, differentiating between people who change their state (to flourishing or to not flourishing) or who stay in their state (flourishing or not flourishing) from one measurement to the next. Thus, the study contributes to the examination of the changeability of flourishing on a short term scale. The ten year longitudinal studies of Wood (2009) and Keyes (2007) suggest that flourishing is a rather sustainable trait, but short term changes could have occurred regularly and unnoticed. More importantly, this study shows the relation of these changes and psychopathology in the near future. This will be important to further understand how flourishing and changes in flourishing influence psychopathology in the future and if it is a valuable factor for treatment and prevention.

To answer these questions, three different steps will be undertaken in this study. First, the amount of flourishing participants on the four measurement occasions was examined. Moreover, different groups will be determined, showing participants changing or remaining in their state of flourishing over the nine months period. This is important to identify the frequency of changes in flourishing. Second, differences of these flourishing groups (whether they changed or not in their state) and their scoring on psychopathology three month later are being observed. In a third step, a six month period instead of a three month period will be applied, thus a wider time perspective on how the groups differ in their psychopathology. Research questions are: how frequent is change in flourishing over the nine month? Is there an observable difference between changes in flourishing and psychopathology after a short period of three and six months? Answering these questions may give a more detailed picture of flourishing and its relation to psychopathology. The outcome could also lead to further recommendation for clinical treatments and could provide support for further promotion and protection of mental health in society.

Method

Participants

A total sample of 1932 Dutch participants has been used for the analyses. The age of the participants varied between 18 and 88 years. The sample contained four different age groups (18-29; 30-49; 50-64; 65+). The distribution of gender was almost equal (49.4% male / 50.6% female). The majority of the participants (77.6%) were native Dutch and 52.7% were married. Concerning the educational background of the participants, 10% had primary education (6 years), 26.5% lower education (10 years), 11.4% secondary (11-12 years) 22.3% middle (13 years), 21.4% higher education (15 years) and 8.4% had university education (16 years).

Procedure

The collected data originates from the longitudinal internet studies for social sciences, (LISS panel). The LISS panel has been created by CentERdata, containing more than 5000 households from the Netherlands. Those households were randomly selected using the municipal registers in the Netherlands. Selected households are being asked to fill in several online questionnaires every month. If necessary, households were provided with internet access or computers. In one third of the households, one member was asked to fill in questionnaires on mental health on four different moments in the nine month period. The first measurement took place in December 2007 (T_0), followed by three month intervals on March (T_1), June (T_2) and the last in September 2008 (T_3). 1932 participants filled in the questionnaires on one or more measurement moments. The actual numbers of filled in modules are 1662 (86%) at T_0, 1675 (86.7%) at T_1, 1243 (64.3%) at T_2 and 1466 (75.9%)at T_3. All four modules were finished by half of the participants (50.8%). There have been almost not significant differences in scoring the questionnaires between the participants who filled in all four modules and those who did not. The only exception was the participants' age. Analysis showed that participants filling out all the modules were significant older than those who did not ($F(1,1930)=7,27$; $p < .05$) (Lamers et al., 2012). To enhance expectation maximization the items were imputed.

Measurement

To measure flourishing, the Mental Health Continuum Short Form (MHC-SF) was used (Keyes et al., 2008; Lamers et al., 2011). The MHC-SF consists of 14 items that represent the three factors of wellbeing (emotional wellbeing = three items; social wellbeing = five items and psychological –wellbeing = six items). The items are scored on a six-point likert scale ranging from 0 = never, to 5 = every day. Higher scores indicate a higher level of wellbeing. The Dutch version shows good psychometric properties and also confirms the classification of the 14 items representing the three theoretical factors of wellbeing (Lamers et al., 2011). Furthermore, longitudinal analysis indicated that the measurement with MHC-SF is highly reliable over time (Lamers, Glas, Westerhof, & Bohlmeijer, 2012). The Cronbach's alpha in this study varied between 0.89 (T_0) and 0.91 (T_2). Keyes (2002) defines the state of flourishing as a high score on two out of the three items of emotional wellbeing and high on six out of the eleven items of social and psychological wellbeing. In this study all participants who scored other than this classification are labeled as not flourishing. Thus moderate and languishing categories are merged together. This is legitimate due to the exclusive interest of this study in flourishing and its changeability.

The Dutch version of the Brief Symptom Inventory (BSI) was used to measure psychopathology (de Beurs & Zitman, 2006). The BSI is one of the most used instruments for screening and assessing psychopathology (Lamers, Westerhof, Glas, & Bohlmeijer, 2012). The Instrument measures 53 psychological symptoms, experienced during the past week. The items can be scored on a 5 point likert scale ranging from 0 = not at all, to 4 = a lot. Higher scores indicate a higher level of psychopathology. The Cronbach's alpha varied between 0.95 (T_0, T_1 and T_2,) and 0.96 (T_3).

Statistical analyses

Prevalence and stability of Flourishing

In the first part of the statistical analyses the interest was in how many participants are flourishing on each occasion and how frequent they change. First, the total number of flourishing participants on all four measurement moments was determined. This is important to see whether the amount of flourishing participants is relatively stable or undergoes certain

variations over the four measurement moments. Second, changes in flourishing of the participants were examined. This gives a better view on the stability of flourishing in the short term period of nine month.

Impact of flourishing on psychopathology over three months

In the second part of the statistical analyses, the focus lay on how flourishing and changes in flourishing could affect psychopathology over a period of three month. To be able to observe the specific interest of changes in flourishing and its impact on psychopathology, two measurement moments over a three month period were consolidated. Looking on both scores different groups can be identified. In total, four groups can be formed: Participants who score flourishing on both occasions and therefore are 'stable in flourishing' over time, participants who score not flourishing on both occasions and therefore are 'stable in not flourishing' over time, participants who show an upward trend, thus changed from not flourishing on the first to flourishing on the second occasion ('changed to flourishing') and participants who show a downward trend, thus change from flourishing on the first to not flourishing on the second occasion ('changed to not flourishing'). The formed groups served as independent variable and the psychopathology scale as dependent variable. Two ANOVAs were conducted in order to investigate on the differences of the groups in psychopathology three month later. In a first analysis, the impact of changes in flourishing states from T_0 to T_1 on the psychopathology scale three month later (T_2) was investigated. For this purpose, the psychopathology score on T_1 was included as a co-variable in order to correct for its autocorrelation. This is important for distinguishing the actual impact of the flourishing conditions on psychopathology. Figure 1 illustrates the exact process.

Where there was a significant difference between the groups with an alpha of 0.05, additional Post Hoc tests were conducted in order to further investigate the differences between conditions. By using this technique the four different groups are being compared pairwise. This enables a direct view on how the groups differ from each other. Even if the ANOVA showed overall significant differences it is possible that some groups do not differ significantly from each other. The Post Hoc test enables identification of those groups. With the ANOVA alone such an occurrence could stay hidden if the rest of the groups would show significant differences in their impact on psychopathology. For this purpose the Tukey HSD test was applied.

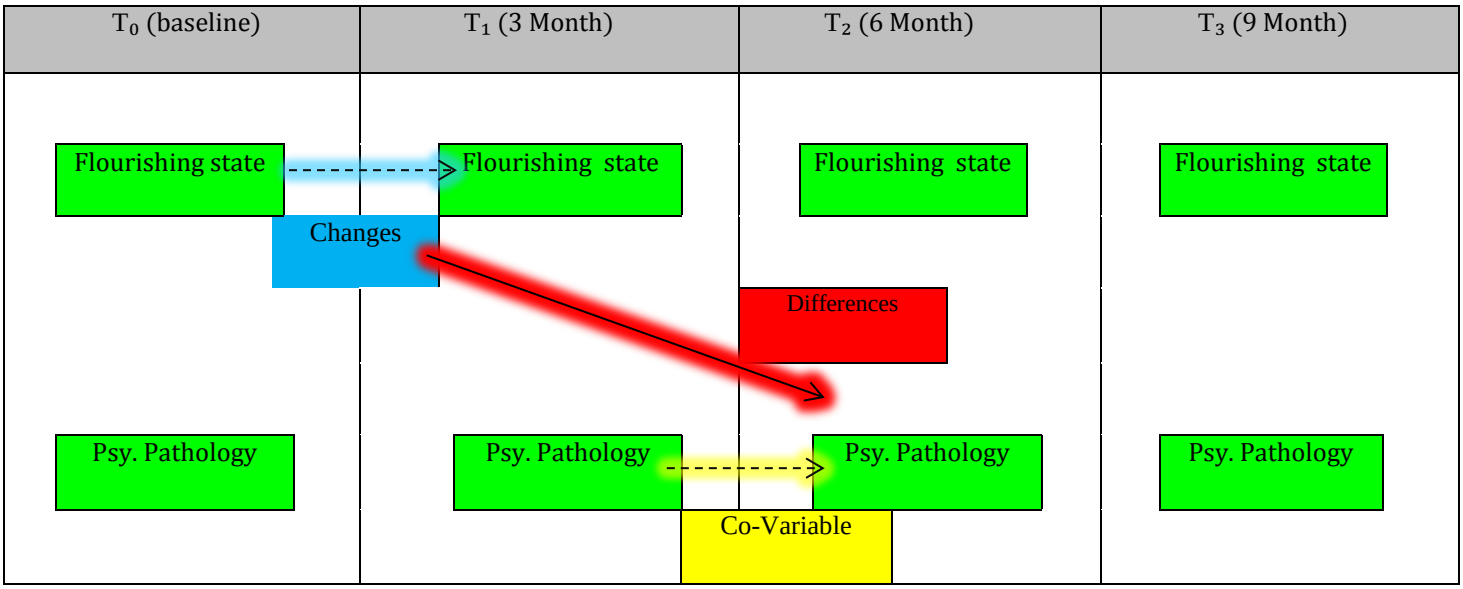

Figure 1: Differences of the groups on psychopathology three month later, first interval. The Co-variable shows the correction of the variable Psychopathology on itself over time.

In order to strengthen the findings another analysis of variance on a later spectrum of time was executed. The four groups therefore were created by merging the scores on T_1 and T_2 instead of T_0 and T_1. The focus was now on the psychopathology score of those groups on the forth measurement moment (T_3). Figure 2 illustrates this procedure.

Again, Post Hoc test were conducted where significant differences were found. The overall significance of scoring yielded a statistical value above 0.05.

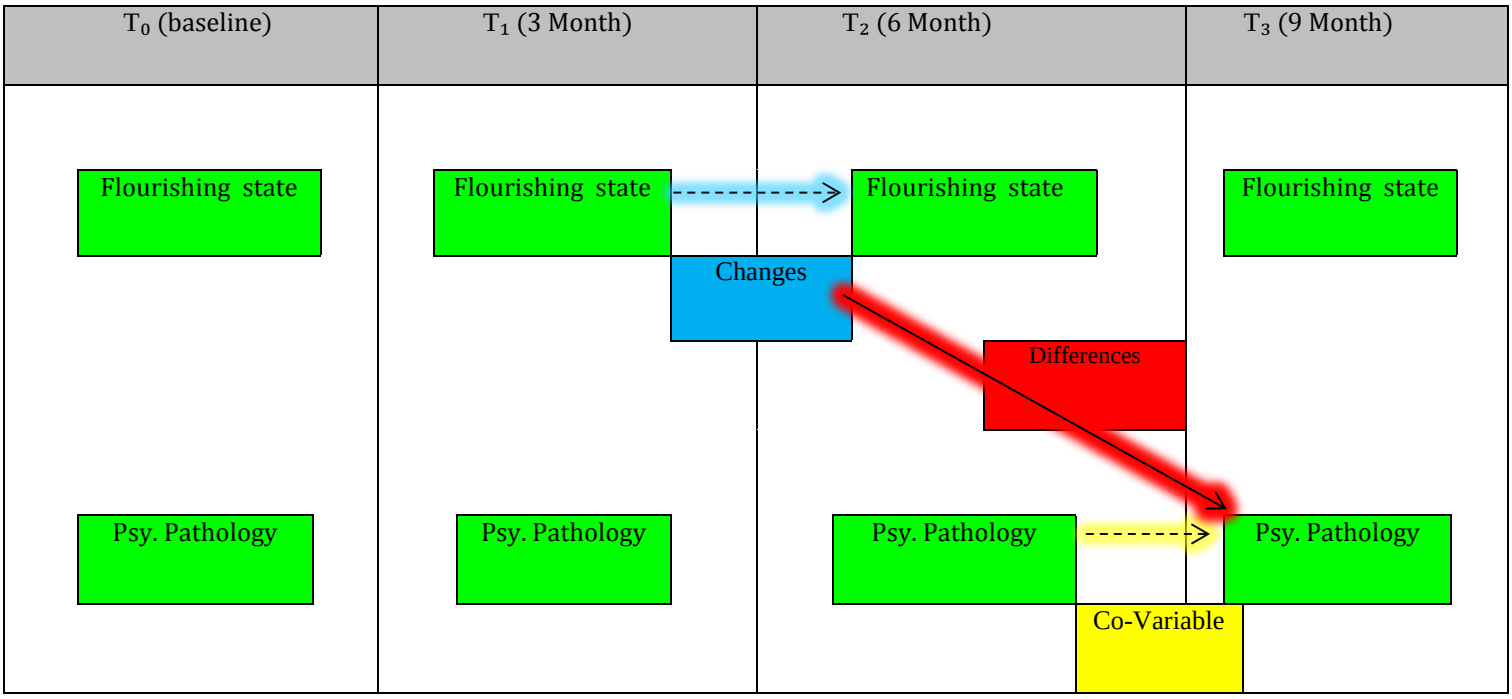

Figure 2: Differences of the groups on psychopathology three month later, second interval. The Co-variable shows the correction of the variable Psychopathology on itself over time.

Impact of flourishing on psychopathology over six months

In the last part of this study the differences of the groups on psychopathology six month later were examined. Thus it differed from the second part of the study because a longer period of time was observed. The flourishing conditions were the same as in the first analysis, the first two measurement moments were merged by subtraction (T_0-T_1). The impact of those conditions on the psychopathology scale was investigated six month later (T_3)**.** The Co-variable was formed on the basis of the psychopathology score of the second measurement moment (T_1). That moment was favored over the next measurement moment (T_2), because of the time synchronicity of the conditional set. This was formed on the first two measurement occasion (T_0-T_1). The co-variable thus was chosen on the same time period as the conditional set was formed to represent the actual six month interval. Figure 3 illustrates the procedure.

Again, post hoc tests were applied where the overall difference reached a significant alpha of 0.05.

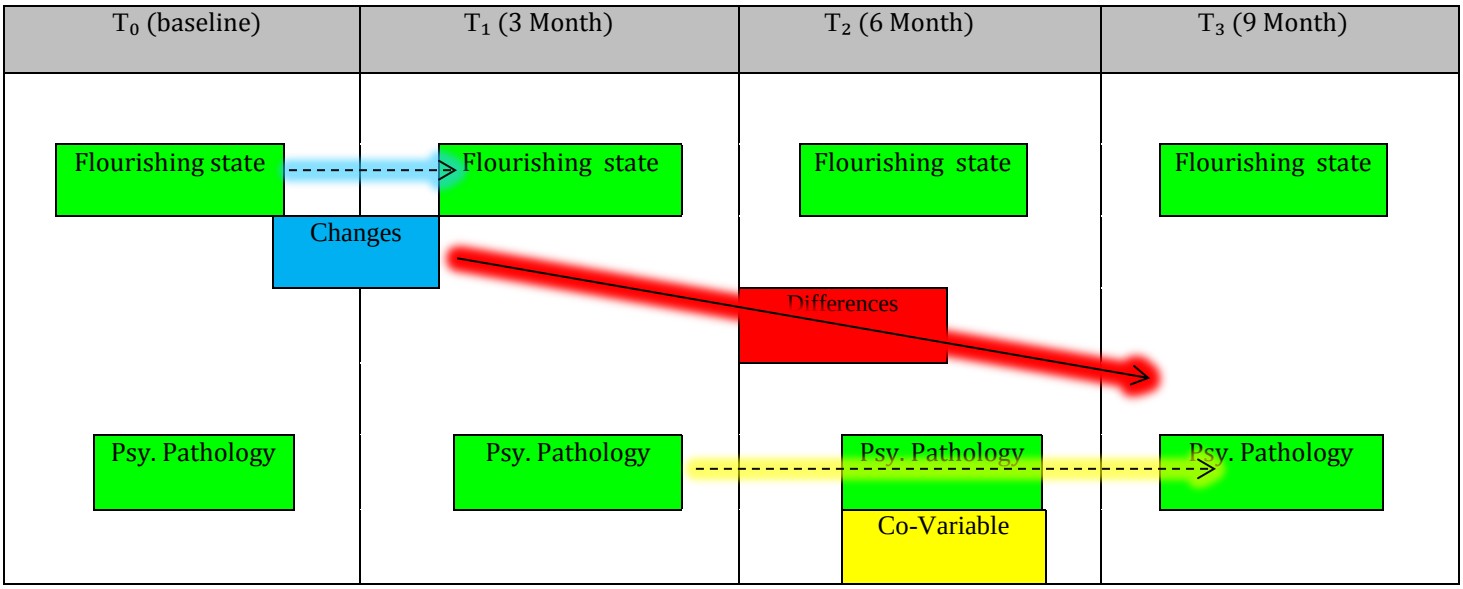

Figure 3: Differences of the groups on psychopathology six month later. The Co-variable shows the correction of the variable Psychopathology on itself over time.

Results

Prevalence and stability of flourishing

In a first analysis, the percentage and stability of flourishing participants was examined. The first step was to determine the amount of flourishing participants on the different measurement occasions. The results indicate that the amount of flourishing participants stayed relatively stable over the four measurement moments. The average proportion of flourishing participants was 30.9% (N=597). The third measurement moment showed the lowest proportion of flourishing participants with 27.7% (N=535). The remaining measurement moments showed a proportion close to 32.0%. T_0 showed the highest proportion with 32.7% (N=631) followed by T_1 with 31.8% (N=615) and T_3 with 31.4% (N=606). This indicates that almost one third of the population was flourishing on each measurement. In Table 1 the results are summarized.

Table 1. *Flourishing prevalence over the nine month period*

	T_0 (baseline) (N=1932)		T_1 (3 Month) (N=1932)		T_2 (6 Month) (N=1932)		T_3 (9 Month) (N=1932)		Overall Mean (N=1932)	
	N	%	N	%	N	%	N	%	N	%
Flourishing	631	32.7	615	31.8	535	27.7	606	31.4	597	30.9
Not flourishing	1301	67.3	1317	68.2	1397	72.3	1326	68.6	1335	69.1

After determining the amount of participants flourishing, the next step was to examine the proportion of participants that are stable or change in their state of flourishing. If you combine all two contiguous scores of the four measurement moments, three sets are left to indicate changes of the participants (T_0-T_1, T_1-T_2 and T_2 -T_3). In table 2 the three sets of the groups are shown. Also overall changes and stability of all four measurement moments are shown in Table 2. The two groups that are changing as well as the two stable groups have been merged into one group to show change versus stability. Results show that from the 1932 participants, 61.4% (N=1185) did not change their condition on any of the four measurement moments. This leaves 38.6% (N=747) of the participants that changed on at least one occasion.

Table 2. *Flourishing changes over the nine month period*

change group	T_0- T_1 (N=1932)		T_1-T_2 (N=1932)		T_2- T_3 (N=1932)		T_0- T_3 (N=1932)	
	N	%	N	%	N	%	N	%
Not flourishing -> flourishing	220	11.4	157	8.1	140	7.3	747	38.6
Flourishing->not flourishing	236	12.2	237	12.3	211	10.9		
Stayed flourishing	395	20.4	378	19.6	395	20.4	1185	61.4
Stayed not flourishing	1081	56.0	1160	60.0	1186	61.4		

Impact of flourishing on psychopathology over three months

In this part of the analysis the different flourishing groups and their influence on psychopathology were determined. Two ANOVA's on different time spectrums were executed. The first ANOVA showed significant differences of the groups (independent variable) on their scoring of the dependent variable psychopathology ($F(3, 1927) = 4.220$, $p < 0.01$). This means that indeed the groups show different scores of psychopathological symptoms three month later. The data shows that on average flourishing groups ('stayed flourishing' and 'changed to flourishing') scored lower on psychopathology than the other two conditions ('stayed not flourishing' and 'changed to not flourishing'). Participants who 'stayed flourishing' scored lowest on psychopathology (.22 on average) while people who 'stayed not flourishing' scored highest (.42 on average). Between the two groups that did not change the two changer groups are located. The group that 'changed to flourishing' scored lower (.29 on average) than the group 'changed to not flourishing' (.31 on average). However, the difference between the two changing groups is rather small (.02). The results are shown in table 3.

To specify the differences between the groups Post-Hoc tests was applied. Four different groups lead to six possible pair comparisons. Of those pairs four showed significant different pattern in scoring on psychopathology. 'Stayed not flourishing' and 'stayed flourishing' showed a significant difference o $p = .00$. 'Stayed flourishing' scored on average .20 lower on the BSI indicating less psychopathology; 'Stayed not flourishing' and 'changed to not flourishing' differed with a significance of $p = .00$. The mean difference on the BSI was .11

higher for the ‘stayed not flourishing’ group indicating higher psychopathology; ‘Stayed not flourishing’ and ‘changed to flourishing’ also differed significant with p = .00. The mean difference was .13 higher for the ‘stayed not flourishing group’; ‘Stayed flourishing’ and ‘changed to not flourishing’ differed significant with p = .00. The mean difference was .09 higher for the ‘changed to not flourishing’ than for the ‘stayed flourishing’ group. There was no significant difference between the pairs of ‘changed to flourishing’ and ‘stayed flourishing’ (p = .06) (mean difference .07 higher for ‘changed to flourishing’ group) Also no significance could be found from the ‘changed to flourishing’ and ‘changed to not flourishing’ groups (p = .87; mean difference .02). The results showed that especially the changing groups show no significance indicating no differences in psychopathological symptoms between the two groups. The results are shown in table 4.

Table 3. *ANOVA change groups T_0- T_1 on psychopathology, three month period*

Change group	Mean score BSI	N	df	F	p
Overall	.31	1932	3	4.22	.01
Not flourishing -> flourishing	.29	220			
Flourishing -> not flourishing	.31	236			
Stayed flourishing	.22	395			
Stayed not flourishing	.42	1081			

Table 4*: Post Hoc Test, Tukey HSD. T_0-T_1 groups on psychopathology T_2*

Change group	Compared Groups	Mean Difference	SD	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Not flourishing-> flourishing	Stayed not flourishing	-.13	.02	.00	-.19	-.07
	Flourishing-> not flourishing	-.02	.03	.87	-.10	.05
	Stayed flourishing	.07	.03	.06	-.00	.14
Flourishing-> not flourishing	Stayed not flourishing	-.11	.02	.00	-.17	-.05
	Not flourishing-> flourishing	.02	.03	.87	-.05	.10
	Stayed flourishing	.09	.03	.00	.02	.16
Stayed flourishing	Stayed not flourishing	-.20	.02	.00	-.25	-.15
	Not flourishing-> flourishing	-.07	.03	.06	-.14	.00
	Flourishing-> not flourishing	-.09	.03	.00	-.16	-.02
Stayed not flourishing	Not flourishing-> flourishing	.13	.02	.00	.07	.19
	Flourishing-> not flourishing	.11	.02	.00	.07	.19
	Stayed flourishing	.20	.02	.00	.15	.25

The second ANOVA is equivalent to the first but looks at a later spectrum in time. Results showed significant differences of the groups in scoring on psychopathology ($F (3, 1927) = 3.365$, $p < .02$). On average the group ‘stayed flourishing’ scored lowest on psychopathology and the group ‘stayed not flourishing’ scored highest. Interestingly the ‘changed to flourishing’ group scored higher on psychopathology (mean score = .33) then the ‘changed to not flourishing’ group (mean score = 28). This indicates that participants who ‘change to flourishing’ show more pathological symptoms then participants that ‘changed to not flourishing’. Table 5 shows the results of the analysis.

Post hoc pairwise comparisons revealed that four of the six pair comparisons showed significant differences of the groups and their scoring pattern on psychopathology. Participants that 'stayed not flourishing' differed significant in scoring in psychopathology from the other groups and also scoring higher on the BSI indicating more psychopathology ('Stayed flourishing', p = .00, mean difference = .19; 'changed to flourishing', p = .02, mean difference = .08; 'changed to not flourishing', p = .00, mean difference = .13). The 'changed to flourishing' and 'changed to not flourishing' did not differ in their scoring patterns on psychopathology (p = .52). The mean difference indicates that the 'changed to flourishing' group scored higher on the BSI than the 'changed to not flourishing' group. The 'stayed flourishing' group now differed significant from the participants that 'changed to flourishing' (p = .00). The 'changed to flourishing' group scored on average .10 higher on the BSI. The 'changed to not flourishing' group and the 'stayed flourishing' group showed no significant differences in scoring on psychopathology (p = .14; mean difference = .06 higher for 'changed to not flourishing'). The results are shown in table 6.

Table 5. *ANOVA groups T_1-T_2 on psychopathology, three month period*

Change group	Mean score BSI	N	df	F	p
Overall	.31	1932	3	3.37	.02
Not flourishing -> flourishing	.33	157			
Flourishing -> not flourishing	.28	237			
Stayed flourishing	.22	378			
Stayed not flourishing	.41	1160			

Table 6*: Post Hoc Test, Tukey HSD. T_1–T_2 groups on psychopathology T_3*

Change group	Compared Groups	Mean Difference	SD	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Not flourishing-> flourishing	Stayed not flourishing	-.08	.03	.02	-.16	-.01
	Flourishing-> not flourishing	.05	.03	.52	-.04	.13
	Stayed flourishing	.10	03	.00	.02	.19
Flourishing-> not flourishing	Stayed not flourishing	-.13	.02	.00	-.19	-.07
	Not flourishing-> flourishing	-.05	.03	.52	-.13	.04
	Stayed flourishing	.06	.03	.14	-.01	.12
Stayed flourishing	Stayed not flourishing	-.19	.01	.00	-.24	-.14
	Not flourishing-> flourishing	-.10	.03	.00	-.19	-.02
	Flourishing-> not flourishing	-.06	.03	.14	-.13	.01
Stayed not flourishing	Not flourishing-> flourishing	.08	.03	.02	.01	.16
	Flourishing-> not flourishing	.13	.02	.00	.07	.19
	Stayed flourishing	.19	.02	.00	.14	.24

Impact of flourishing on psychopathology over six month

After six months, no significant differences between the groups in scoring on psychopathology were found, $F (3, 1927) = 1.582$, $p < 0.19$. The mean scores indicate a relatively linear relation with the 'stayed not flourishing' group at the top in scoring on psychopathology (.42) followed by the 'changed to not flourishing' group (.33), the 'changed to flourishing' group (.29), leaving the 'stayed flourishing' group with the lowest average score (.22). However, none of the differences reached significance leaving the means to be viewed only descriptively. With no overall significant difference no Post Hoc test was executed. The aim of the Post Hoc was to better differentiate significance. Without an overall significance this is not necessary. The results are shown below in table 7.:

Table 7: *ANOVA groups T_0- T_1 on psychopathology, six month period*

Change group	Mean score BSI	N	df	F	p
Overall	.32	1932	3	1.58	.19
Not flourishing -> flourishing	.29	220			
Flourishing -> not flourishing	.33	236			
Stayed flourishing	.22	395			
Stayed not flourishing	.42	1081			

Discussion

The aim of this study was to get more insight in the process of flourishing over time and the short term effects of these changes on psychopathology. Seeing psychopathology and mental health as two separate entities is a relatively new perspective. The implication requires to rethink current concepts and to form a new view on health, its structure and dynamics. Being a separate entity, mental health could be used as a substantially support to enhance therapy. Another major assumption is the preventive character mental health could have. Enhancing mental health in society could therefore lead to a more resilient and happy society. Thus, better understanding of mental health and its benefits could lead to possible application in therapy as well as in society. For this purpose, three different research questions were examined. First, the prevalence of flourishing individuals in the population as well as the changes in people's flourishing states over time have been studied. In the second part of the study, the focus was on these changes of flourishing and differences in psychopathology scores three month later. Finally, the time interval under investigation was extended to six months. In the following the findings of the three parts and their implications will be discussed.

When comparing the flourishing prevalence of this study with those of other studies, it is noticeable how great the variance of the different studies and the found prevalence are. The average amount of flourishing participants in the present study was 30.9 %. In Keyes study (2010) around 20.0% of the participants were found to be flourishing. Huppert (2013) showed a great variety in 23 different European countries. Huppert identified many different reasons such as income equality, developed social welfare and health care system that influence flourishing in a population. The knowledge that these factors influence countries to have different amounts of flourishing individuals points to the possibility to influence mental health in a society directly through governance of these factors. Therefore, it would indeed be possible to promote and protect flourishing in a population. Even though Huppert identified several factors influencing flourishing this only explains a part of the variation. Huppert (2013) for example found, that the prevalence of flourishing people in the Netherlands was 20%, thus 10% less then what was found in the present study, which also used a representative sample out of the Dutch population. Hone et al. (2014) stated that the different prevalence could also be due to differences in definitions and operationalization of the flourishing construct. She identified four different operationalization of flourishing, each

containing different parameters in rating a person as flourishing. In this study the operationalization of Keyes was used that can be thought of as more flexible than that of Huppert (Hone 2014). This possibly led to the higher prevalence of flourishing individuals in the present study and could explain the difference of 10% found in the present study in comparison with that of Huppert.

This creates problems, especially when comparing studies with different operationalization and could explain inconsistent findings. When it comes to changes in flourishing, almost 38,6% of the participants changed at least on one moment to flourishing or not flourishing over the total period of nine months. This shows that even though the prevalence of flourishing in the sample stays more or less the same on each measurement moment (average 30.9%), people do change on an individual level. These findings are similar to Keyes' (2007), showing a consistent amount of flourishing participants on both measurement moments over ten years, while almost half representing new cases at the second measurement. Thus, dependent on the operationalization different prevalence of flourishing are found. These amounts are relatively stable over time even if there are individual changes.

In the second part of this study, the four groups ('stayed flourishing', 'stayed not flourishing', 'changed to flourishing' and 'changed to not flourishing') were compared based on their psychopathological symptoms three months later. Individuals that 'stayed flourishing' over all measurement moments showed the least amount of psychopathological symptoms. Individuals that 'stayed not flourishing' over time showed the most psychopathological symptoms. This is a clear indication for a negative correlation of mental health and psychopathology. Stability seems to be very important for benefits on the one hand and also for deficits on the other. Individuals, who changed their flourishing condition, show no distinguishability. According to the promotion and protection hypothesis gains in mental health should have protected people from psychopathological symptoms in the future. Losses should have put them at greater risk. The expected result therefore, was that people who 'changed to flourishing' would show less psychopathology than individuals that 'changed to not flourishing'. This was not confirmed by the present findings. It might be possible that the effects need more time to manifest than just a three months interval. This would mean, that mental health going up and psychopathology going down, is not an instantaneous effect but rather a process that takes longer than the observed timespan. A prolonged duration before effects becomes visible supports the two continua model. If mental health and

psychopathology would be ends of the same continuum, the effects of change would be more linear and direct and could thus be observed within the short timespan.

Concerning the six month period, no differences in psychopathological symptoms were found for any of the groups. This is contradictory to earlier research of Wood (2009) and Keyes (2007), who have found such effects over a period of ten years. It seems to contradict the possibility that the beneficial effects take more time than three month to be observable. This would be an argument against the promotion and protection hypothesis. A more reasonable explanation concerns the three month in which the changes are being observed. The relatively high percentage of individuals changing in flourishing over the nine months indicates that there might be a difference in the quality of the changes. Some changes might be of very short nature, what would have less effect on psychopathology. Others changes might be more sustainable. The time span of three month could be too short to identify sustainable effects on psychopathology. The changes within three month would therefore be a limited view on a flexible construct.

To better explore this possible explanation it is important to compare this research to relevant long term studies. Keyes (2010) for example, found that almost half of the flourishing participants (51%), were still flourishing after ten years. In the present study 43.2% of flourishing participants stayed flourishing over the nine month period. The difference is that in the present study four measurement moments instead of two were applied. Through more measurement moments, more changes were recorded that might be responsible for the lower percentage of participants who stayed flourishing over nine months in comparison to those observed over ten years. This might indicate that flourishing is not as stable as Keyes suggests. This would mean that some of the participants in Keyes study who seemingly stayed flourishing over the ten years, actually could have experienced several changes over time. As shown in this study, individuals could undergo changes frequently. It might be the case that flourishing is very sensitive to change over short periods of time, but over a long period of time some sort of "baseline" could exist on which a general trend can be observed.

Brickman and Campbell (1971) formulated the hedonic treadmill theory that argues in a comparable direction of an underlying baseline. The theory states that people do react briefly to good and bad events, but in a short time they return to neutrality (baseline). Based on an automatic habituation model the theory argues that through adaptation, constant stimuli fade away into the background in order to have resources available to deal with novel stimuli. The theory assumes that the happiness of individuals is more or less set and that there is little one can do to change it. This assumption is criticized by Diener et al. (2006). They reviewed the

hedonic treadmill theory, showing that it is more complex than simply a neutral set point that cannot change. Those set points show great diversity in their characteristics dependent on individuals and circumstances. Diener (2006) concludes that it is possible to change those fix points but also states that the effects of a sort baseline are present and are to be considered carefully. He claims that interventions that aim to enhance mental health should change the baseline of individuals. Mancini (2011) also criticizes the hedonic treadmill as to rigid. He observed in a twenty years longitudinal study how three major life events (bereavement, divorce and marriage) influence the subjective wellbeing of the participants. He identified different trajectories people tend to follow in specific life event. Those trajectories are dependent on differences in individual characteristics but also the event seems to have a considerable influence. Interestingly Mancini found that individuals with stable and high level of subjective wellbeing showed the least impact of the life events. This is an indication for the possible protective benefits of mental health described in the promotion and protection hypothesis of Keyes (2007). The notion of having a sort base line, regardless of its flexibility, is important for interpreting the results of this study. The changes recorded in this study over a period of three month might just reflect the constant deviation of the individuals from the baseline. Many of the changes in mental health could be only temporarily and would return after a short period to the baseline niveau. Effects described and observed by earlier longitudinal studies of the promotion and protection hypothesis are concerning wider intervals of years. Those intervals are wide enough so they might actually measure the baseline rather than the short living changes.

This study thus reveals that the promotion and protection of mental health could result in beneficial effects on psychopathology. The real question concerning the treatment of psychology, as shown in this study, is not if we should promote and protect mental health but rather how we should do it. People seem to have individual overall tendencies, here referred to as baseline, that influence their mental health. Additionally short living changes seem to be present at all time, without a long term impact. A promotion and protection of mental health therefore could be more difficult than originally thought. The first step would be a better understanding of the underlying mechanisms and influences of the described baseline. Enhancing mental health seems like a task a single clinical intervention hardly can fulfill on its own. Diener (2006) concludes that effective interventions must aim to change the baseline of people. This must happen in a constant and repeated manner to ensure a lasting effect. This means even if treatment can be enhanced through considering mental health, the actual

promotion and protection of mental health needs to be accomplished in society and the everyday life of people. Only this way long lasting change in mental health can be accomplished. These lasting enhancements would maximize the resilience of a population preventing it from future psychopathology. If mental health would only be enhanced during the treatment of psychopathology, it might be too late to get the maximum benefits that a preventive approach could ensure. Nonetheless it is not clear how treatment could profit from involving mental health as a separate part of the therapy.

The study design in itself has several strengths and limitations. A strength is the longitudinal character of the study. Containing four different measurement moments makes it possible to study the changes of flourishing and the impact of these on psychopathology over time. Moreover, the sample taken from the LISS panel forms a good representation of the Dutch population. In combination with the MHC-SF questionnaire that shows good psychometric properties (Lamers, 2011) and the BSI, a widely used screening instrument for psychopathology (De Beurs, 2006), makes the study more robust and valid.

A limitation of the study is the comparability with earlier research. The Constructs used in this and other studies were not the exact same. This could have led to differences in findings. Wood (2009) was not investigating the concept of flourishing but the impact of psychological wellbeing on depression. Psychological wellbeing is just one of the three pillars of mental health. Furthermore, he investigated the impact of psychological wellbeing on just one psychopathological phenomenon (depression). Keyes (2005) study used the same flourishing concept, but looked at just four different mental disorders. In this study the BSI was used as measurement for psychopathology, checking for a wide variety of different psychopathological symptoms. This could have had a major impact on the findings in comparison to the studies of Keyes (2005) and Wood (2009). With a greater variety of psychopathological symptoms, more variation in psychopathological symptoms is possible. This problem surely arises from the infancy of flourishing in research (Hone, 2014). More longitudinal studies with similar parameters are necessary in order to shed light on this matter.

Another limitation is the usage of the BSI that brings some advantages as well as some disadvantages. Advantages are that the instrument shows good psychometric properties and it screens for a great variety of psychopathological symptoms (De Beurs, 2006). This creates a more holistic image of psychopathology and the influences it asserts on. However, a major

disadvantage is that there is no discrimination between disorders. The differentiation of the measurement only concerns more or less psychopathological symptoms but fails to identify specific syndromes. Some disorders are more severe than others and could intervene very differently with the mental health continuum. It is possible that some disorders turn out to have more negative influences on the mental health continuum, so that certain individuals hardly reach the state of flourishing. The identification of such patterns could be essential for further research on the topic as well as for creating new therapies in the clinical context.

Further studies could focus on different countries with different prevalence, in order to get a better understanding of flourishing and its impact on psychopathology. Huppert (2013) examined 23 different countries with different percentages of flourishing individuals. It would be very interesting to examine how these countries show differences in psychopathological symptoms and how flourishing is associated with it. If Keyes hypothesis is right, countries with more flourishing individuals should show less prevalence of psychopathology and vice versa. If this pattern can be confirmed, it would be a strong argument for therapy and society to study and enhance mental health. This would also be of interest in further investigations of a possible baseline and how and why differences exist between countries. Another suggestion is to identify specific groups of individuals that show similar patterns of flourishing and changes in flourishing like Mancini (2011) did in his study. A possibility would be to differentiate between specific disorders rather than events and their connection to mental health. Some disorders could have more dramatic impacts on mental health which could endanger them to develop or maintain poor mental health. On the other hand, some disorders could turn out to benefit easily from mental health improvement which could lead to integration of mental health into the therapy for these specific disorders. Very important is the question if some individuals actually are very stable in flourishing over a great period of time and show the mentioned baseline. If those individuals can be identified it could be beneficial to study what differentiates them from people who flourish less. Longitudinal studies in general seem to be inevitable to understand the complex construct of mental health.

A very important issue in the study of flourishing is to agree on a shared definition and operationalization of the construct. Hone (2014) found four different operationalization of flourishing. The four models consistently find different prevalence rates that limit the usefulness for scientific research. It is indispensable to measure this construct in a consistent manner. The reason for such diversity in operationalization of flourishing is due to the relative novelty of this construct (Hone, 2014). More research will lead to a consistent manner of

measuring flourishing that will enhance scientific comparability. Or as Huppert (2013) stated: "In the same way that it has taken many years for clinicians to agree on the diagnosis of mental disorders (and this remains a dynamic process as our understanding of mental disorders increases), it will take some years to achieve agreement on the definition and measurement of mental health."

Concluding, flourishing and its impact on psychopathology turns out to be a dynamic and complex process. The short term changes in flourishing seem to be frequent but with different lasting impacts. The beneficial effects of mental health on psychopathology described by the promotion and protection hypothesis do not seem to be evident on a short term interval of three months. Considering longitudinal studies, with evidence for this hypothesis, it seems plausible to speak of a baseline in people's mental health. Short living changes would therefore occur frequently but most individuals return to their baseline of mental health. Future research should investigate on this baseline, its characteristics and its changeability.

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