

Age, well-being and personality

The relationship between age and the effectiveness of a positive psychology intervention and the role of personality

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Abstract

The aim of the present research was to examine the influence of two age groups (adolescents and middle aged/old people) on the effectiveness of a positive psychology intervention. The study further strived to investigate the degree in which the age groups, in addition to the personality, lead to improvements in predicting the effectiveness of the intervention.

All participants took part in an online intervention in which they were asked to do the “three good things exercise” every day, for one week. In this exercise, participants are asked to write down three things that went well on that day and why it went well. This intervention was supposed to increase the participants' subjective well-being, which was defined by decreases in negative and increases in positive affect. The Positive and Negative Affect Schedule (PANAS) was used to measure the changes in subjective well-being. In order to get to know how the participants score on the five personality traits, extraversion, neuroticism, openness, agreeableness and conscientiousness, the Brief Big Five Inventory (BFI-10) was used.

It was expected that the intervention would lead to a greater decrease in negative affect in adolescents compared to an older age group. It was further expected that the positive affect would increase more in old people than in adolescents. Besides the personality, it was assumed that the age group could lead to better predictions of the changes in positive and negative affect. In contrast to these expectations, the results showed that the negative affect decreased as much in the adolescents as in the old people. Whereas the positive affect increased in adolescents, it did not significantly change in the old people. With regard to personality, the results indicated that the addition of the age group as a predicting variable did not lead to improvements in predicting the changes of positive and negative affect.

To conclude, the results of the present study indicate that the three good things exercise is more effective in adolescents than in old people. Future research can be conducted in order to examine if other positive psychology interventions are more convenient for older people.

Samenvatting

Het eerste doel van deze studie was om de invloed van twee leeftijdsgroepen (jonge volwassenen en volwassenen/oude mensen) op de effectiviteit van een positieve psychologische interventie te onderzoeken. Het tweede doel van deze studie was om te onderzoeken in welke mate de twee leeftijdsgroepen toegevoegd aan de persoonlijkheid, leiden tot een verbetering in het voorspellen van de effectiviteit van de interventie.

Alle respondenten hebben aan een online interventie deelgenomen. Bij deze interventie hebben de respondenten de “three good things” oefening dagelijks uitgevoerd, gedurende één week. De “three good things” oefening houdt in dat de deelnemers drie dingen opschrijven die op deze dag goed waren en waarom deze goed zijn gegaan. Het regelmatig uitvoeren van deze oefening zal tot een verbeterd subjectief welbevinden leiden. Dat wil zeggen dat het negatief affect afneemt,- en het positief affect toeneemt. De verandering in het welbevinden werd met behulp van de Positive and Negative Affect Schedule (PANAS) gemeten. Verder werd de Brief Big Five Inventory (BFI-10) gebruikt om te weten te komen welke scores de respondenten bij de vijf persoonlijkheidstrekkens extraversie, neuroticisme, openheid, mildheid en ordelijkheid, halen.

Het werd verwacht dat de interventie bij de jong volwassenen tot een grotere afname in negatief affect zou leiden dan bij de oudere mensen. Verder werd verwacht dat het positief affect bij de oudere mensen meer zou toenemen dan bij de jong volwassenen. Er werd bovendien aangenomen dat de persoonlijkheid samen met de twee leeftijdsgroepen tot betere voorspellingen van de veranderingen in positief en negatief affect zou leiden. De resultaten laten echter zien dat het negatief affect in beide leeftijdsgroepen in dezelfde mate af is genomen. Terwijl het positief affect bij de jonge volwassenen is toegenomen, is deze bij de oude mensen niet significant veranderd. Verder bleek dat het toevoegen van de leeftijdsgroepen aan de persoonlijkheid niet tot verbeterde voorspellingen van de veranderingen in positief en negatief affect heeft geleid.

Samengevat bleek dat de “three good things” oefening bij jonge volwassenen effectiever is dan bij oudere mensen. Vervolgonderzoek zou kunnen nagaan of andere positieve psychologische interventies voor oudere mensen beter toepasbaar zijn. Dat wil zeggen dat andere interventies niet alleen tot een afname van het negatief affect leiden maar ook tot een toename van het positief affect bij oudere mensen.

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1. Introduction

Within the field of psychology, a new direction of research has emerged, which is known as the positive psychology movement (Gable & Haidt, 2005). In the second half of the twentieth century, traditional psychological research addressed topics such as mental illnesses, violence, racism, and irrationality. That is, research often focused on the dysfunctioning of people.

Positive psychology on the contrary, focuses amongst others on the strengths, positive emotions, and positive character traits of people (Seligman, Steen, Park & Peterson, 2005).

Gable and Haidt (2005) define positive psychology as “*(...) the study of the conditions and processes that contribute to the flourishing or optimal functioning of people, groups, and institutions*” (p.104). That is, positive psychology does not only aim to understand how to bring people from a negative to a neutral state, it rather aims at understanding how to bring people from a neutral to a good state. In other words, positive psychology is not only about functioning or being healthy, but about maximal human functioning and subjective well-being.

Within the positive psychology interventions are offered to various groups of people (Bohlmeijer, Westerhof, Bolier, Steenveld, Geurts & Walburg, 2013). These interventions aim to improve their subjective well-being. There still exists the need of a better knowledge for which groups these interventions work best. It is important to gain knowledge about the interaction of interventions and specific groups of people because interventions can lead to negative affects if they are not offered appropriately. According to Mroczeck and Kolarz (1998) there exists a gap of knowledge about the relationship between age and people's subjective well-being in the context of other well known factors, like personality. The present research aims to contribute to fill in the gap of knowledge about the relationship of age and well-being in the combination of personality not in general but with regard to positive psychology interventions. First, the relationship between age and a positive psychology intervention is going to be examined. More precisely, the present research aims to answer the research question “in what degree does age have an influence on the effectiveness of positive psychology interventions?”. The effectiveness in this study is defined as increases in positive and decreases in negative affect. Secondly, the factor age is going to be examined in combination with personality. Personality is known to be a strong predictor for subjective well-being (Diener, 2000). This is why, the present research further strives to investigate the degree in which age adds predicting value to personality in predicting the effectiveness of a positive psychology intervention.

Positive psychology mainly focuses on the variables happiness, subjective well-being, and positive affect (Pietrowsky & Mikutta, 2012). These three variables are closely connected

to each other. The present study focuses on the variables subjective well-being and positive affect. This research takes these two variables into account because Seligman claims that the positive psychology aims to increase people's well-being and positive affect is one component of subjective well-being (Seligman, 2012). Subjective well-being refers to the evaluations that people make of their own lives (Diener, 2000; Diener, Suh, Lucas & Smith, 1999). It consists of different components. One component is life satisfaction, that is a global judgment of one's life. The second component is one's satisfaction with important domains, such as work, family, and finances. The last component is people's emotional responses, which includes the experience of positive affect and low levels of negative affect.

Watson, Clark and Tellegen (1988) describe the terms positive and negative affect. According to these researchers, people scoring high on positive affect experience energy, pleasure and concentration. On the contrary, people who score low on positive affect, feel tired and sad. The score on negative affect indicates the degree in which people are struggling with unpleasant feelings. Whereas people, that score low on negative affect are typically quite calm, do people that score high in negative affect experience aversive feelings such as guilt, fear, and anger. In sum, positive affect refers to the experience of pleasant emotions and moods whereas negative affect compromises experiences of unpleasant emotions and moods (Diener, 2000).

The experience of positive emotions is linked to the optimal functioning of people in the broaden-and-build-theory of positive emotions from Barbara Fredrickson (2001). This theory provides insights in possible ways of improving the subjective well-being (Bohlmeijer et al., 2013). According to this theory, positive emotions help to broaden the cognition, action and attention. For instance, feelings of joy trigger the urge to play and feelings of interest can lead to the urge of gaining new information and experiences. This "broadening" effect, in turn, helps to build up physical, social and cognitive resources that support the resilience of people. As an example, when children have feelings of joy, this can trigger the urge to play, respectively to do sports (broadening effect). When children actually engage in team-sports, they do not only train their body (physical resources), they also train their ability to make accurate judgments (cognitive resources) and they learn to build up and cultivate social bonds with others (social resources) (Bohlmeijer et al., 2013). In this way, the broaden-and-build-theory of positive emotions provides insights in how positive emotions contribute to the optimal functioning of people. New insights in the effectiveness of positive emotions provide important knowledge about possible ways of preventing or weakening the damage of diseases, stress and disorders (Gable & Haidt, 2005). The broaden-and-build-theory of positive

emotions is just one of more theories within the field of positive psychology that examines how subjective well-being can be improved (Bohlmeijer et al., 2013).

One well-known intervention to improve well-being is the “three good things” exercise (Seligman et al., 2005). In this exercise, participants are asked to write down three good things that went well on each day for one week. Moreover, they are asked to explain why the three things went well. This exercise actually aims to increase the gratefulness of the participants (Pietrowsky & Mikutta, 2012). In being grateful, people attend to the positive things of their life's and appreciate them. In this way, positive affect increases whereas the negative affect decreases, which in turn enhances the subjective well-being. Research shows that this exercise is effective in increasing the happiness and decreasing depressive symptoms (Seligman et al., 2005). Moreover, participants seem to integrate this exercise beyond the intervention program.

The positive psychology interventions can be used for different populations with varying age and personality (Bohlmeijer et al., 2013). This research aims to contribute to the knowledge about which interventions work best for which populations. Positive psychology interventions like the “three good things” exercise aim to increase the positive and decrease the negative affect. As already mentioned, both factors age and personality can be linked to these two components of subjective well-being (Kunzmann, Little & Smith, 2000; Diener, 2000). This is why the present study focuses on these two variables. With regard to age, the present study aims to examine in what degree the age influences the effect of the positive psychology intervention “three good things” on the positive and negative affect of the participants. The socio-emotional selectivity theory provides insights into age-related changes. According to this theory, people pursue different social motives, ranging from basic survival to psychological goals (Carstensen, 1995). More precisely, there are three social motives: emotion-regulation, self-concept and information seeking. The importance of these goals varies depending on one's place in the life cycle. As shown in figure 1, the regulation of emotion becomes increasingly salient from the adolescence onwards. The motive to regulate the emotions is especially important during middle and old age. In contrast to this, the importance of information acquisition decreases from the adolescence onwards. The motive to seek for information is especially low in middle and old age.

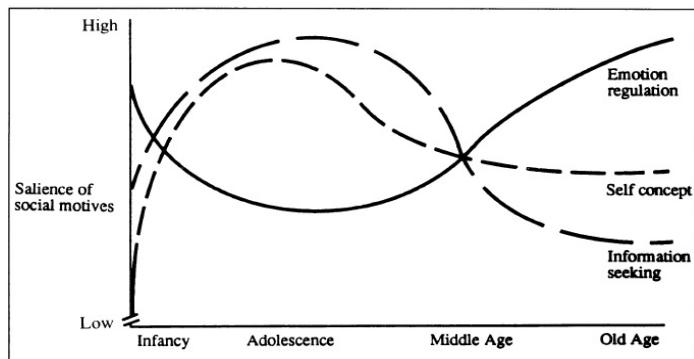


Figure 1. Idealized model of socio-emotional selectivity theory's conception of the salience of three social motives across the life span.

According to the socio-emotional selectivity theory, young people and adolescents typically perceive the future extensive and open-ended (Carstensen, 1995; Carstensen & Mikels, 2005). They seek new information to prepare and attain long-term goals. As opposed to young people, older people, that is middle-aged and older people, perceive the future as limited, therefore focusing on immediate needs, emotional states, and emotional satisfaction. As older people direct attention to emotionally meaningful goals in the present, their emotion regulation gets improved, thereby reducing negative affect. In order to minimize negative emotions, while maximizing positive emotions, older people seek contact with well-known people such as close friends and/or relatives and try to avoid negative events (Frederickson & Carstensen, 1990). In sum, this theory predicts emotion regulation differences in adolescents, middle-aged and old people. Emotions play an important role in the field of positive psychology. Most interventions, like the “three good things” exercise, aim to increase people’s positive emotions in order to heighten their subjective well-being. Based on the socio-emotional selectivity theory it could be expected that middle aged and old people are more motivated to maximize their positive and minimize their negative emotions. In fact, it can be expected that not only their motivation is higher but also that they have a greater ability to actually regulate their emotions than adolescents. As positive psychology interventions aim to improve people’s emotional state and the age obviously has an impact on people’s emotion regulation, an interaction can be expected. This is why the present study aims to examine the influence of two different age groups, that is adolescents on the one hand and middle aged and old people on the other. Knowledge about the influences of age on the effectiveness of positive psychology interventions allows tailoring these interventions to relevant populations. Overall, knowledge about which positive psychology interventions work best for which age group could be beneficial in gaining greater effects of interventions.

To gain a differentiated insight in age-related changes, both, theory supporting and conflicting results are going to be reviewed. Research supporting the aspect of emotion-regulation of the socio-emotional selectivity theory shows that older people actually seem to attend to, hold in mind, and remember emotionally positive information more than negative or neutral information (Carstensen & Mikels, 2005). On the contrary, younger people tend to process negative information more thoroughly than positive information (Baumeister, Bratslavsky, Finkenauer & Vohs, 2001). Additionally, younger people place more emphasis on negative information during impression formation, memory, and decision making.

Kunzmann, Little and Smith (2000) state that empirical evidence overall suggests that subjective well-being is relatively stable throughout the life course. Even when confronted with problems related to aging, such as declines in physical health and the deaths of spouses and acquaintances do older people seem to be at least even happy as middle-aged or adolescents (Mroczek & Kolarz, 1998). This is also known as the “paradox of well-being” (Carstensen, Pasupathi, Mayr & Nesselroade, 2000). The finding of the “paradox of well-being” fits well to the broaden-and-build theory and socio-emotional selectivity theory. According to the broaden-and-build theory, positive emotions contribute to the well-being and optimal functioning of people (Fredrickson, 2001). The socio-emotional selectivity theory predicts that middle-aged and older people are more motivated to regulate their emotions and improve their ability to maximize positive and minimize negative emotions (Carstensen, 1995). Taken together, this would explain why the well-being of middle-aged and old people does not seem to be lower in comparison with adolescents.

However, research examining the development of positive and negative affect during the life course, shows mixed evidence (Kunzmann, Little & Smith 2000; Mroczek & Kolarz, 1998). These studies investigate the development of the subjective well-being more precisely by taking the variations in both components, positive and negative affect, of the subjective well-being on their own into account. Kunzman et al. (2000) reviewed several studies and came to the conclusion that some of them point to stable levels of negative affect whereas others indicate a decrease in negative affect with preceding age. As it comes to age-related changes in positive affect, studies indicate that the “paradox of well-being” might not hold true in this component of well-being. That is, evidence shows that positive affect either tends to be stable with preceding age, or it declines. Thus, based on the socio-emotional selectivity theory it can not be concluded that older people’s improved ability to regulate their emotions automatically lead to higher levels in positive and lower levels in negative affect in comparison with adolescents.

This research also aims to examine the degree in which the age group in addition to the personality leads to improvements in predicting the effectiveness of the positive psychology intervention. Research shows that personality generally has an influence on subjective well-being (Diener, 2000). Whereas extraversion is closely linked to positive affect, neuroticism tends to predict negative affect (Diener, 2000; Isaacowitz & Smith, 2003). As the personality influences the subjective well-being of people this might in fact influence the effect of positive psychology interventions. The relationship between personality and positive and negative affect remains stable in different age groups (Diener, 2000). The study of Mroczek and Kolarz's (1998) aimed to examine the age-related change in positive and negative affect and showed that personality is a stronger predictor for affect than age. However, age did have an additional predicting value to personality. Therefore, the present study aims to investigate if age also adds significant predicting value to personality in the context of a positive psychology intervention.

Based on the mentioned empirical findings, different hypotheses are going to be tested. Overall, it is expected that the “three good things” exercise is equally effective, in terms of high positive affect and low negative affect, for both age groups. Research shows that the negative affect tends to be on the same level or on a lower level in older people compared to younger people (Kunzmann, Little & Smith 2000). This might leave some more space for improvement in younger people as the intervention might help them to pay more attention to positive instead of negative things. This is why the hypotheses is tested that after having undergone the intervention, the negative affect decreased more in adolescents compared to older people. Things are different regarding the positive affect. Research indicates that the positive affect tends to be on the same or lower level in older people compared to younger people (Kunzmann, Little & Smith 2000). Thus, older people's positive affect might leave some more space for improvement. Findings show, that older people already tend to focus more on positive information (Carstensen & Mikels, 2005). This tendency might be strengthened with the “three good things” exercise. This is why the second hypothesis is that after having undergone the intervention, the positive affect increased more in older people compared to adolescents. Taken together, these expected effects on the positive and negative affect might in fact, lead to equal levels of effectiveness in both age groups.

Finally, the present research aims to examine if the age group, besides the personality, accounts for some extra variance in predicting both, the participants changes in positive and negative affect. As mentioned above, personality traits are strongly associated with well-being

(Diener, 2000). This is why two hypotheses are going to be tested. First that the addition of age group to personality considered as a whole, and to each of the five traits separately, leads to significant improvements in predicting the changes in negative affect from the pre- to the post-measurement. Second, that the addition of the age group to personality considered as a whole, and to each of the five traits separately, leads to significant improvements in predicting the changes in positive affect from the pre- to the post-measurement.

2. Method

2.1 Participants

Originally, 266 participants took part in the intervention program. The data of some participants could not be used for the analysis due to technical problems. 133 participants did not receive the personality questionnaire (BFI-10). Furthermore there were 19 participants who did not receive all the necessary informational emails. Another technical problem arose because eight participants did not receive a personal ID code. Finally the data of 62 participants were not complete because they did not complete the last section of the measurement. At the end, the data of 44 self-selected participants from Germany was used in this research. The only requirement for being able to participate in this research was being at least 18 years old and being able to understand German.

The present sample was divided into two different age groups. This division is based on the model of the socio-emotional selectivity theory. The first group ($N=17$) consisted of participants in the age of 18 to 39 years ($M = 24.06$, $SD = 2.90$). The second group ($N=27$) involved participants that are 40 years and older ($M = 52.85$, $SD = 6.90$). One half of the whole sample was randomly assigned to the control and the other half to the experimental group. Both groups received the positive psychology intervention. The only difference was that the experimental group got a motivational picture in order to test whether this can lead to an increased motivation to participate on a daily basis. The two conditions (experimental/control group) were not taken into account in the present research.

2.2 Materials

2.2.1 Demographic information

The participants were asked to give information about their gender, age and highest educational degree.

2.2.2 Brief Big Five Inventory (BFI-10)

The BFI-10 is an abbreviated version of the BFI questionnaire, which originally consists out of 44 items (BFI-44) (Rammstedt & John, 2007). The BFI-10 measures the Big Five personality traits Extraversion ($\alpha = .71$), Agreeableness ($\alpha = .41$), Conscientiousness ($\alpha = .41$), Neuroticism ($\alpha = .29$), and Openness ($\alpha = .30$). The BFI-10 contains 10 items in total, that is 2 items per personality factor. In this study, a German version was used. The participants are asked to indicate in what degree each statement, for instance “I see myself as someone who

has an active imagination”, refers to their personality by using a 5-point Likert-scale, ranging from (1) “strongly disagree” (“trifft überhaupt nicht zu”) to (5) “agree strongly” (“trifft voll und ganz zu”).

2.2.3 Positive and Negative Affect Schedule (PANAS)

The PANAS is a brief, self-reporting questionnaire that assesses two dimensions of affect (Watson, Clark & Tellegen, 1988). One dimension of affect is the positive affect ($\alpha = .86$) which includes ten items in the PANAS. The other dimension is the negative affect ($\alpha = .87$) which also consists of ten items. So in total does the PANAS consist of 20 items. The participants are asked to indicate on a 5-point Likert-scale in what degree they have experienced different emotions during a specific period. A score of (1) means that the person “strongly disagrees” (“trifft überhaupt nicht zu”) and a score of (5) indicates that the person “agrees strongly” (“trifft voll und ganz zu”). Examples of emotions referring to positive affect are being “interested”, “enthusiast” and “strong”. Being “distressed”, “upset” and/or “nervous” examples of emotions that are associated with negative affect. The higher the score on each dimension, the higher either the positive or negative affect. In the present study, the German version of the PANAs is used.

2.3 Procedure

The present study consist of an online intervention which ran seven days. The link to this intervention was distributed via Facebook, e-mail and during personal contact. Opening this link, participants first received information about the research and the intervention program. Afterwards they were asked to give their informed consent. In addition to that, they were asked to fill in their e-mail address in order to receive an e-mail every day, that reminds and motivates the participants to continue with the exercises and gives feedback on their emotional state. Having filled in all this information, they received their first mail, containing an ID to register for the actual intervention and in order to allow handling the following steps in an anonymous way. The participants were assigned to either the control or the experimental group.

Following their registration, all participants were first asked to answer the demographic questions. Then they were asked to fill in both, the BFI-10 and the PANAS. Afterwards they received information about the positive psychology intervention, that is the “three good things” exercise. This exercise had to be done every day. The task for the participants hereby was to write down three things that went well and why they went well.

After having done this exercise, the participants filled in the PANAS again. So the participants did the “three good things” exercise and filled in the PANAS afterwards every day for a week. This took about 10 minutes every day. It was only the first day when they additionally had to answer demographic questions and fill in the BFI-10. Both the control and experimental group underwent this program. In opposition to the control group, the experimental group received an extra motivational picture every day. This picture got nicer every day. At the end of the whole intervention all participants received a last e-mail, containing a conclusive feedback on their performance and thanking them for their participation.

2.4 Statistical Analysis

All participants that filled in the parts of the intervention on the first day as well as on the last day were included into the statistical analysis.

In order to examine if the two sub-scales of the PANAS (positive and negative affect) on the first and last measurement, the changes in positive and negative affect and the sub-scales of the BFI-10 are normally distributed, the Shapiro-Wilk test was carried out.

The first hypothesis “after having undergone the intervention, the negative affect decreased more in adolescents compared to older people” and second hypothesis “after having undergone the intervention, the positive affect increased more in older people compared to adolescents” were tested in carrying out a repeated measurement analysis of variance (ANOVA) with the normally distributed sub-scales of the PANAS. The within-subject factor hereby is the test scores on the two sub-scales of the PANAS and contains two levels (pre-, and post-measurement). The between-subject factor is the age group and also consists of two levels (adolescents and old people).

Finally, the third hypothesis “the addition of age group to personality considered as a whole, and to each of the five traits separately, leads to significant improvements in predicting the changes in negative affect from the pre- to the post-measurement” and the fourth hypothesis “the addition of the age group to personality considered as a whole, and to each of the five traits separately, leads to significant improvements in predicting the changes in positive affect from the pre- to the post-measurement” were tested in carrying out a multiple regression analysis. Hereby, the independent variables consisted of the two age groups and the scores on the different sub-scales of the BFI-10, whereas the dependent variables were the range of the changes in the test-scores from the pre- to the post-measurement on the two different sub-scales of the PANAS.

3. Results

3.1 The demographic characteristics

In total 44 participants took part in the intervention program (Table 1). The sample contained 15 men and 29 women. The mean age of the participants was 42 years. The average educational status in the sample was high. Nearly half of the participants (45, 50%) had an university degree.

In the recent study the influence of two different age groups is going to be examined. Whereas the group of adolescents consisted of 17 participants, the group of old people contained 27 participants. The rate of gender did not significantly differ between the two age groups. Both groups were composed of more female than male participants. The educational status also did not significantly differ between the age groups. There was a significant difference in mean age between the two groups. Whereas the mean age of the adolescents was 24 years, the mean age of the old people was 53 years.

Table 1. Demographic information of $n=44$ participants, separated into two age groups (adolescents and old people)

	Total n = 44	Adolescent (18-39) n = 17	Old (39 <) n = 27	Chi-square	T	p
	n (%)	n (%)	n (%)			
Gender						
Man	15 (34.10 %)	5 (29.40 %)	10 (37.00 %)	.27		.75
Woman	29 (65.90 %)	12 (70.60 %)	17 (63.00 %)			
Education				8.74		.12
Lowest school graduation	2 (4.50 %)	0 (0.00 %)	2 (7.40 %)			
Mid school graduation	2 (4.50 %)	1 (5.90 %)	1 (3.70 %)			
Higher school graduation (permission for university of applied science)	2 (4.50 %)	1 (5.90 %)	1 (3.70 %)			
Highest school graduation (permission for university)	11 (25.00 %)	8 (47.10 %)	3 (11.10 %)			
University of applied science degree	7 (15.90 %)	2 (11.80 %)	5 (18.50 %)			
University degree	20 (45.50 %)	5 (29.40 %)	15 (55.60 %)			
Others	0 (0.00 %)	0 (0.00 %)	0 (0.00 %)			
Age						
Mean	41.73	24.06	52.85			
SD	15.27	2.90	6.90	-19.16		.00

3.2 Normal distribution

The scores on the last measurement of negative affect were not normally distributed (Table 2).

The scores on the sub-scales of the BFI-10 were also not normally distributed.

Table 2. *Shapiro-Wilk test for normal distribution of the PANAS (pre-measurement (T0) and post-measurement (T1)), the changes in positive and negative affect and the BFI-10, for the whole sample*

Whole sample (n=44)		
	Statistic	p
Positive Affect T0	.98	.46
Positive Affect T1	.97	.36
Negative Affect T0	.95	.06
Negative Affect T1	.79	.00
Extraversion	.93	.02
Agreeableness	.94	.02
Openness	.93	.01
Conscientiousness	.93	.01
Neuroticism	.93	.01
Changes in positive affect	.99	.83
Changes in negative affect	.97	.30

3.3 The PANAS

The means of the two age groups on the pre- and post-measurement of the PANAS did only significantly differ from each other on the post-measurement of positive affect (Table 3). On the post-measurement of positive affect, the adolescents significantly scored higher than the old people. Whereas the positive affect of the adolescents significantly increased from the pre- to the post-measurement, $t(16) = 2.66, p = .02$, the positive affect of the old people did not show significant changes, $t(26) = -1.15, p = .24$. The negative affect significantly decreased in both, the adolescents, $Z = -3.42, p < .01$ and the old age group, $Z = -3.55, p < .01$.

Table 3. *Means (M) and standard deviations (SD) for the sub-scales of the PANAS (pre-measurement (T0) and post-measurement (T1)), separated into two age groups and parametric and non-parametric independent sample t-tests to compare the two groups*

	Adolescent (n=17)		Old (n=27)		T	Z	p
	M	SD	M	SD			
Positive Affect To Positive Affect T1	3.23	.48	3.44	.69	-1.18		.25
Negative Affect T0	3.66	.53	3.22	.82	2.14		.04
Negative Affect T1 (Median, IQR)	2.19 1.20 (.55)	.56	2.31 1.20 (.70)	.82	-.57		.57
						-.10	.92

Correlation analysis showed that neither age and the changes in negative affect, $r(42) = .04, p = .80$, nor age and the changes in positive affect, $r(42) = -.13, p = .07$, significantly

correlated.

3.3.1 Negative Affect

The main effect of the intervention on negative affect was significant, $F(1,42) = 37.94$, $p < .001$. Participants reported significantly lower levels in the negative affect after the intervention program ($M = 1.38$, $SD = .08$) than before the intervention ($M = 2.25$, $SD = .11$). The main effect of age group was not significant, $F(1,42) = 1.14$, $p = .29$.

The interaction effect of the intervention and age group was not significant, $F(1,42) = .05$, $p = .82$ (figure 2). The decrease in negative affect did not significantly differ between the two age groups. Therefore the first hypothesis “after having undergone the intervention, the negative affect decreased more in adolescents compared to older people” is rejected.

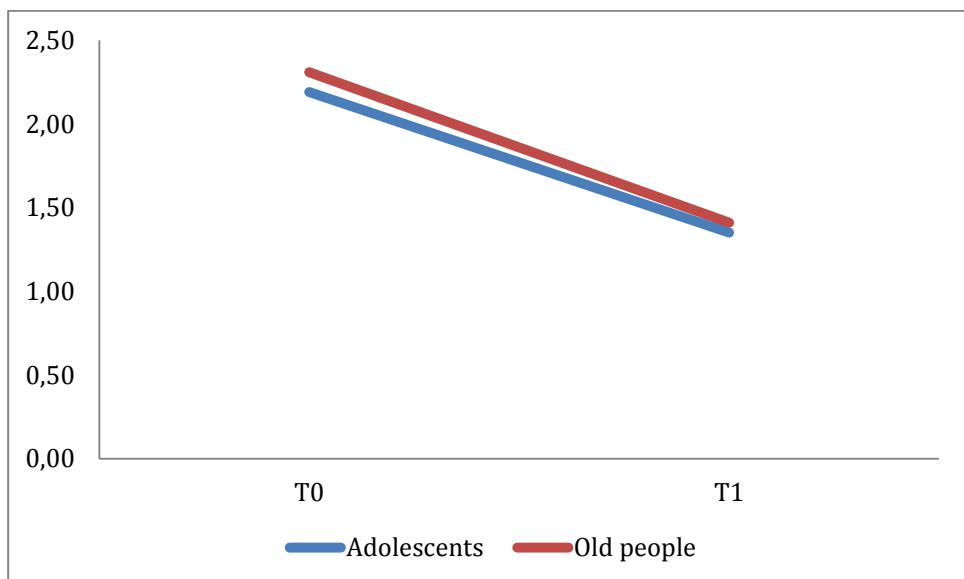


Figure 2. The means of the two age groups on negative affect (PANAS) at the two measurement points (T0 and T1)

3.3.2 Positive Affect

The main effect of the intervention on positive affect was not significant, $F(1,42) = .57$, $p = .45$. Participants did not report significantly higher levels in the positive affect after the intervention program ($M = 3.44$, $SD = .11$) than before the intervention ($M = 3.33$, $SD = .10$). The main effect of age group also was not significant, $F(1,42) = .51$, $p = .48$.

The interaction effect between the intervention and age group was significant, $F(1,42) = 5.63$, $p = .02$ (figure 3). The changes in positive affect significantly differed between the two groups. Whereas the positive affect significantly increased in adolescents,

$t(16) = 2.66, p = .02$, it did not show significant changes in the old group, $t(26) = -1.15, p = .24$. The second hypothesis “after having undergone the intervention, the positive affect increased more in older people compared to adolescents” therefore also needs to be rejected.

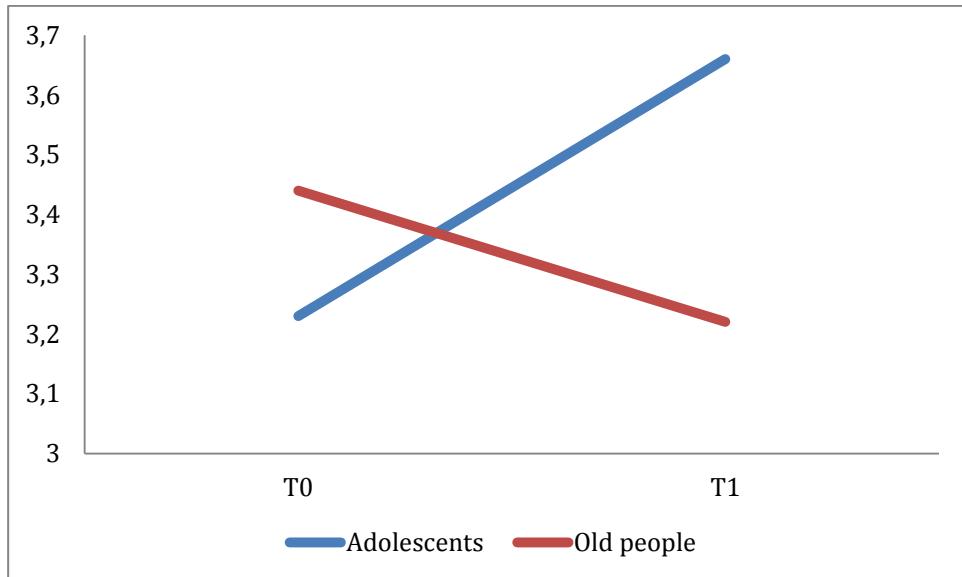


Figure 3. The means of the two age groups on positive affect (PANAS) at the two measurement points (T0 and T1)

3.4 BFI-10

In table 4, the median, interquartile range, means and standard deviations of the two age groups on the BFI-10 are represented. The means of the adolescents on the five personality traits did not greatly differ. The values varied from 3.29 to 3.71. The means of the old age group also did not show great differences. Here, the values ranged from 3.00 to 3.93. Both groups on the average scored highest on the personality traits openness and conscientiousness and lowest on neuroticism.

In comparison, the two age groups did not show significant differences in their scores on the five personality traits.

Table 4. Median, interquartile range (IQR), means (M) and standard deviations (SD) for the subscales of the BFI-10, separated into two age groups and non-parametric independent sample t-tests to compare the two groups

	Adolescent (n=17)				Old (n=27)				Z	p
	Median	IQR	M	SD	Median	IQR	M	SD		
Extraversion	3.50	1.75	3.47	.89	3.50	1.50	3.35	.89	-.53	.60
Agreeableness	4.00	1.00	3.38	1.02	3.00	1.00	3.17	.76	-1.60	.11
Openness	4.00	1.50	3.71	.99	4.00	1.00	3.91	.69	-.44	.66
Conscientiousness	3.50	1.25	3.68	.73	4.00	1.00	3.93	.69	-1.25	.21
Neuroticism	3.00	1.25	3.29	.77	3.00	1.00	3.00	.71	-1.26	.21

Only the correlation between neuroticism and negative affect was significant, $r(42) = .30$, $p = .05$ (Table 5). The two variables did positively correlate. That is, the negative affect increased with higher scores on neuroticism.

Table 5. Correlations between negative and positive affect on the first point of measurement (T0) and the Big Five personality traits

	Negative Affect		Positive Affect	
	r	p	r	p
Extraversion	.07	.68	.02	.89
Agreeableness	-.02	.91	.23	.14
Openness	-.05	.77	.08	.63
Conscientiousness	.08	.62	.14	.36
Neuroticism	.30	.05	-.19	.22

Multiple regression analysis was used to test if the addition of the age group to the personality traits leads to a significant improvement in predicting participant's changes in positive and negative affect.

The results of the regression analysis indicated that the personality did not significantly predict the changes in negative affect, ($R^2 = .07$, $F(1,42) = .56$, $p = .73$) (Table 6). The addition of the age groups to the different personality as a whole and to the different traits separately did not significantly account for extra variance in negative affect. Consequently, the hypothesis that "the addition of the age group to personality considered as a whole, and to each of the five traits separately, leads to significant improvements in predicting the changes in negative affect from the pre- to the post-measurement" is rejected.

Table 6. *Multiple regression predicting the decrease in negative affect and the increase in positive affect (PANAS) on the basis of personality traits and age group*

Predicting variable	Negative Affect			Positive Affect		
	R ²	F	p	R ²	F	p
Step 1. Personality	.068	.559	.731	.069	.564	.727
Step 2. Personality x Age group	.078	.519	.790	.164	1.212	.322
Step 2. Extraversion x Age group	.002	.033	.968	.132	3.125	.055
Step 2. Agreeableness x Age group	.010	.208	.813	.118	2.746	.076
Step 2. Openness x Age group	.008	.172	.843	.132	3.130	.055
Step 2. Conscientious- ness x Age group	.003	.057	.945	.118	2.748	.076
Step 2. Neuroticism x Age group	.060	1.302	.283	.118	2.754	.075

The results of the regression analysis further indicated that the personality also did not significantly predict the changes in positive affect ($R^2 = .07$, $F(1,42) = 0.56$, $p = .73$) (Table 6). The addition of the age groups to the different personality as a whole and to the different traits separately did not significantly account for extra variance in positive affect. Therefore, the hypothesis that “the addition of the age group to personality considered as a whole, and to each of the five traits separately, leads to significant improvements in predicting the changes in positive affect from the pre- to the post-measurement” is rejected.

4. Discussion

The present study aimed to examine the relationship between age, personality and positive psychology interventions. Both factors, age and personality, can be associated with subjective well-being, that is composed of positive and negative affect (Mroczek & Kolarz's, 1998). The positive psychology intervention “three good things” is used to improve people’s subjective well-being, in increasing the positive and decreasing the negative affect. Therefore, it can be expected that both, age and personality, can exert an influence on the effectiveness of the “three good things” exercise. This study mainly focuses on the factor age because little is known about the relationship between age and positive psychology interventions. More precisely, the present research aimed to examine the influence of two age groups (adolescents and middle aged/old people) on the effectiveness of the positive psychology intervention “three good things”. With regard to personality, the study strived to investigate the influence of the age group in addition to the personality in the prediction of the changes in positive and negative affect. Knowledge about the interaction between age, personality and positive psychology interventions might help tailoring these exercises to relevant populations, making them more effective.

With regard to age, it was expected that middle-aged and old people should have at least equally high levels of subjective well-being than adolescents at the beginning of the intervention. This expectation was confirmed by the present study. Before the intervention started, there were no significant differences between the two age groups in both, positive and negative affect. This is in line with literature, which suggests that the negative affect either tends to be stable or decreases with preceding age (Kunzmann et al., 2000). The positive affect also tends to be stable or even declines with preceding age. The socio-emotional selectivity theory predicts a greater motivation and ability to regulate the emotions with preceding age (Carstensen, 1995). The findings of Kunzmann et al. (2000) already indicated that based on the socio-emotional selectivity theory, it can not be concluded that older people’s improved ability to regulate their emotions automatically leads to higher levels in positive and lower levels in negative affect in comparison with adolescents. The results of the present research also support this inference.

Based on the age-related findings, it was expected that there are differences in the changes of the negative and positive affect between the two age groups at the end of the intervention. More precisely, it was expected that the intervention leads to a greater decrease in negative affect in adolescents than in old people. However, the results showed that the decrease in negative affect was not different between the two age groups. With regard to the

positive affect, it was expected that the intervention leads to a greater increase in positive affect in old people than in adolescents. In contrast to this expectation, the positive affect increased in adolescents but did not significantly change in old people.

Differences in motivation and behavior are predicted by the socio-emotional selectivity theory (Frederickson & Carstensen, 1990). These differences might account for the different effectiveness of the intervention in the two age groups. With regard to adolescents, the intervention was effective in both, decreasing the negative affect and increasing the positive affect. Research conducted by Baumeister et al. (2001) showed that younger people, generally are more concerned with negative aspects in their information processing, impression formation, in decision making and memory. The intervention has been effective in changing both, positive and negative affect because the three good things exercise asks the participants to focus on positive aspects of the day. This might have been an effective counterbalance to adolescents' tendency to be overly concerned with negative points.

The intervention was not as effective in old people as in adolescents in decreasing the negative and increasing the positive affect. Whereas the negative affect decreased, there was no significant change in positive affect. Research shows that the negative affect in old people tends to be stable or declines with preceding age (Kunzman et al., 2000). Studies further show that older people, in contrast to younger people, generally are more concerned with positive aspects (Carstensen & Mikels, 2005). That is, they more attend to, hold in mind and remember positive than negative or neutral information. Older people might already focus more on positive aspects of the day on their own, which apparently leads to a stabilization or even decline in their negative affect during the life course. In the present study, it was expected that the tendency to focus on positive things would be strengthened through the intervention and therefore would lead to increases in positive affect. However, the findings that only the negative affect tends to be stable or improves, whereas the positive affect tends to be stable or gets worse (Kunzman et al., 2000) and the same pattern found in this study for older people's positive and negative affect, suggests that improvements in their emotion regulation mainly become visible in their negative affect. Older people might regulate their emotions in such a way that they experience a more stable, internal balance than adolescents. This might allow them to react more calmly when confronted with stressful or negative events. Therefore, they experience less negative emotions and their negative affect is stable or declines. When confronted with positive events they also might react less impulsive. Thus, the three good things exercise did support older people's already existing focus on positive things and therefore led only to effects in the negative affect. Other positive psychology

interventions should eventually raise deeper, positive emotions in order to induce increases in the positive affect. Strengthening their focus on positive things alone might not be enough to increase the positive affect.

The present study further strived to investigate the influence of personality in the prediction of the changes in positive and negative affect. It was expected that personality significantly predicts the change in participants subjective well-being. However, the results of the present research show, that the personality on its own did not have a predicting value for both, positive and negative affect. This is not in line with literature. Personality traits are strongly associated with well-being (Diener, 2000). Especially extraversion is strongly associated with positive affect and neuroticism with negative affect (Diener, 2000; Isaacowitz & Smith, 2003). The finding that only neuroticism did significantly correlate with negative affect is also not in line with the described literature. There was, at least also a correlation between extraversion and positive affect expected. In this research the sub-scales of the BFI-10 were not normally distributed. The reliability of the different sub-scales of the BFI-10 in the present study might also have had an influence on these results. The values of the Cronbachs alpha were all below .45, besides for the personality trait extraversion (.71). That is, the reliability of the sub-scales was relatively low (Nunnally, 1978). One reason for the low reliability might be that the overall sample size, due to technical problems, was quite small. The influence of personality might have been significant with more reliable data for the different personality traits.

Another expectation of this study was that the addition of the age groups to the personality would lead to significant improvements in predicting the changes in the negative and positive affect. This expectation was not confirmed. The study of Mroczek and Kolarz (1998) investigated the predicting value of different factors for positive and negative affect. In their research, the age did have significant additional predicting value to personality. However, they investigated the influence of age and personality on positive and negative affect in general and not in the context of positive psychology interventions. It is worth mentioning that in this study the predicting value of personality and age for the positive affect was not significant. Nevertheless, there was a tendency towards a significant predicting value, especially for the personality traits extraversion together with age and openness together with age. There might be a tendency toward significant values because there was an interaction found between the age group and the positive affect. By using a bigger sample size the tendency might become significant.

The relatively small size of the sample should be considered in interpreting all the

results. This is why the present research should be replicated with a bigger sample size. Furthermore, the old age group in the present research was not that old. The mean age was 52 years. Research examining age-related changes in positive and negative affect often included older people or even separated the people into three different age groups (Kunzmann et al., 2000). Therefore it would be interesting to replicate the present study with more older people (above 60) in the old age group or with having three different age groups (for example 18-39; 40-59 and 60-90 years). In such a research design, the influence of age might become more distinct as the trends in changes of positive and negative affect, during the life course, are more pronounced in older people.

In addition to replicate the present research with even older people, further research could be conducted in order to examine if other positive psychology interventions lead to other changes in the positive and negative affect of the age groups and especially in an old age group. An example of another effective positive psychology intervention, that could be used by its own or even in combination with the three good things exercise, is the “using signature strengths in a new way” exercise (Seligman et al., 2005). In this intervention, participants fill in an inventory of character strength to find out what their top five strengths are. Afterwards, they are asked to use one of these strengths in a new and different way every day for one week. Here, the participants are not only asked to pay attention to positive aspects but also to change their behavior. As mentioned above, older people already seem to focus more on positive information than on negative or neutral information by their own (Carstensen & Mikels, 2005). In the “using signature strength in a new way” exercise, they would not only be encouraged to attend to positive aspects but also to use this information to actively change their behavior. If they manage to use their strengths in new ways, this might raise stronger, positive emotions, like feelings of competence, than only focusing on positive things. In this way, this might not only lead to decreases in negative affect but also to increases in positive affect in an old age group.

To conclude, the present research indicated that the “three good things” exercise is more effective in terms of decreasing the negative and increasing the positive affect in adolescents than in older people. That is, negative affect decreased equally in both age groups but there was no change in positive affect in the old people. There might be other positive psychology interventions or combinations that work better for older people in increasing the positive affect. The “three good things” exercise is equally effective for all personalities. Furthermore, the personality together with the age group did not have a significant influence on the effect of the intervention. However, the personality together with the age group might

have an influence on the effect of the intervention regarding the positive affect when a bigger sample size is involved.

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