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Influence of Video Film and Video Film with Guidance on Performance of Divergent Thinking Tasks among Vulnerable Orphans

Harry Obi-Nwosu

Department of Psychology, Nnamdi Azikiwe University, Awka, Nigeria

Oluchi Dike

Department of Psychology, Imo State University, Owerri, Nigeria

Ugwu-Oju Anthony

Department of Psychology, Nnamdi Azikiwe University, Awka, Nigeria

Abstract:

Influence of learning on divergent thinking among vulnerable orphans was studied using video alone, and video with auditory cues. Fifty-eight (58) vulnerable orphans comprising 32 females and 26 males, aged between 12 and 17 (mean age 15, SD 2.2) participated in the study. One group was shown video clips of creative activities alone, while for the second group, as the video was showing events therein were explained (auditory cues). The pre and post-tests required participants to use items provided (match boxes, broom sticks, cardboard papers, and bottles of gum) to make representations of useful objects. T-test analyses of scores obtained by counting the number of objects represented, showed that at $P \leq .05$, both learning methods had statistically significant effect. However, there was no statistically significant difference between the two methods, and there was also no statistically significant gender difference in performance of the creativity tasks. The results strongly suggest that learning could improve creativity. It was therefore recommended that creativity training should be embodied in all programmes aimed at alleviating the conditions of vulnerable children since creativity is a prelude to sustainable self-help, productivity, and enhancement of socio-economic status.

Key words: Creativity; Divergent thinking; Learning; Vulnerable; Orphans; Video clips

1. Introduction

There has been a significant increase in research interest among scholars on ways to establish scientific explanation for some covert behaviours once perceived to be supernatural, and wholly innate. This search was probably informed by the belief that scientific explanation for such important behaviours and characteristics would ultimately lead to the development of methods to assess how much of such characteristics an individual possesses, what factors modify the behaviours, and more importantly, how to inculcate such desirable characteristics in people who do not possess them. Accordingly, the concern for proper and in-depth understanding of creativity and its associated constructs is believed to be a reflection of the weight attached to these constructs in relation to proffering solutions to organic and environmental problems, as well as engendering further exploitation of the universe to enhance development. Since creative thinking involves a process of recognizing meaningful connections between unrelated ideas, and this is first a personal experience that may become shared and made manifest in many covert expressions, it becomes essential that research should be directed at ways of improving the skill of divergent thinking in young people, especially the disadvantaged ones. VandesBos (2007) defines divergent thinking as a type of creative thinking in which an individual formulates new solutions to problems, the aim of which is often to generate a variety of possible answers which can be analyzed and evaluated. This is almost opposite of convergent thinking, which is the type of thinking that enables the individual to analyze a number of already formulated solutions to a problem to determine the one that is most likely to be successful. Thus, while convergent thinking is a form of directed problem, focused thinking in which the individual tests possible solutions for errors or drawbacks, and verifies the validity of a process and its results, divergent thinking gives impetus to the ability to produce or develop original works, novel solutions to hitherto adamant problems, new techniques, and ideas. It typifies originality, imagination, and expressiveness.

Weider (2000), opines that the most extensive work on divergent thinking was done under the guidance of J.P. Guilford at the University of California by the Aptitudes Research Project (ARP), whose findings between the 1950s and 1970s produced a broad structure-of-intellect (SI) model that encompassed all intellectual functions, including divergent thinking. This was like a follow up to Guilford's earlier work, in which he posited that the ability to envision multiple solutions to a problem (what he called divergent

thinking) lay at the core of creativity, and it is opposite to the tendency to narrow all options to a single solution (convergent thinking). Furthermore, he did identify three components of divergent thinking to include: fluency (the ability to quickly find multiple solutions to a problem), flexibility (being able to simultaneously consider a variety of alternatives), and originality (referring to ideas that differ from others).

The foregoing buttresses the relationship between divergent thinking and creativity, of which Muniford (2003) holds that of consensus, it involves the production of novel, useful products. Therefore, even when it is incorrect to use creativity interchangeably with divergent thinking, it seems plausible to hold that a good analysis of the creative process willy-nilly explains to a large extent the tenets of divergent thinking. This stance seems to be obvious in the explanation of the **investment theory of creativity**, Sternberg (2006). He explained that according to the investment theory, creativity requires a confluence of six distinct but interrelated resources of: intellectual abilities, knowledge, styles of thinking, personality, motivation, and environment. Even though all the six skills are components of a whole, Sternberg's analysis of intellectual skills highlighted three sub components of : (a) the synthetic skill to solve problems in new ways and to escape the bounds of conventional thinking, (b) the analytic skill to recognize which of one's ideas are worth pursuing and which are not, and (c) the practical contextual skill to know how to persuade others to accept the value of one's ideas and to sell same to them, and these could also pass for composites of divergent thinking- from abstraction to concretization.

An elaboration of this relationship has been made by Wilson (2004) who asserts that creative production is often characterized by the divergent nature of human thought and action. He agrees that divergence is usually indicated by the ability to generate many, or more complex or complicated ideas from one idea or from simple ideas or triggers, and holds that there are traditionally eight elements that are commonly accepted as inherent elements of creative production as well as attributes associated with creative problem solving abilities.

These elements are : Fluency- The ability to generate a number of ideas so that there is an increase of possible solutions or related products, Flexibility- The ability to produce different categories of perceptions whereby there are a variety of different ideas about the same problem or thing; Elaboration- The ability to embellish, or build of an idea or product; Originality- The ability to create fresh, unique, unusual, totally new, or extremely different ideas or products, Complexity- The ability to conceptualize difficult, intricate, many layered or multifaceted ideas or products; Risk-taking- The willingness to become courageous, adventurous one, Daring- trying new things or taking risks in order to stand apart; Imagination- The ability to dream up, invent, or to see, to think, to conceptualize new ideas or products; and Curiosity- The trait of exhibiting probing behaviors, asking and posing questions, searching, being able to look deeper into ideas and wanting to know more about something.

Indeed, evidence from developmental and social psychology pointedly suggests that most of these characteristics are environmentally determined. Although humans generally possess a measure of these characteristics as part of the developmental processes to understand their world , it seems plausible to evoke the threshold paradigm (O'Hara's Sternberg 1999) to explain the possibility that the level of curiosity or imagination for instance that would ignite and sustain creative production cannot possibly be 'naturally' bestowed on individuals and this is why the capacity for palpable creative production seem not to be evenly distributed among 'general populations'. What makes the difference is how stimulating the environment is- whether or not the environment engenders enough challenges or puzzles to attract attention, and what opportunities are available for free exploration of same. It must be emphasized that it is not only the physical environment that must be conducive, but the psychological environment also. Hence, as explained by Fredrickson, in her Broaden and Build model, that positive emotion such as joy and love, broaden a person's available repertoire or cognitions and actions, thus enhancing creativity.

The aforesaid may be aligned to the evolutionary theory which emphasizes that development of solutions to problems is fundamental for survival in any ecosystem (socioeconomic environment). The perspective would explain stimulating environment in terms of the presence of challenges and obstacles to actualizing one's social, economic, political or career potentials, the need to improve on one's circumstances, or reduce physical or psychological discomfort. The argument here is that divergent thinking is a product of one or more of these necessities (stimuli), which, when they become strong, motivate the individual to look beyond immediate options, to seek alternatives, to decode complex relationships among variables and stimuli, and to go for something that is not in apparent existence. Problem solving in this sense, means adaptation to rapidly changing environments. It is plausible that individuals among the species who are specially endowed may first develop the desired survival characteristics (creativity), then others would learn, and subsequent performances coupled with further needs would culminate in improvement and perfection of the initial product by other (creative) people.

The explanation above seems to support a synergy production, in which elements in the environment and neurobiological factors combine to give rise to divergent thinking. The neurobiological perspective derives from the work of Heilman, Nadeau and Beversdorf (2003) which suggests that such abilities might require a co-activation and communication between regions of the brain that are ordinarily not strongly connected. Their view was strengthened by the findings that highly creative people who excel in creative innovation tend to differ from others in three ways by: having a high level of specialized knowledge, having capability for divergent thinking mediated by the frontal lobe, and having the ability to modulate neurotransmitters such as norepinephrine in their frontal lobes. Again, Alice Flaherty in 2005 presented a three-factor model of the creative drive. Drawing from evidence in brain imaging, drug studies and lesion analysis, she described the creative drive as resulting from an interaction of the frontal lobes, the temporal lobes, and dopamine from the limbic system. It is posited that the frontal lobes are responsible for idea generation, while the temporal lobes are responsible for idea editing and evaluation. Abnormalities in the frontal lobe (for example, anxiety or depression) generally decrease creativity, while abnormalities in the temporal lobe often increase creativity. High activity in the temporal lobe typically

inhibits activity in the frontal lobe, and vice-versa. High dopamine levels increase general arousal and goal directed behaviors and reduce latent inhibition, and all three effects increase the drive to generate ideas (Flaherty, 2005).

That divergent thinking is an immensely desirable covert behavior since it is a prelude to creativity is a truism. This has stimulated interest among scholars of different disciplines, such that a lot of work has been done on different aspects of divergent thinking and creativity, especially in terms of what the basic constituents are, and scientific methods of assessment. However, the problem of what methods to use in inculcating divergent thinking into people that lack it still exists. This is irrespective of such ground breaking deductions that link creativity to expertise and functional education as put forth by Redelinhys (2010). This study is therefore intended to stimulate interest in the direction of 'training people' to possess divergent thinking and creative ability.

Vulnerable children in this environment, lack adequate provisions to tax or challenge their creative abilities, yet they seem to be the ones who really need to be creative so as to be able to change their situations of deprivation and neglect, and grow up to become important and productive members of the society. Since it is practically impossible to move all such children to stimulating environments, it makes sense trying to inculcate in them such behaviors and abilities that would enable them, conquer obstacles to the full realization of their potentials, and prime ability in this respect in divergent thinking. This study therefore is to investigate whether by providing vicarious stimulation through video films; these children's divergent thinking abilities would be significantly enhanced. Consequently, the following hypotheses were tested.

- **Hypothesis I**
Washing video of creative activities and explaining same will significantly improve scores on divergent thinking tasks among vulnerable children.
- **Hypothesis II**
Washing only video of creative activities alone (without explanation) will significantly improve scores on divergent thinking tasks among vulnerable children.
- **Hypothesis III**
Those trained through video alone will perform significantly better than those trained through video and explanation.
- **Hypothesis IV**
Males will perform significantly better than females post treatment (after training)

2. Method

2.1. Participants

A total of fifty-eight (58) participants, comprising of 32 females and 26 males, aged between 12 and 17 years old, (mean age of 15 and SD of 2.2), took part in the study. All were enrolled from two local government areas. 19 were in primary five, while 39 were in primary six. All were orphans.

2.2. Instruments

The main instrument was Video CD which had two sections: first was clips of crafts and skilled persons who use a cane-stick to make several useful household items-furniture for living rooms, bedrooms and kitchen, and those who use beads to make many valuable items, the second was edited film, made by capturing features where people in traps and extremely difficult situations escaped captivity or disaster by devising escape methods. Both films lasted one hour. These instruments were designed, to stimulate divergent thinking in the participants. Adjunct instruments were matchboxes, broom sticks, cardboard papers, and bottles of liquid paper gum.

2.3. Procedure

The study was a follow up to Anambra State Government's psychosocial training project for orphans and vulnerable children. The participants were among the children who had been identified by the Ministry of women affairs in rural local government areas. All the orphans who participated in the project were requested to join in this study, but many could not, because of difficulties with caretakers and other excuses.

The pretest consisted of using all or those items they found useful - match sticks, broom sticks, cardboard sheets and gum to make representations of as many objects as possible either singly or in combination. Participants were scored based on the number of items they could try to make up in one hour, not whether or not their work was beautiful or full. One hour was granted, because most children at this developmental stage and level of education lose concentration on serious cognitive tasks after one hour. However, participants who finished before the time were allowed.

After the pretest, they were separated into two groups of 29 participants each (16 females and 13 males), through a simple randomization process of balloting. Group one received the video film and as the film was shown, the need for divergent thinking was discussed in the vernacular while group two received only the video film. This was done every other day, for five occasions. The next day after the fifth occasion, the participants were presented with all the items they had during the pretest and asked to carry out the same task. Their scores were then analyzed to test the hypotheses.

3. Results

- T-TEST for Hypothesis I

	Mean	N	Std. Deviation	Std. Error Mean
Pair I Post-test with Explanation	5.3103	29	1.22776	.22799
Pre-test with Explanation	4.1379	29	1.12517	.20894

Table 1: Paired, Sample Statistics

	N	Correlation	Sig.
Pair I Post-test with Explanation and Pre-test with Explanation	29	.769	.000

Table 2: Paired, Sample Correlation

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidences Interval of the Difference				
				Lower	Upper			
Pair I Post-test video with Explanation and Pre-test With Explanation	1.17241	.80485	.14946	.86627	1.47956	7.844	28	.000

Table 3: Paired Sample Test

The table above indicates that at $P < .05$, video with explanation significantly improved divergent thinking tasks.

- T-TEST for Hypothesis II

	Mean	N	Std. Deviation	Std. Error Mean
Pair I Post-test Video alone	5.1379	29	1.05979	
Pre-test Video alone	4.1379	29	1.12517	

Table 4: Paired Sample Statistics

	N	Correlation	Sig.
Pair I Post-test Video alone & Pre-test Video alone	29	.762	.000

Table 5: Paired, Sample Correlation

	Paired Differences					t	df	Sig. (2-tailed)
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair I Post-test Video alone Pre-test Video alone	1.00000	.75593	.14037	.71246	1.28754	7.124	28	.000

Table 6: Paired Sample Test

The table above indicates that at $P < .05$, Video alone significantly improved scores on divergent thinking tasks.

- T-TEST for Hypothesis III

	N	Mean	Std. Deviation	Std. Error Mean
Video alone	29	1.0000	.75593	.14037
Video and Explanation	29	1.1724	.80485	.14946

Table 7: Group Statistics

	Levene's Test for Equity of Variances		t-test for Equality of Means				
	f	sig	t	df	Sig (2-tailed)	Mean Difference	Std Error Difference
Video Equal Variances	.468	.497	-.841	56	.404	-.17241	.20504
Assumed Equal Variances not assumed			-.841	55.781	.404	-.17241	.205054

Table 8: Independent Samples Test

	t-test for Equality of Means	
	95% Confidence Interval of the Difference	
	Lower	Upper
Video Equal Variances	-.58316	.23833
Assumed Equal Variances not Assumed	-.58320	.23837

Table 9: Independent Samples Test

The tables above indicate no statistically significant difference between scores due to video alone and video with explanation at $P < .05$.

- T-TEST for Hypothesis IV

	N	Mean	Std. Deviation	Std. Error Mean
Post-test Males	26	5.5000	.90554	.17759
Females	32	5.000	1.27000	.22451

Table 10: Group Statistics

	Levene's Test for Equity of Variances		t-test for Equality of Means				
	f	sig	T	df	Sig (2 tailed)	Mean Difference	Std. Error Difference
Post-test Male Equal Variances Assumed	1.851	.179	1.688	56	.097	.50000	.29625
Equal Variances not Assumed			1.747	55.155	.086	.50000	.28625

Table 11: Independent Samples Test

	t-test for Equality of Means	
	95% Confidence Interval of the Difference	
	Lower	Upper
Post-test Male Equal Variances Assumed	-.09345	1.09345
Equal Variances not Assumed	-.07363	1.07363

Table 12: Independent Samples Test

The table above indicates no statistically significant difference between scores by males and females at $P < .05$.

4. Summary of findings

Hypothesis I and Hypothesis II were upheld. This implies that divergent thinking skills were significantly improved by both watching video films of people who exhibit divergent (creative) tasks, and watching video with an explanation of the salient points in the film. This strongly suggests that training can significantly improve divergent thinking among children.

On the other hand, hypotheses III and IV were rejected, indicating that none of the training methods had an obvious advantage over the other. Both methods of training equally inculcated divergent thinking skills among the children (their level of efficacy was same). Furthermore, there was no statistically significant difference between the performance of males and females after training, implying that both genders benefitted equally from training.

5. Discussion and Conclusion

Ai (1999), observed that creativity is influenced by environmental and personal factors. Personal characteristics include age, gender, intelligence, and personality. While the availability of facilities, opportunity for exploration and learning constitute determining environmental factors. Although there was no control group in this study, the results strongly suggest that learning is a very strong facilitator of divergent thinking- creativity. This is supported by Marashi & Dadari (2012), who investigated the impact of task-based writing about EFL learners' writing performance and creativity, and demonstrated that learners benefitted significantly from task-based writing in terms of both their writing and creativity. Additionally, Ainsworth-Land & Jarman (1992), posited that learning 'without a fixed model/skill' provides enabling environment for divergent thinking creativity. Indeed, divergent thinking- creativity could be a personality attributes, especially for adults, then, like other personality attributes, learning must be a prime formative component.

As for the no significant gender differences obtained in the study, researchers have reported varying results. According to Baer and Kaufman (2008), empirical evidence does not reveal simple conclusions regarding gender differences in scores on creative tasks. The authors state that some studies report that girls and women score higher than boys and men, and there are others that report the opposite. The former (studies in which girls and women score higher) are more numerous, it would therefore be hard to make a case for male advantage. In another study, Roue (2011), used both qualitative and quantitative analyses, found no gender differences in divergent thinking measures much like the present study. However, in their study of gender, gender roles and creativity, Stoltzfus, Ma, Nibbelink, Vredenburg, and Thrum (2011), found significant differences favoring males in some aspects of creativity task performance (picture construction and nonverbal creativity) while no significant differences were recorded on other aspects (flexibility and fluency scores) on the two verbal creativity tasks.

Although divergent thinking does not equate creativity, it seems plausible that a good analysis of creative processes ineluctably entangles divergent thinking, hence divergent thinking correlates positively with creativity, and both are mediated by the frontal and temporal lobes of the brain, and dopamine from the limbic system. The findings of this study: that vulnerable children's performance on divergent thinking tasks was significantly improved through exposure to video recordings, as well as video and auditory cues suggest very strongly that creativity could be inculcated into young person's through calculated guidance. Indeed, properly designed school curriculum holds the ace to unleashing latent creative potentials of individuals, especially vulnerable children.

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