Advanced Cognitive Processes
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Lecture – 30
Creativity

Hello and welcome to the course Introduction to Advanced Cognitive Processes. I am Ark Verma from IIT Kanpur. In most of this week we have been talking about different aspects and approaches towards problem solving. In the last lecture of the week I will very briefly touch upon one of the topics that is slightly linked to problem solving, but it is also a very important topic in it is own right.

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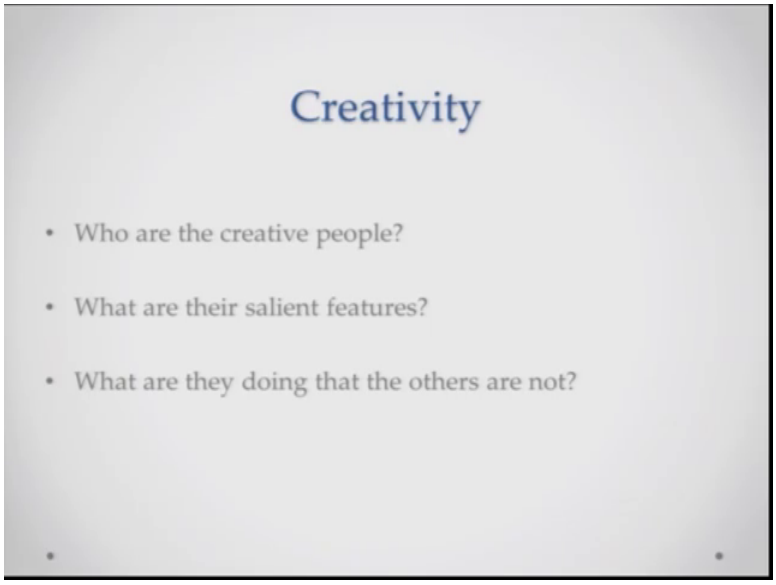

Creativity now, what is creativity? You know we will talk about definitions at some point, but you can just pause and look around who are the people that you consider as creative you know inventors, authors, actors, poets so on and so forth. You know people who have some qualities that are you know identifyingly identifiably very different from all the other people around them. What are these qualities? What are the salient features of people who are considered creative if you observe them?

If you observe how they you know go about things, go about doing things, how they think, how they approach problems, how they solve particular problems are in some sense different from how ordinary people solve problems.

Also what are these people doing that others are not? Why are these people very successful why are their solutions more impactful why are their solutions quicker considered more in generous and the solutions that come through ordinary thinking that come through you know thinking of normal common individuals. So, some of these questions you can ask yourself I will very briefly touch or a very briefly kind of circle around these questions and let us we will talk about how creativity is a very important cognitive activity.

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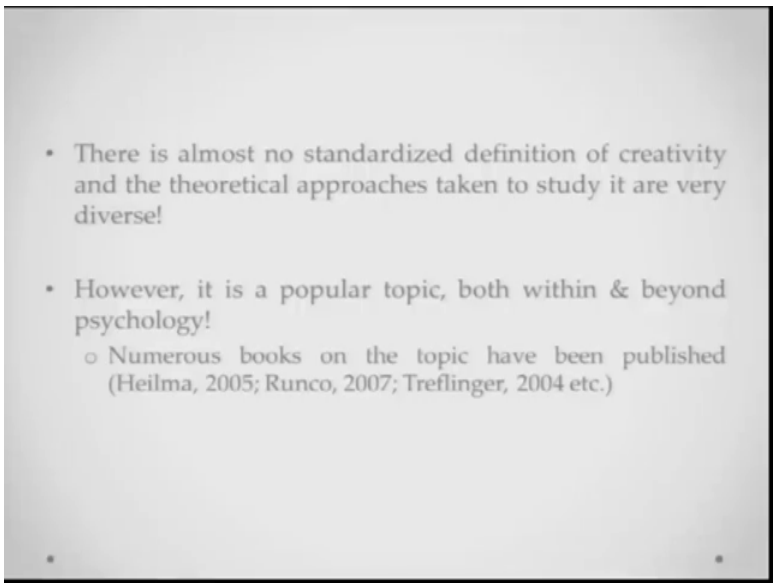

Now, to come of there to talk about definitions there is almost no standardized definition of creativity and the theoretical approaches taken to study it are a very diverse you know. There is almost no agreement on what creativity actually is and there is almost no agreement on what is the best approach to study creativity different people have defined creativity in different ways different people adopt different paradigms to measure and assess creativity and this is how the field is structured you know.

And even though this is there is so much of controversy even though there is so much of agreement disagreement you know discussion and debate about what is creative what is not, who is creative who is not, what is what does it constitute being creative the topic is very popular there are multiple books written there multiple papers published on the topic of creativity even in the decade of 2000 a lot of books were published on creativity.

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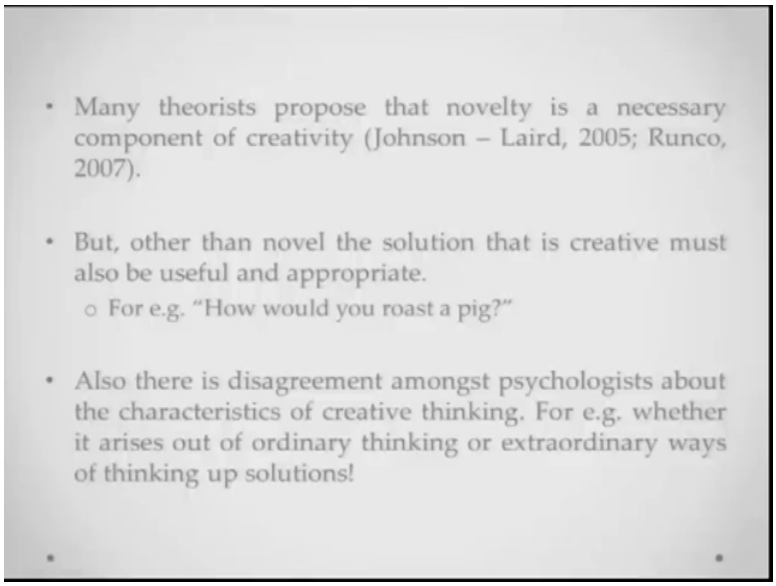

Now, just kind of observing and examining this topic many theorists have proposed that novelty is very important or almost a necessary component of creativity. So, a creative person should come up with solutions that are novel and that you know have not been offered before, that is one way of looking at it.

Other than the fact that the solution is novel you know a creative solution must be useful as well it must be appropriate as well as reading through one of these books and a very interesting example is that you know if the question is, how would you roast a pig? Charles (Refer Time: 03:33) in you know in nineteenth century observes that you know one of the ways to roast a pig would be to you know put the pig in the house and burn down the house, that is also a way to roast the pig, but is it a useful solution is it an appropriate solution?

So, even novel solutions should be qualified with other criteria's like these and only then you can actually you know definitively say that this is a creative solution. Also there is disagreement amongst a psychologist about the characteristics of you know creative thinking for example, whether it arises out of ordinary thinking methodical step by step kind of thinking that we have been seeing in you know the past couple of weeks or it involves some kind of extraordinary way of thinking of solutions extraordinary way of concocting solutions out of thin air.

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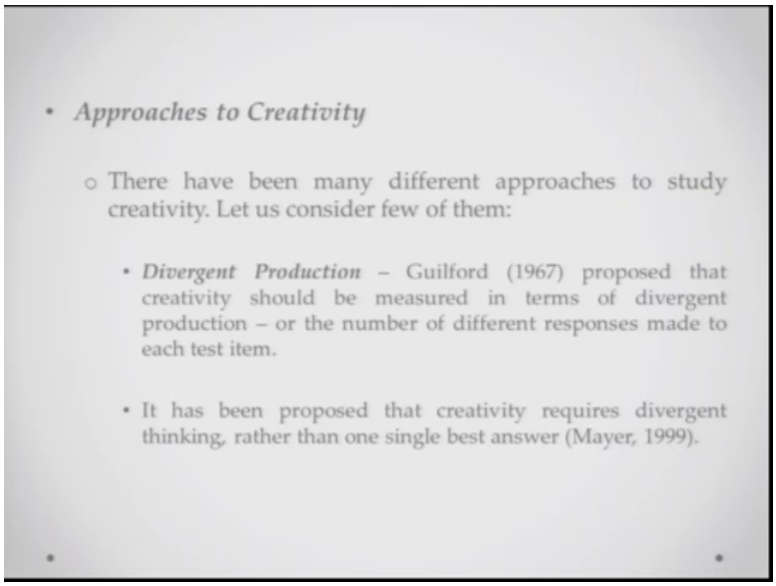

How do creative people think, what are their ways of what are their methods of churning of solutions? So, there is there is a lot of debate there as well I just briefly touch upon two approaches one of the approaches was put forward by Guilford back in the 1960's and Guilford proposed that creativity should be measured in terms of divergent production. How many different solutions how many different responses can one give to each test item. So, it has been proposed that creativity requires divergent thinking rather than coming up with just one single best answer.

You should be able to flexibly think of so many different kinds of responses to whatever test item whatever you know question is posed in front of you. It makes a little bit of a sense you know it is not completely a bad idea. It is obviously, say for example, if somebody is intelligent if somebody is witty enough they can actually come up with a variety of responses to the same question and that is certainly you know can be considered creative.

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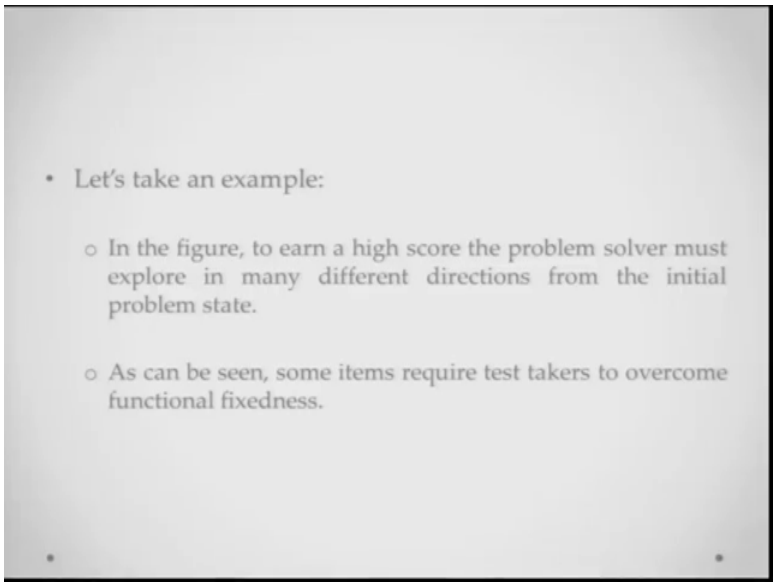

But, say for example, let us take an example one of the tests that Guilford used he basically gave these participants tests and he somebody who scores high on these kind of tests must have been you know must need to explore the solutions in a creative fashion and they will get a high score on this test and they will can be considered more creative

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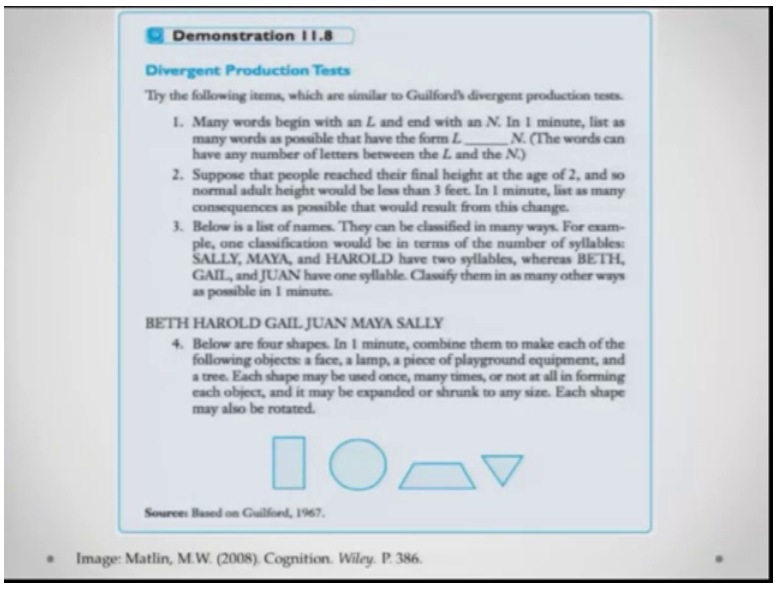

So, the demonstration is like you know divergent production test would be something like this many words begin with an L and N in one minute list as many words as possible that have the form L beginning and end N till the end the words can have any number of

letters between L and N. So, you can you know you have to come up with so many words as many words as possible in just one minute.

Then the other problem is suppose that people reach their final height at the age of 2. So, the normal adult height would be less than 3 feet. In 1 minute lists as many consequences as possible that would result from this change, how much can you think, how divergent you can think this will happen this will happen this will happen and you can have to give you know in just 1 minute, how many different eh things that are possible.

Below another problem could be below is a list of names. So, Sally, Maya, Harold and Beth and what you have to do is you have to say a Beth Gail and Juan and what you have to do is you have to arrange these names in as many orders as possible in as many ways as possible in just one minute. One of the ways could be you know you could just use a number of syllables, you could use number of letters, you could use male names female name, so many things you can do.

The fourth problem is that there are four shapes here and in one minute you have to combine them to make each of the following objects a face, a lamp, a piece of playground equipment and a tree. Each shape may be used once many times or not at all in forming each object and it may be expanded or shrunk to any size, each shape may also be wrote.

So, there is a lot of freedom there and you have to just use these four shapes to make up whatever requirements have been placed before you now depending upon what kind of responses people come up with and depending upon different people coming up with different ranges of responses one can actually you know give them a score on divergent thinking. You know somebody can come up with five hundred solutions to one of these problems in one minute and the other person can just come up with two hundred solutions then you would, obviously, assume that the person coming up with five hundred solutions is more creative.

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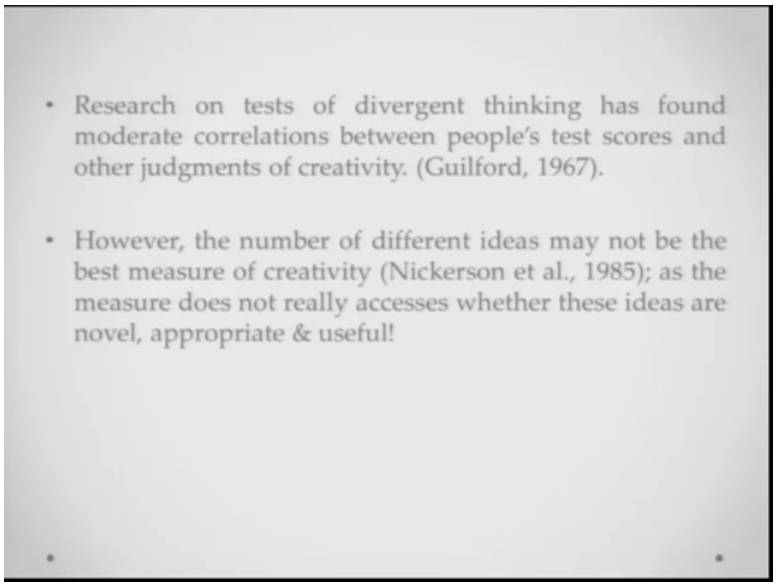

Research on tests of divergent thinking have found moderate correlation between peoples test scores and other judgment of creativity. So, it has been in some sense in a moderate sense shown that people who achieve higher score on these tests of divergent production are considered creative by other tests as well. However, the number of different ideas may not be the best measures of creativity and that is basically been repeated in a lot of other studies as well because this measure does not really accesses and it does not really give you the idea about whether the number of ideas that you are generating are all novel or appropriate or useful.

So, they are how effective those ideas are is not really just measured by number of ideas. So, there would be other tests of creativity as well.

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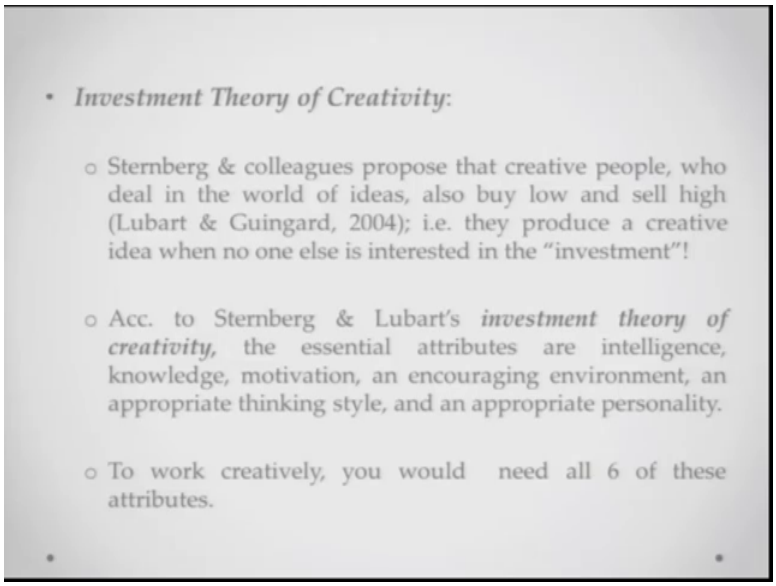

Let us talk about a different theory of creativity investment theory of creativity. Now, Sternberg and colleagues proposed that creative people who deal in the world of ideas also they behave a little bit like investors you know when nobody is buying this stock buy a lot of it and when everybody is interested in that just sell it off and move to something else.

So, creative people according to Sternberg and colleagues produce a creative idea when no one else is interested in the investment. As soon as a lot of people start getting interested in the same ideas they leave that and they move to newer pastures. So, according to Sternberg and Lubart's investment theory of creativity the essential attributes of creative are six; they are intelligence knowledge motivation and encouraging environment and appropriate thinking style and also an appropriate personality.

To work creatively you must possess all six of these things if you are missing on any of any one of our any two of these different attributes you will not be considered creative. So, if Sternberg and Lubart design a test it would measure all six of these things and a combination of scores of all 6 of these attributes would give you a certificate of creativity or not. Now this is also a interesting approach to look at creativity.

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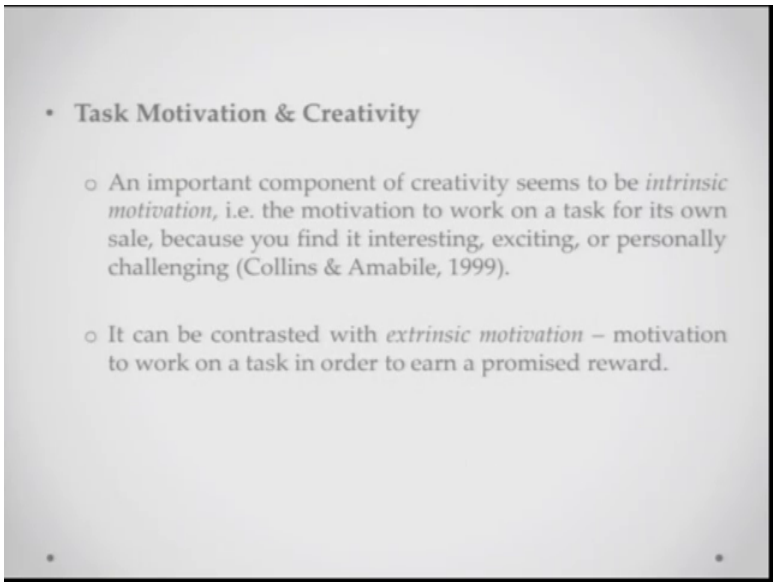

One of the other factors that people have looked at with respect to creativity is the kind of motivation towards doing a task. So, you know and this motivation can be looked at in two ways an important component of creativity seems to be intrinsic motivation you know how passionate towards the task you are yourself how involved or engaged in the task you are just for the sake of the task. So, intrinsic motivation is basically the motivation to work on a task for its own sake because you find it interesting, you want to spend time with that task and because it is interesting to you will think of various ways you will think of different new novel, innovative useful ways to actually ach[ieve] complete that task.

The task has to be exciting for you it has to be personally challenging for you and it should hold your interest for longer times, that is what intrinsic motivation is. Now, intrinsic motivation can be contrasted with extrinsic motivation. What is extrinsic motivation? Extrinsic motivation is when you are not really interested in doing that task it does not really appeal to you so much, but you are doing the task because completing that task promises you certain reward or a certain you know raise or something like that.

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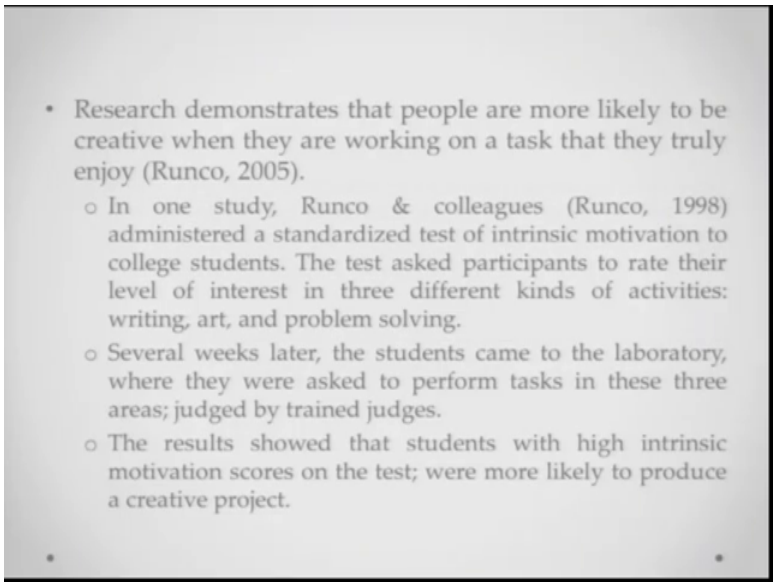

Now, a lot of research has been done to compare the two kinds of motivation and kind of you know look into creative and non creative people and how these different motivations vary among these people. So, research has demonstrated that people are more likely to be creative when they are working on a task that they are truly interested in that, they truly enjoy.

In one of the studies Runco and colleagues they administered a standardized test of intrinsic motivation to college students. So, they made administered a test when they come up with scores of intrinsic motivation. The tests asked participants then to rate their level of interest in three kinds of activities; writing, art and problem solving.

Several weeks later the students are again brought to the lab laboratory and when they are and they are asked to perform tasks in these three areas and these their performance in these tasks are now judged by trained judges, who will judge these in their performance on whether these performances are creative or not creative. The results showed that the students with high intrinsic motivation scores on the test suppose in high intrinsic motivation in art or high intrinsic motivation and in writing or high intrinsic motivation in problem solving were more likely to produce a creative project.

So, they directly kind of correlated how intrinsically motivated you are and how creative your solutions are going to be.

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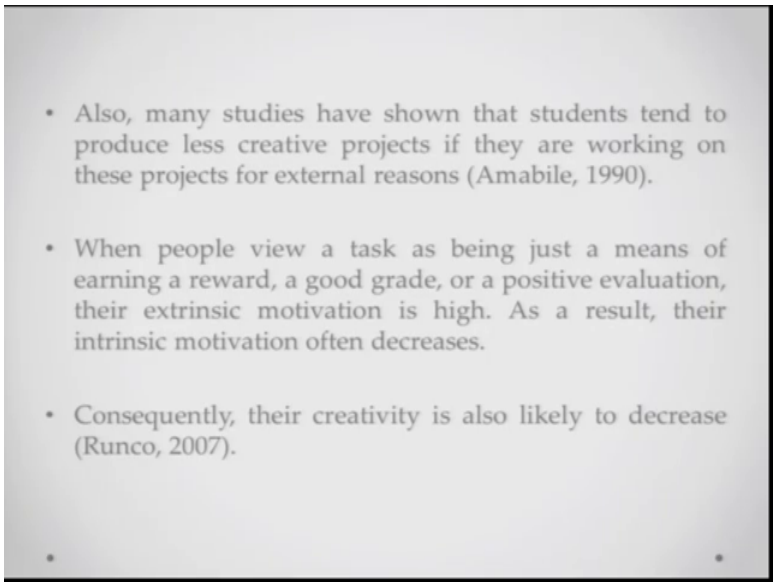

Many studies have also shown that students tend to produce less creative projects if they are working on these projects for external reasons. If you are just working for a high grade if you are just working for getting a good salary, if you are just working for you know. So, that people may think good of you then probably you are not really putting yourself in that task as much as you need to do you might not excel in the task you might not be able to be creative with that task.

So, when people view a task as just being a means of earning a reward or a good grade or a positive evaluation their extrinsic motivation is higher and that kind of lowers down the intrinsic motivation. Consequently, as a result of this trade off the creativity is also likely to decrease.

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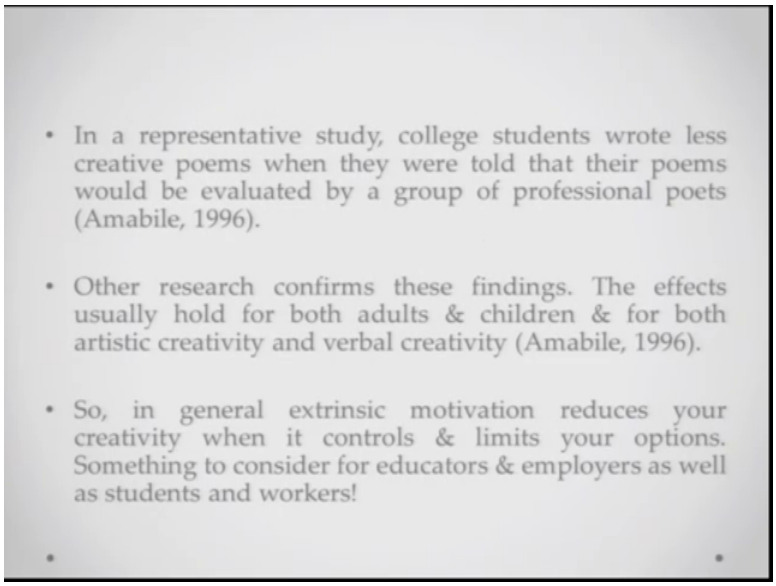

So, in a representative study what they did was they asked the college students to write basically write creative poems and these people were told that they their poems will be judged by a group of professional poets. So, because they are kind of you know the motivation is the intrinsic motivation is not there they are basically told that you know these professional poets will judge you and we might give you a reward if it was just highly creative or so on and so forth and it was found that the college students wrote less creative poems when they were told that their poems are going to be judged than otherwise.

Other research in the similar area also confirms these findings the effects usually hold for both adults and children and for both artistic creativity and verbal creativity. So, motivation is a very important factor in whether you are going to be creative with a particular project or whether you whether you are going to be able to creative in particular tasks or not.

So, in general you can assume that extrinsic motivation reduces your creativity when it is controlling the limit and limiting your options. Is something very important to actually consider for both educators and employers as well and also as well as students and workers it is a very good idea to choose to work in an area that you intrinsically enjoy that you intrinsically look forward to you know it is it is a good idea doing a job that you

enjoy rather than doing a high paying job which you really you know do not enjoy at all. So, that is probably all from me.

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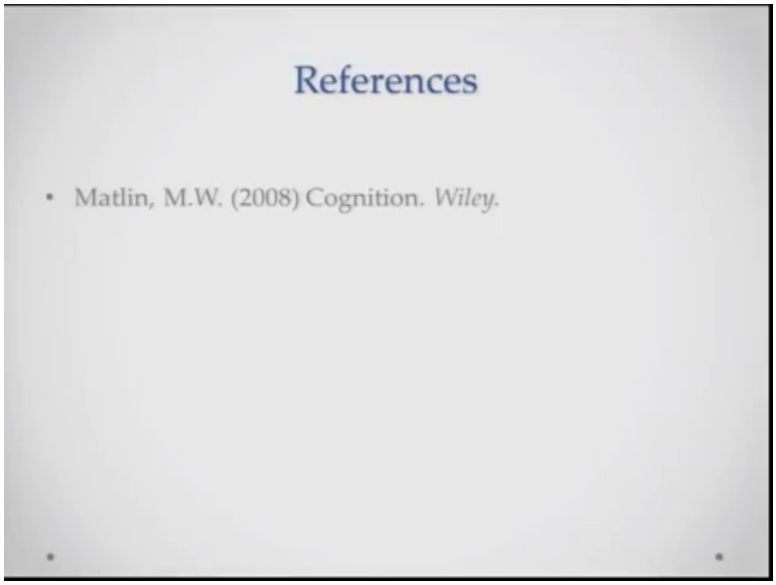

From creativity it was just a small introduction into what creativity is about and that kind of ends the sixth week we will see you in the seventh week with a different topic.

Thank you.