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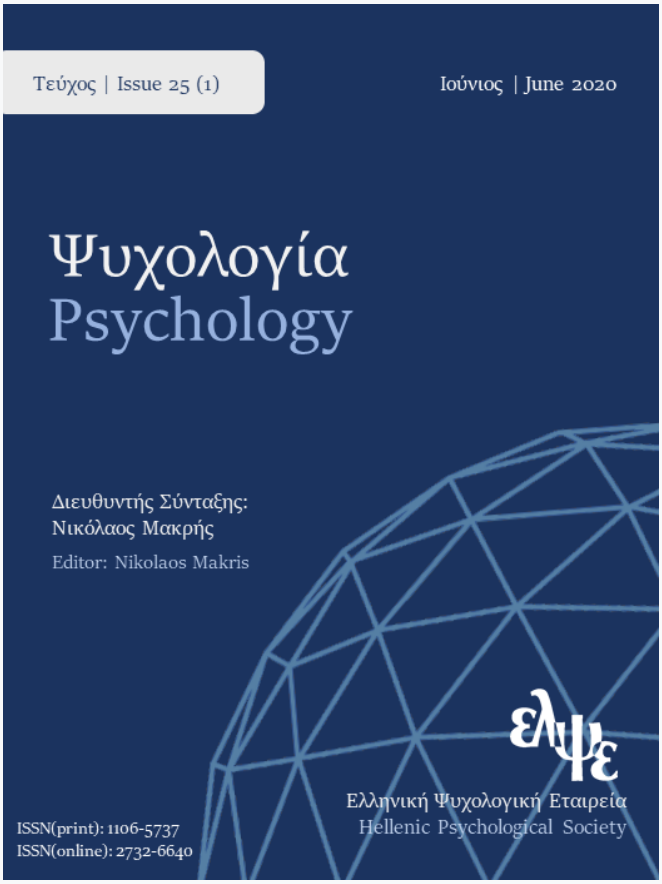

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ΕΜΠΕΙΡΙΚΗ ΕΡΓΑΣΙΑ | RESEARCH PAPER

Humor in aging: is it able to enhance wellbeing in community dwelling older adults?

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KEYWORDS

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ABSTRACT

The present study aimed at examining the effects of humor on community-dwelling older adults' wellbeing. A humor-based intervention was introduced to older adults - members of the Open Care Center for Older Adults, in order to enhance five components of wellbeing as psychological flourishing (positive emotions, engagement, relationships, meaning, accomplishment). The sample consisted of 40 (20 male, 20 female) participants aged 65-91 years old, screened for depressive symptomatology and objective cognitive impairment. Participants were randomly divided into two groups (experimental / control group), matched in age, gender, and education, and were assigned two different researcher-administered tasks (recollection of humorous events / recollection of early memories) respectively. The Positive Psychological Intervention (PPI) of humor and the control condition lasted one month. Wellbeing was measured by the PERMA Profiler instrument at three times (pretest, posttest, follow-up). The results regarding the specific components of wellbeing as psychological flourishing showed that only the participants in the experimental condition tended to score higher in the posttest assessment compared to the pretest measurement and these results remained relatively unaffected one month after the intervention (follow-up). Hence a humor-based intervention could indeed contribute to the improvement of wellbeing as psychological flourishing in aging.

The concept of humor has changed over the centuries. Although several definitions have been created for humor, there seems to be no universal agreement on the meaning of the concept. It can be defined as a person's ability to joke, laugh and bring smiles to the faces of others (Wilkins & Eisenbraun, 2009). Humor, from Ruch's point of view (1998), consists of a cognitive-emotional way of managing situations that allows individuals to acknowledge the existence and focus on the positive aspects of the situations, no matter how hard or unpleasant they may be.

In an attempt to approach the concept of humor more elaborately, a number of theories have emerged. The "Broaden-and-Build Theory (Fredrickson, 2004) posits that the social and cognitive features of humor promote the reconsideration and reassessment of the negative meaning of difficulties and helps individuals gain control over their lives.

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Martin (2003) supports the idea that humor is an extremely complex and multidimensional structure that covers a wide range of phenomena, including the existence of stimulating stimuli, cognitive processes, comprehension and appreciation of humor, but also of the reactions naturally caused by humor (smile, laughter, pleasure, etc.). In addition, humor as a concept involves not only cognitive but also emotional processes. It is both intrapersonal and interpersonal. At the same time, it is sometimes perceived as a state (pleasure, fun) and sometimes as a characteristic (sense of humor).

Humor in aging

Humor is widely used among adults regardless of their age and has a beneficial influence on their everyday life (Goldstein & Ruch, 2018). Its use seems to remain intact throughout the lifespan or even increase with advancing age (Proyer et al., 2010). However, sometimes older adults experience difficulties in humor cognitive processing and comprehension and as a result, their ability to understand jokes or produce humor diminishes (Greengross, 2013; Mak & Carpenter, 2007; Wanzer, 2014). Research findings indicate that older adults are capable of distinguishing between funny and neutral content, apprehend the general meaning and even enjoy it more than younger adults. The older adults that make many errors in distinguishing between funny and neutral content are those with low performance in working memory and verbal abstract ability (Shammi & Stuss, 2003). They have difficulty mainly in producing humor and their errors are due to a decline in the right frontal lobe functioning rather than a misconception of the jokes (Darby & Walsh, 2005; Martin, 2006).

Types of humor and aging

Martin and his colleagues (Martin et al., 2003) have created the Humor Styles Questionnaire, a tool for measuring the different types of humor used by individuals regardless of age. In the questionnaire, four different types of humor emerge, two of which (affiliative humor, self-enhancing humor) contribute favorably to wellbeing and two (aggressive humor, self-defeating humor), that usually have a negative impact on it (Kuiper et al., 2010; Leist & Müller, 2013). In particular, affiliative humor is associated with a general tendency of joking, quick wit and the ability to narrate stories in a funny way (Galloway, 2010; Kuiper, 2012; Martin et al., 2003). Self-enhancing humor is related to the adoption of a positive outlook towards the world and the future, but also to the use of humor as a means of self-empowerment, adaptation and coping with difficulties (Galloway, 2010; Kuiper, 2012; Martin et al., 2003). On the other hand, aggressive humor refers to sarcasm, friendly teasing, criticism and manipulation, whereas humor as a defense mechanism is used to make the individual win the favor of others by being deliberately self-deprecating (Kuiper, 2012; Martin et al., 2003).

Another quite influential study concerning the different types of humor was conducted recently by Ruch, Heintz, Platt, Wagner and Proyer (2018). They examined eight different comic styles that are outlined below: “fun” is related to fun and jokes, “benevolent humor” involves identifying inconsistencies in everyday behavior and experience and approaching them with humor and goodwill, “nonsense” refers to the appreciation and use of humor that makes no sense, but is playful and witty, “wit” encompasses more intelligent and ingenious ideas, “irony” is associated with controversial comments that are only understood by the members of the group, “satire” pertains to criticizing and correcting defects, misconduct and moral wrongdoings, “sarcasm” as a kind of humor refers to the preference to criticize others by using sarcastic commentary; and “cynicism” is related to maintaining a cynical attitude towards current events and the tendency to make mocking remarks.

Regarding older adults, they use humor in two ways. They use humor primarily as a means of coping with adversities and losses and adapting to contextual circumstances (Celso et al., 2003; Damianakis & Marziali, 2011; Gremigni, 2013; Martin & Kuiper, 2016; Marziali et al., 2008; McCreaddie & Wiggins, 2008). However, they also use humor positively and benevolently to have fun and strengthen their relationships and not to belittle others or downgrade them. Thus, older individuals are less likely to enjoy aggressive or biting humor, which emphasizes one's superiority over others and is used to a considerable extent by young adults. Fun, wit and benevolent humor are positively correlated with wellbeing, while the contrary is true for sarcasm and cynicism (Ruch et al., 2018; Stanley et al., 2014).

The benefits of humor

Humor helps people build their resilience by recognizing and accepting their personal weaknesses and the flaws of other people while dealing with life's adversities (Monahan, 2015). Moreover, it builds positive relationships, since it reduces loneliness and creates a positive atmosphere and a sense of trust, intimacy, and security among discussants (McCreaddie & Wiggins, 2008; Wilkins & Eisenbraun, 2009). Also, humor generates positive emotions through re-evaluating unpleasant or disturbing situations from a positive point of view (Sin & Lyubomirsky, 2009). Furthermore, humor mediates and improves the aging process. Older adults manage physical, cognitive, and social losses more effectively with humor (Lurie & Monahan, 2015). In this way, they gain control over the process of aging and everyday incidents (Marziali et al., 2008; Ruch et al., 2010).

Another benefit of humor is that through laughter contributes to the function of the central nervous system, the muscular and the endocrine system (Berk, 2001) as well as the circulatory system (Berk, 2001; Kim et al., 2015). Humor decreases the arterial pressure and the levels of several stress hormones in the blood and by extension, it relieves subjective pain (Linge-Dahl et al., 2018; Lurie & Monahan, 2015; Mahony et al., 2001) and it seems to improve immune system's functioning in general (Gremigni, 2013; Wilkins & Eisenbraun, 2009).

Humor discharges the superfluous energy that is accumulated through daily events and interactions, diminishes stress and depression levels, fills life with meaning, restores psychological and physical balance and boosts physical health and subjective sense of wellbeing (Crawford & Caltabiano, 2011; Falkenberg et al., 2011; Martin & Kuiper, 2016; Leist & Müller, 2013; Peterson et al., 2006; Ruch & Heintz, 2013; Ruch & Hofmann, 2017; Ruch et al., 2010).

Humor interventions for improving wellbeing among older adults

Due to the beneficial impact of humor on older adults' wellbeing and subjective health status, many humor interventions have been designed and administered in vivo or online and be standardized or ad hoc (Ruch & Hofmann, 2017). Some of them involve engagement in activities and structured programs in form of therapeutic sessions or workshops that include becoming conversant and acquainted with humor, learning humor techniques, joining role plays or taking part in humor-inducing activities (Konradt et al., 2013; Mathieu, 2008; Proyer et al., 2014; Turner et al., 2017).

The McGhee's Seven Humor Habits Program (7HHP) is an example of a guideline for boosting sense of humor, even among older adults, by cultivating seven major skills that are considered indispensable for developing or improving sense of humor (Falkenberg et al., 2011; McGhee, 2010a, 2010b).

Regarding the content of the interventions include older adults' room decoration with funny pictures, watching comedies and clown or comedian visits in 'patients' and 'non-patients' rooms (Auerbach et al., 2016; Hirsch et al., 2010; Low et al, 2013; Ruch & Hofmann, 2017). Other activities include watching funny

videos and movies, browsing funny pictures, reading funny books, jokes, or anecdotes (Monahan, 2015). Moreover, recalling funny incidents of the past or writing a humor journal, in which are recorded all the funny incidents that happened during the day, have proved to be a remarkably well-received and effective approach to improve sense of humor among older adults (Gander et al., 2013; Konradt et al., 2013; McGhee, 2010a, 2010b; Wellenzohn et al., 2016a, 2016b).

Many humor interventions have been implemented. Lebowitz, Suh, Diaz and Emery (2011) examined the use of humor by older adult patients suffering from chronic obstructive pulmonary disease as an efficient and operant mechanism of coping with difficulties. After the intervention (watching humorous videos), the participants appeared to have fewer symptoms of anxiety and depression and reported an improvement in the quality of their lives. Similarly, Tse, Lo, Cheng, Chan, Chan, and Chung (2010) applied a two-month humorous intervention (collection of humorous material, exchanging funny stories and jokes, exercises and laughter games, attending lectures on humor) to test whether humor could alleviate chronic pain, promote happiness and life satisfaction and decrease loneliness in a sample of older adults with intact cognitive abilities. The results indicated that humor has a positive effect on perceived pain and loneliness reduction, and it enhances life satisfaction and happiness.

Similar findings were extracted by the research carried out by Proyer, Gander, Wellenzohn and Ruch (2014), which examined the influence of a positive psychology intervention (gratitude visit, three good things, three funny things, signature strengths) on the wellbeing of older adults. Researchers observed that specifically the exercise “three funny things” led to an increase in subjective happiness and proved to be the most effective technique in terms of ameliorating depressive symptoms.

In 2016, Wellenzohn, Proyer and Ruch developed an online, one-week humor intervention (three funny things, collecting funny things, counting funny things, applying humor and resolving unpleasant and stressful situations in a humorous way) for older adults. Through this intervention, depressed mood was scaled down, attentional focus was shifted to optimistic and hopeful events, while wellbeing levels and subjective happiness strengthened. Overall, it seems that humor interventions are effective in assisting psychological flourishing and facing difficulties in aging.

Subjective wellbeing and the PERMA Theory

Subjective wellbeing is a multidimensional concept, encompassing the individual's perception of the different aspects of their life, including both positive and negative experiences and feelings as well as their attitudes and views towards life (Efklides & Moraitou, 2013a, 2013b).

Seligman’s PERMA theory approaches wellbeing through a more contemporary and positive perspective, this of psychological flourishing (Seligman, 2011). Flourishing could be defined as a dynamic optimal state of psychosocial functioning that emerges from a well-balanced and effective adaptation in multiple psychosocial domains. Essentially, according to this theory, wellbeing is based on five concrete key factors: positive emotion, engagement, relationships, meaning, and accomplishments. In particular, positive emotions refer to the ability of being optimistic and viewing life from a positive perspective (Butler & Kern, 2016). Engagement, on the other hand, concerns concentration, attentional focus and dedication (Csikszentmihalyi, 1990; Schaufeli et al., 2006). It can be described as a vital part of successful aging (Rowe & Kahn, 1987) as it refers to the absorption and engagement with various physical, cognitive, behavioral and emotional domains in life. Relationships refer to the creation of strong and stable emotional bonds. It is about love, care, intimacy, social ties, social networks and support (Butler & Kern, 2016). Meaning pertains to having a direction in life. It is associated with life satisfaction and the feeling that one’s life is worthwhile (Steger, 2012). Accomplishment deals with self-efficacy, self-determination, goal orientation,

ambitions, achievement and success as important components of psychological flourishing and progress (Butler & Kern, 2016).

The present study

Considering that, no study so far has implemented a humor intervention in older adults aiming at enhancing their wellbeing as psychological flourishing, the main objective of the present study was to investigate whether an intervention to foster the sense of humor among community-dwelling older individuals, could improve their subjective wellbeing as psychological flourishing.

The hypotheses of the study were formulated as follows: the level of wellbeing as psychological flourishing of the participants in the humor intervention group (experimental group) is expected to rise directly after the intervention and to be maintained or even increase one month later, compared to its pre-intervention level (Hypothesis 1a) and compared to the control group (Hypothesis 1b).

Method

Design and Participants

The research followed an experimental quantitative design with a face to face 2 (groups: experimental, control) x 3 (times: pre-, post-, follow-up) intervention design.

A total of 40 older adults, members of the Open Care Centers for Older Adults of the municipality of Thessaloniki, were randomly assigned into two groups (experimental group and control group). Out of the 45 persons who initially agreed to participate, five were excluded because they did not meet the sample inclusion criteria. Specifically, potential participants with depressive symptomatology or cognitive impairment were excluded. The existence of depressive symptoms was examined via the brief form of the Geriatric Depression Scale (GDS-15 – Yesavage et al., 1983; Greek version: Fountoulakis et al., 1999) and participants with a performance of less than 5 were excluded from the sample. In addition, cognitive status was tested through the Montreal Cognitive Assessment (MoCA – Nasreddine et al., 2005; Greek version: Poptsi et al., 2019) and consequently those who scored lower than 25 were excluded. The remaining 40 participants took part in the intervention and the pretest, posttests, and follow-up assessments.

So, the sample consisted of 40 older adults aged 65-91 (M = 74.03; SD = 6.99). The experimental group included 10 women and 10 men aged 65-91 (M = 75.15; SD = 7.25). In this group, seven participants were highly educated (more than 12 years of education), seven had a middle level of education (9-12 years of education), six were low educated (less than 9 years of education). The control group, on the other hand, consisted of 20 people (10 men and 10 women) aged 65-83 (M = 72.90; SD = 6.72). About 1/3 of this group was highly educated. (n = 6), seven participants were middle educated and seven had a lower educational level. In the experimental group, the mean score of MoCA was M = 27.35 and of GDS-15 M = 2.25. In the control group the mean score of MoCA was M = 27.20 and of GDS-15 M = 2.15 (Table 1).

One-way analysis of variance (ANOVA) was applied to determine whether the experimental and control groups were matched in age, MoCA, and GDS-15 scores. It seems that the two groups did not differ significantly in age, F (1, 38) = 1.03, p > .05. Apart from that there was no statistically significant difference in the mean scores of MoCA, F (1, 38) = .20, p > .05, and GDS-15, F (1, 38) = .35, p > .05, between the two groups. Moreover, the two groups did not differ significantly both in terms of educational level, χ^2 (2) = .15, p > .05, and in gender as the N of men and women in the two groups was exactly matched.

Table 1
Participants' distribution according to Age and screening tests' Mean and Std. Deviation

	Experimental Group					Control Group				
	N	**Min**	**Max**	**M**	**SD**	**N**	**Min**	**Max**	**M**	**SD**
Age	20	65	91	75.15	7.24	20	65	83	72.9	6.72
MoCA* (total score)	20	26	29	27.35	1.13	20	26	29	27.2	.95
GDS-15** (total score)	20	0	5	2.25	1.51	20	0	5	2.15	1.84

*Note. MoCA= Montreal Cognitive Assessment, **GDS-15= Geriatric Depression Scale

Humor Intervention

To examine the effect of humor on wellbeing, a positive psychology intervention and more specifically a humor intervention, based on the existing literature, was put into practice (Gander et al., 2013; Konradt et al. 2013; Wellenzohn et al., 2016a, 2016b), during which 4 intervention sessions (once a week) for one month were held.

During the first week, the experimental group, that is the "humor intervention group", was asked to recall either a funny incident that happened over the past year, a cartoon or a comedy that made them laugh or even a funny picture or a joke that they thought was funny. The control group, namely, the "past memories intervention group", on the other hand, was called upon to recollect an incident from childhood. The response of an experimental group participant to the assigned exercise is given below: "Yesterday I was wearing my shirt inside-out and I only realized it before I put my pajamas on. I laughed a lot. I thought it was very funny".

In the second week, the experimental group was instructed to state an incident that a friend or relative shared with them and found it funny. The control group invoked an event from puberty. An indicative example is the recollection of a participant from the experimental group: "I found hilarious an incident that my wife shared with me. She was walking down the street and suddenly saw a person, who looked like her cousin, G., and started waving and calling out his name. The man looked at her questioningly and continued walking, but she did not stop and tried to catch up with him. As soon as she approached him, she realized he was not her cousin, and felt very embarrassed. She did not wear her glasses and confused a stranger with her cousin".

In the third week, the participants of the experimental group mentioned a funny event, a funny story, or an anecdote they read recently. The control group was requested to describe an incident of their youth. One person from the experimental group reported: "I laughed a lot with a cartoon in the newspaper. It was ridiculing the imprisonment of the cleaner who had forged her primary school diploma. The picture depicted two black cars with non-transparent windows that probably belonged to hired killers with the caption "Fortunately we clean (kill) people because if we cleaned stairs we could have gotten into trouble with Greek justice. I found it quite funny and tragicomic".

During the fourth and last week, the participants of the experimental group narrated a funny event that happened to an unknown person while they happened to be in the same place. The members of the control group brought to their memory an event of their middle-age life. A woman from the experimental group said: "Last Friday, after the choir, I was heading home when I saw a woman. She was holding her

plastic bag and trying to put back in the oranges that had fallen but it was vain because there was a hole and as soon as she put the oranges in they fell and started rolling down the sidewalk. In the end, she figured it out and put them all in her purse. This scene seemed funny to me. "

The intervention was conducted in participants' environment and had the form of a friendly conversation. Most of the participants were willing to elaborate on the incident they reported and as a result, their responses were overly detailed. The participants enjoyed discussing the intervention and their experiences. Some of them wanted to mention both humorous and past events from their lives. Many of them were curious about the answers their friends had given and a few claimed that they were too tired or bored and sometimes they were reluctant to cooperate, but these difficulties were easily overcome. Before and after each session we sometimes discussed topics of general interest but as the intervention was held on days in which they engaged in physical activities they did not have much time to comment extensively on the intervention or chat with each other.

Instrument

PERMA Profiler: (Butler & Kern, 2016; Greek version: Pezirkianidis et al., 2019) The measurement is based on Seligman's (2011) PERMA theory of wellbeing. The PERMA acronym corresponds to the terms Positive Emotion, Engagement, Relationships, Meaning, and Accomplishment. These factors are considered to be the five basic pillars for wellbeing. Furthermore, negative emotions, as well as health levels, are examined and, last but not least, a single item measuring subjective happiness and a single item measuring loneliness are taken into account. The instrument consists of 23 items rated based on a Likert type scale ranging from 0 = *never / not at all* to 10 = *always / completely*.

The factorial structure of the PERMA-Profiler scale has been confirmed by Pezirkianidis and colleagues (2019) in a Greek sample. Cronbach's alpha values for each factor of the original scale and the Greek version respectively are as follows: Positive emotion: α = .88 and α = .85, Engagement: α = .72 and α =. 57, Relationships: α = .82 and α = .75, Meaning: α = .90 and α = .78 and Accomplishment: α = .79 and α = .73. The PERMA Profiler subscales have demonstrated acceptable test re-test reliability, internal and cross-time consistency, and evidence for construct, convergent, and divergent validity. Cronbach's alphas for the three PERMA (as regards the five basic pillars of wellbeing) measurements in the present study were: pre-test: α = .72, post-test: α = .73, follow-up: α = .76.

Procedure

The PERMA Profiler was administered individually by keeping external environmental factors under control and lasted 15 to 30 minutes, depending on the participant. Older adults who had difficulty in seeing, reading, or writing were offered extra help. Upon completion of the intervention, the PERMA Profiler was re-assigned to examine whether a change in the initial scores occurred as a result of the intervention. After one month the process was repeated. At the end of the follow-up, participants were requested to evaluate the intervention and report whether and to what extent they felt they have been benefited from the intervention. Finally, they were asked whether they were willing to continue practicing the intervention on their own.

Ethical Standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. The Committee of the Open Care Center of Thessaloniki, after

reviewing the research protocol, confirmed that all ethical guidelines for research on human subjects were followed. The participants in the study were active members of the Open Care Centers for Older Adults and participated in the study voluntarily. They were informed about the procedure and the aim of the study and their written informed consent was taken.

Results

After the computation of the total scores for each factor of the PERMA Profiler, the data were analyzed with a 2 (group: experimental - control) x 3 (time of assessment: pretest, posttest, follow up) Mixed Measures ANOVA. Mixed Measures ANOVAs were conducted for each of the 5 components of psychological flourishing - factors of the PERMA Profiler and for the 4 additional variables or factors of the questionnaire (health, happiness, negative emotions, loneliness). Particularly, the group type (experimental vs. control) was defined as the between-subjects factor, and the measurements of the questionnaire examining wellbeing (pretest, posttest, follow-up) as the within-subjects factor. In case that the results were statistically significant in terms of time of assessment, Repeated Measures ANOVAs were conducted in each group separately, and on one occasion Multivariate Analysis of Variance (MANOVA) was performed when the group effect was found significant. The Bonferroni test was used as a post-hoc test due to the fact that many independent statistical tests concerning time effect on PERMA components were performed.

The main effects of time of assessment on the PERMA Profiler variables in the experimental group

As far as Positive emotions are concerned, 2 (group) x 3 (time of assessment) mixed measures ANOVA indicated that there was no significant time - group interaction effect, F (2, 37) = 2. 12, $p > .05$, $\eta^2 = .10$, or group effect, F (1, 38) = .690, $p > .05$, $\eta^2 = .02$. Notwithstanding the time of assessment had a significant influence on the mean scores of Positive emotions, F (2, 37) = 8.50, $p = .001$, $\eta^2 = .31$. So as to further examine this outcome, Repeated Measures ANOVAs were performed in each group separately. It was deduced that time had a significant effect on the PERMA Profiler mean score of Positive emotions only in the experimental group, F (2, 18) = 7.06, $p = .005$, $\eta^2 = .44$, and not in the control group, F (2, 18) = 2.295, $p > .05$, $\eta^2 = .20$. It was manifested that positive emotions were boosted in the 2nd, I-J = 1.70, $p = .003$, (M = 24.45), and 3rd, I-J = 1.55, $p = .018$, (M = 24.30) assessment as to the pretest evaluation (M = 22.75) (see Figure 1). In the control group positive emotions' level was rather consistent in the three time assessments: Positive emotions in the posttest: M = 23.20, in follow-up: 23.45, in the pretest evaluation: M = 22.50 (see Figure 1 & Table 2).

With respect to the PERMA component of *Engagement* the application of a 2 (group) x 3 (time of assessment) Mixed Measures ANOVA implied that the interaction of time with the group was not statistically significant, F (2, 37) = 2.101, $p > .05$, $\eta^2 = .10$. There was no significant difference between the two groups, F (1, 38) = .078, $p > .05$, $\eta^2 = .00$, as well. Nevertheless, the time effect was statistically significant, F (2, 37) = 10.023, $p = .001$, $\eta^2 = .35$. So, Repeated Measures ANOVAs were applied. It was indicated that although there was not a significant time effect on the control group, F (2, 18) = 3,077, $p > .05$, $\eta^2 = .25$, time had a significant impact on the experimental group, F (2, 18) = 7.017, $p = .006$, $\eta^2 = .43$.

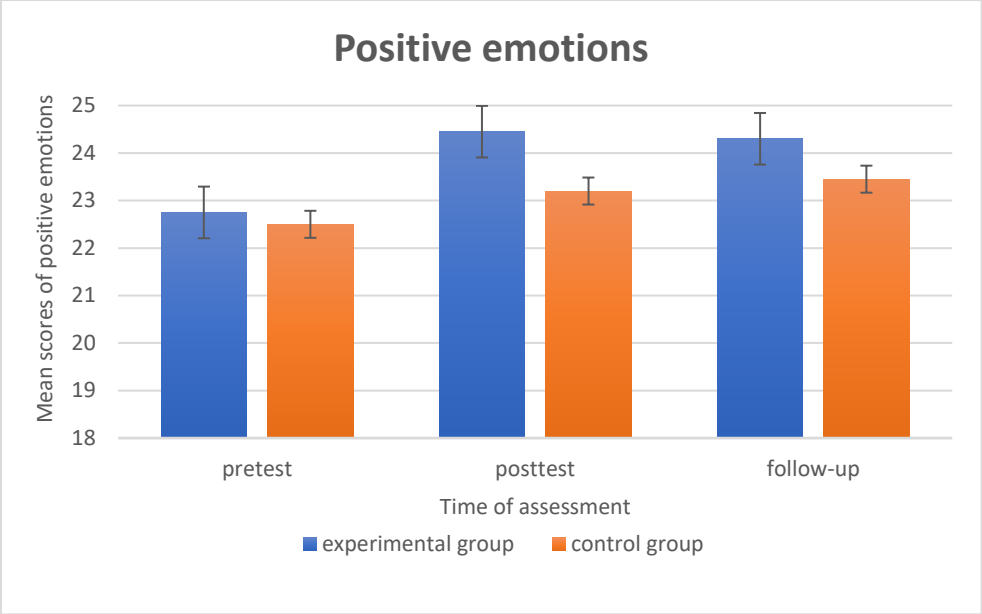

Figure 1. The levels of the Positive Emotions component of the PERMA-Profiler in the humor intervention group as compared to the respective levels of Positive Emotions in the control group, in pre-, posttest and follow-up assessments

Although there was no significant difference between the posttest and follow-up time assessments, time effect differed from the pretest to the posttest, I-J = 2.30, p = .004 and follow-up measurement, I-J = 1.75, p = .025. The mean scores of Engagement for the experimental group were as follows: pretest: M = 21.45, posttest: M = 23.75, follow-up: M = 23.20.For the control group the mean scores were the following: pretest: M = 22.45, posttest: M = 23.30, follow-up: M = 23.35, (see Figure 2, Table 2).

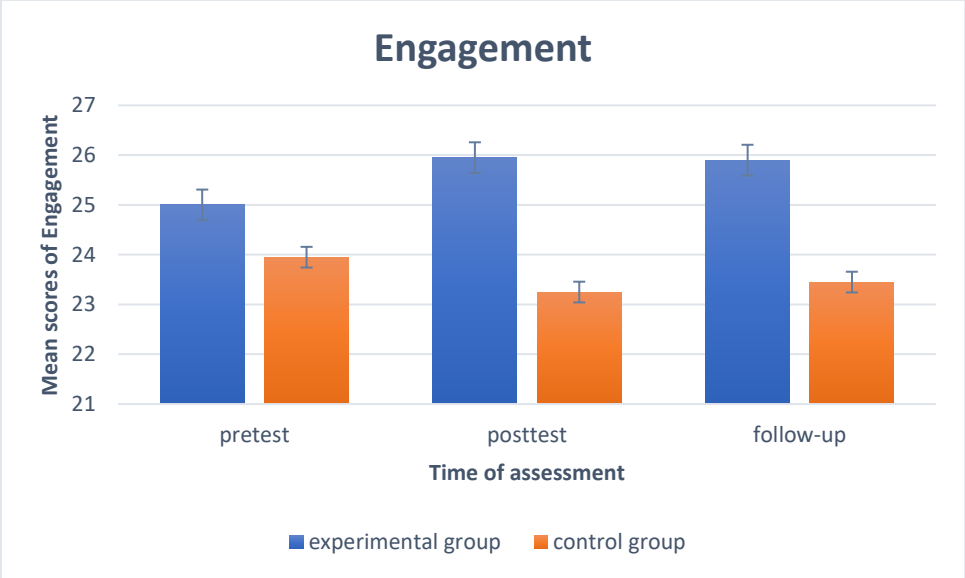

Figure 2. The levels of the Engagement component of the PERMA-Profiler in the humor intervention group as compared to the respective levels of Engagement in the control group, in pre-, posttest and follow-up assessments

Table 2
Participants' distribution according to PERMA Profiler's Mean Scores and Std. Deviation

	PERMA											
	Experimental Group						**Control Group**					
	Pretest		**Posttest**		**Follow-up**		**Pretest**		**Posttest**		**Follow-up**	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Positive Emotion	22.75	3.8	24.45	2.74	24.30	2.49	22.5	3.67	23.2	3.01	23.45	2.89
Engagement	21.45	3.13	23.75	2.04	23.2	2.72	22.45	3.26	23.3	3.11	23.35	2.85
Relationships	25	2.79	25.95	2.39	25.90	2.1	23.95	3.57	23.25	3.56	23.45	3.06
Meaning	23.75	3.2	25.25	3.04	25.15	2.62	24.1	2.78	24.3	2.57	24.4	2.5
Accomplishment	24.1	2.97	25	2.75	25.3	2.53	24	2.82	24.35	3.45	24.4	3.21
Negative Emotion	12.25	5.9	10.25	5.65	9.65	5.94	12.8	6.54	12.3	5.33	12.05	5.36
Health	22.85	4.45	24.6	3.20	24.6	3.06	22.65	4.1	22.9	4.03	23.1	3.4
Happiness	7.45	1.43	7.75	1.06	7.75	1.06	7.55	1.46	7.65	1.49	7.65	1.49
Loneliness	3.65	2.49	3.65	2.9	4.25	3.2	4.05	3.23	3.8	3.07	3.7	3.04

As regards the *Meaning* component, it was first applied a 2 (group) x 3 (time of assessment) Mixed Measures ANOVA that demonstrated a significant effect of the interaction of time with the group, F (2, 37) = 5.04, p = .01, η^2 = .21. Although, there was no significant difference between the two groups, F (1, 38) = .279, p > .05, η^2 = .00, time had a significant effect on the mean scores of Meaning, F (2, 37) = 8.722, p = .001, η^2 = .32. Two Repeated Measures ANOVA$_S$ on each group respectively revealed that time had a significant effect on the mean scores of Meaning in the experimental group, F (2, 18) = 8.649, p = .002, η^2 = .49. Specifically, in the posttest (M = 25.25) assessment, there was a significant increase in the reported subjective meaning in life compared to the pretest, I-J = 1.50, p = .001. The same is true for the follow-up condition, I-J = 1.40, p = .013. In the follow-up assessment though, the score remained almost unchanged (M = 25.15) compared to the posttest assessment. The levels of meaning in the control group, on the other hand, were quasi the same, F (2, 18) = .768, p > .05, η^2 = .08, throughout the 3 assessments (pretest: M = 24.10, posttest: M = 24.30, follow-up: M = 24.40, see Figure 3, Table 2).

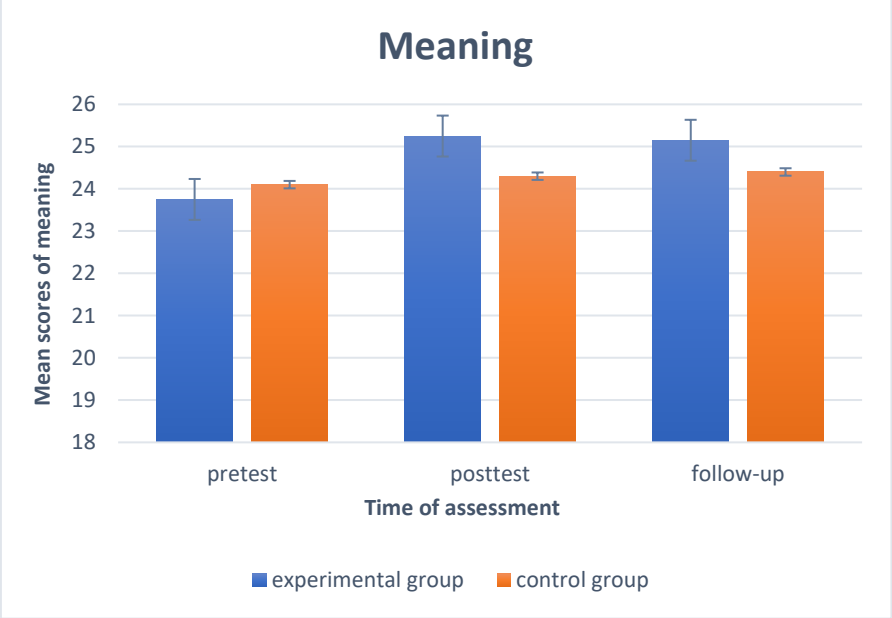

Figure 3 The levels of the Meaning component of the PERMA-Profiler in the humor intervention group as compared to the respective levels of Meaning in the control group, in pre-, posttest and follow-up assessments

In relation to the *Accomplishment* component, 2 (group) x 3 (time of assessment) Mixed Measures ANOVA demonstrated no worth mentioning effect of time -group interaction, F (2, 37) = .988, p > .05, η^2 = .05, as well as of group, F (1, 38) = .377, p > .05, η^2 = .01. However, there was a significant effect of time, F (2, 37) = 3.993, p = .027, η^2 = .18. Therefore, Repeated Measures ANOVA was carried out in each group. The results of these analyses suggested that there was a significant effect of time only in the experimental group, F (2, 18) = 3.842, p = .041, η^2 = .29 and not in the control group, F (2, 18) = .590, p > .05, η^2 = .06. Based on the results of this test the mean score of Accomplishment in the experimental group increased significantly only in the follow-up (M = 25.30) condition in comparison with the pretest assessment, I-J = 1.20, p = .036, (M = 24.10). Apart from that Accomplishment did not differ significantly in the posttest (M = 25.00) compared to the pretest assessment. In the control group the levels of Accomplishment remained

relatively stable in the 3 times of assessment (pretest: M = 24.00, posttest: M = 24.35, follow-up: M = 24.40, see Figure 4, Table 2).

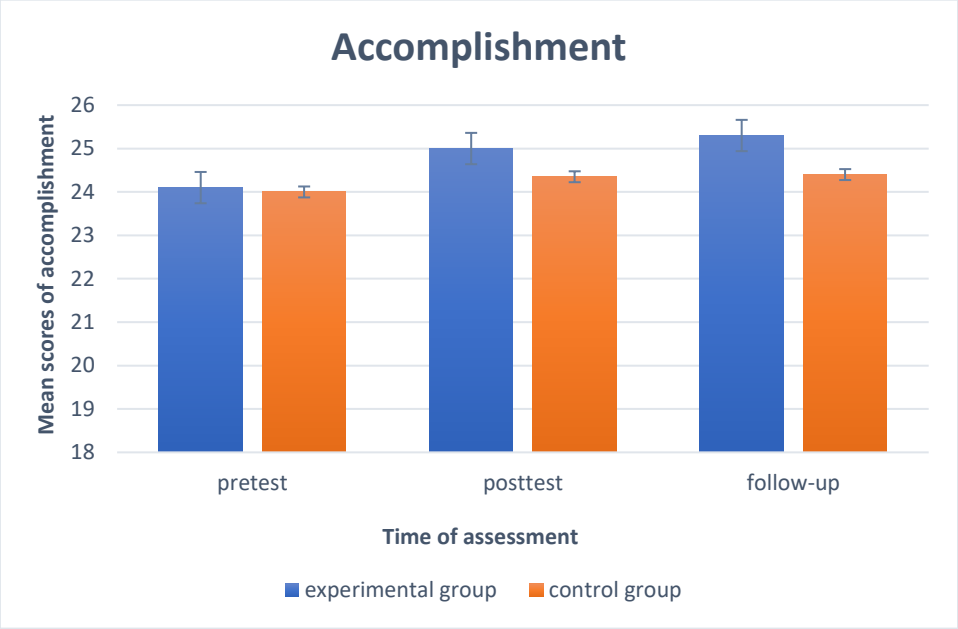

Figure 4 The levels of the Accomplishments component of the PERMA-Profiler in the humor intervention group as compared to the respective levels of Accomplishments in the control group, in pre-, posttest and follow-up assessments

With reference to *Negative emotions*, the 2 (group) x 3 (time of assessment) Mixed Measures ANOVA implemented, exhibited that neither the interaction of time of assessment with group, F (2, 37) = 1.753, p > .05, η^2 = .09, nor group, F (1, 38) = .883, p > .05, η^2 = .02, had a significant effect. Nonetheless time had a significant impact on the mean scores of Negative emotions, F (2, 37) = 5.368, p = .009, η^2 = .22. As it was later demonstrated through the use of Repeated Measures ANOVA for each group separately, time had a significant effect on the Negative emotions' scores of the experimental group, F (2,18) = 7.735, p = .004, η^2 = .46, and not of the control group, F (2,18) = .475, p > .05, η^2= .05. It was indicated that there was a significant decline in the score of Negative emotions in the posttest, I-J = 2.00, p =.015, and follow-up condition, I-J = 2.60, p = .002, compared to the pre-test assessment. Nevertheless, there was no significant difference in the level of negative emotions in the posttest and follow-up measurements. So, in the experimental group the mean scores of Negative emotions showed a progressive decline (pretest: M = 12.25, post-test: M = 10.25, follow-up: M = 9.65), although the last drop in the score could not be considered significant. Yet, the performance of the control group was maintained practically unchanged in the three measurements (pretest: M = 12.80, post-test: M = 12.30, follow-up: M = 12.05 (see Figure 5 & Table 2).

A 2 (group) x 3 (time of assessment) Mixed Measures ANOVA utilized showed that despite the fact there was no significant effect from the interaction of time with the group, F (2, 37) = 2.696, p > .05, η^2= .12, or from group, F (1, 38) = 1.005, p > .05, η^2 = .02, time of assessment had indeed a major effect on the levels of Health, F (2, 37) = 4.528, p = .01, η^2 = .19. Repeated Measures ANOVAs were conducted in order to examine which group had benefited the most and to which extent the mean scores of Health had altered

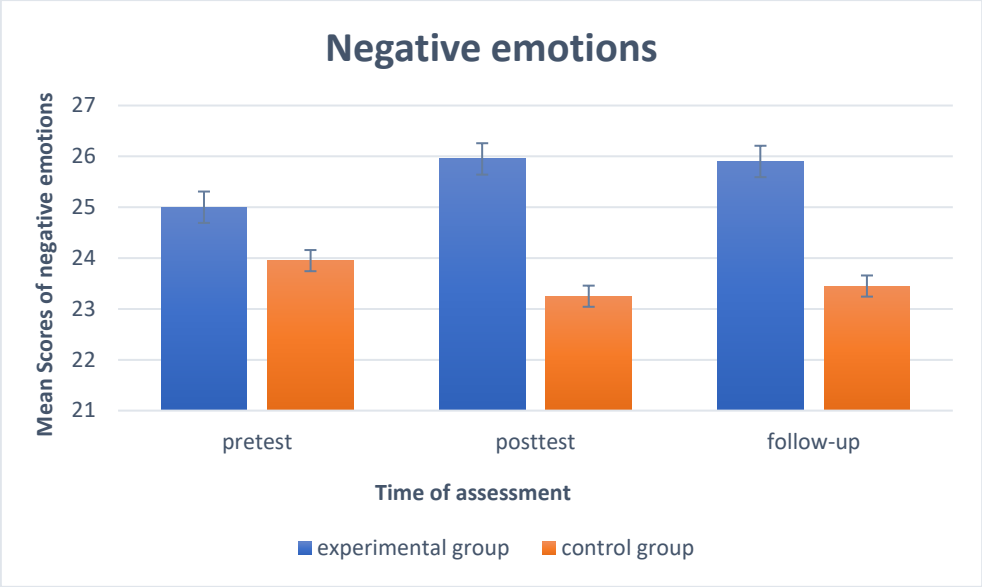

Figure 5 The levels of the Negative Emotions component of the PERMA-Profiler in the humor intervention group as compared to the respective levels of Negative Emotions in the control group, in pre-, posttest and follow-up assessments

in each group through the 3 times of assessment. It seems that time had a significant effect in the experimental group, F (2, 18) = 3.913, p = .039, η^2 = .30. The level of subjective health rose steeply in the posttest condition, I-J = 1.75, p = .030, and then remained exactly the same (pretest: M = 22.85, post-test: M = 24.60, follow-up: M = 24.60). The improvement was marginally significant in the follow-up condition compared to the pretest assessment, I-J = 1.75, p = .049. In the control group (pretest: M =22.65, posttest: M = 22.90, follow-up: M = 23.10), the result was not statistically significant, F(2, 18) = .728, p > .05, η^2 = .07 (see Figure 6 & Table 2).

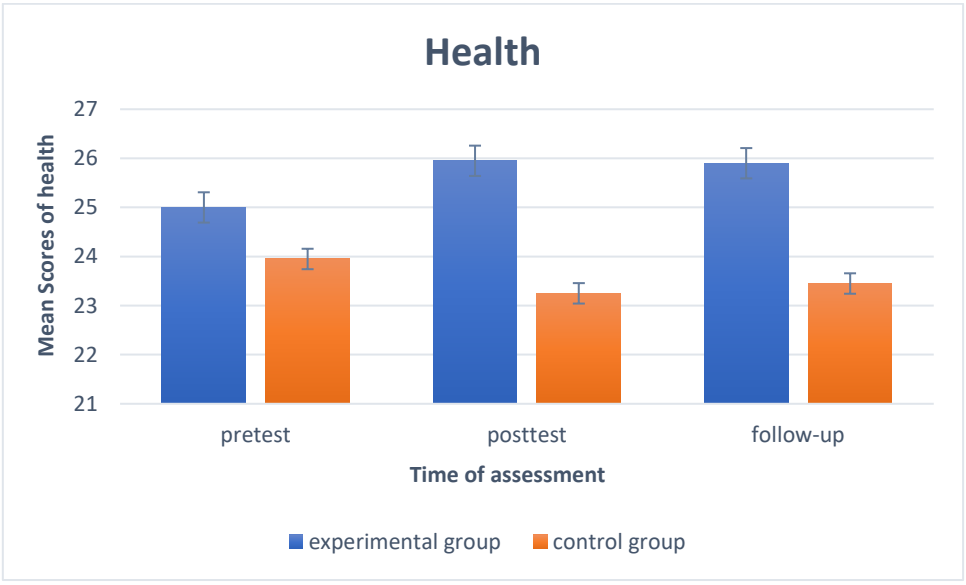

Figure 6 The levels of the Health component of the PERMA-Profiler in the humor intervention group as compared to the respective levels of Health in the control group, in pre-, posttest and follow-up assessments

The application of 2 (group) x 3 (time of assessment) Mixed Measures ANOVA on the data of the Happiness indicator as measured in the PERMA Profiler showed no significant interaction effect of group with the time, F (1, 38) = 1.086, p > .05, η^2 = .02, or a main effect of group, F (1,38) = .006, p > .05, η^2 = .00. There was only a marginal time effect, F (1, 38) = 4.343, p = .04, η^2 = .10. No significant effect of time neither in the control group, F (1, 19) = 2.111, p > .05, η^2 = .10, nor in the experimental group, F (1, 19) = 2.803, p > .05, η^2 = .12 was indicated (see Table 2).

With reference to Loneliness it could be assumed from the application of a 2 (group) x 3 (time of assessment) Mixed Measures ANOVA that there was neither a significant interaction effect of group with assessment time, F (2, 37) = 1.299, p > .05, η^2 = .06, nor a statistically significant effect of group, F (1,38) = .000, p > .05, η^2 = .00, nor time, F (2, 37) = .686, p > .05, η^2 = .03 (see Table 2).

The main effects of group type on the PERMA component of Relationships

Regarding Relationships the application of a 2 (group) x 3 (time of assessment) Mixed Measures ANOVA showed that the interaction between time of assessment and group was not significant, F (2, 37) = 2.49, p > .05, η^2 = .12, and time did not have a significant effect either, F (2, 37) = .128, p > .05, η^2 = .00. However, the effect of group was statistically significant, F (1, 38) = 5.887, p = .02, η^2 = .13. In order to delve deeper into these results Multivariate Analysis of Variance (MANOVA) was applied, with the scores of the 3 times of assessment as the dependent variables and group as the independent variable. MANOVA indicated that group had a significant effect on the mean scores of Relationships, F (3, 36) = 3.342, p = .03, η^2 = .20. Although there was no statistically significant difference between the two groups in the pretest condition, F (1, 38) = 1.072, p > .05, η^2 = .02, there was a statistically significant difference in the 2nd, F (1, 38) = 7.899, p =.008, η^2 = .17, and 3rd, F (1, 38) = 8.681, p = .005, η^2 = .18, time of assessment i.e. posttest, follow-up (see Figure 7, Table 2). The Relationships' mean scores of the experimental group were quite higher in the posttest (M = 25.95) and follow-up (M = 25.90) conditions compared to those of the control group (posttest: M = 23.25, follow-up: M= 23.45).

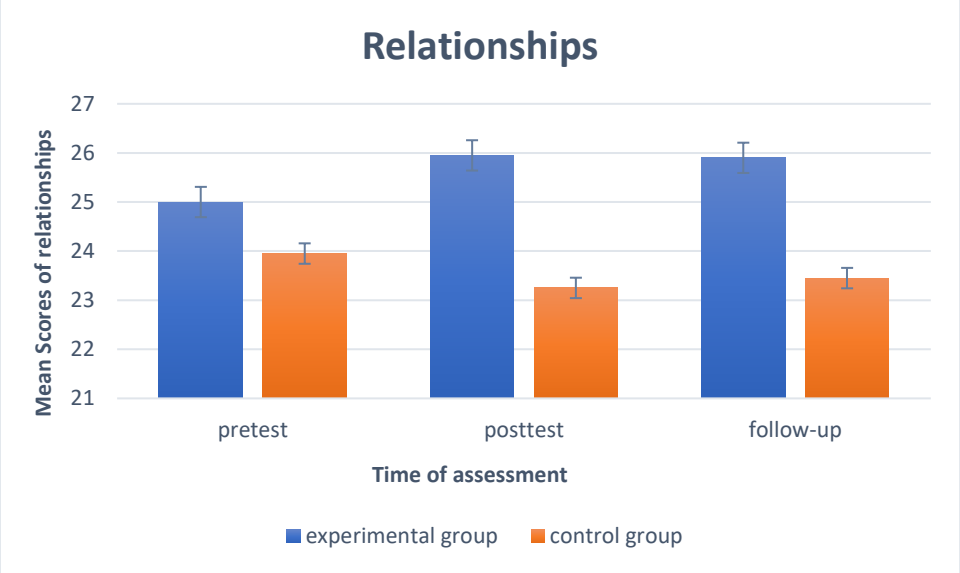

Figure 7 The levels of the Relationships component of the PERMA-Profiler in the humor intervention group as compared to the respective levels of Relationships in the control group, in pre-, posttest and follow-up assessments

Discussion

The purpose of this study was to examine whether a humor-based intervention could enhance subjective wellbeing in community-dwelling older adults. This was tested by dividing participants into two groups (experimental and control) and measuring their performance on the different components of wellbeing based on PERMA Profiler before (pretest), after (posttest), and one month after the intervention program (follow-up).

The hypothesis of the study was that the level of wellbeing in the humor intervention group (experimental group) would increase directly after the intervention and that it would remain high or even get improved one month later (follow-up) compared to its pre-intervention level (Hypothesis 1a) and also to the scores of the older adults in the control group (Hypothesis 1b). These predictions were partly confirmed as there was an increase in almost all the components of wellbeing (positive emotions, engagement, meaning, accomplishments, health, relationships) and a decrease in negative emotions among the participants of the experimental group in the posttest assessment compared to their pre-intervention performance. These results were maintained in the follow-up assessment. Those results are in line with the findings of previous attempts to implement a humor intervention in older adults (Lebowitz et al., 2011; Proyer et al., 2014; Tse et al., 2010; Wellenzohn et al., 2016b).

However, the results were not equally encouraging for every PERMA factor as the humor intervention did not have a significant impact on levels of loneliness and happiness (single items). As far as the control group is concerned, it seems that no major changes in terms of wellbeing components were demonstrated. In fact, there was either no difference in the baseline, posttest and follow-up scores (Hypothesis 1a). In addition to this, the factor group had no significant impact on any of the PERMA components except for relationships (Hypothesis 1b).

More specifically, it seems that this humor-based intervention contributed to the enhancement of almost all components of wellbeing as psychological flourishing. This result may be interpreted through the “Broaden-and-Build theory of positive emotions” (Fredrickson, 2004, 2005). Based on this theory, experiencing positive emotions produces more positive emotions through an upward spiral and reduces the experiencing of negative emotions, that produce downward spirals. Moreover, positive emotions broaden the repertoire of thoughts and behaviors letting new information get in our system. Not only this, but experiencing positive emotions build enduring physical, psychological, cognitive, and interpersonal resources, that assist individuals to face difficulties in their lives. All the above procedures result in higher life satisfaction and wellbeing levels, better physical health, and longevity. This model could shed light on the mechanisms through which humor boosts wellbeing and the ability to deal with adversities. Humor allows individuals to gain greater control over their lives and be alert and prepared to face any potentially unpleasant situation. So, as time progresses, individuals reconsider and reevaluate the negative events from a more positive point of view and, thus, feel more optimistic and hopeful. It is likely that, during the process of reminiscing funny moments, people savor and appreciate the little things in life and enjoy more their daily routine (Monahan, 2015; Sin & Lyubomirsky, 2009).

The impressive improvement of the humor intervention group in the main PERMA factors could be explained through the mechanism of self-efficacy. Pallant (2000) supported that a sense of humor could provide a perception of control and empowerment, and thus help the individual adjust better and cope more effectively with life adversities. According to Leist and Muller (2013), self-regulatory strategies mediate the humor - wellbeing association. Consequently, people who feel in charge of their lives and able

to adjust their behavior and emotions accordingly tend to thrive and fulfill their aspirations. In fact, while thinking about previous funny experiences participants appeared to control their thoughts and sometimes to feel more satisfied with what they had achieved so far. For instance, some events that were mentioned during the intervention could be considered upsetting or stressful but, due to the fact that a considerable amount of time had passed, and these incidents were no longer seen as threatening, participants stated proud to have overcome these obstacles and more capable to handle similar situations in the future. So, from this perspective, humor improved their sense of self-efficacy and, by feeling responsible for their own destiny and not adopting a fatalistic attitude, these people deployed the highest of their potential.

The results concerning specifically positive emotions, demonstrated a considerable increase in the level of positive affect, in the experimental group, in the posttest condition. Interestingly, this outcome persisted one month after the intervention. This finding indicates that the humor intervention, though short, indeed potentiated the positive affect among older adults. By recalling funny incidents, participants were re-experiencing all the positive emotions that these events elicited (Ruch & Hofmann, 2017).

Based on "Broaden-and-Build Theory", already mentioned in the introduction, a subset of positive emotions such as joy, contentment and love can broaden an individual's momentary thought-action repertoire. Positive emotions promote discovery of novel and creative actions, ideas and social bonds, which in turn improve individual's personal resources, ranging from physical and intellectual resources, to social and psychological resources. So, by inducing positive emotions this intervention potentially promoted emotional resilience and enduring personal resources, that could function as reserves and these reserves can be drawn on later to enhance the odds of successful coping and survival. (Fredrickson, 2004, 2005).

In addition to this, participants were encouraged to shift their attentional focus on positive events. The study of Sanchez and Vazquez (2014) on positive information-processing bias and this of Wadlinger and Isaacowitz (2011) on attention training as an effective strategy of emotion regulation suggest that mood can be improved just by emphasizing on the positive aspects of incidents.

Last but not least, the cognitive processes of a joke release corresponding emotional reactions that could be summarized in the word "Mirth". This emotional reaction is accompanied by the activation of the pleasure centers of the limbic system and thus one enjoys humor and feels more positive (Martin & Kuiper, 2016). However, this claim could not be tested in this study and thus it could be an objective for future research.

The score of negative emotions in the experimental group declined significantly in the posttest and follow-up assessments compared to the pretest condition. Nevertheless, the level of negative affect remained relatively stable in the follow-up measurement. It seems that, by participating in a humor-based intervention, these older adults did not only boost their positive affect, but they also decreased their negative emotions. After the intervention, they reported feeling less sad, less angry and less anxious. Applying Fredrickson's Broaden-and-Build theory (Fredrickson, 2004, 2005), it could be argued that negative emotions could hinder optimal wellbeing. So, by diminishing them, positive results may occur. It is possible that through this intervention older adults learned to actively seek and appreciate more the humorous aspects of everyday events and hence a more playful attitude was fostered.

According to the literature, humor appears to work as a coping or defensive mechanism as it helps people deal with difficult or unpleasant situations and challenges in their lives (Celso et al., 2003; Gremigni, 2013; Martin & Kuiper, 2016) as well as adjust their attitude and see things from a positive point of view (Sin & Lyubomirsky, 2009). So, although humor may not be the cure for stress, it certainly constitutes a

viable alternative to it as by generating humor people learn to cope with stressful situations and emotional symptomatology (Falkenberg et al., 2011).

The relief theory of humor could also be an alternative to explain the decrease in negative emotions. This model is strongly associated with Aristotle's concept of catharsis. It supports the idea that humor discharges the tension and superfluous psychic energy of everyday incidents either physically or cognitively (Wilkins & Eisenbraun, 2009). So, participants, thanks to this humor-based intervention may have experienced relief from sorrow, stress, and anger.

With reference to Engagement, Meaning, and Accomplishments, the results manifested similar effects to those of positive emotions. The scores tended to be higher in the posttest in comparison with the pre-test assessment in the experimental group. In the follow-up measurement, the scores remained quite high. The only exception was that the score of accomplishment was statistically significant compared to the pretest intervention only in the follow-up and not in the posttest condition.

These positive effects could be interpreted through the Values In Action theory (Peterson & Seligman, 2004). According to this theory, wellbeing can be improved through identifying, cultivating and developing character strengths. Humor (playfulness) is one of the 24 strengths listed in the VIA classification. So, from this point of view, the enhancement of humor could indirectly have a positive impact on wellbeing by the improvement of its components (i.e. engagement, meaning, accomplishments). Indeed, it could be a possible explanation to why participants after the humor-based intervention reported being more dedicated to their activities and goals and more capable of achieving them as well as leading a more meaningful life.

Subjective health was also a component that got significantly improved in the experimental group. According to the findings, the level of subjective health increased in the posttest condition and then remained unchanged. Humor -mostly through laughter- enhances the function of the muscular and endocrine system (Berk, 2001) as well as the circulatory's (Berk, 2001; Gremigni, 2013; Kim et al., 2015) and immune system's functioning (Gremigni, 2013; Wilkins & Eisenbraun, 2009). Humor can also alter the subjective sense of pain (Linge-Dahl et al., 2018; Lurie & Monahan, 2015). Usually, the actual level of health is measured with specific procedures including electrocardiography or examining the endocrine gland by using imaging techniques etc. In this study, however, the score of subjective health was measured only through self-reports. So, it is likely that the evaluation of health was based more on how the person was feeling emotionally rather than managing physically. As a result, only abstract assumptions can be made to support the findings and further research is needed.

As regards relationships it seems that the mean scores of the two groups (experimental and control) differed in the posttest and follow-up conditions. This enhancement is consistent with the literature since older adults use humor to flourish interpersonally. They use humor positively and benevolently to have fun and strengthen their relationships and not to belittle others or downgrade them. Fun, wit, and benevolent humor are positively correlated with wellbeing (Ruch et al., 2018; Stanley et al., 2014). Apart from that humor empowered and endorsed their relationships and as it is generally considered a social activity it offered them the opportunity for interaction. In the cases presented during the intervention, laughter occurred in social contexts and so the cohesion of the group was enhanced and it became a more stable, protective, and supportive social environment (Martin & Kuiper, 2016; Wilkins & Eisenbraun, 2009).

With respect to loneliness, although fostering humor is potentially beneficial to its reduction (Cann & Etzel, 2008; McCreaddie & Wiggins, 2008; Wilkins & Eisenbraun, 2009) this study could not confirm these

results perhaps because this factor was underrepresented in the PERMA Profiler. The same is true for the component of happiness. Even though actively seeking humor and systematically exposing oneself to it are possible ways of enhancing happiness, according to the extant literature (Turner et al., 2017), in this study no significant effect was observed. Thus, further research is needed.

Limitations and future research

The current study has potential limitations. First of all, the restricted nature of the sample should be highlighted. In particular, a convenience sample of only 40 older adults was recruited and thus the results could neither be generalized to the entire aging population nor be considered definite. In fact, research bias could have arisen as the participants selected were more likely to generate the desired results. Apart from that, the potentially short duration of the humor intervention (4 weekly sessions – 1 month) and the relatively limited period of time (1 month) mediated the 2nd and 3rd administration of the PERMA Profiler (posttest, follow-up measurements) could be taken into account as limitations. The lack of prior research studies focusing on the improvement of older adults' wellbeing as a factor of psychological flourishing makes it more challenging to compare these results with the outcomes of other humor interventions. In addition to this, as the data were self-reports, they could be subject to selective memory, telescoping, or exaggeration.

It would be really interesting to examine how this humor intervention could be applied to larger groups of healthy elderly people, to different age groups such as younger or middle-aged adults or to populations with different cultural background. Moreover, the duration or the content of the intervention could be possible objectives of future studies. This intervention could be enriched with other activities such as watching humorous videos and movies, reading humorous articles and books, or writing a humor journal. The follow-up period could also be extended to two or even six months so that possible changes in the levels of wellbeing would be examined longitudinally. In this study, wellbeing is being approached as psychological flourishing. So, the benefits of this humor intervention on other aspects of wellbeing such as life satisfaction, hope, optimism, could be further assessed. Furthermore, along with self-reports, different sources could be utilized (e.g. peer-reports, interviews, etc.). It should be noted that this intervention was conducted face to face and thus it was quite time-consuming and demanding for both researchers and participants. In an online setting, the Hawthorne effect would be eliminated as participants would probably not feel the urge to respond in a socially acceptable way or improve their performance due to being observed. Last but not least participants were not requested to recall humorous incidents that foster a concrete humor type or style. As different people appreciate different kinds of humor it would be advisable in future studies that participants are instructed to state incidents that improve a certain type of humor that has already been proven to positively correlate with wellbeing in order to avoid the possible detrimental effects of humor.

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ΕΜΠΕΙΡΙΚΗ ΕΡΓΑΣΙΑ | RESEARCH PAPER

Το χιούμορ κατά τη γήρανση: μπορεί να βελτιώσει την ευζωία των ηλικιωμένων;

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ΛΕΞΕΙΣ ΚΛΕΙΔΙΑ

Γήρανση,
Ευ ζην,
Θετική παρέμβαση,
Θετική ψυχολογία,
Χιούμορ

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ΠΕΡΙΛΗΨΗ

Η παρούσα μελέτη στοχεύει στον έλεγχο της επίδρασης του χιούμορ στα επίπεδα ευ ζην ηλικιωμένων ατόμων. Μία παρέμβαση θετικής ψυχολογίας, που εστιάζει στο χιούμορ, εφαρμόστηκε σε ένα δείγμα ηλικιωμένων, μελών του Ανοιχτού Κέντρου Φροντίδας Ηλικιωμένων, με σκοπό την ενίσχυση πέντε συστατικών του ψυχολογικού ευ ζην (θετικά συναισθήματα, δέσμευση, θετικές σχέσεις, νόημα ζωής και επιτεύγματα). Το δείγμα αποτελούνταν από 40 συμμετέχοντες (20 άνδρες και 20 γυναίκες) ηλικίας 65-91 ετών, οι οποίοι εξετάστηκαν για πιθανή παρουσία καταθλιπτικής συμπτωματολογίας ή γνωστικής έκπτωσης. Οι συμμετέχοντες χωρίστηκαν τυχαία σε δύο ομάδες (πειραματική / ελέγχου) με σκοπό οι δύο ομάδες να είναι ίδιες ως προς την ηλικία, το φύλο και την εκπαίδευση των συμμετεχόντων. Κάθε ομάδα δέχθηκε οδηγίες να εφαρμόσει ένα διαφορετικό έργο (ανάκληση αστείων συμβάντων και ανάκληση πρώιμων εμπειριών αντίστοιχα) για διάστημα ενός μήνα. Το ευ ζην μετρήθηκε με τη χρήση του PERMA Profiler σε τρεις χρονικές στιγμές (πριν, αμέσως μετά κι έναν μήνα μετά την παρέμβαση). Τα αποτελέσματα αναφορικά με τα επίπεδα του ευ ζην έδειξαν, ότι τα μέλη της πειραματικής ομάδας σε αντίθεση με αυτά της ομάδας ελέγχου ανέφεραν σημαντικά υψηλότερα επίπεδα ευ ζην μετά την παρέμβαση σε σύγκριση με πριν από αυτήν, ευρήματα που παρέμειναν αναλλοίωτα έως κι έναν μήνα μετά την παρέμβαση. Επομένως, μία θετική παρέμβαση, που βασίζεται στο χιούμορ, μπορεί να συνεισφέρει στη βελτίωση του ευ ζην των ηλικιωμένων οδηγώντας στην ψυχολογική τους άνθηση κατά τη γήρανση.