It Takes Two to Tango: the Two-Continua Model in a Self-Help Acceptance and Commitment Therapy Intervention

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Background According to the positive psychology movement, mental health is more than the absence of psychopathological symptoms. Researchers accommodated a growing body of research in support of a two-continua structure of mental health. The present research examined the relation of the two continua within a self-help intervention based on acceptance and commitment therapy ('Living to the fullest'). **Method** Participants (N=250) with mild to moderate depression and anxiety were recruited and took part in the self-help intervention with email support. Levels of depression, anxiety and mental health were assessed prior to, directly and three months after the intervention. Pearson's correlation, cross tabular as well as eight blockwise linear regression analyses were performed in order to examine the relationship between psychopathology and mental health. Baseline levels of psychopathology and mental health were controlled for within the regression analyses. **Results** The two continua are distinct but show a modest negative correlation. Change in levels of psychopathology are predictive for future mental health. Likewise, change in levels of mental health are predictive for future psychopathology. Participants improved on both psychopathology and mental health separately through the intervention. **Conclusion** The study provides the first findings of the two-continua model within an intervention sample using multiple measurement occasions. These findings underline the importance of acknowledging mental health as a complete state, instead of the mere absence of symptoms. In order to enhance individuals' mental health, both dimensions have to be taken into account. Further research is required in order to identify and create interventions that make individuals truly mentally healthy.

Keywords: two-continua model, acceptance and commitment therapy, positive psychology, mental health

Affective and anxiety disorders are major public health problems in our society. In the Netherlands, among the age group of 18 to 64 years, 643,800 individuals suffered from an affective disorder in 2010. In the same age group 1,057,800 individuals suffered from an anxiety disorder (De Graaf, Ten Have, & Van Dorsselaer, 2010). When remaining untreated, these disorders can cause limitations concerning the overall functioning of the person, increase the costs for national health care (Meijer, Smit, Schoemaker, & Cuijpers, 2006), and decrease quality of life (Saarni et al., 2007). In recent years there has been growing interest in finding interventions to reduce the prevalence and prevent the early onset of mental disorders.

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Traditionally, interventions aimed at prevention and reduction of psychopathological symptoms to improve the mental health state of people. Interventions based on the theory of cognitive behavioral therapy, interpersonal therapy as well as behavioral activation treatments are proven to be effective for individuals at risk of developing a disorder, and depressions in particular (Cuijpers, Van Straten, Smit, Mihalopoulos, & Beekman, 2008; Meijer et al., 2006).

During the last decade, however, there has been a shift in thinking. The idea that the mere absence of psychological symptoms does not equal mental health made place for a more positive approach of seeing mental health as a state of positive human functioning (Seligman & Csikszentmihalyi, 2000). In line with the new positive view on mental health the World Health Organization (2004) describes a mentally healthy individual as capable of realizing own abilities, coping with daily stressors, functioning effectively and contributing to community. This approach to mental health stands in close comparison to two different study traditions

of well-being, the hedonic and eudaimonic (Deci & Ryan, 2008; Ryff & Keyes, 1995; Weich et al., 2011; Westerhof & Keyes, 2010). The hedonic approach to mental health defines well-being as a state of positive affect, with high levels of energy and absence of negative feelings (Deci & Ryan, 2008; Weich et al., 2011). In the view of the eudaimonic approach to mental health the focus lies on the ability to create meaningful relationships with family and friends and living life in a deeply satisfying way (Deci & Ryan, 2008; Weich et al., 2011). Within these two study traditions three types of well-being can be distinguished: emotional, social, and psychological well-being (Keyes, 2007; Keyes, 2011). Emotional well-being addresses the presence of positive and absence of negative affect, feelings of happiness as well as perceived satisfaction in life (Keyes, 2002, 2005).This concept of well-being is closely linked to the hedonic study tradition (Keyes, 2011). Social well-being focuses on an individual's functioning in social contexts and covers the following aspects: social integration, social contribution, social coherence, social actualization, and social acceptance (Keyes, 1998). Psychological well-being describes the level of individual growth and covers the following aspects: purpose in life, autonomy, personal growth, positive relations with others, self-acceptance, and environmental mastery (Keyes, 2005; Ryff & Singer, 2008). The concepts of social and psychological well-being are closely related to the eudaimonic approach to mental health (Keyes, 2002). Individuals showing high levels of the three structures of well-being can be considered mentally healthy and are called flourishing. In contrast to that, people having low levels of mental health are called languishing (Keyes, 2002). Individuals who are flourishing suffer less from health limitations and show higher levels of professional and psychosocial functioning compared to people who are languishing (Keyes, 2005).

In agreement with the initial idea of positive psychology, that mental health is more than being free from psychological limitations, numerous studies were conducted. These studies strengthen the concept of a two-continua structure of mental health as opposed to a single-continuum structure (Keyes, 2002, 2005, 2007; Lamers, 2012; Weich et al., 2011; Westerhof & Keyes, 2010). Even if free of any mental disorders, people who are languishing experience a great level of dysfunctions. This is in accordance with the concept that mental health and mental illness can be seen as two distinct continua (Keyes, 2005). Furthermore, it was found that although older adults were experiencing less mental illness than their younger counterparts, they showed lower levels of mental health (Westerhof & Keyes, 2010). As mentioned earlier, although lying on two distinct continua mental health may still exert a great deal of influence on the level of psychopathology. In a representative study, Keyes (2005) showed that the two continua are distinct but correlate modestly with -.53. Thus, an increasing level of mental health decreases the prevalence for mental illness. Recently published work by Lamers (2012) replicated these findings. According to her, changes in mental health were predictive for later levels of psychopathology and vice versa (Lamers, 2012). The above mentioned findings suggest that in order to make individuals truly mentally healthy we must consider mental health as a complete state, implying that assessment of both psychopathological symptoms and mental health is required. In addition to reducing psychopathological symptoms, treatments must focus on increasing the well-being of individuals. Several interventions that address psychological limitations as well as a creation of a state of mental health have been developed. One intervention worth mentioning in that context is Acceptance and Commitment Therapy (ACT) (Biglan, Hayes, & Pistorello, 2008; Hayes, Luoma, Bond, Masuda, & Lillis, 2006).

Acceptance and Commitment Therapy (ACT)

ACT is a third generation cognitive behavioral therapy that combines processes of mindfulness, acceptance, and behavioral change. Central to the idea of ACT is the goal of increasing the psychological flexibility of the individual rather than encouraging him to eliminate thoughts and feelings. Psychological flexibility is the ability of consciously contacting the present moment and choosing to act according to own life values (Hayes et al., 2006). This flexibility is acquired through six core processes: acceptance (embracement of aversive internal processes), cognitive diffusion (change way of interaction with thoughts), contact with the present moment (mindfulness), self as context (realize to be more than thoughts and emotions), values (recognizing important values in life), and committed actions in accordance to own values (Biglan et al., 2008). Within this intervention participants actively face the ways in which they try to control experiences and thoughts in order to make space for a more accepting approach. Furthermore, by clarifying important own values people participating in the intervention create a base for taking actions in directions that are valuable to them (Biglan et al., 2008; Hayes et al., 2006).

The ACT model has shown to be effective for people from different cultural backgrounds and across a wide range of psychological problems (Hayes et al., 2006; Powers, Zum Vörde Sive Vörding, & Emmelkamp, 2009). The concept of ACT has been adapted to the Dutch setting under the name 'Living to the fullest' (Bohlmeijer & Hulsbergen, 2009). Within this intervention mindfulness exercises are provided complementary to the training of ACT. Mindfulness can be seen as a state of mind where one is open to novelty, sensitive to the context and engaged in the present moment (Baer, 2003; Langer, 2011). Currently 'Living to the fullest' is implemented in about half of the Dutch mental health institutions in both a group and guided self-help format. The group format has proven effective in a study among indi-

viduals with mild to moderate psychological distress. The intervention had a significant effect on the level of emotional and psychological well-being mediated by the improved psychological flexibility (Fledderus, Bohlmeijer, Smit, & Westerhof, 2010). In addition, the early treatment with the 'Living to the fullest' group intervention successfully decreased the levels of fatigue and depressive symptomatology, which possibly reduces the risk of developing a full clinical depression (Bohlmeijer, Fledderus, Rokx, & Pieterse, 2011). Moreover, a study on the effectiveness on the self-help format of this intervention showed significant reductions in levels of depression, anxiety, and fatigue. On top of that, there was a significant increase in the level of mental health of the participants on all three subcategories of well-being (Fledderus, Bohlmeijer, Pieterse, & Schreurs, 2011).

The studies on the effectiveness of this intervention could successfully show both a decrease in level of symptoms and an increase in level of mental health. However, to this day little attention has been paid to the relationship between the two outcomes within one intervention. The objective of the current research is to determine whether the underlying structure of these outcomes match the concept of a single continuum or the concept of two distinct continua. Knowledge about the underlying structure of the intervention 'Living to the fullest' would contribute to our understanding of the mechanisms of mental health and mental illness. That in turn can provide implications for mental health services, meaning that interventions should not merely focus on symptom reduction but also on an increase in mental health.

Method

The present study is supplementary to the study of Fledderus et al. (2011) which pointed out the effectiveness of the self-help intervention 'Living to the fullest' in decreasing symptoms of psychopathology as well as increasing the level of mental health. This study was a randomized controlled trial with three conditions: ACT intervention with minimal support via email (n=125), ACT intervention with extensive email support (n=125), and a waiting list group (n=126). The waiting list group has been excluded from the sample of the current research. Due to comparable effectiveness the two experimental groups (n=250) were merged into one within the current sample.

Participants and procedure

The participants were recruited in 2009 through advertisements in Dutch newspapers. The initial sample responding to the newspaper advertisement received information about the study as well as an informed consent form. The participants were further screened for the inclusion and exclusion criteria. Inclusion criteria were a minimum age of 18 years and mild to moderate depressive symptoms (between 10 and 39 points on the Center of Epidemiology Studies-depression scale (CES-D);(Radloff, 1977)) as well as anxiety symptoms (between 3 and 15 points on the Hospital Anxiety and Depression Scale-anxiety subscale (HADS-A); (Zigmond & Snaith, 1983)). Individuals showing severe depressive and/or anxiety symptoms (more than one standard deviation above the mean of the population on the CES-D (cut-off score $\geq$ 39; (Bouma, Ranchor, Sanderman, & van Sonderen, 1995)) and/or HADS-A (cut-off score $\geq$ 15; (Olssøn, Mykletun, & Dahl, 2005)) were excluded due to a need for more intensive individual diagnostics and treatment. Further exclusion criteria were: few depressive symptoms ($\leq$ 10 on the CES-D) and/or anxiety ($\leq$ 3 on the HADS-A)), receiving psychological or psychopharmacological treatment within three months prior to the study, and a high suicide risk. For further information on the selection procedure see Fledderus et al. (2011).

Table 1
Characteristics of participants (N=250)

Characteristic	n	%
Gender		
Female	174	69.9
Male	76	30.4
Mean age, years (*SD*)	42.5 (11.0)	
Marital status		
Married	107	42.8
Divorced	22	8.8
Widowed	4	1.6
Unmarried	116	46.4
Nationality		
Dutch	233	93.2
Other	17	6.8
Education,		
High	196	78.4
Middle	49	19.6
Low	5	2.0
Employment status		
Paid job	178	71.2
In school	20	8.0
Other	52	20.8

The majority of the respondents of the sample (N=250) were female (70%), of Dutch origin (98%), highly educated (78%), and employed (74%). The mean age of the participants was 42 years (*SD*=11.00; R=18-73). For an overview of characteristics of the participants see Table 1.

Intervention

All participants within the experimental conditions received a copy of the self-help book 'Living to the fullest' (Bohlmeijer & Hulsbergen, 2009). This book is based on the concept of ACT (Biglan et al., 2008). The self-help intervention covers a period of nine weeks and contains modules that are based on the six core processes of ACT. The intervention consists of three major parts. The first part focuses on the core process of acceptance, by analyzing control strategies concerning their effectiveness. Within the subsequent part of the intervention the core aspects cognitive diffusion and ex-

periencing self are practiced. Based on that, the participants of the intervention are to find ways to come in contact with experiences without avoiding or controlling them. The third and last part of the intervention focuses on recognizing personal values and acting according to them. Throughout the complete intervention the participants are asked to practice mindfulness on a daily basis (based on mindfulness-based stress reduction, see also Kabat-Zinn (1990)).

Measures

The respondents of the study completed questionnaires at baseline (T0), after three weeks (T1), after six weeks (T2), and directly after the intervention (T3; nine week after baseline). Participants assigned to the experimental condition also took part in a follow up measurement three months after the intervention (T4). In the present study only measures at times T0, T3 and T4 are taken into account.

Depression. The CES-D (Bouma et al., 1995; Radloff, 1977) consists of 20 items and is a short self-report scale to measure depressive symptomatology. The total score on this measure ranges from 0 to 60 points, high scores indicating more depressive symptoms. A score of 16 or higher indicates a clinical depression (Beekman et al., 1997). The psychometric properties of this scale are good. The internal consistency of the scale was good within the current study (α=.86).

Anxiety. The HADS-A (Zigmond & Snaith, 1983) consists of seven items and is a self-report scale to measure symptoms of anxiety. Total scores on this measure range from 0 to 20 points, high scores indicating more anxiety symptomatology. A score of eight or higher indicates the presence of an anxiety disorder. The psychometric properties of the HADS-A are good (Spinhoven et al., 1997). The internal consistency was good within the current study (α=.73)

Mental health. The Mental Health Continuum-Short Form (MHC-SF; (Keyes, 2005; Lamers, 2012)) was used to assess the level of mental health. This scale consists of 14 items measuring the three domains of well-being: emotional well-being (three items), social well-being (five items) and psychological well-being (six items). For the total scale a mean score was computed. Higher scores on this scale indicate higher levels of well-being. In addition to the mean score a dichotomous score was used in this study. Within a recent study of a representative sample of 1,662 Dutch respondents a mean score of 3.98 (SD=0.85) was found (Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011). The mean score of these respondents served as a cut-off score. A mean score of higher than 3.98 indicates that a person is mentally healthy/flourishing. The psychometric properties (Lamers, 2012) as well as the internal consistency within the current study were good (α=.91).

In addition to the measures of these three scales, data of the respondents included age, gender, origin, level of education, as well as marital and employment status.

Statistical analyses

In order to examine the underlying structure of the intervention, different statistical analyses were performed using PASW 20 (Predictive Analytics Software; IBM, USA). All statistical analyses were carried out at a 5% level of significance (p<.05). Prior to the statistical analyses, difference scores between T3 and T0 as well as T4 and T0 of the measures of depression, anxiety, and mental health were calculated.

Correlations among measures *(H1)*. Bearing in mind the results of recent comparable studies, we hypothesized to find a structure of two distinct continua that share a certain amount of variance with each other. To gain insight into the underlying structure of the self-help treatment 'Living to the fullest' we questioned how anxiety, depression and mental health were related to each other prior to, directly and three months after the end of the intervention. We expected to find a modest negative correlation (.30 < r < .60) between psychopathology and mental health prior to and after completion of the intervention. In order to analyze the relations between these measurements, Pearson's correlations were computed at T0, T3 and T4.

Psychopathology predicting mental health after completion of the intervention *(H2)*. We hypothesized that the baseline level of depression/anxiety and the degree of change during the intervention (up to T3 and T4) are predicting the level of mental health after the intervention (T3 and T4). In order to analyze this hypothesis, four blockwise linear regression analyses were performed. Each regression analysis comprised two blocks. Since mental health at baseline is closely related to the criterion (mental health after the intervention) we included it as a controlling variable in the first block of the regression. As a second block, the level of depression as well as the change in depression up to T3 and T4 were added to analyze their predictive value for the outcome variable (the level of mental health at time T3 and T4). In order to examine the predictive value of the baseline level of anxiety as well as change in level of anxiety, regression analyses were performed likewise. Standardized regression coefficients (β), significance levels, R^2, and R^2-change were reported for each regression analysis.

Mental health predicting psychopathology after completion of the intervention *(H3)*. We hypothesized that the baseline level of mental health as well as the degree of change up to after the intervention (T3 and T4) are predicting the level of of depression/anxiety after the intervention (T3 and T4). In order to examine this relationship, another four blockwise linear regressions were performed. Each regression analysis again comprised two blocks. Due to its close relationship to the criterion (level of depression/anxiety at T3 and T4) the baseline level of anxiety/depression was included each as a controlling variable as a first block. As a second block, the level of mental health at baseline and change in

Table 2
Descriptives and interscale correlations of measures of mental health, depression, and anxiety

	1	2	3	4	5	6	7	8	9
1. MHC-SF T0	3.11 (0.79)	.62**	.58**	-.33**	-.30**	-.24**	-.06	-.15*	-.13
2. MHC-SF T3		3.90 (0.85)	.76**	-.24**	-.51**	-.43**	-.16*	-.44**	-.36**
3. MHC-SF T4			3.94 (0.87)	-.22**	-.48**	-.64**	-.13	-.37**	-.51**
4. CES-D T0				22.78 (6.58)	.31**	.24**	.48**	.24**	.18**
5. CES-D T3					13.08 (7.61)	.64**	.20**	.74**	.53**
6. CES-D T4						12.97 (8.39)	.16*	.46**	.75**
7. HADS-A T0							9.52 (2.58)	.42**	.30**
8. HADS-A T3								6.05 (3.10)	.57**
9. HADS-A T4									5.70 (3.25)

Note. Scale means, and standard deviations within parentheses, are represented on the table diagonal. MHC-SF = Mental Health Continuum Short Form; CES-D = Center of Epidemiology Studies Depression Scale; HADS-A = Hospital Anxiety and Depression Scale - Anxiety Subscale; T0 = Baseline; T3 = Directly after the intervention; T4 = Follow up. $^{**}p<.01$; $^{*}p<.05$.

mental health up to T3 and T4 were added in order to analyze their predictive value for the outcome variable (the level of psychopathology at time T3 and T4). For each regression analysis standardized regression coefficients (β), significance levels, R^2, and R^2-change were reported.

Various combinations of psychopathology and mental health *(H4)*. According to the idea of the two-continua model we further hypothesized that it is possible to have any level of psychopathology with any given level of mental health. Therefore we assumed that people would have varied combinations at all given times (T0, T3, T4). In order to test this hypothesis, the participants were divided into four different groups based on their level of mental health as well as their level of psychopathology. Based on their cut-off scores, the sum score of depression (cut-off score 16, Beekman et al. (1997)) and anxiety (cut-off score 8, Spinhoven et al. (1997)) were recoded as dichotomous variables (depressive symptoms=1 vs. no depressive symptoms=0; anxiety symptoms=1 vs. no anxiety symptoms=0). In a further step, the participants were assigned 1 for psychopathological symptoms if they showed depressive symptoms and/or anxiety symptoms. Participants who showed no signs of these symptoms were assigned 0. The grouping procedure based on their level of mental health was done likewise. The cut-off score of 3.98 served as a base for recoding the level of mental health as a dichotomous variable. Individuals scoring above 3.98 were interpreted as mentally healthy (flourishing) and were assigned a 1. On the contrary, individuals scoring 3.98 or below were interpreted as having a low level of mental health (languishing) and were assigned a 0. As a result, the four following groups could be distinguished: flourishing without symptoms of psychopathology, flourishing and psychopathology, languishing without symptoms of psychopathology, and languishing and psychopathology. With the help of a cross tabulation for every measuring moment (T0, T3, T4) it was then analyzed to what extent all different combinations of level of mental health and level of psychopathology are represented.

Overrepresentation flourishing without symptoms and languishing with symptoms *(H5)*. Due to the correlation between the two continua we assumed that individuals would be overrepresented within the group flourishing without symptoms of psychopathology and the group languishing with symptoms of psychopathology. To examine this assumption we investigated the distribution of the individuals with a chi square significance test based on the previously retrieved cross tabulations.

Effect of intervention on both level of mental health and level of psychopathology *(H6)*. We hypothesized that the intervention 'Living to the fullest' has an impact on both level of mental health and level of psychopathology separately. In order to verify this hypothesis, participants with low levels of mental health and high levels of psychopathology at baseline were identified based on the same cut-off scores as applied within the cross tabular analyses. In a further step, the development of the participants concerning measures of mental health and psychopathology were monitored for T3 and T4.

Results

Correlations among measures *(H1)*. In order to answer the first hypothesis *(H1)* a correlational analysis was performed. Table 2 visualizes the extent to which the three different measures are interrelated with each other at each time (T0, T3, T4). As expected there was a significant negative correlation between the measures of mental health and the level of depression at T0 (r=-.33, p<.01), T3 (r=-.51, p<.01), and T4 (r=.-64, p<.01). In addition to that, significant negative correlations between mental health and anxiety were found for all but one time point: T0 (r=-.06, not signif-

Table 3
Blockwise multiple regressions analyzing baseline level and change in levels of depression and anxiety in prediction of mental health after the intervention (T3, T4)

	Block 1 β	Block 2 β
Depression predicting mental health at T3		
MHC-SF T0	.62**	.53**
CES-D T0		-.26**
ΔCES-D T0 and T3		-.41**
R^2 (%)	38.6	50.8
ΔR^2 (%)	38.6**	12.1**
F (df)	132.57 (1,211)	71.79 (3,209)
Depression predicting mental health at T4		
MHC-SF T0	.58**	.48**
CES-D T0		-.33**
ΔCES-D T0 and T4		-.60**
R^2 (%)	33.8	60.8
ΔR^2 (%)	33.8**	27.1**
F (df)	100.94 (1,198)	101.45 (3,196)
Anxiety predicting mental health at T3		
MHC-SF T0	.62**	.57**
HADS-A T0		-.27**
ΔHADS-A T0 and T3		-.38**
R^2 (%)	38.4	50.7
ΔR^2 (%)	38.4**	12.2**
F (df)	131.77 (1,211)	71.69 (3,209)
Anxiety predicting mental health at T4		
MHC-SF T0	.58**	.52**
HADS-A T0		-.31**
ΔHADS-A T0 and T4		-.49**
R^2 (%)	33.5	52.3
ΔR^2 (%)	33.5**	18.8**
F (df)	100.11 (1,199)	72.13 (3,197)

Note. MHC-SF = Mental Health Continuum - Short Form; CES-D = Center of Epidemiology Studies Depression Scale; HADS-A = Hospital Anxiety and Depression Scale - Anxiety Subscale; T0 = Baseline; T3 = Directly after the intervention; T4 = Follow up. **p<.01

icant), T3 (r=-.44, p<.01) and T4 (r=-.51, p<.01). Furthermore, the correlational analysis pointed out that depression and anxiety were significantly positively interrelated at the three measuring times: T0 (r=.48, p<.01), T3 (r=.74, p<.01), and T4 (r=.75, p<.01).

Depression predicting mental health after completion of the intervention *(H2)*. In order to analyze the predictive value of depression and change in level of depression for predicting mental health after the intervention (T3, T4), two blockwise linear regression analyses were performed. The results are shown in Table 3. Mental health at baseline was added in a first block. This predictor (β=.53, p<.01) significantly predicted 38.6% of the variance. The baseline level of depression (β=-.26, p<.01) as well as the change in level of depression up to T3 (β=-.41, p<.01) were added to the model in the second block. This second block significantly predicted 12.1% of variance on top of that predicted by the first block. In a comparable manner, a second regression analysis was performed for predicting mental health at T4. The first block added 33.8% of predictive value to the model (β=.48, p<.01). Being significant predictors, the baseline level of depression (β=-.33, p<.01) and the change in depression (β=-.60, p<.01) added 27.1% of predictive value.

Anxiety predicting mental health after completion of the intervention *(H2)*. In order to analyze the predictive value of the baseline value of anxiety and change in anxiety in predicting mental health after the intervention (T3, T4), two further blockwise linear regression analyses were performed (see Table 3). The baseline level of mental health (β=.57, p<.01) was added in a first block and added 38.4% of predictive value. In a second block, the baseline level of anxiety (β=-.27, p<.01) and change in level of anxiety (β=-.38, p<.01) were added in a second block. This second block added 12.2% to the predictive value of the model. The regression model for mental health at point T4 showed comparable results. The baseline level of anxiety (β=-.31, p<.01) and change in level of anxiety up to T4 (β=-.49, p<.01) added 18.8% on top of the variance predicted by the controlling variable.

Mental health predicting depression after completion of the intervention *(H3)*. In order to analyze the predictive value of mental health and change in mental health in predict-

Table 4
Blockwise multiple regressions analyzing baseline level and change in levels of mental health in prediction of depression and anxiety after the intervention (T3, T4)

	Block 1 β	Block 2 β
Mental health predicting depression at T3		
CES-D T0	.31**	.23**
MHC-SF T0		-.39**
ΔMHC-SF T0 and T3		-.44**
R^2 (%)	9.9	31.0
ΔR^2 (%)	9.9**	21.1**
F (df)	23.15 (1,211)	31.34 (3,209)
Mental health predicting depression at T4		
CES-D T0	.24**	.17**
MHC-SF T0		-.45**
ΔMHC-SF T0 and T4		-.66**
R^2 (%)	5.8	46.0
ΔR^2 (%)	5.8**	40.2**
F (df)	12.27 (1,198)	55.73 (3,196)
Mental health predicting anxiety at T3		
HADS-A T0	.42**	.36**
MHC-SF T0		-.28**
ΔMHC-SF T0 and T3		-.42**
R^2 (%)	17.7	34.2
ΔR^2 (%)	17.7**	16.5**
F (df)	45.38 (1,211)	36.18 (3,209)
Mental health predicting anxiety at T4		
HADS-A T0	.30**	.24**
MHC-SF T0		-.32**
ΔMHC-SF T0 and T4		-.54**
R^2 (%)	9.1	35.1
ΔR^2 (%)	9.1**	26.0**
F (df)	19.94 (1,199)	35.50 (3,197)

Note. MHC-SF = Mental Health Continuum - Short Form; CES-D = Center of Epidemiology Studies Depression Scale; HADS-A = Hospital Anxiety and Depression Scale - Anxiety Subscale; T0 = Baseline; T3 = Directly after the intervention; T4 = Follow up. **p<.01

Table 5
Cross tabulation of distribution of individuals concerning presence of symptomatology and mental health for three time points

	Languishing, % (n)	Flourishing, % (n)	∑, % (n)
Distribution of individuals at T0[a]			
No symptomatology, % (n)	6.0 (15)	4.0 (10)	10.0 (25)
Symptomatology, % (n)	78.4 (196)	11.6 (29)	90.0 (225)
∑, % (n)	84.4 (211)	15.6 (39)	100.0 (250)
Distribution of individuals at T3[b]			
No symptomatology, % (n)	22.9 (49)	41.1 (88)	64.0 (137)
Symptomatology, % (n)	25.7 (55)	10.3 (22)	36.0 (77)
∑, % (n)	48.6 (104)	51.4 (110)	100.0 (214)
Distribution of individuals at T4[c]			
No symptomatology, % (n)	17.4 (35)	42.8 (86)	60.2 (121)
Symptomatology, % (n)	28.4 (57)	11.4 (23)	39.8 (80)
∑, % (n)	45.8 (92)	54.2 (109)	100.0 (201)

Note. T0 = Baseline; T3 = Directly after the intervention; T4 = Follow up.
[a] χ^2 (1,N=250)=12.56, p<.001.
[b] χ^2 (1,N=214)=25.10, p<.001.
[c] χ^2 (1,N=201)=34.76, p<.001.

ing depression after the intervention (T3, T4) two blockwise linear regression analyses were furthermore performed (see Table 4). The baseline level of depression was added as a first block in order to control for the different level of depression prior to the intervention. The baseline level of mental health (β=-.39, p.01) as well as the change in level of mental health up to T3 (β=-.44, p<.01) were added in a second block and predicted an additional amount of 21.1% of variance of depression at T3. The regression model for depression at T4 showed comparable results. The baseline level of mental health (β=-.45, p<.01) as well as the change in mental health up to T4 (β=-.66, p<.01) significantly predicted 40.2% of the variance of depression top of the variance predicted by the controlling variable.

Mental health predicting anxiety after completion of the intervention *(H3)*. In order to analyze the predictive value of mental health and change in mental health in predicting the level of anxiety after completion of the intervention (T3, T4) two final regression analyses were performed (see Table 4). The baseline level of anxiety (β=.36, p<.01) was added in a first block and significantly added 17.7 % of variance to the model. The baseline level of mental health (β=-.28, p<.01) as well as the change in mental health up to T3 (β=-.42, p<.01) was added in a second block and significantly added 16.5% of variance of anxiety at T3. Also in the regression model for the level of anxiety at T4 the baseline level of mental health (β=-.32, p<.01) and change in mental health up (β=-.54, p<.01) served as a strong predictor (ΔR^2=26.0%).

Various combinations of psychopathology and mental health *(H4)* and overrepresentation of combinations *(H5)*. In order to examine *H4* and *H5* a cross tabulation analysis was performed (see Table 5). Before the intervention most participants (78.4%) had as well symptoms as was languishing. Directly after the intervention and at the follow up most participants had no symptomatology and were flourishing (T3=41.1%; T4=42.8%) . A chi square test of independence was performed to examine the relation between symptomatology and the state of mental health. The relation between these variables was significant at all three time points: T0 (χ^2(1,N=250)=12.56,p<.001), T3 (χ^2(1,N=214)=25.10, p<.001), and T4 (χ^2(1,N=201)=34.76, p<.001). Individuals showing symptoms of psychopathology were more likely to be languishing than individuals showing no symptoms at all times. In addition to that the cross tabular analysis revealed that a considerable amount of individuals showed symptoms of psychopathology with high levels of mental health as well as individuals without symptoms of psychopathology that were languishing.

Table 6
Development of individuals showing psychopathology as well as low mental health at baseline

	Languishing, % (n)	Flourishing, % (n)	∑, % (n)
Distribution of individuals at T3			
No symptomatology, % (n)	26.2 (44)	35.1 (59)	61.3 (103)
Symptomatology, % (n)	30.4 (51)	8.3 (14)	38.7 (65)
∑, % (n)	56.6 (95)	43.5 (73)	100.0 (168)
Distribution of individuals at T4			
No symptomatology, % (n)	18.7 (29)	37.4 (58)	56.1 (87)
Symptomatology, % (n)	33.6 (52)	10.3 (16)	43.9 (68)
∑, % (n)	52.3 (81)	47.7 (74)	100.0 (155)

Note. T0 = Baseline; T3 = Directly after the intervention; T4 = Follow up.

Effect of intervention on both level of mental health and level of psychopathology *(H6)*. To examine the impact the intervention exerted on individuals showing symptoms of psychopathology and low levels of mental health their further development (up to T3 and T4) concerning these measurements was monitored. Table 6 gives an overview of the results of this analysis. As can be seen, the majority of the individuals became flourishing without symptoms (T3=35.0% and T4=37.4%). However, this analysis revealed that there is a group of individuals without symptoms that are languishing (T3=26.2% and T4=18.7%) and vice versa (T3=8.33% and T4=10.3%).

Discussion

The objective of this study was to determine whether the effects of 'Living to the fullest' on mental health and psychopathology resemble a one-continuum or two-continua structure.

The results of the present research provide evidence for a two-continuum structure of mental health (Keyes, 2002,

2005, 2007; Lamers, 2012; Weich et al., 2011; Westerhof & Keyes, 2010). This structure is supported by three major findings.

The first important finding in favour of the two-continua model is that measures of mental health and psychopathology are weakly to modestly and negatively correlated. These modest correlation coefficients indicate that within our study, psychopathology and mental health are not the outer extremes of one continuum but can be seen as points on two distinct continua. Whilst revealing that the two continua are distinct from one another, the correlations between measures of mental health and psychopathology also underline the relation they have with each other. This modest correlation therefore implies that individuals suffering from a mental disorder frequently experience lower levels of mental health. The fact that the correlation is modest instead of high also suggests that individuals can be flourishing while having high levels of psychopathology, and vice versa. These findings not only replicate the results of prior studies conducted by Keyes (2005) and Lamers (2012, Chapter 7), stating that mental health and psychopathology are distinct, but share a noticeable amount of variance. The present study also broadens the body of research as multiple measuring occasions within one intervention were considered.

The second important finding was the predicting effect of change in psychopathology on future mental health, after the initial level of mental health was controlled for. The fact that the change in level of psychopathology added a considerable amount of predictive value on top of the baseline level of mental health, underlines the existence of a two-continua structure. Mental health and psychopathology as two continua are therefore complementary to each other. Together they predict the criterium more appropriate than one continuum would do alone. As already pointed out by previous research in the field of the two-continua model (Lamers, 2012), changes in levels of psychopathology were better predictors for later levels of mental health than absolute levels of psychopathology at baseline. Also, change in mental health predicted later psychopathology better than the baseline level of mental health. These results imply that a reduction in level of psychopathology possibly has a positive effect on the level of mental health and vice versa (See also Keyes, Dhingra, & Simoes, 2010; Lamers, 2012; Wood & Joseph, 2010) However, it is to note that the predictive value of mental health in predicting psychopathology and psychopathology in predicting mental health are not of equal value. In the present study, psychopathology measures were stronger predictors for future mental health. This finding is in line with recently published work by Lamers (2012).

The third finding in support of the two-continua structure was that all combinations of psychopathology and mental health existed among the participants, at the three measure moments. This was not possible if psychopathology and mental health were lying on one continuum, with mental health being the absence of psychopathology. This result is in agreement with those of an earlier conducted study (Keyes, 2005). Although participants within the present study showed various combinations of mental health and psychopathology, the majority of individuals either had no symptoms and were flourishing or had symptoms and were languishing. This finding underlines the relation between the two continua. Keyes (2005) found a comparable distribution of individuals in the different groups. This accordance of the result has to be viewed with caution since the categories in the present study were operationalized differently. Within the study of Keyes (2005) psychopathology comprised five and mental health three different categories. The analyses were based on a representative population sample as opposed to an intervention sample with mild to moderate levels of psychopathology in the present study.

In addition to the findings in support of the two-continua structure, the results of our study further suggest that the intervention 'Living to the fullest' had an effect on mental health as well as psychopathology separately. Among the group of participants with low initial levels of mental health as well as a high initial levels of psychopathology, most participants improved on both regards. However, there were individuals that only improved on one of the two aspects, providing evidence that the intervention exerted effects on both measures independently.

Strengths and limitations

To this day research on the two-continua model was mostly done based on population samples. Within this study, we examined the structure of mental health throughout an intervention, being the first research of this kind. This study design not only allowed an insight into the underlying structure of mental health, but also outlined whether the intervention exerts an effect on psychopathology and mental health separately.

A number of limitations need to be noted regarding the present study. Rather than on diagnoses of clinical professionals, the measures within the current study relied upon self-report instruments. Although validation studies on the employed instruments revealed their validity, future research using professional diagnoses can increase the external validity of the findings. Notwithstanding the fact that depression and anxiety are disorders with a high prevalence within our society, they do not cover the whole spectrum of mental disorders. Therefore, the absence of these disorders does not equal a symptom-free state. Future research could extend our knowledge on the two-continua model by incorporating a larger variety of mental disorders.

Implications and future directions

Having found a two-continua concept of mental health has important implications for the national health system. According to this concept, psychopathology and mental health lie on two distinct but modestly interrelated continua. Interventions focusing on the mere reduction of symptoms, therefore, may have a limited impact on mental health. Accordingly, interventions with a focus on mental health will have only a limited impact on psychopathology.

Up to this day, mental health care in the Netherlands almost exclusively focuses on symptom reduction. However, the results of the present study show that individuals can be languishing while being free of psychopathological symptoms, and thus not being completely mentally healthy. Due to their lack of symptoms those individuals would not receive help within the current system. That, however, is not without danger as research shows that languishing individuals are at a high risk of developing chronic physical conditions as well as mental disorders (Keyes, 2011). That possibly causes an increase in the number of individuals suffering from a mental or physical condition, which in turn generates a rise in costs for healthcare (Meijer et al., 2006).

In order to address this problem and truly make individuals mentally healthy, it is essential to provide care for both psychopathology and mental health (Keyes, 2007). An example is set by the Public Health Agency in Canada, which launched a new innovative strategy to improve the mental health of its citizens about half a decade ago (Public Health Agency of Canada, 2011; Stieber, 2012). Recent numbers provide evidence for the effectiveness of this new strategy of mental health care, with the number of flourishing Canadians being twice as high as the number of the Dutch (Statistics Canada, 2012; Stieber, 2012).

The findings of our research showed that the intervention 'Living to the fullest' had an impact on the two continua separately and is therefore a suitable intervention to improve both regards of mental health. Future research should further examine the effectiveness and working mechanisms of other existing interventions regarding the two dimensions of mental health. That means, it needs to be examined what the unique effects on psychopathology and mental health are, when controlling for mental health and psychopathological symptoms, respectively. Moreover, we suggest that future research should examine the effectiveness of mental health interventions for languishing individuals without symptoms of psychopathology. This knowledge could contribute strongly to creating mental health care that meets the needs of individuals with different combinations of psychopathology and level of mental health.

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