

# Relationship between Creativity and Intelligence among Individuals with Intellectual Disability

## Abstract

**Background:** Creativity is the means to create new ideas and product with existing but unrelated materials or situation. Creativity is the combination of thinking and producing. Creativity will bloom where intelligence is there as it is ever expanding and not bound by rules. **Objective:** To find out the relationship between creativity and intelligence among individuals with intellectual disability. **Sample:** Individuals with intellectual disability (N=50) IQ ranging from 50-69 with age group 10-20 years studying at GRIID, Chandigarh, India were selected as sample. A sampling frame was prepared and 50 subjects were selected randomly from the sampling frame. **Design:** Descriptive correlation research method was used. Tool: A New Test of Creativity (NTC) developed by Pal (1991) published by National Psychological Corporation-Agra, India was used to assess creativity of individual with intellectual disability. **Results:** The results of the study reveal significant correlation between intelligence and creativity ( $r=0.252$ ,  $p<0.05$ ) among individuals with intellectual disability. However, IQ was not correlated with fluency ( $r=0.189$ ,  $p>0.05$ , NS), and originality ( $r=0.075$ ,  $p>0.05$ , NS) domain of creativity except flexibility ( $r=0.282$ ,  $p<0.05$ ). No significant difference in IQ ( $t=1.210$ ,  $p>0.05$ , NS) and creativity ( $t=0.620$ ,  $p>0.05$ , NS) among individuals with intellectual disability with respect to gender. Also, no significant difference in IQ ( $F=0.551$ ,  $p>0.05$ , NS) and creativity ( $F=0.952$ ,  $p>0.05$ , NS) among individuals with intellectual disability with respect to age except for originality ( $F=2.883$ ,  $p<0.05$ ) one of the domains of creativity. **Conclusion:** The result indicated that there is significant correlation between creativity and intelligence among individuals with Intellectual disability. However, no significance difference was found in creativity and intelligence among individuals with Intellectual disability with regard to gender and age. It has been also found that as age increases the level of creativity also increases.

**Keywords:** Creativity, Intelligence, Intellectual disability

## Introduction

Creativity is the way to produce new ideas and product with existing but unrelated materials or situation. Creativity is the combination of thinking and producing. People link their thoughts to make connection and to unhidden pattern in apparently unrelated situation

to generate the solution (Valqui, 2010; Nakano & Wechsler, 2018). Creativity is the ability of producing the imagination and new idea into reality. Creativity is process of bringing out the original solutions. Creativity gives insight to unstructured though and imagination to form a structure pattern into existence. Every new step which

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is taken to innovate new ideas or things, we need to live into ocean of knowledge. Real life theories and practical shares a huge percentage of this ocean (Okpara, 2007). One who understands the problem and rear will power to confront and find solution for that is ready to swim and drive into it. Critical thinking and ability to use available resources in an efficient manner are the basic requirements for a person to find a creative solution for a specific problem (Papathanasiou et al., 2014).

Intelligence can be explained by various factors. It is concerned as the capacity of understanding this logically, having the capability of thinking creatively at critical scenarios, self-awareness etc. Humans works on areas which is related to brain. Birth till death every single second of life complies and constitutes the development of brain which is termed as intelligence (Kotchoubey, 2018; Glattfelder, 2019). It can be measured and enhanced through various modes. Intelligence includes many factors such as emotional stability, reasoning ability, social adaptability etc (Bohr & Memarzadeh, 2020). Intelligence is such an important aspect that people are trying to induce intelligence into machines as well that is artificial intelligence. This is the intelligence which separate human from animals and machines (Lake et al., 2017).

## Need And Significance

Intelligence demonstrates capability to recollect concepts and replicate their results on similar problems, whereas creativity not only interpret creativity, except for enhance it (Jauk et al., 2013). Creative projects can largely improve the social functioning and enhance performance in academic and private fields. In fact, person with intellectual disabilities who continually work with creative projects can do away with stereotypes and perform better within the community and therefore the workplace (Benedek et al., 2014). Once the creative students and their potential fields will located by parents, teachers, psychologists and everyone those

that have concerned for the scholar and therefore the nation need to consider ways and means to encourage and foster their creative potentials (Saskia & Thomas, 2017; Ritter & Mostert, 2017). Therefore, it's necessary that the aims of the education, curriculum, and methods of teaching, promotions and rewards should be reframed consistent with the requirements of the youngsters. because the needs of creative and non- creative students are quite different, the tutorial policy should be reframed with the supply of special classes and special schools, diversified curriculum and individualized instructions. this study goes explore the relation between creativity and intelligence among individuals with intellectual disability.

## Objectives

- To find out the relationship between creativity and intelligence among individuals with intellectual disability.
- To find out the difference in creativity and intelligence among individuals with intellectual disability with regard to gender and age.

## Method

### Sample:

Individuals with intellectual disability (N=50) IQ ranging from 50-69 with age group 10-20 years studying at Government Rehabilitation Institute for Intellectual Disabilities (GRIID), Chandigarh, India were selected as sample. A sampling frame was prepared and 50 subjects were selected randomly from the sampling frame based on the following criteria: willingness to participate, having age 10 to 20 years and assessment of IQ should not be older than two years. Following were the exclusion criteria: subject having age below 10 and above 20, other disability likes autism, sensory disabilities, specific learning disability and subject having IQ less than 50 or greater than 70.

## Design:

Descriptive correlation research design was used.

## Tools:

The investigator of the present study reviewed a number of tools on creativity but could not find even a single tool for individuals with intellectual disabilities to assess creativity. The reviewed tools include:

- Passi Test of Creativity available in both language (H/E) and developed by Passi (1997) published by National Psychological Corporation (NPC), Agra, India. The primary 3 tests are verbal and last 3 are non-verbal in nature It measures three components of creativity fluency flexibility and originality it's standardized on 600 students of both gender of urban and rural background of 9th to 11th standard.
- Verbal Test of Scientific Creativity (VTSC-SS) Hindi/English developed by Sharma and Shukla (1986) published by NPC, Agra, India. Test consists of twelve items which are classified into four sub-tests namely: I consequences new relationship thinks why Scoring is given on each item for fluency flexibility and originality Norms are available for 7th and 8th class boys and girls Language.
- Language Creativity Test (LCT-MK) developed by Malhotra and Kumari (1990) published by NPC, Agra, India. Test includes 27 items in 5 areas. This test had been standardized on 600 male and feminine from School and College for 8th to Graduate Student.
- Verbal Test of Creative Thinking (VTCT-M) (H/E) developed by Mehdi (1977). published by NPC, Agra. This test consists 10 items. It provides three factor scores I fluency, II flexibility, and III originality for class 7th and 8th).
- Non-verbal Test of Creative Thinking

(NVTCT-M) Hindi/English developed by Mehdi (1973) published by National Psychological Corporation, Agra. This test consists 26 items. It provides two factor scores I elaboration, and II originality for class 7th and 8th).

- A New Test of Creativity (NTC) developed by Pal (1991) published by NPC, Agra, India. It consists of 39 items. Measures Fluency, Flexibility and Originality) (For any age group, available in Hindi/English).

After reviewing all the tools, a focus group discussion with experts was organized to discuss the possibilities of reviewing and selecting an appropriate tool for the present study. The investigators were suggested by the experts for piloting of the following tools on individuals with intellectual disability:

- Passi Test of Creativity (Passi, 1997)
- A New Test of Creativity (Pal, 1991)
- Verbal Test of Creative Thinking (Mehdi, 1977)
- Non-verbal Test of Creative Thinking (Mehdi, 1973)

The above four tools were piloted on 10 individuals with intellectual disability age ranging 10-20 years having an IQ between 50-69. It was decided to select the tool which has less difficulty in understanding and administering. The hierarchy was made and each difficulty level was noted. Based on the result of the pilot study it was decided to use A New Test of Creativity (NTC) developed by Pal (1991). This tool was found to be less difficult when it is compared with the other tools which were part of pilot study. This test is design to assess the creativity of any age and gender. The test consists of 39 items. The test has three domains namely: Fluency (18) Flexibility (16), and Originality (5). Test-retest and split-half methods have been used for reliability of the test. The scores of test-retests for fluency, flexibility, originality and total creativity were .361, .879, .792 and .939 respectively.

## Procedure:

After the clearance from research and ethics committee of the institute, investigator took permission from the authorities of GRIID and selected subjects on the basis of inclusion and exclusion criteria. Researchers made the subjects understand, that the information and conclusion drawn from this study shall remain confidential. The

Intelligence Quotient (IQ) scores of the participant was obtained from the clinic in-charge. Selected subjects were asked to complete the test on creativity in stipulated time period and answer the question honestly. However, need based prompts were provided to the participants by the investigator in the easiest language possible.

## Results

**Table-1**  
**Correlation between intelligence and creativity among IID**

		<b>IQ</b>	<b>Fluency</b>	<b>Flexibility</b>	<b>Originality</b>	<b>Total</b>
<b>IQ</b>	Pearson Correlation coefficient	1	.189	.282*	.075	.252*
	N	60.0	60.0	60.0	60.0	60.0
<b>Fluency</b>	Pearson Correlation coefficient	.189,NS	1	.482**	.411**	.918**
	N	60.0	60.0	60.0	60.0	60.0
<b>Flexibility</b>	Pearson Correlation coefficient	.282*	.482**	1	.055	.727**
	N	60	60	60	60	60
<b>Originality</b>	Pearson Correlation coefficient	.075,NS	.411**	.055	1	.529**
	N	60.0	60.0	60.0	60.0	60.0
<b>Total</b>	Pearson Correlation coefficient	.252*	.918**	.727**	.529**	1
	N	60	60	60	60	60
*Correlation is significant at the 0.05 level **Correlation is significant at the 0.01 level						

Table 1 shows the Pearson correlation shows significant correlation between intelligence and creativity ( $r = .252$ ,  $p < .05$ ) among individuals with intellectual disability. However, IQ was not correlated with fluency ( $r = .189$ ,  $p > .05$ , NS), and originality ( $r = .075$ ,  $p > .05$ , NS) domain of creativity except flexibility ( $r = .282$ ,  $p < .05$ ).

**Table-2****Means on IQ and creativity among IID respect to gender**

Components	Gender	N	Mean	S D	t-value
<b>IQ</b>	Male	17	61.11	5.02	1.210, NS
	Female	43	59.27	5.40	
<b>Fluency</b>	Male	17	8.23	5.11	.426, NS
	Female	43	7.67	4.37	
<b>Flexibility</b>	Male	17	10.00	2.52	1.123, NS
	Female	43	9.00	3.30	
<b>Originality</b>	Male	17	2.11	1.79	.423, NS
	Female	43	2.34	1.95	
<b>Total</b>	Male	17	20.35	7.54	.620, NS
	Female	43	19.02	7.47	

The above table (2) shows no significant difference on IQ ( $t=1.210$ ,  $p>.05$ , NS) and creativity ( $t=.620$ ,  $p>.05$ , NS) among individuals with intellectual disability with respect to gender. Also, no significant difference was found in any of the domains of creativity with respect to gender.

**Table: 3****Mean and SD on IQ and creativity among IID respect to age**

Components	Age	N	Mean	SD	F-value
<b>IQ</b>	10-15	5	58.60	6.34	.551, NS
	16-20	39	59.48	5.27	
	21-25	16	60.93	5.29	
<b>Fluency</b>	10-15	5	5.00	2.23	1.181, NS
	16-20	39	7.89	4.94	
	21-25	16	8.56	3.91	
<b>Flexibility</b>	10-15	5	9.80	2.28	.151, NS
	16-20	39	9.12	3.35	
	21-25	16	9.50	2.85	
<b>Originality</b>	10-15	5	0.40	0.54	2.883*
	16-20	39	2.48	1.94	
	21-25	16	2.37	1.78	
<b>Creativity (Total)</b>	10-15	5	15.20	4.02	.952, NS
	16-20	39	19.51	8.19	
	21-25	16	20.43	6.06	

Table 3 shows no significant difference in IQ ( $F=.551$ ,  $p>.05$ , NS) and creativity ( $F=.952$ ,  $p>.05$ , NS) among individuals with intellectual disability with respect to age except for originality ( $F= 2.883$ ,  $p<.05$ ) one of the domains of creativity. The result reveals that the age group 16-20 years has been found more creative in terms of originality.



## Discussion

The results of the study reveal significant correlation between intelligence and creativity ( $r = .252$ ,  $p < .05$ ) among individuals with intellectual disability. There is significant relationship between creativity and intelligence and there are few studies which support the findings of the present research. The findings of a study conducted by Jauk et al. (2013) suggest that intelligence significantly predicted creative potential in a lower IQ range but not in the upper IQ range. Correlation between intelligence and creative potential appears to be moderated by the level of intelligence. Jung (2014) argues that intelligence can be viewed as the problem-solving capacity of everyday life, while creativity can translate the subject's skills to solve less common problems. Other perspectives argue that creativity and intelligence are both cognitive functions. A similar finding was reported by Karwowski et al. (2016), which concludes that intelligence is necessary but not sufficient for creative cognition. Another study conducted by Verma and Maniktala (2017) on 30 girls and 30 boys, aged 12-18 revealed that intelligence and creativity were positively correlated and also found the significant differences existed between boys and girls on creativity when their intelligence levels are the same. Benedek et al. (2017) found direct support for the executive involvement in creative thought and shed further light on the functional relationship between intelligence and creativity. Another recent study conducted by Vestena et al. (2020) demonstrated the close relationship between intelligence and creativity. Corazza & Lubart (2020) suggest that the intelligence and creativity constructs can be mapped onto the four quadrants and found to overlap more or less, depending on the context characteristics. However, findings of the study conducted by Weiss et al. (2020) suggest no evidence for the threshold hypothesis of creativity across different analytical procedures in their studies. Another study reports a consistent pattern that supports the necessary-but-not-sufficient relationship between intelligence and creativity (Karwowski et al., 2016).

## Limitations

Every research conducted realizes certain limitations at the end. In social sciences research, it is not easy to control everything. Although the present study has new findings that can be taken into account, it ends up with certain limitations. There has been limited literature on intelligence and creativity among persons with intellectual disability. Thus, the findings of the present study have not been discussed in the light of relevant literature. To the best of researchers' knowledge, there is no tool available to assess the creativity of persons with intellectual disability. The piloting and selection of tools were not statistically determined, which can be viewed as one of the major limitations.

## Conclusion

The findings of the present study indicated significant correlation between creativity and intelligence among individuals with intellectual disability. However, no significant difference was found in creativity and intelligence among individuals with Intellectual disability with regard to gender and age. The present study's findings have some distinct implications concerning the education, training, and rehabilitation of children with intellectual disabilities. The policymakers must pay attention to creativity while developing the curriculum for children with intellectual disabilities.

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