

Transforming the Elderly's Disadvantage into Advantage in Creativity Activities

Yunmeng Zhao, Ding-Bang Luh, and Yue Sun

Guangdong University of Technology, Guangzhou, 510090, China

ABSTRACT

Due to the crystal intelligence accumulated in life, the elderly have their unique advantages in creativity. However, in creativity activities, the elderly often lack self-confidence and motivation to participate because they are often perceived as lacking creativity, this phenomenon related to the degree of intersection of crystal intelligence between the evaluators involved in creativity evaluation and the older creators involved in creativity activities. The cross degree of crystal intelligence is closely related to the age difference. It is hypothesized that the lower the age intersection between the evaluator and the older respondent on Sternberg's writing domain creativity test, the higher the score of "originality" from the evaluators for the older respondent on the test. The creativity test in the writing domain proposed by Robert J. Sternberg is selected as the tool for this experiment. First, 6 elderly people aged 65 years and above with similar life experiences were recruited to take the creativity test in the domain of writing. Then 30 evaluators were recruited to evaluate the writing of 6 elderly people. The evaluators were divided into three equal groups, The first group of evaluators were 14 years old, the second group of evaluators were 31 years old, and the third group of evaluators were 48 years old. The lower the age intersection between the evaluator and the older respondent on Sternberg's writing domain creativity test, the higher the evaluation of "originality" from the evaluator for the older respondent on the test. The results of this study can provide a corresponding reference for constructing a creativity activity for the elderly, allowing the elderly to get more positive evaluation in creativity activities.

Keywords: Elderly, Creativity, Crystal intelligence, Creativity evaluation

INTRODUCTION

Society often positions the elderly as a vulnerable group, but overlooks that they also have unique advantages that other age groups do not. For example, the elderly are often considered to be lack of creativity, but is that really the case? There are many discussions on the relationship between age and creativity. Research has proven that aging leads to a decline in divergent thinking skills and a decline in creativity influenced by divergent thinking (McCrae and Arenberg, 1987). Some scholars considered that compared with age, the creativity of the elderly is more affected by factors such as environment, working time, and the differences of individual and field (Simonto, 1990). Then, other scholars analyzed real cases and concluded that creativity will not decline with individual aging (Hickson and Housley, 1997). It was further

suggested that knowledge and experience are the main factors affecting creativity, and people of any age have the potential of creativity (Cohen, 2005). It was pointed out that professional age has a greater impact on creativity than chronological age (Kong and Rowena, 2016). To sum up, creativity does not decline or disappear with the increase of age, and the elderly are not a group lacking creativity.

For the elderly, exertion creativity can reduce stress and negative emotions, strengthen the immune system and enhance social participation (Cohen, 2005). In the global context of population aging, encouraging the elderly to participate in creation is not only beneficial to their physical and mental health and reduce social medical costs, but also helps to stimulate the vitality of the elderly in their later years and give more positive impact to the society. Therefore, this paper aims to study how to transform the weakness of the elderly into an advantage in creativity, so that the elderly can get better performance in creative activities. In order to encourage the elderly to actively participate in creative activities, help the elderly see the value and significance of their old age, and improve the stereotype of the society for the elderly.

Starting from Sternberg's creativity test, we highlights the crystal intelligence advantage of the elderly by formulating the evaluation strategy of the test, so that the elderly can reasonably obtain better evaluation scores in the test, so as to enhance their self-confidence, and provide corresponding reference for the construction of creativity games for the elderly.

CREATIVITY TEST IN THE FIELD OF WRITING

A number of creativity measurement tools have been developed that are authoritative in the field of creativity research (Sternberg, 2006; Urban, 2005; Barbot, 2011). Among them, Sternberg proposed a creativity test in the field of writing, which was recognized by the academic community. . In this test, participants need to write stories based on one of the titles provided: "A Fifth Chance," "2983," "Beyond the Edge," "Saved," "Under the Table," "Between the Lines," "The Keyhole," "The Octopus's Sneakers," "It's Moving Backwards," and "Not Enough Time". The stories were assessed by a team of judges in reference to originality, complexity, emotional evocativeness, and descriptiveness (Lubart and Sternberg, 1996; Xue GUI, 2001; Sternberg, 2006). We sent an email to Robert J. Sternberg in June 2021 to ask for his explanation of the above four evaluation angles, and the reply was "these days we only rate novelty and usefulness." This word is similar to the original "originality", so we use "originality" as the evaluation angle of creativity test in writing field. We selected Sternberg's creativity test in the field of writing to explore how to transform the weakness of the elderly in the test into an advantage, so that the elderly can get a better evaluation score in the creativity test.

CREATIVITY IN THE ELDERLY

It was proposed that there are three main components of creativity, including domain related skills, creativity relevant skills and task motivation (Amabile, 1983). Domain related skills depend on innate cognitive and motor abilities and acquired knowledge and skills. creativity relevant skills mainly

depend on experience and personality. Task motivation mainly depends on the external environment. In conclusion, innate cognitive and motor abilities, external environment, acquired knowledge, skills and experience which can also be summarized as crystal intelligence, and personality are important factors affecting creativity.

HIGHLIGHTING THE CRYSTAL INTELLIGENCE OF THE ELDERLY

If we want to highlight the advantages of the elderly in the creativity test, we should pay more attention to the consideration and evaluation of crystal intelligence when evaluating the test results. A person's age, living environment, class, education level and occupation will affect the composition of this person's crystal intelligence, thus affecting the story written in the creativity test in the field of writing. A story makes the evaluator who reads the story feel "original", usually because the story text is new to the evaluator, and there is little or no intersection between the story text and the evaluator's crystal intelligence accumulated in the past. In order to reduce the intersection of the crystal intelligence of the evaluator and the subject as much as possible, it is necessary to control the background factors that will affect the crystal intelligence of the evaluator and the subject as little as possible. Among many background factors, age is an important factor affecting crystal intelligence. Therefore, it is hypothesized that the lower the age intersection between the evaluator and the older respondent on Stenberg's writing domain creativity test, the higher the evaluation of "originality" from the evaluator for the older respondent on the test.

METHOD

Participants

There were two types of subjects in this study: those who took the creativity test in writing field, that is, the writers, and those who evaluated the creativity test in the writing domain, that is, the evaluators.

Writers of Creativity Test in the Field of Writing

A combination of national definitions of old age, people aged 60 or 65 years or older are generally referred to as elderly. Therefore, six senior citizens aged 65 years or older with similar living area, education, occupation, and marital history were selected. In this experiment, these writers were all from Wenzhou, China. They are all teachers with education above high school. And they have been married and have children.

Evaluator of Creativity Test in Writing Field

The evaluators were divided into 3 groups, each containing 10 people, they were all from Wenzhou, China. The age difference between the evaluators of the three groups was 17. The first group of evaluators were 14 years old, the second group of evaluators were 31 years old, and the third group of evaluators were 48 years old.

Instrument Creativity Tests in the Field of Writing

The writer chooses one of the ten keywords given as the title and creates a story that is on topic within 30 minutes. The keyword list includes the following 10 terms: "A Fifth Chance," "2983," "Beyond the Edge," "Saved," "Under the Table," "Between the Lines," "The Keyhole," "The Octopus's Sneakers," "It's Moving Backwards," and "Not Enough Time". The stories of the six writers in this study are shown in the table below (see Table 1).

Consensus Assessment Technique (CAT)

The Consensus Assessment Technique (CAT) involves organizing an evaluation panel and having the panelists score the creative work based on their own understanding of creativity. It has existed as the definitive method for creativity evaluation since its introduction by Amabile (Amabile, 1982), and many studies, and others have confirmed the reliability of CAT for creativity evaluation (Charles, 2015; Stefanic, 2014; Barth and Stadtmann, 2020). In this study, the evaluators were divided into three age groups to evaluate the "originality" of the writers' work on the Writing Domain Creativity Test.

Likert 7-Point Scale

Scoring was on a Likert 7-point scale, with 7 points for very creative, 6 points for very creative, 5 points for relatively creative, 4 points for generally creative, 3 points for relatively uncreative, 2 points for very uncreative, and 1 point for very uncreative.

Procedure

In order to prevent the influence of handwriting on the evaluation, all writers' stories will be collected and sent to the evaluator in electronic format. The evaluation panel members were required to go through all the subjects' works and then evaluate them in random order, with each member completing the evaluation independently.

CONCLUSION

The average of each evaluator's rating of the six stories in each group is recorded as score in the table 2 (see Table 2). It is known that average 1 > average 2 > average 3.

The Test of Homogeneity of Variances was used to test the hypothesis of chi-square, and the test results are shown in Table 3 (see Table 3). $p = 0.153 > 0.05$, which is highly significant and can be considered as the variance is chi-squared, so the next step of one-way ANOVA can be performed.

The results of the analysis of variance (ANOVA) were used to show that the differences in scores between the three age groups were statistically significant ($p < 0.05$) (see Table 4). The LSD method was used for the two-by-two comparison between the three groups, and the specific results are shown in Table 5 (see Table 5), which shows that the differences between any two age groups were statistically significant.

Table 1. The stories of the six writers in this study.

Title	Original story	Meaning
Saved	1971年,有一个人没有工作,计划分配表拿在手,但进不了单位,当时在1971到1974年工作很难找,这个人就找到一个男人,78年嫁给了他,把他带进了永久锁厂。有工作就等同于获救。那时候很苦,她没工作的原因还包括家庭身份不好,不然老早就进国营单位,后来她缺只能进了集体单位,但也算是一种获救了。	In 1971, there was a person who did not have a job. She had a schedule assignment form but couldn't get into a unit. Jobs were hard to find, so she found a man, married him in '78, and he brought her into the permanent lock factory. Having a job was that same as being saved. It was a hard time, and the reason she didn't have a job was that her family had a bad status, otherwise she would have joined the state unit a long time ago. Later she could only enter the collective unit, but it was a kind of salvation.
A Fifth Chance	没成家的时候想创业,他开了一个厂,鹿城板焊厂。然后,他在外面搬上了工程,赚了一批钱,娶了老婆。但后来板焊厂倒闭了,亏了一大笔钱。天无绝人之路,这时他的厂又搬上了一个大的工程,厂子需要完成安阳啤酒厂的六个大型设备,那就是发酵用的不锈钢罐。紧接着,他又在河北邯郸魏县柠檬酸厂,接了一个化工染料厂的工程,和一个河北邢台化肥厂的大工程。他感谢三十岁能吃苦,敢出去创业的自己,也感谢一次又一次的机会。	When he didn't have a family and wanted to start a business, he opened a factory called Deer City Plate Welding Factory. Then, he was outside the project, earned a batch of money thus married a wife. But then the plate welding factory closed down and lost a large amount of money. Fortunately, at this time, his factory again solicited a big project, the factory needs to complete the six large equipment of Anyang Brewery, that is, stainless steel tanks for fermentation. Immediately after that, he took on a chemical dye factory project in the citric acid warehouse factory in Handan County, Hebei, and a large project in a fertilizer factory in Xingrai, Hebei. He thanked himself for being able to suffer at the age of thirty and daring to go out and start his own business, as well as for the opportunity after opportunity.
It's Moving Backwards	那时过年要穿新衣,每年过年有好吃的,有鞭炮,刚刚过了年就盼望下次过年。现在是天天过年,不为吃穿发愁。我小时候,过年有一双好的新鞋就开心的不得了,不讲究什么牌子,有鞋子就已经满足了,袜子根本不考虑卫生,是不是有毒,是不是转基因的产品。我们那时候跳绳,跳鞍马,打弹子,男孩子跳鞍马,打水瓢。但这个时代老人都跟不上,力不从心,跟不上时代。现在对于我们来说时代在前进,身体却在倒退。我们没有赶上好时代,但社会是前进的,所以年轻人要珍惜现在。我们曾为吃穿而愁,而你们年轻人是为了怎样玩得开心发愁。	At that time, we had to wear new clothes for New Year's Eve, there were delicious food and firecrackers every New Year's Eve, and we looked forward to the next New Year's Eve just after the New Year. Now it's New Year's Day every day, without worrying about food and clothing. When I was a kid, I was so happy to have a good pair of new shoes for the New Year, I didn't care about the brand, I was satisfied with the shoes, even though there were no socks at all. Now firecrackers are not even allowed. But there is one thing, in the past, eating inside the consciousness does not even consider hygiene, is not toxic, is not genetically modified products. We were jumping rope, jumping pommel horse, playing marbles, boys jumping pommel horse, keeping water floating. But this era of the elderly can not keep up, the force can not keep up with the times. Now for us the times are advancing, the body is lacking in retrogression. We have not caught up with the good times, but society is moving forward, so young people should cherish the present. We had to worry about food and clothing, and you young people are worried about how to have fun.

Table 1. Continued

Title	Original story	Meaning
Saved	<p>1964年,响应的号,我下乡去,龙湾小学停课,后来户口政策痛退,回到了温州市防卫处。户口是命运,因为当时没有户口,就没有工作,小孩户口也登不起来,报不上去。我记得很清楚的是当时生小孩要买红糖,需要红糖票,没有户口红糖票就拿不到。1972年我迁回了户口,有了煤球票,布票,棉花票,全国流动票。当时饭都吃不饱,都只能把煤球票卖掉买粮食吃,捡柴火烧。所以病退也是某种意义上上的获救。</p>	<p>In 1964, in response to the call of the Party, I went to the countryside to substitute teaching at Longwan Primary School, and later retired due to illness and returned to the Wenzhou Defense Department. Account is fate, because at that time there is no account, there is no work, children's account can not be registered, can not be reported. I remember clearly that at that time, the birth of a child to buy brown sugar, need brown sugar tickets, no account brown sugar tickets can not get. 1972 I moved back to the household registration, with cinder block tickets, cloth tickets, cotton tickets, national mobile tickets. At that time, there was not enough food to eat, you could only sell the cinder blocks to buy food to eat and collect firewood to burn. So the sick retirement is also a sense of being saved.</p>
Saved	<p>我从师范学校毕业后,被分配到乡村小学任教,一千就是四十年,其中有一件让我终身难忘。有一次,我在校开会后,已经是晚上十点多钟了,我独自一人回家。当时农村经济困难,没有公路,没有电,只有崎岖的小道,回家只能步行,也没有其他的交通工具。黑夜里只有手电筒照明,还要通过一条山路。半路上,我顺着手电筒的光向前看,前面十多米远的路旁竟蹲着一头猛兽,睁着一对圆圆的碧绿色的大眼睛。当时我就傻了,我太害怕了以至于无法发出声音。这时就没有行人经过也没有电话求救。我想我今晚一定是猛兽的猎物,无法再见到家人,见不到自己的学生。在这关键时刻,想起农村老人的话,我就按照农村老人口的话去做:“如果路上碰到猎狗等猛兽,人蹲下来用石头碰过去,它就会逃走的。”果然有效,我蹲了几分钟,站起来的时候,打开手机筒看去,它已经走到树林里去,无影无踪了。我就一口气跑回家,过了好长时间还静不下来,心脏怦怦直跳。</p>	<p>After I graduated from Normal School, I was assigned to teach in a rural elementary school for forty years, during which many things happened, one of which I will never forget. Once, after a meeting at school, it was already more than ten o'clock at night, and I went home alone. At that time, the rural economy was difficult, there were no roads, no electricity, only rugged paths, so I had to walk home, and there was no other means of transportation. There was only a flashlight to illuminate the darkness, and a mountain road to pass. Halfway, I followed the flashlight light to look forward, more than ten meters in front of the roadside actually squatting a beast, with a pair of big round turquoise eyes. At that time I was dumbfounded, I was so scared that I could not make a sound. There were no pedestrians passing by and no phone calls for help at this time. I thought that I must be the prey of the beast tonight and would not be able to see my family or my students again. At this critical moment, remembering the words of the old man in the countryside, I followed the words of the old man in the countryside: "If you encounter a fierce beast such as a hunting dog on the road, a person crouches down and smashes it over with a stone, it will escape." Sure enough, I squatted for a few minutes, when I stood up, open the flashlight to see, it has gone to the woods, no trace. I ran home in one breath, after a long time still can not be quiet, heart pounding.</p>
Under the Table	<p>女儿刚出生我和两个伙伴开了一家面馆,不仅是烧面,更像饭店,有时会在店里承办酒席,生意火爆。店里有三张八仙桌,能坐很多人,也有坐不到隔壁店的。基本上客人都是在店里。我每一天都要打扫店里的桌子,忙碌于桌上。有时会遇到邋遢的客人,垃圾扔得桌下到处都是;有时也会遇到要求高的客人,一会儿要这个一会儿要那个,但为了谋生,还是咬咬牙干下去。开了十几年的店面,最后因为一个搭伙的同伴家中出事了,所以没能继续下去,关闭了店铺。</p>	<p>When my daughter was first born I opened a noodle shop with two partners, not only cooking noodles, more like a restaurant, and sometimes catering in the store, business is very good. The store has three eight immortal tables, can sit a lot of people, but also can not sit down to the next store. Basically, the customers are workers from the fishery. I need to clean the tables in the store every day, busy under the table. Sometimes I met sloppy customers, throwing garbage everywhere under the table; sometimes I also met demanding customers, asking for this and that, but in order to make a living, I still gritted my teeth and went on. After more than ten years of operation, the store was finally closed because of an accident in the family of one of the partners, so it could not continue.</p>

Table 2. Average scores.

The first group (14-year-old)		The second group (31-year-old)		The second group (48-year-old)	
Number of evaluator	score	Number of evaluator	score	Number of evaluator	score
1-1	4.33	2-1	3.67	3-1	2.33
1-2	5.17	2-2	4.16	3-2	3
1-3	4.83	2-3	3.83	3-3	3.67
1-4	5.67	2-4	4.33	3-4	2.67
1-5	5.33	2-5	4.17	3-5	2.83
1-6	5.17	2-6	4	3-6	2.5
1-7	5	2-7	3.83	3-7	3.33
1-8	4.33	2-8	4.33	3-8	2.67
1-9	4.83	2-9	4.17	3-9	3.17
1-10	4.83	2-10	4	3-10	2
Average1	4.949	Average2	4.049	Average3	2.817

Table 3. Test of Homogeneity of Variances.

Levene statistic	Df1	Df2	Sig.
2.016	2	27	.153

Table 4. ANOVA.

Group	N	Mean	Standard deviation	F	p
1	10	4.9500	.41611	73.787	0.000
2	10	4.0500	.22292		
3	10	2.8167	.49348		
Total	30	3.9389	.96736		

Table 5. Multiple comparisons: Tukey.

(I) group	(J) group	Mean Difference (I-J)	Sig.	P	95% Confidence interval	
					Lower Bound	Upper Bound
1	2	.90000	.17633	.000	.5382	1.2618
	3	2.13333	.17633	.000	1.7715	2.4951
2	1	-.90000	.17633	.000	-1.2618	-.5382
	2	1.23333	.17633	.000	.8715	1.5951
3	1	-2.13333	.17633	.000	-2.4951	-1.7715
	2	-1.23333	.17633	.000	-1.5951	-.8715

This paper studies the relationship between the age of raters and their ratings of older writers' stories in Sternberg's writing field creativity test by one-way ANOVA. The greater the age difference between the evaluator and the older respondent on Stenberg's writing domain creativity test, the higher

the evaluation of “originality” from the evaluator for the older respondent on the test. The results of this study can provide a corresponding reference for constructing a creativity activity for the elderly, allowing the elderly to get more positive evaluation in creativity activities, thus enhancing their self-confidence, improving the social stereotype of the elderly, and helping the elderly see the value and meaning of their later life.

ACKNOWLEDGMENT

Supported by the Research Center for Design Science and Art.

REFERENCES

- Amabile, T. (1983). *The Social Psychology of Creativity*. Springer-Verlag New York.
- Barbot, B., Besançon, M., & Lubart, T. (2011). Assessing creativity in the classroom. *The Open Education Journal*, 4(1).
- Cohen, G. D. (2005). *The mature mind: The positive power of the aging brain*. Basic Books (AZ).
- Hickson, J., & Housley, W. (1997). Creativity in later life. *Educational Gerontology: An International Quarterly*, 23(6), 539-547.
- Kong, & Rowena. (2016). Does creativity decline with age?. *Scientific American Mind*, 27(2), 70-70
- Mccrae, R. R. , Arenberg, D. , & Jr, C. P. . (1987). Declines in divergent thinking with age: cross-sectional, longitudinal, and cross-sequential analyses. *Psychology & Aging*, 2(2), 130.
- Simonton, & D., K. . (1990). Creativity in the later years: optimistic prospects for achievement. *Gerontologist*, 30(5), 626-631.
- Sternberg, R. J. . (2006). The rainbow project: enhancing the sat through assessments of analytical, practical, and creative skills. *Intelligence*, 34(4), 321-350.
- Sternberg, R. , & Lubart, T. . (1996). Defying the crowd: cultivating creativity in a culture of conformity. *American Journal of Psychotherapy*, 50.
- Urban, K. K. (2005). Assessing Creativity: The Test for Creative Thinking-Drawing Production (TCT-DP). *International Education Journal*, 6(2), 272-280.
- Xue, G., Dong, Q., Zhou, L. F., Zhang, H., & Chen, Chuan-Sheng. (2001). A study of the relationship between internal motivation, external motivation, and creativity. *Psychological Development and Education*, V17(1), 6-11.