

# Periodic Research

## Study of Adolescent Creativity in Relation to Intrinsic Motivation

### Abstract

The study intends to investigate the role of intrinsic motivation in the development of creativity in adolescents. In order to assess the level of creativity in adolescents Test of Creative Thinking (Baquer Mehdi 1974) was used and Intrinsic Motivation Inventory (Ryan, Koestner & Deci, 1991) was used to assess the level of intrinsic motivation in adolescents. Data analysis was done by using Correlation analysis and Step-wise Multiple Regression analysis techniques.

Correlation results reveal that each domain of intrinsic motivation and creativity are significantly correlated with each other. More specifically, interest, perceived competence, importance, perceived choice, value and relatedness domain of intrinsic motivation is positively correlated with fluency, flexibility, originality and elaboration whereas pressure domain of intrinsic motivation is negatively correlated with each domain of creativity.

Stepwise Multiple Regression Analysis (SMRA) evinced that age was found strongest predictor of fluency, flexibility originality and elaboration. Afterwards, Fluency was positively predicted by perceived competence and interest, Flexibility was positively predicted by interest and perceived competence whereas negatively predicted by relatedness, Originality was positively predicted by perceived competence and interest and lastly Elaboration was found positively predicted by perceived choice whereas negatively predicted by gender, pressure and importance. Results are discussed.

**Keywords:** Adolescents, Creativity, Fluency, Flexibility, Originality, Elaboration and Intrinsic Motivation

### Introduction

Creativity is an important human characteristic or, perhaps, even something more: "a mode or essence of being that represents pure human potential" (Lemons, 2010). To study and further this human characteristic or mode of essence, it is crucial to discuss what creativity is and how it can be measured or captured. A close perusal of research on creative potential reveals that the dynamics of creativity is wider than its concept. In fact, Creative potential is that characteristic of human behavior which seems most mysterious, and yet most critical in human advancement. It is the capacity to solve the problems in new way and to produce things that are novel, appropriate and socially valuable, is the ability that has fascinated people for centuries. Most of creativity researches concern about the nature of creative thinking, the distinctive characteristics of the creative person, the development of creativity across the individual's life span, and the social environments most strongly associated with creative activities (Simonton, 2000).

The term 'creativity' was systematically applied by Guilford in 1950. Afterwards, creativity became in the prime focus of psychological researches. The first systematic study on creativity represented by divergent thinking is accredited to Guilford (1950) in his model of the structure of the intellect (SOI), as opposed to other cognitive processes, such as convergent thinking, cognition, memory, and evaluation. Later, creativity researchers questioned the idea that creative ability can be understood as a synonym of divergent thinking alone, since it involves deductive and inductive thinking, as well as the use of problem solving strategies to generate novel insights and solutions. Although there is considerable evidence that creative ability predicts creative achievement, there is a consensus that personality traits, such as openness to experience, as well as cognitive characteristics, are predictors of creative engagement and creative production later in life. Child (1973) observed that 'there is no clear, unambiguous and widely accepted definition of



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creativity'. Whether creativity is to be defined and studied in term of "process' or 'product', constitutes a major issue in much research. This issue has been dealt by Gallagher (1963), Golann(1964), Jackson and Messick(1965), Stein (1962) and Taylor (1964).Therefore, most theories regarding giftedness or human talent embrace creativity as a core component.

Intrinsic and extrinsic motivations are often implicitly viewed as opposite extremes of a single dimension. Thus, one could not enjoy a task for its own sake and be motivated by reward at the same time. Deci and Ryan's (1985) cognitive evaluation theory supposes that motivation is innately promoted by perceptions of self-determination and competence. Conversely, external constraints on behavior, including reward, innately reduce intrinsic motivation by lessening the perception of personal freedom. According to cognitive evaluation theory (Deci & Ryan, 1985), individuals view the offer of reward for an enjoyable task as an attempt to control their behavior. This aversive reduction in perceived autonomy reduces intrinsic task interest (see also Amabile, 1982).

Moreover, relevant literature pertaining to creativity clearly evinced that creativity is a developmental phenomenon which occurs throughout the life span (early childhood to ageing). Most of the studies related to creativity, focused on the development of creativity in childhood and adulthood. However, a most sparking and productive age i.e. adolescence is almost ignored by researchers. Arasteh (1968) and Torrance (1964) raised this issue that creativity is a developmental phenomenon in which growth occurs throughout the life but why very little emphasis has been given to the most fertile age group of adolescence. Why adolescence age group didn't attract the concern of researchers? This period is very crucial in the life span development of human being which represents a transition from childhood to adulthood. During adolescence, there are a number of forces that work against each other. There are conditions that push young people forward and others that hold them back, especially in the early adolescence. Neo- adolescents have desire to assert their individuality and also a great need to conform. They want to be considered like adults and yet also to be protected. They rebel; aggressive impulses and fears and guilt regarding them. There is something radical about being an adolescent, yet something conservative. The impulse to grow is strong. The impetus to venture into new and untried is powerful too. But while adolescents anticipate the new, they are also bound by the past. Hence, Eisenberg (1965) expressed that adolescence as a distinct developmental stage, is critical in terms of its impact on a changing society as well as the effect it has on the development of individual. Therefore, this age group is very peculiar which have many pros and cons in the life circumstances. Adolescence period covers 11 to 21 years; classified into three stages i.e.; neo- adolescence (11- 14 years), middle-adolescence (15- 18 years) and late- adolescence

(19- 21 years). So, it is our zeal to comprehend the issues of creativity in terms of adolescents. Although development follows predictable pattern, however a little variation in the level of development is found between males and females. This variation is clearly observed in physical growth at the stage of early adolescence (Hurlock, 1973). Both of them are lived in same society but their behavioral practices are different. They learn different moral and social entities. Therefore, a question is raised about their intellectual and cognitive development. Because the previous researches who deal with gender issue showed an unequivocal facts about the development of creativity. Based on number of investigations carried out the past two decades it is opined that there is direct link between intrinsic motivation and creativity but this relation is positive or negative, incremental or decremented is yet questionable. And the role of intrinsic motivation in the development of creativity is less investigated issues in Indian Culture. Therefore, in the present study intrinsic motivation is taken as an independent variable to know the role of intrinsic motivation in the development of creativity.

### Objective of the Study

Against this backdrop, the present study was planned to find out the relationship between various dimensions of intrinsic motivation and creativity and the predicting roles of various dimensions of intrinsic motivation and creativity.

### Hypothesis

On the basis of above objectives, following hypotheses were formulated for investigations-

1. A direct link between various domains of intrinsic motivation and creativity would be found.
2. Domains of Intrinsic Motivation, age and gender would be found predictors of creative potentials.

### Method

#### Design

Present study is correlational in nature. Therefore, to assess the relationship between intrinsic motivation and creativity, Pearson correlation analysis has been done. Moreover, to determine the role of intrinsic motivation in creativity, step wise multiple regression analysis (SMRA) has also been done.

#### Participants

A total of 120 adolescents (60 boys and 60 girls), age ranged 11 to 21 years (Mean age 16.33 yrs.), were randomly selected from the different educational and social strata of Gorakhpur city. Stratified random sampling technique was used for the sample selection. Further, on the basis of median score obtained on intrinsic motivation inventory (Median = 108) participants were divided into high and low intrinsically motivated groups.

#### Measures

##### The Test of Creative Thinking

This test was developed by Baqer Mehdi (1974) and has includes four major categories of activities. *First type* of activities is known as "**Consequences Test**" in which three questions are asked. The response on the particular question is subjective in nature and on the subject choice to give more and more responses on the particular questions.

Every question takes 5 min. and in total 15 min. is assigned to complete the first activity. *Second activity* is related to “**Unusual Uses Test**”. In this activity three different object names are mentioned and the major task in this activity is to propagate some different and new uses of the genuine objects like stone, wood, sick etc. Similarly, for this activity 15 min. are assigned to complete the task. *Third activity* includes “**New Relationship Test**” in which two different pairs of objects are given and the main motive of this activity is to evoke a new and original relation between these two general kinds of objects like, man and animal, ladder and tree etc. Similarly, a total of 15 min. are given for this activity. The *fourth activity* is called “**Product Improvement Test**”. One toy like ‘horse’ is given and the major concern is to improve the quality and beauty of the product within 6 min. of times. The verbal test of creative thinking is scored in terms of fluency, flexibility and originality and elaboration.

### Intrinsic Motivation Inventory (IMI)

This inventory was developed by Ryan, Koestner & Deci (1991) and has 43 items related to interest/ Enjoyment (7 items), Perceived Competence (6 items), Effort/ Importance (5 items), Pressure/ Tension (3 items), Perceived choice (7 items), Value/ Usefulness (7 items) and relatedness (8 items). The IMI has 5 point scale ranging from ‘very true’ to ‘not at all true’ (1 to 5). The interest/ enjoyment subscale is considered the self-report measure of intrinsic motivation. Perceived choice and competence are theorized to be positive predictors of both self-report

**Table 1:- Correlation between various domains of Intrinsic Motivation and Creativity**

	Fluency	Flexibility	Originality	Elaboration
Interest	.457**	.481**	.455**	.405**
Perceived Competence	.432**	.435**	.432**	.454**
Importance	.427**	.452**	.399**	.430**
Pressure	-.204*	-.200*	-.157	-.265**
Perceived Choice	.473**	.484**	.469**	.495**
Value	.464**	.497**	.478**	.447**
Relatedness	.393**	.397**	.411**	.418**

\*\*p< 0.01

\*p<0.05

### Fluency

Correlation results (table 1) revealed that interest ( $r = 0.457$ ,  $p < 0.01$ ), perceived competence ( $r = 0.432$ ,  $p < 0.01$ ), importance ( $r = 0.427$ ,  $p < 0.01$ ), perceived choice ( $r = 0.473$ ,  $p < 0.01$ ), value ( $r = 0.464$ ,  $p < 0.01$ ) and relatedness ( $r = 0.393$ ,  $p < 0.01$ ) domains of intrinsic motivation were significantly and positively correlated with fluency whereas pressure ( $r = -0.204$ ,  $p < 0.05$ ) domain of intrinsic motivation was negatively correlated with fluency.

### Flexibility

Similarly, significant relationships were found between various domains of intrinsic motivation and flexibility (Table 1). Pressure domain ( $r = -0.200$ ,  $p < 0.05$ ) of intrinsic motivation was negatively correlated with flexibility whereas interest ( $r = 0.481$ ,  $p < 0.01$ ), perceived competence ( $r = 0.435$ ,  $p < 0.01$ ), importance ( $r = 0.452$ ,  $p < 0.01$ ), perceived choice ( $r = 0.484$ ,  $p < 0.01$ ), value ( $r = 0.497$ ,  $p < 0.01$ ) and relatedness ( $r = 0.397$ ,  $p < 0.01$ ) were positively correlated with flexibility.

### Originality

Table 1 shows that originality was also significantly and positively correlated with various dimensions of intrinsic motivation like interest ( $r = 0.455$ ,  $p < 0.01$ ), perceived competence ( $r = 0.432$ ,  $p < 0.01$ ), importance ( $r = 0.399$ ,  $p < 0.01$ ), perceived choice ( $r = 0.469$ ,  $p < 0.01$ ), value ( $r = 0.478$ ,  $p < 0.01$ ) and relatedness ( $r = 0.411$ ,  $p < 0.01$ ) were positively correlated with originality whereas pressure ( $r = -0.157$ ) domain was negatively correlated with originality.

### Elaboration

Similarly, results evinced that (table 1) elaboration was also found significantly correlated with each domains of intrinsic motivation and creativity. It is clear from the results that pressure ( $r = -0.301$ ,  $p < 0.01$ ) was negatively correlated with elaboration whereas positively correlated with interest ( $r = 0.413$ ,  $p < 0.01$ ), perceived competence ( $r = 0.423$ ,  $p < 0.01$ ), importance ( $r = 0.361$ ,  $p < 0.01$ ),

perceived choice ( $r = 0.476, p < 0.01$ ), value ( $r = 0.410, p < 0.01$ ) and relatedness ( $r = 0.407, p < 0.01$ ).

**Step-Wise Regression Analysis (SMRA)**

To examine the relative contributions of antecedent factors (Dimensions of intrinsic motivation) in criterion variables (Creativity) Step-wise Multiple Regression Analysis (SMRA) was computed. Results are displayed in tables. Findings of analysis are in order-

**Prediction of Fluency**

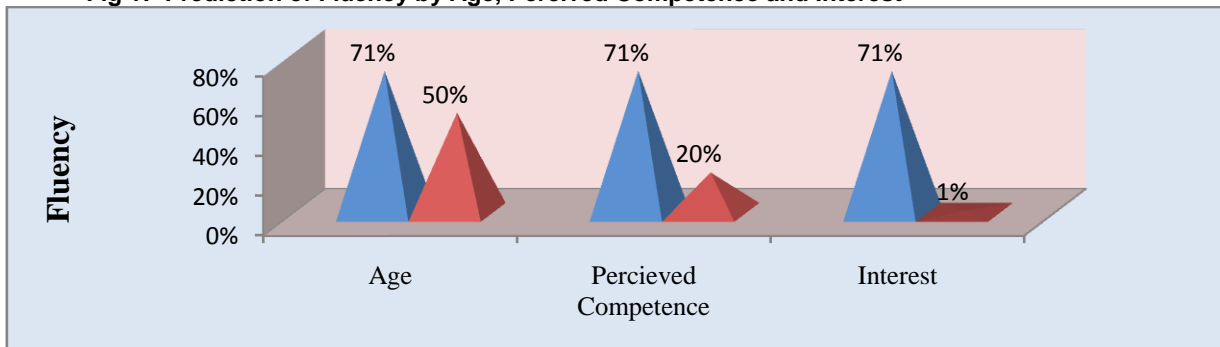
As regression results (table 2 & fig.1) indicated that fluency was positively explained by

three factors; Age was found strongest predictor of fluency, which contributed maximum positively ( $\beta=.710, R^2=.503$ ) followed by perceived competence ( $\beta=.442, R^2=.195$ ) and interest ( $\beta=.226, R^2=.015$ ). Though independently, Age explained 50% of variance, Perceived competence explained 19% of variance and interest explained only 1% of variance but the composite contribution of age, perceived competence and interest was found 71% variance in criterion variable.

**Table 2:- Stepwise Multiple Regression Analysis of Fluency on to the Intrinsic Motivation**

Predictor Variables	Criterion Variables (Fluency)					
	R	R <sup>2</sup>	R <sup>2</sup> change	β (Beta)	t	F
Age	.710	.503	.503	.710	10.939	119.662***
Perceived Competence	.836	.699	.195	.442	8.71	135.815***
Interest	.845	.714	.015	.226	2.43	96.308***

**Fig 1:- Prediction of Fluency by Age, Percieved Competence and Interest**



**Prediction of Flexibility**

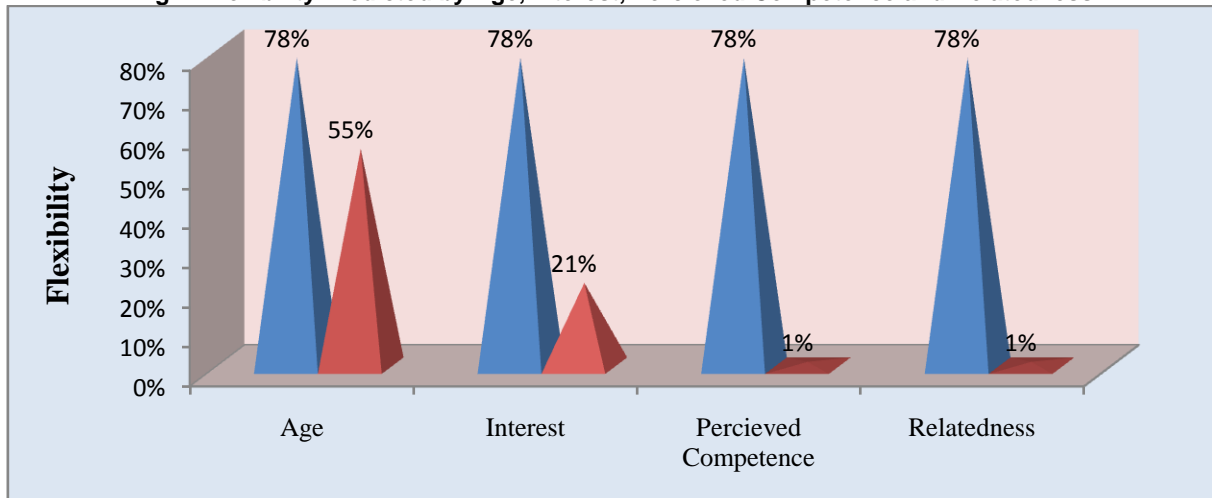
Results (table 3 & fig 2) reveal that flexibility was positively explained by three factors and negatively affected by one factor; Age was found strongest predictor of flexibility, which contributed maximum positively ( $\beta=.742, R^2=.551$ ) followed by interest ( $\beta=.462, R^2=.213$ ) and perceived competence ( $\beta=.195, R^2=.011$ ) and negatively predicted by

relatedness ( $\beta=-.240, R^2=.010$ ). Though independently, Age explained 55% of variance, interest explained 21% of variance, perceived competence explained 1% of variance and relatedness also explained only 1% of variance but the composite contribution of age, interest, perceived competence and relatedness was found 78% variance in the criterion variable

**Table 3:- Stepwise Multiple Regression Analysis of Flexibility on to the Intrinsic Motivation**

Predictor variables	Criterion Variables (Flexibility)					
	R	R <sup>2</sup>	R <sup>2</sup> change	β (Beta)	t	F
Age	.742	.551	.551	.742	12.027	144.637***
Interest	.874	.764	.213	.462	10.273	189.145***
Perceived Competence	.880	.775	.011	.195	2.363	132.89***
Relatedness	.886	.784	.010	-.240	-2.295	104.657***

**Fig2:- Flexibility Predicted by Age, Interest, Percieved Competence and Relatedness**



**Prediction of Originality**

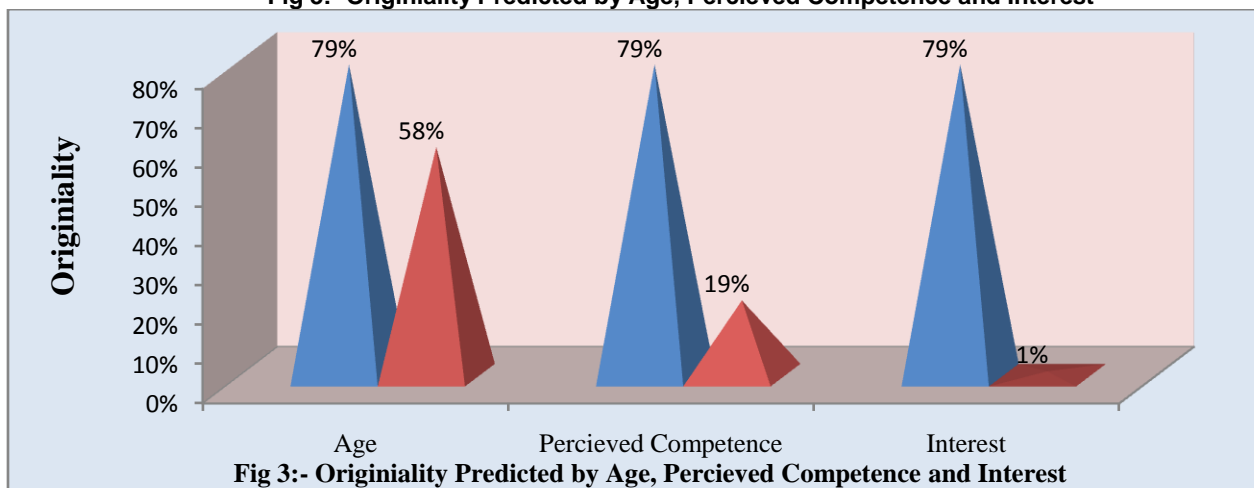
Results (table 4 & fig 3) indicate that originality was positively explained by three factors. Age was found strongest predictor of originality, which contributed maximum positively ( $\beta=.764$ ,  $R^2=.584$ ) followed by perceived competence ( $\beta=.444$ ,  $R^2=.197$ ) and interest ( $\beta=.209$ ,  $R^2=.013$ ). Though

independently, Age explained 58% of variance, perceived competence explained 19% of variance and interest explained only 1% of variance, but, the composite contribution of age, perceived competence and interest was found 79% variance in the criterion variable.

**Table 4:- Stepwise Multiple Regression Analysis of Originality on to the Intrinsic Motivation**

Predictor variables	Criterion Variables (Originality)					
	R	R <sup>2</sup>	R <sup>2</sup> change	$\beta$ (Beta)	t	F
Age	.764	.584	.584	.764	12.86	165.370***
Perceived Competence	.883	.780	.197	.444	10.23	207.807***
Interest	.890	.793	.013	.209	2.64	148.005***

**Fig 3:- Originality Predicted by Age, Percieved Competence and Interest**



**Fig 3:- Originality Predicted by Age, Percieved Competence and Interest**

**Prediction of Elaboration**

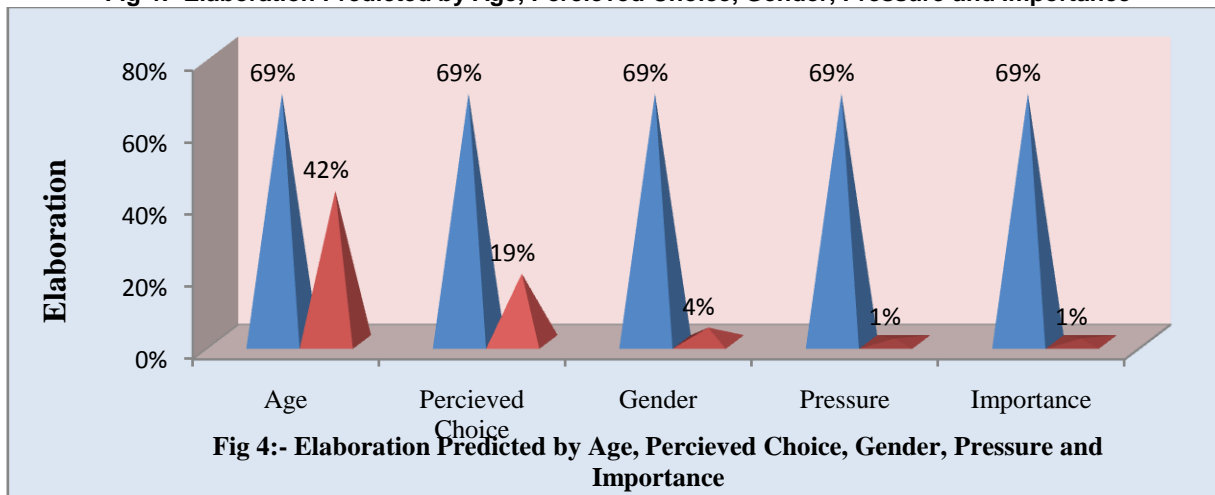
As regression results (table 5 & fig 4) indicate that elaboration was positively explained by two factors and negatively affected by three factors; Age was found strongest positive predictor of elaboration, which contributed maximum positively ( $\beta=.649$ ,  $R^2=.421$ ) followed by perceived choice ( $\beta=.446$ ,  $R^2=.199$ ) whereas negatively predicted by gender ( $\beta= -.212$ ,  $R^2=.045$ ) followed by pressure ( $\beta= -$

.155,  $R^2=.012$ ) and importance ( $\beta= -.210$ ,  $R^2=.014$ ). Though independently, age explain 42% of variance, perceived choice explain 19% of variance, gender explain 4% of variance, pressure explain 1% of variance and importance also explain 1% of variance. But the composite contribution of age, perceived choice, gender, pressure and importance was found 69% of variance in the criterion variable

**Table 5:- Stepwise Multiple Regression Analysis of Elaboration on to the Intrinsic Motivation**

Predictor variables	Criterion Variables (Elaboration)					
	R	R <sup>2</sup>	R <sup>2</sup> change	β (Beta)	t	F
Age	.649	.421	.421	.649	9.26	85.86***
Perceived choice	.787	.620	.199	.446	7.82	95.45***
Gender	.815	.665	.045	-.212	-3.93	76.67***
Pressure	.823	.677	.012	-.155	-2.05	60.14***
Importance	.831	.690	.014	-.210	-2.24	50.80***

**Fig 4:- Elaboration Predicted by Age, Percieved Choice, Gender, Pressure and Importance**



**Fig 4:- Elaboration Predicted by Age, Percieved Choice, Gender, Pressure and Importance**

### Discussion

Findings of the present study have been interpreted and discussed under two sections. First section deals with major findings of the study whereas; in the second section findings are discussed in the light of empirical and theoretical evidences.

Results (Table 1) evinced that intrinsic motivation exerted significant positive role in the development of creativity. It reveals that intrinsic motivation was found positively correlated with various domains of creativity except for the pressure domain, in which it is negatively correlated with creativity. On the basis of correlation result it is clear that with increase in the level of interest, perceived competence, importance, perceived choice, value and relatedness creativity increases whereas when pressure domain decreases then only creativity increases. This correlation result explains only relation between the variables but from this result it is not clear that which dimension clearly predict the criterion variable. Therefore, step wise multiple regression analysis was computed. This result indicated that creativity was strongly and positively predicted by age followed by perceived competence and interest.

These results have ample of empirical as well as theoretical evidences and therefore findings have been discussed in the following section.

### Intrinsic Motivation and Creativity

Findings have been supported by number of exclusive studies. Amabile, (1997) explained the fact that intrinsic motivation is conducive to creativity whereas extrinsic motivation is detrimental because intrinsically motivated person perform an activity for his own sake or gets personal meaning of it. And if adolescents feel competent,

autonomous, related and self-determined then they will generate the power of self-efficacy and self-realization which can turn them into more motivated toward the task and creates more appropriate and novel ideas into the reality (Deci, 1971).

Furthermore, Deci and Ryan (2000) do acknowledge that even when a school environment supports autonomy and competence but he was not interested in a particular learning activity than he will not be intrinsically motivated for engagement. Rather than, he will be motivated by external factors like grades. And if a person is motivated by external regards than their fantasy world would not be open and by the restriction of imaginative thinking creativity can't be emerged as a source of new and relevant thought process. So, here it is clear from above interpretation that intrinsic motivation is a precursor of creativity and buffer system for maintaining that creativity. Because intrinsic motivation is not the only form of motivation, but it is pervasive and important one. From birth onwards, humans, in their heartiest states are active, inquisitive, curious and playful creatures displaying a ubiquitous readiness to learn and explore, and they do not requires extraneous incentive to do so. This natural motivational tendency is critical element in cognitive, social and physical development because it is through acting on one's inherent that one grows in knowledge and skills. The inclination to take interest in novelty, to activity assimilate and to creativity apply our skills is not limited to childhood, but is significant feature of human nature that affects performance, persistence and well-being life's epoch (Deci, Koestner & Ryan,1999). Similarly, Woodman and Schoenfeldt's (1989) were acknowledged that intrinsic motivation as

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a component of the individual that is conducive to creative accomplishment. The research of Amabile also confirms that intrinsic motivation is an important component of creativity (Amabile, Dejong & Leeper 1976; Hennessey & Amabile 1998,). They argue that people are likely to be most creative when they are working on a task that they truly enjoy. Therefore, there is a direct relationship between the motivation orientation brought to a task and the likelihood of creativity at that task.

## Age, Gender and Creativity

With all these empirical evidences and the results obtained, it is clear that intrinsic motivation is related to creativity but further to increase the relevancy of this result age was also found significant and strongest positive predictor of creativity and contributed role is around 70-80% in criterion variable. This result clearly emphasizes the role of age in development of creativity. It reveals that creativity is a developmental phenomenon in which sophistication and maturation occurs with growing age from neo-adolescents to late-adolescents. This finding is strongly supported by Piaget's theory of cognitive development in which he was clearly propounded that in age of adolescence person go through the process of formal operational stage. And this stage was precursor of abstract thinking and justification process so; here it is quite obvious that adolescents were mugged up with these thinking processes and generate some interesting thoughts, views, ideas and products. Furthermore, Piaget also explained that this kind of abstract thinking is truly develop in age of adolescence but, not abruptly at age of twelve it will take time to get perfection and gradually unfold through a combination of physical maturation and environmental experiences that's why here the result also depict that the intensity of creativity differed across neo-adolescents to late-adolescents.

Similarly, Vygotsky (1998d) mentioned that imagination and fantasy play an important role in development of creativity. During the age of adolescence person's fantasy were in peak. Two kind of fantasy generate during the age of adolescence: subjective and objective fantasy. And adolescents learn to balance these two kinds of fantasy and become increasingly reflective and critical about their own imaginative products. Artworks produced in childhood whereas syncretic, fusing different styles and techniques are the products of adolescence. On the basis of Vygotsky's approach it is clear that due to this basic difference in creative product during childhood and adolescence, they will perform more smoothly and differently in verbal and non-verbal test of creative thinking. Children are good enough in non-verbal test of creative thinking whereas adolescents were more comfortable in verbal test of creative thinking. So, by the above theoretical interpretation and empirical findings it is simply applicable that creativity is a unique quality of adolescents if suitable environment provided to them.

Creativity was also partially influenced by gender because gender issues are totally based socialization patterns in our society. Girls are

practiced to learn conformity whereas boys are expected to be active and dominant risk takers (Block, 1983). Lau and Li (1996) studied 633 Chinese students in grade five and found that boys were viewed to be more creative than girls. Torrance (1963 a) also found a little difference in the ability of boys and girls until five years, from then boys begin to acquire superior ability in manipulating and experimenting, whereas girls excel only in fluency of responses. Cultural sanctions apparently, discourage girls from becoming interested in boy's activities. However junior high school girls, who were given special training in science concepts subsequently, demonstrated an increased ability to explain science principles.

Therefore, from the above discussion it might be clear that intrinsic motivation provide supportive role in development of creativity but it is found to be more superior when intrinsic motivation is adjoined along with personal factor like age and gender.

## Conclusion

The findings of present study have proved the hypothesis that intrinsic motivation exerted significant and positive role in development of creativity except for pressure domain. It reveals that with increase in intrinsic motivation creativity increases but, pressure (domain of intrinsic motivation) decreases the level of creativity. Age and gender are also contributed in creativity. A cursory glance at findings of present study reveals that intrinsic motivation is a significant precursor of creative thinking and highly correlated with growing age. Intrinsic motivation becomes an innate integral part of different kind of abstract thinking. Therefore, intrinsic motivations are emerged as a quality of understanding their inner interest and implement those interests into a more significant creative outcome. This research provides support to a large number of those any interesting purpose and facing lots of problems and failures. Because intrinsic motivation is the quality which can generate interest and further provide a meaning to the life.

## Suggestion

This study is helpful in understanding the relation between creativity and intrinsic motivation but this study is limited only in between these two variables. Apart from the above relation creativity is multi-dimensional construct so, for better understanding of creative mechanism some other variables like cognition, intelligence, birth order, parenting, socio-economic status etc. can also be used.

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