



Divergent Thinking in Older Adults: Understanding its Role in Well-being

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Abstract

The purpose of the study was to explore the nature of the relationship between Divergent Thinking and Well-being. Two theoretical models about the relationship between Divergent thinking, Psychological well-being and Life Satisfaction were tested. A total of 152 subjects between 65 and 84 years old participated in the study. Final model emphasises the idea that PWB is affected by DT and that PWB is also significantly related to LS. The model also highlights the importance of four dimensions of well-being: environmental mastery, life purpose, personal growth and self-acceptance. The goodness-of-fit indexes confirmed the existence of a significant relationship between DT and well-being, and between the latter and life satisfaction. Nevertheless, the final model did not confirm a direct link between DT and life satisfaction, only an indirect relationship through psychological well-being. These results help to understand that successful living in older adulthood requires effort and personal investment. Intervention programs for the elderly should consider the promotion of DT skills through individual and group activities.

Keywords Divergent thinking · Life satisfaction · Psychological well-being · Older adults

1 Introduction

Older adults' lives are full of challenges associated with the reduction of both material and personal resources that may occur in aging. Healthy aging means adapting to the new demands of the environment, making use of past experience to face the present, and establishing new goals for future development.

The way in which older adults address their life challenges depends, at least partially, on their divergent thinking skills. You might think that divergent thinking is important for older adults' well-being but very little research has been done in this regard. Divergent thinking (DT) is usually scored in terms of fluency (the number of ideas), flexibility (the

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number of category shifts in responses), and originality (the number of infrequent ideas). Some people have a strong tendency to latch onto the first acceptable idea that occurs to them (Alfonso-Benlliure et al. 2013) while some others are able to find alternative ideas and look for multiple novel solutions. In this sense, DT can be useful as a flexible cognitive strategy to solve various problems with everyday life.

Although traditional literature (e.g., Jaquish and Ripple 1984; McCrae et al. 1987) argue that older adults have less original and flexible ideas than younger adults, more recent studies (e.g., Leon et al. 2014; Palmiero et al. 2014; Roskos-Ewoldsen et al. 2008) conclude that despite the general cognitive decline, older adults are still capable to think divergently and under certain conditions (e.g., no time limits), sometimes even better than younger adults.

The fact that older adults preserve or even improve their DT skills can have important implications for active aging and the way older adults manage their well-being. Investigating the relationship between well-being and DT in older adults is a fairly novel approach. Well-being implies taking on challenges and making efforts to achieve the proposed goals. DT could play an important role in the adaptation processes necessary to achieve this well-being.

In this line, Ryff (2014) states that well-being means the effort for enhancement and transcendence that flourish in the establishment of personal potentials and talents. The concept of well-being includes a double perspective (Deci and Ryan 2008). The first is an eudaimonic one, related to psychological well-being (PWB) that leads to a perspective of life oriented towards growth and the creation of meaning (Ryff 2014); The second perspective (LS) is a hedonistic one, that has to do with subjective well-being or life satisfaction (LS). It refers to a value judgment in which a person's quality of life is globally assessed according to his/her chosen criteria (Diener et al. 2013). We find evidence of a positive relationship between both types of well-being and DT (Daly et al. 2016; Dolan and Metcalfe 2012; Kaufman and Paul 2014; Wright and Pascoe 2015).

2 Divergent Thinking and Psychological Well-being

Literature shows evidence of a positive relationship between PWB and DT but the direction of this association is unclear. On one side, engaging in DT tasks can help older adults in ways that can support PWB (Ramey and Chryssikou 2014; Smith 2017). Ryff (2014) proposes a six dimensions' structure of PWB. Three of them (purpose in life, environmental mastery and personal growth) have shown links with DT.

With respect to personal growth, according to Hughes and Wilson (2017), active engagement in DT tasks can boost psychological well-being because they provide opportunities for learning and achieving. Therefore, the extent to which older adults make use of their personal talents and potential to fix problems and learn can be essential for their psychological well-being (Fisher and Specht 1999; Romero et al. 2012). In essence, DT can help to promote feelings of personal growth helping older adults to make an effective use of their own resources, personal skills and creative talents (e.g., decoupage, cooking, gardening...).

With respect to environmental mastery, Kilroy et al. (2007) found that after engaging in divergent tasks, the highest psychological well-being improvement in a sample of older adults took place in environmental mastery. It seems that DT helps them to feel greater control over their lives and personal circumstances. Because of these circumstances

(possible loneliness, body changes, reduced mobility, sensory limitations, etc.) older adults may be highly exposed to environmental challenges and more vulnerable to environmental uncontrollability. For example, some older adults may need more personal and material resources to perform certain tasks and solve everyday problems (e.g., knowledge and access to leisure activities, read the labels of the products they buy, accessibility to public toilets, etc.). Therefore, DT may increase the chances of success and influences beneficially on the feeling of control.

Finally, DT can also be related with increases in older adult's purpose in life feelings. Defined as the ability to find life meaningful, purpose in life bring older adults the feeling of being able to make projects come true, and have a sense of direction in their lives (Fisher and Specht 1999; Flood and Phillips 2007). Even little research has been conducted about the relationship between purpose in life and DT, several studies (e.g., Hallaert 2018; Krawczynski and Olszewski 2000) suggest some psychological benefits of DT like promoting "optimal life experiences" or being a protective factor on the suicide risk. In this line, Fisher and Specht (1999) found that older adults, (age 60–93) who participated in weekly divergent-creative art activities cultivated a sense of purpose in life. Meléndez et al. (2016) found that older adults with higher scores in DT were more active in their lives, engaged in a greater number of leisure activities, and showed greater openness to the experience. In essence, it seems clear that DT can help to glimpse a clearer horizon and find meaning to life.

The relationships between DT and the other three Ryff's components (positive relations with others, autonomy and self-acceptance) seems more controversial. Most of the existing literature focuses on young people, adolescents or children. Few studies focus on older adults. For example, Barron and Harrington (1981) posit that DT reflects personality traits as nonconformity that may favor the search for more and better ideas but at the same time may compete with self-acceptance feelings. Sharaf et al. (2019) state that older adults who have high levels of self-acceptance may rely on such inner strengths to mobilize DT skills.

In sum, it appears that DT may be significantly linked to the PWB (or some elements of it) but the direction of that link remains unclear. The literature reviewed so far suggests a relationship in which DT promotes PWB, but we also found some support (although less forceful) for the idea that it is PWB that favors DT. Huppert (2009) examines evidence for the causes of positive well-being and also its consequences, including beneficial effects for many aspects of cognitive functioning, health, and social relationships, The study concludes that psychological well-being facilitates DT. Jena et al. (2018) also state that psychological well-being promotes divergent thinking and pro-social behaviour. Nevertheless, none of these studies focus on older adults. The lack of studies focused on this life stage and the contradictory nature of the available results, leads us to claim the need to explore and deepen the knowledge of these relationships.

Psychological well-being is associated with flexible and creative thinking, pro-social behaviour, and good physical health.

3 Divergent Thinking and Life Satisfaction

A significant link between DT and LS is also a plausible notion but little is known about it (Dolan and Metcalfe 2012). Weinberg (2006) suggest that older people often make set off innovations, while younger individuals are more involved throughout the whole invention

process. So, DT might be U-shaped through the life-cycle, just as LS is (Blanchflower and Oswald 2008; Stone et al. 2010).

The DT–LS connection is based on the idea that self-awareness of the cognitive capacities implicated in DT could be closely linked to the cognitive assessment of one's quality of life. Peterson et al. (2007) asked two samples of U.S. and Swiss adults to complete surveys in measuring character strengths (DT among them), and LS. In both samples, DT was significantly related to LS. Dolan and Metcalfe (2012) used an important amount of data set derived from the British Household Survey to test the relationship between self-perceptions about originality and imaginative ideas and LS. They also found a direct relationship between perceived innovation (DT) and LS. Personal strengths related to LS seem to be those that made possible a full life (Peterson et al. 2005). Because DT helps to channel personal talents, it could be a relevant influence when older adults make their cognitive assessment of the quality of their experiences. Nevertheless, some other researches have not been able to confirm a direct DT–LS relationship (e.g., Diener et al. 2003; Peterson and Seligman 2004), so this connection is still controversial and needs further research.

In summary, the review of the literature led us to identify two models to explain the relationship between several components of PWB, LS and DT. The purpose of this study is to test those two theoretical models in order to know which one fits better. Model 1 (Fig. 1) states that DT has a positive and direct influence on PWB whereas in model 2 (Fig. 2) is PWB which has a positive and direct influence on DT. Both models assume a direct relationship between DT and LS and that both forms of well-being (PWB and LS) are strongly connected.

The study also tries to assess which is the weight of the different components of PWB in the relationship with DT. Given the low amount of studies with older adults on the relationship between DT and PWB's variables such as positive relations with others, autonomy and self-acceptance, both models (1 and 2) also include these variables with exploratory objectives. The final objective of the study is to propose a comprehensive theoretical model that explains these interrelationships and helps to better understand how PWB, LS and DT interact in older adults.

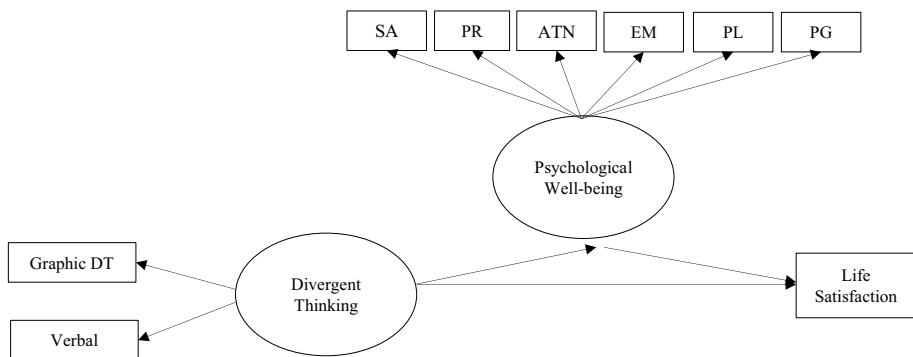


Fig. 1 Hypothesized Structural model of the relationships between DT, Psychological Well-being and Life Satisfaction. *Note:* SA: Self-Acceptance; PR: Positive Relations with others; ATN: Autonomy; EM: Environmental Mastery; PL: Purpose in Life; PG: Personal Growth

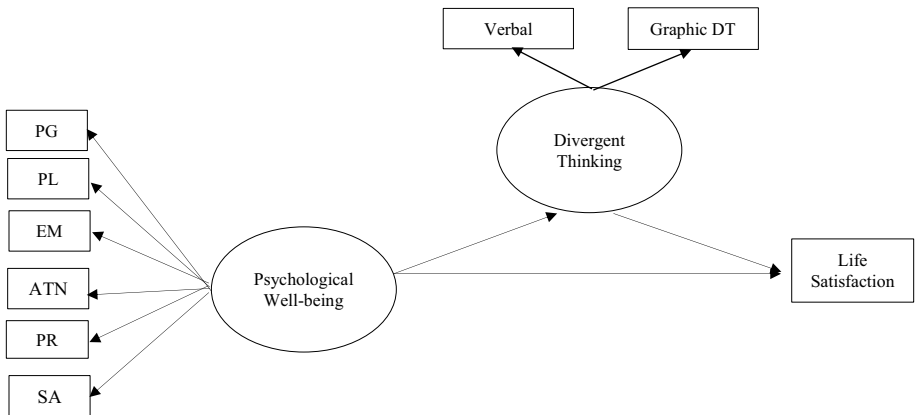


Fig. 2 Hypothesized Structural model of the relationships between DT, Psychological Well-being and Life Satisfaction. *Note:* SA: Self-Acceptance; PR: Positive Relations with Others; ATN: Autonomy; EM: Environmental Mastery; PL: Purpose in Life; PG: Personal Growth

4 Method

4.1 Participants

The total sample was comprised of 152 participants, all over 65 years old. Subjects were recruited from two sources: “Nau Gran university community”, a senior program at the University of Valencia, and a Center Specialized in Attention to Elderly (CEAM), a Valencia city Hall program where older adults get involved in different types of learning and leisure activities. Participants were recruited through newsletters and email advertising and billboards at senior day Centers. Those who decided to participate signed up and were subsequently contacted. Written informed consent was obtained from each participant. The demographic characteristics of the participants were as follows: age ranged between 65 and 84 years, mean = 72.32; $SD = 6.23$, 72% were women while 28% were men.

Data collection was carried out through individual sessions. They were conducted by a psychologist at the faculty of psychology. More specifically, sessions took place in small rooms that included a table and two chairs. Privacy was guaranteed. Temperature, light and sound conditions were appropriate for this type of task. All participants were previously informed and clarified about the purpose of the study having given informed consent. All data were collected in writing. Each session lasted between 50 and 60 min.

Those subjects with cognitive impairment (determined by a score of less than 26 on the Spanish version of the Mini-Mental State Examination (“Mini Examen Cognitivo”; Lobo et al. 2002), or depression (determined by a score of more than 16 on the Centre for Epidemiologic Studies Depression (CES-D; Radloff 1977) were excluded from the study (28 participants were excluded, 13 for cognitive impairment and 15 for depressive symptomatology). The mean for this groups of MMSE was 28.56 ($SD = 1.51$), and 15.16 ($SD = 9.01$) for depression.

4.2 Instruments

Participants completed five scales and some socio-demographic indicators.

Mini-mental State Examination (MMSE; Folstein et al. 1975; Lobo et al. 2002). This instrument estimates the existence and severity of cognitive impairment, without providing a diagnosis of any specific nosological entity.

Centre for Epidemiologic Studies-Depression (CES-D; Radloff, 1977). The CES-D, is a short self-report scale designed to measure depressive symptomatology in the general population. It consists of 20 items assessing symptoms of depression during the week before test performance. CES-D is widely used in research with adults of all ages, with high reliability, internal consistency, and discriminant and construct validity. A cutoff score of 16 is typically used to indicate clinically significant symptoms.

Test of Creative Imagination for Adults. (PIC-A; Artola et al. 2010). This instrument is composed of 4 tasks (3 verbal and 1 graphic). It takes about 40 min to be implemented. The verbal tasks offer scores on the criteria of Fluency (number of answers given), Fantasy (responses that transcend the stimuli presented on the laminated sheet), Flexibility (types of answers offered by the subject), and Originality (statistical infrequency of the answers). The graphic task offers scores on Originality, Elaboration (Level of detail, development or complexity of the ideas presented), Special Details (Number of details that involve a perceptual restructuring of the problem) and Title (Verbal responses to visual stimuli that go beyond mere description). PIC-A also provides a score for verbal DT, graphic DT and General DT. According to the test manual, it has a Cronbach's Alpha of 0.85 and acceptable construct and criterion validity (Artola et al. 2010).

Ryff's psychological well-being scales were applied. These scales conceptualize and measure well-being with six dimensions: self-acceptance (e.g., "In general, I feel safe and positive about myself"), positive relations with others (e.g., "I know that I can trust my friends, and they know they can trust me"), autonomy (e.g., "I tend to worry about what other people think of me"), environmental mastery (e.g., "I often feel overwhelmed by my responsibilities"), purpose in life (e.g., "I enjoy making plans for the future and working to make them a reality"), and personal growth (e.g., "I have the sense that I have developed a lot as a person over time"); all of the items were scored from 1 (totally disagree) to 6 (totally agree). There are several versions available, depending on the number of items. All the versions have been extensively validated in their original English versions (for example, Ryff and Keyes 1995; Keyes et al. 2002). The scale has been adapted and validated in Spain (e.g., Tomás et al. 2008; Van Dierendonck et al. 2006). Meléndez et al. (2009) obtain the following alphas: autonomy ($\alpha=0.78$); environmental mastery ($\alpha=0.78$); personal growth ($\alpha=0.76$); positive relations with others ($\alpha=0.83$); self-acceptance ($\alpha=0.78$); and purpose in life ($\alpha=0.75$).

Life Satisfaction Index (LSI-A; Neugarten et al. 1961). LSI-A consist of 18 items assessing life satisfaction. The scale assigns 2 points for positive answers, 0 for negative answers, and 1 for "don't know" answers, providing a range of 0–36, with the highest scores indicating the greatest satisfaction. The scale was translated into Spanish by Stock, Okun and Gómez (1994). According to these authors, its internal consistency index is 0.74.

4.3 Analyses

The statistical analyses included structural equations models (SEM) using EQS 6.1. Before developing the structural model, the theoretical measurements are tested. The measurement model is computed assuming that each observed variable significantly contribute to its respective latent variable and assuming the existence of significant relation between each pair of latent constructs.

As for the SEM, it simultaneously examines the variance among multiple dependent and independent variables and allows the analysis of observed and unobserved variables. Given that the sample size influences the decision to accept or reject a model, the following criteria were applied to evaluate the fit (Hu and Bentler 1999): (a) the chi-squared statistic; (b) a comparative fit index (CFI), goodness of fit index (GFI) and adjusted goodness of fit index (AGFI) above 0.90; (c) a mean quadratic error of approximation (RMSEA) of 0.08 or less. Furthermore, the Lagrange Multiplier (LM) and Wald (W) tests indices have been used to know if it's necessary to add some parameters to the model (LM), or eliminated (W).

5 Results

In order to study the relationships among the variables included in the model, a Pearson correlation analysis was carried out (see Table 1). PWB variables with significant correlations with DT were positive relations with others, personal growth and environmental mastery. Although significant, these relationships are moderate. On the other hand, LS showed a significant relationship with DT (graphic) and total DT. All PWB variables had a significant correlation with LS except Autonomy.

Initial model (Fig. 1) did not showed adequate fit with the analysis of structural equations χ^2 ($g = 12$) = 14.506; $p > 0.001$; CFI = 0.892, GFI = 0.890, AGFI = 0.898, RMSEA = 0.088 (90% = CI = 0.052, 0.124).

Table 1 Pearson's correlations among variables of the model

	V. DT (1)	G. DT (2)	T. DT (3)	ATN (4)	PR (5)	PL (6)	PG (7)	EM (8)	S.A (9)
1.	–								
2.	0.37**	–							
3.	0.94**	0.49**	–						
4.	0.02	0.00	0.01	–					
5.	0.24**	0.23**	0.27**	0.11	–				
6.	0.11	0.14	0.12	0.16	0.28**	–			
7.	0.23**	0.24**	0.26**	0.24**	0.31**	0.45**	–		
8.	0.20*	0.22*	0.23*	0.23**	0.54**	0.65**	0.39**	–	
9.	0.10	0.00	0.01	0.29**	0.20*	0.45**	0.22**	0.37**	–
10. LS	0.17	0.22*	0.19*	0.00	0.41**	0.52**	0.32**	0.55**	0.26**

Note: V. DT: Verbal Divergent Thinking; G. DT: Graphic Divergent Thinking; T. DT: Total Divergent Thinking; ATN: Autonomy; PR: Positive Relations with others; PL: Purpose in Life; PG: Personal Growth; EM: Environmental Mastery; SA: Self-Acceptance; LS: Life Satisfaction

Note: * $p < 0.05$; ** $p < 0.01$

The analysis of the results suggests making modifications to the psychological well-being scale. The Wald test (WT) indicated to remove two dimensions of PWB, positive relations with others and autonomy; and remove the relationship between DT and LS. Psychological well-being, maintains four of the six theorised dimensions: self-acceptance, environmental mastery, personal growth and purpose in life.

Regarding the measurement part of the model, DT, the first component, includes both verbal and graphic components, with this last one having the greatest factorial weight. The second component, psychological well-being, maintains four of the six theorised dimensions: self-acceptance, environmental mastery, personal growth and purpose in life. Once PWB is reduced to these four components, the model fits much better. Some research suggests that there is sufficient justification for treating autonomy and positive relations with others as independent PWB factors, but that environmental mastery, self-acceptance, purpose in life, and personal growth could be combined or represented by a second-order PWB factor (e.g., Burns and Machin 2009; Espinoza et al. 2018). Our results seem to be in line with this bifactor structure of Ryff's model of psychological well-being and confirm a significant relationship between DT and all the elements of this second-order factor.

Finally, the third component of the model is an observed variable obtained from the LSI scale which, as mentioned, measures life satisfaction. The proposed modifications were made, and indexes were obtained with optimal fit χ^2 ($g\ 1=12$) = 13.27, $p > 0.001$; in addition, Comparative Fit Indices for this model showed scores within the accepted parameters (CFI = 0.994, GFI = 0.970, AGFI = 0.931, RMSEA = 0.029 (90% = CI = 0.000, 0.097), giving rise to the final model (see Fig. 3). In summary, the initial path model, presented in Fig. 1 (hypothetical model) did not fit the data well. Given the unsatisfactory fit indices, the estimated model weights would have been inappropriate for interpretation. This recommended a need for modifications to the model. Wald test suggested that it was possible to improve the model fit by eliminating two dimensions of psychological well-being. The model fit was also improved after removing the arrow from DT to LS (see Fig. 3).

As regards the model in Fig. 2, the analysis showed an inadequate fit (CFI = 0.889, GFI = 0.892, AGFI = 0.852, RMSEA = 0.094 (90% = CI = 0.005, 0.129), and high error levels, so this model was definitely discarded. In addition, The WT indicated the elimination of the relationship between PWB and DT, which would give rise to the relationship established in model 1.

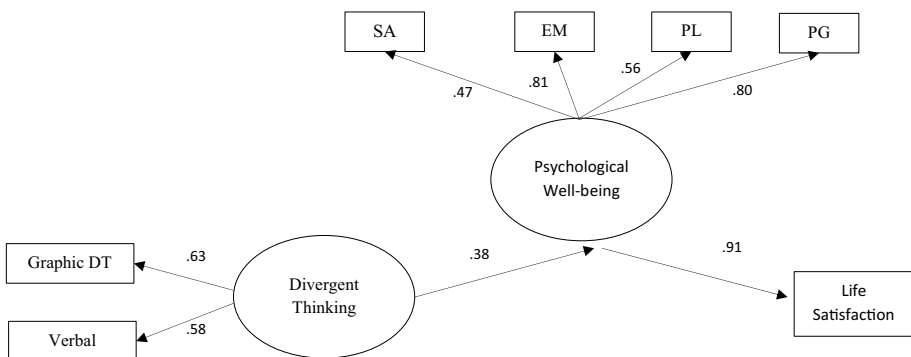


Fig. 3 Final structural equation model predicting Wellbeing and Life Satisfaction in older people. *Note:* SA: Self-Acceptance; EM: Environmental Mastery; PL: Purpose in Life; PG: Personal Growth

6 Discussion

In this study, the issue of how divergent thinking is related with psychological well-being and life satisfaction in older adults was explored. One of the aspects to highlight is the novelty of this study which test two theoretical models of the relationships between DT, psychological well-being and life satisfaction in elderly. When comparing the models, the structural part of the best model (Fig. 3) provides evidence that DT is directly related to psychological well-being. It suggests that older adults with higher scores in DT have better psychological well-being. This relationship is consistent with other studies with older adults (i.e., Fisher and Specht 1999; Flood and Phillips 2007; Kilroy et al. 2007) and the idea that this type of mental work can be an important resource at this stage of life. Therefore, this study is meaningful in that it confirms the value of DT that helps adaptation or happiness in elderly life.

When confronting problems, the ability to use DT is key to productively reframe the difficulty, generate possible solutions and visualise a time beyond the existence of the current problem (Griffin and Tyrrell 2003). Although both forms of DT are significantly related to psychological well-being, the weight of the graphic DT is slightly higher. Visual-graphic DT can help to perceive, decode and imagine visual information and to build mental models with the help of memory (Bilbokaitė 2008). Verbal DT can help to refer to culturally relevant semiotics of expression, a sequential process more usually associated with the rationality of language that can help older adults to find multiple and alternative ways to communicate, explore multiple contexts, launching new ideas. The most important thing is that both types of DT (graphic and verbal) interact in problem solving processes and both are related to wellbeing. When solving everyday problems (e.g., time management, social relationships, emotional expression, practical problems associated to age...), most of the time, graphic and verbal DT work together.

The final model suggests that DT affects psychological well-being, especially in four dimensions (see Fig. 3): environmental mastery, personal growth, life purpose, and self-acceptance. The first three were clearly expected. Fisher and Specht (1999) also concluded that DT fosters a sense of proficiency, purpose, and self-growth, characteristics they consider essential to successful aging.

Two PWB variables stand out above the others: environmental mastery and personal growth. Fixing problems with DT skills helps older adults to perceive the environment, at least partially, as "under control", less threatening, more open and friendly (Montpetit and Bergeman 2007). DT not only helps to feel a higher degree of control over their life circumstances but also to challenge personal limits and be aware of their own personal development. Positive psychology has found evidence that psychological investments (such as those involved in divergent thinking) represent opportunities to reap benefits in the form of psychological well-being (Lyubomirsky et al. 2005; Ong et al. 2006). Personal effort is clearly related with psychological well-being. Through this effort at the service of DT skills it is possible to enlarge personal limits.

With less relevance but also significant, we find purpose in life. Results suggest that implementation of DT skills linked to personal talents can help older adults to perceive a greater sense of direction in their lives, as they set clearer goals to follow and achieve. Meléndez et al. (2016) found that older adults with higher scores in DT were more active in their lives, engaged in a greater number of leisure activities, and showed greater openness to the experience. Sternberg and Lubart (2014) assert that this kind of thinking (DT) is the result of a personal decision: how much time and effort to invest. This investment

seems to have a very favourable impact on the psychological well-being of older adults, transcending the immediacy of the problems associated with old age (Flood and Phillips 2007) and offering a sense of direction to their lives (Duhamel 2016).

The last PWB's component that appears significantly linked to DT is self-acceptance. His inclusion in the models had an exploratory purpose as the existing literature is meager and contradictory. The results of the present study suggest that older adults who have more diverse, flexible and original ideas also show greater levels of self-acceptance. As Kim (2015) states, maybe being aware of one's divergent abilities fosters a good image of oneself and a greater approval of personal characteristics. Being divergent can help older adults to better accept their personal characteristics because DT makes them be more flexible and helps them to equilibrate the balance of virtues and limitations. This breadth is inherent to divergence. To reconcile with their past and accept their life circumstances and who they are is an important task for older adults. Perhaps and this would be an idea to explore in the future, divergence promotes self-acceptance in older adults to a greater extent than in earlier stages of life.

Regarding the rest of the PWB variables, DT is not linked to either "positive relations with others" or "autonomy". DT does not help to deepen the quality of older adult's relationships nor makes them more independent from others influences. It seems that this kind of flexible thinking has nothing to do with these components of psychological well-being in which the neighbor is involved.

The final model did not confirm a direct connection between DT and LS, only an indirect one through PWB. Literature shows that older adults have relatively high levels of LS although, it is not age that affects LS but other factors such as socioeconomic level, relationship, level of education, etc. The hypothesis that DT could be one of these factors directly related to LS has not been confirmed. Instead, it can be said that the higher the DT, the higher the PWB, which leads to a higher LS. Other studies found similar results (e.g., Diener et al. 2003; Ryan and Deci 2001). Peterson and Seligman (2004) found that strengths such as DT, taste for beauty or intellectual learning, despite having a high social value, had no direct relationship with LS.

Finally, the expected direct relationship between PWB and LS was confirmed. This relationship has a strong theoretical basis in the literature. For example, Raggi et al. (2010) concluded that having a sense of control over events and a high self-efficacy led to higher levels of LS. De-Juanas et al. (2013) found that those with greater self-acceptance and purpose in life had better scores on LS. A high self-acceptance is associated with high levels of self-esteem and self-knowledge, which helps to make a judgment about oneself, promoting satisfaction and knowing one's limitations (Keyes et al. 2002).

In sum, the main contribution of this study is to confirm a direct connection between divergent thinking and psychological well-being in elderly life. Thinking in a divergent way help older adults to have a feeling of control over what has been achieved in life and what is to come and a feeling of self-learning and self-awareness of progress and growth. It also helps them to link the future to personal effort, thoughtfulness about the direction and objective of their lives and acceptance of their vital moment with both positive and negative aspects involved. This psychological well-being helps older adults to feel more subjectively happy, so there is also an indirect connection between divergent thinking and life satisfaction through psychological well-being.

With the lengthening of the expectation of life, we are increasingly aware of the importance of continuing to learn and developing personal talents in order to achieve the psychological and subjective well-being. Fostering DT through individual or group activities that promote personal choice, self-control, and self-acceptance are requisites to successful

aging (Duhamel 2016). Most intervention programs for the elderly have focused only on specific domains such as memory, reasoning, or speed processing (Ballesteros et al. 2015). The results of the present study lead us to consider that these programs should be more ambitious and take into account the advantages of promoting divergent thinking skills. DT brings more and better ideas to apply to everyday problem solving but also to face challenges associated with creative and leisure activities. At the cognitive level, DT can be promoted with problem finding exercises and tasks designed to redefine situations, search for analogies, etc. On an affective-personal level, DT can be promoted with self-awareness, self-control, motivational and attitudinal exercises. This practice results in higher levels of control, balance, and transformative perspective of older adults' lives (Corbett 2012).

This study has some limitations to be considered. Among them, the size of the sample and cultural differences in the concept of well-being (PWB and LS) across the globe. Consequently, they could affect the representativeness and the generalization of the results. Another important limitation is that casual implications cannot be drawn due to the research methodology. Possible lines of investigation are to compare the similarities of the relationship between DT and both types of well-being in older and younger adults. Maybe, DT is more important in order to facilitate self-acceptance or environmental mastery in older adults than in earlier moments of life. Another line of research will be to deepen the relationship between DT and LS.

The considerable increase in older adults in our societies has led to an increase in studying their living conditions, their specific needs and how to satisfy them. The results of this and other researches help us to understand that successful living in older adulthood requires determination, effort and personal investment in creating a life one was meant to live, successfully (Duhamel 2016). Future generations of older adults will seek continued personal growth in their retirement years, thereby intensifying the demand for educational programs and services designed to meet those needs (McHugh 2016). To stimulate personal skills like DT, seems like a good social and personal investment in order to face a fuller and more satisfying life.

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