

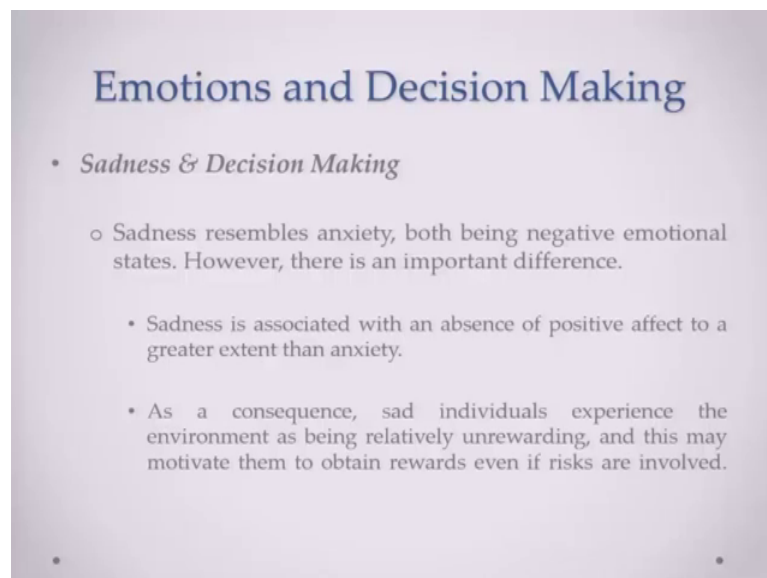
**Advanced Cognitive Processes**  
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**Lecture – 34**  
**Cognition and Emotion – IV**

Hello and welcome to the course introduction to advanced cognitive processes I am Ark Verma from IIT Kanpur we are in the 7th week of the course and in this week we have been discussing about cognition and emotion. In the last few lectures in this week I have talked to you about the interactions of emotional states that has mood states with attention memory, we have been in discussion about how important region of the brain amygdala is and how it helps us process particular emotions.

In the last lecture is also I also started talking to you about the effects of particular kinds of emotion, on the process of judgment and decision making we will continue our conversation with respect to that and let us now talk about a couple of other emotions.

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**Emotions and Decision Making**

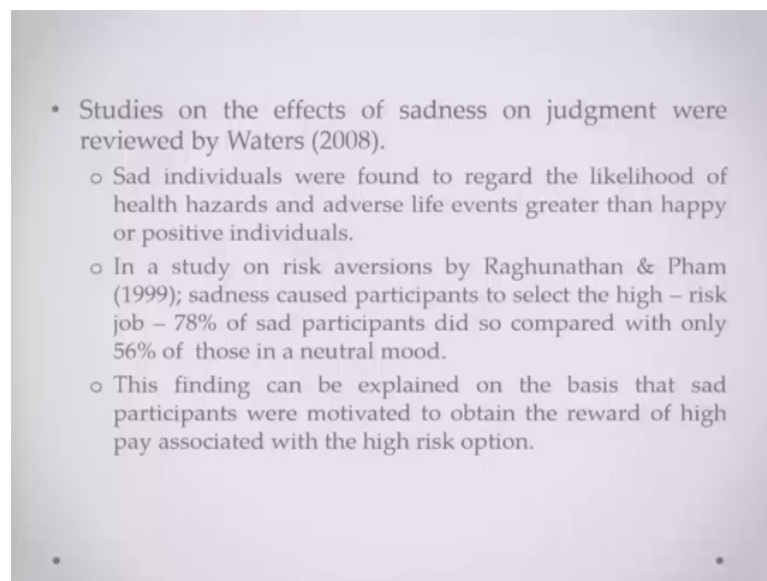
- *Sadness & Decision Making*
  - Sadness resembles anxiety, both being negative emotional states. However, there is an important difference.
    - Sadness is associated with an absence of positive affect to a greater extent than anxiety.
    - As a consequence, sad individuals experience the environment as being relatively unrewarding, and this may motivate them to obtain rewards even if risks are involved.

Let us talk about sadness and decision making, now sadness resembles anxiety, because both are negative emotional states, but one of the things that characterizes sadness more than anxiety is that sadness is related to more often absence of positive effect as compared to anxiety. Sadness is in some sense you know we keep positive emotions

happy and sad on the 2 continuum and in that sense sadness is basically referred to as some more of a loss of or more, more of a deficiency of any positive effect.

So, that is one of the things that characteristically differentiates sadness from anxiety, now because sadness is basically about the absence of positive effect it is kind of almost intuitive to expect that sad individuals experience environment as being relatively unrewarding you know it is not happy, it is relatively unrewarding and this often motivates a sad people to try and avoid the sadness to try and come out of the sad state and in that sense they would sometimes you know they are in that sense seeking some kinds of rewards, they are continuously trying to not be sad they are consciously trying to change their you know scenario. So, that is something which we will have to remember about what you know sad people behave like.

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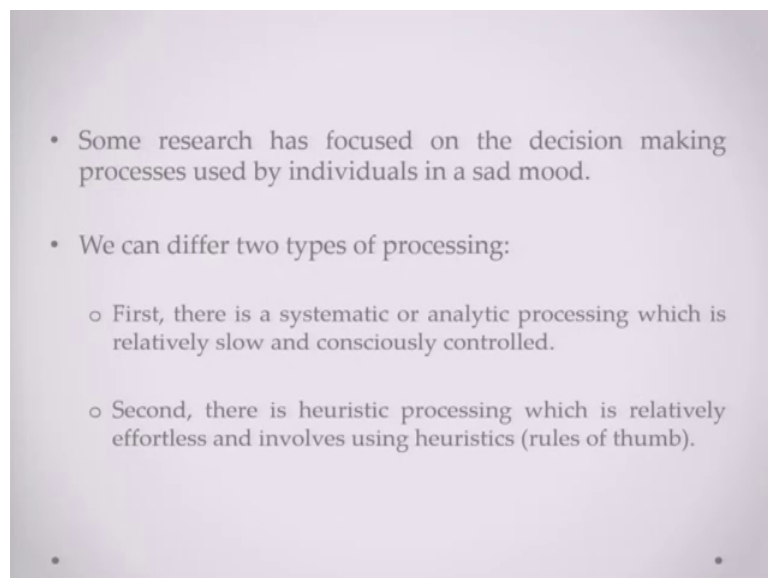
Now people have studied the effects of sadness and judgment in decision making and what is basically did this review, whether the kind of review several studies on the basis of how you know what kind of emotions interact with decision making processes. Now, sadness was actually found to basically regard the likelihood sad individuals of found to regard the likelihood of negative events as more probable you know they basically think if you ask them you know whether there is a possibility that you would have a serious illness or there will be death or you know there will be destruct those kind of things.

So, sad individuals were found to regard the likelihood of health hazards and adverse life events much greater than happy individuals. In a study on risk aversion by Raghunathan and Pham in 1999 sadness caused participants to select the high risk job 78 percent of the participants selected the high risk job as compared to only 56 percent of the people who were in the neutral mood.

You remember I was talking about 2 jobs job A and job B, where job A is high salary low job security job and job B is average salary high risk job security. So, this in this study 78 percent of the sad individuals were to take the risk in as a referring to this tend and trying to come out of this stage even though taking risks is involved. So, a 78 percent of individuals took that risk they wanted the high salary low job security job because they want to come out of their state.

Also finding can be explained on the basis that you know participants were motivated to obtain the reward of high pay associated with the high risk option they are not really I mean in that sense for them everything is anyways going to go down will. So, why not really you know die trying that is kind of the attitude that sad individuals or extremely sad individuals will display in a different situations.

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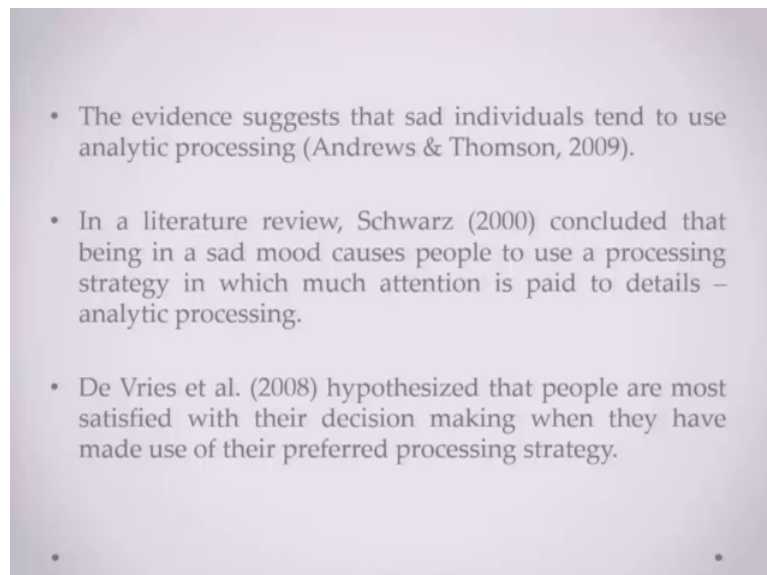


Now some of the research has focused on the decision making processes that you know that these individuals use when they in they are in sad mood, now when you talking

about particular kind of a decision making process literature has basically distinguishes 2 kinds of processing 2 types of evolution evaluation of alternatives that goes on.

So, firstly, there is a systematic or analytic processing where the individual considers or options ways them compares them against each other which is this one is a relatively slow and it is rather consciously control, this is the analytic processing deliberative processing. Second is there the heuristic processing which is relatively effortless and it involves use of heuristics you know heuristics are shortcuts which may work may not work, but they are shortcuts they give results very quickly.

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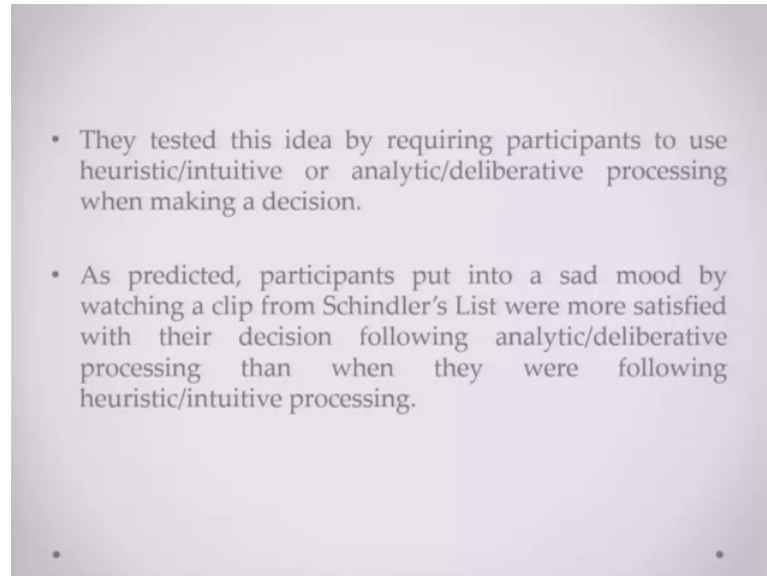


So, sad individuals basically people have said there is evidence of sad individuals tend to use the analytic processing a lot more as compared to heuristic processing. In a literature review Schwarz in the year 2000 concluded that being in a sad mood causes people to use a processing strategy in which much of the attention is paid to details you know analysis are done options are wait how we like amount of my sadness these things are done. So, you will say this sad individuals use analytical processing deliberative processing a lot more as compared to individuals you know affected with different other kinds of emotions.

Now De Vries and colleagues in 2008 hypothesize that people are most satisfied with their decision making when they have used a preferred strategy. So, they just wanted to

test that what kind of decision making strategies people are used and they found that people are satisfied when they have used the strategy they would preferred.

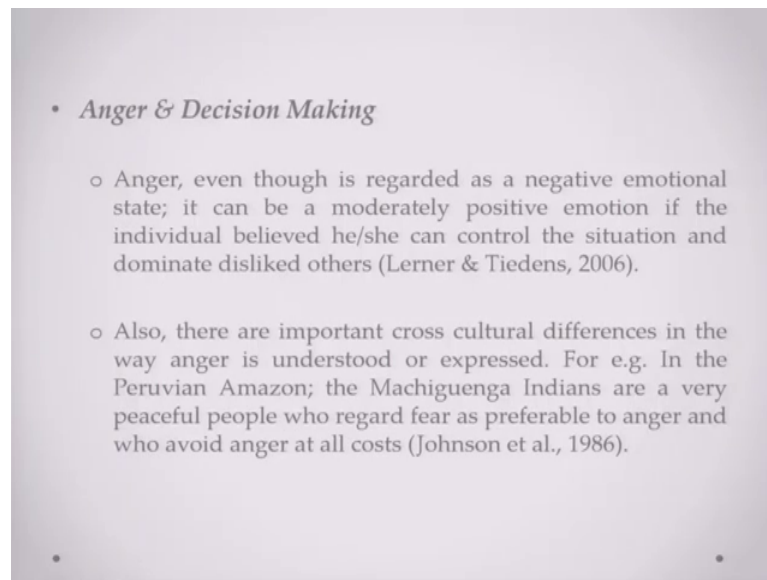
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So, they tested this by requiring participants to use either a heuristic intuitive way or analytic deliberative way of processing when making a particular decision. Now as predicted participants put into a sad mood by watching a clip from you know the Schindler's list was a you know amazing movie, Schindler's list were more satisfied with their decision following analytic and deliverable deliberative style of processing and then they were when they were supposed to use the heuristic or in intuitive kind of processing.

So, in that sense again it kind of confirms this thing that you know sad individuals are using analytic processing paying attention to all of the details weighing everything before making the final decision now so that was about sadness.

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Let us talk about a different emotion let us talk about anger. Now, anger is a negative emotion anger is a something that is not really desirable, but I will just kind of briefly mentioned that anger even though it is regarded broadly as a negative emotional state. It can be a moderately positive emotion as well it can be viewed as negatively moderately positive emotion as well.

If the individual believed he can control he or she can control the situation and dominate the disliked others, you know sometimes in a place of anger you think that if I am going to show anger the other person is going to listen to me, you know if I am going to show anger that that person will be afraid of me and they will agree to whatever I have to say.

So, we were talking about sadness and you know there is; obviously, enough evidence now that sadness kind of makes individuals follow the analytic deliberative style of processing, but now let us move on to different emotion let us talk about anger. Now anger is a negative emotion, anger is a state that you would not really want to be in, but anger even though it is a negative emotional state it can be you know viewed as a moderately positive emotion if the individual believes that he or she you know can control the situation better or can dominate disliked others.

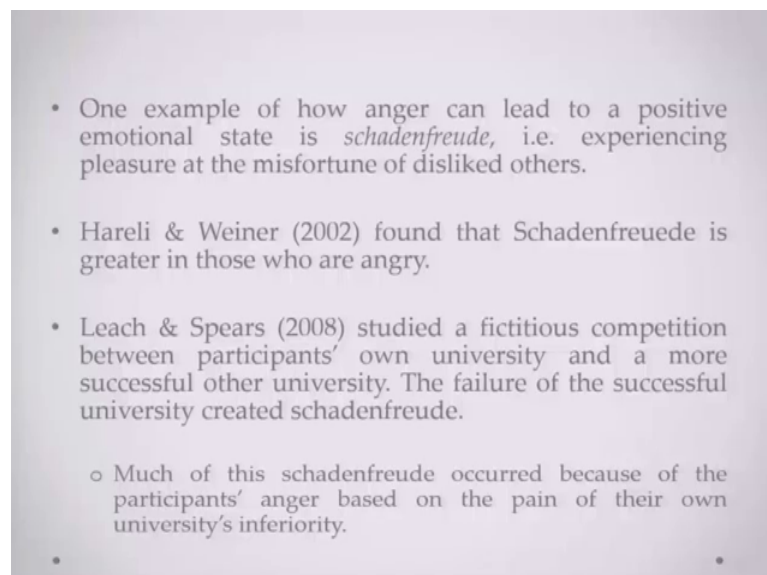
The fact is say for example, if somebody feels that you know if I am angry if I am showing anger the other people will listen to me if I am angry you know everybody will be afraid of me and I can get whatever I want you know just that display of angered. So,

one of the things is sometimes people start misconstruing their anger as a positive emotion and they kind of reinforce ways in which they can show and harbor anger and many they can make use of their anger whenever they want to.

Now, this is interesting so, there are kind of there is a sort of a literature which says that you know some people might be angered as they you know more masculine and more you know power kind everything so; obviously, there is a slight evidence that says that maybe some people in some sense construe anger as a slightly positive emotion I will come back to that in a bed.

Now, another important thing about anger is that there are important cross cultural a very important cross cultural differences in the way anger is perceived is understood or expressed in some cultures anger is considered nice. It is considered you know let us say it could be considered more powerful, more masculine, more acceptable in their culture, but in other cultures it could be completely opposite and example I would take is the massive anger people in the Peruvian Amazon they are basically a very piece loving people and they basically would the other be afraid than be angry they would try and the try and avoid anger at all costs.

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- One example of how anger can lead to a positive emotional state is *schadenfreude*, i.e. experiencing pleasure at the misfortune of disliked others.
  - Hareli & Weiner (2002) found that Schadenfreude is greater in those who are angry.
  - Leach & Spears (2008) studied a fictitious competition between participants' own university and a more successful other university. The failure of the successful university created schadenfreude.
    - Much of this schadenfreude occurred because of the participants' anger based on the pain of their own university's inferiority.

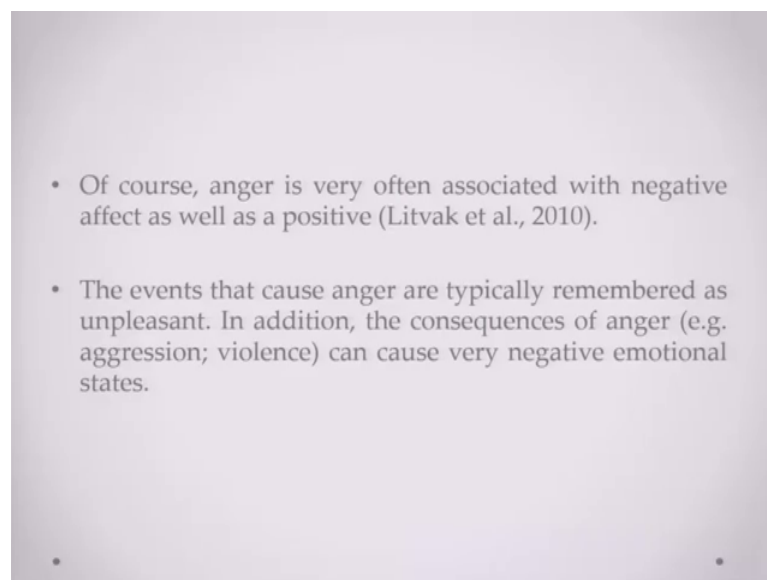
So, this is interesting that how anger is understood across cultures and societies might also be very different so, how do you measure the effect of anger on decision making, how does this really happen.

There is one very interesting term is a very interesting German term which kind of also links anger to the positive emotion thing is that anger can lead to a positive emotional state if is Schadenfreude is happening. So, Schadenfreude is basically a term which is about experiencing pleasure at the misfortune of others.

Now, Hareli and Weiner in 2002 they found this Schadenfreude is basically in greater for you know is greater for people though who are angry. So, leach and spears also they kind of conducted this research and the, what kind of studying a fictitious competition among 2 universities and you know the students were basically supposed to react to one of the universities winning. So, one of the university is winning.

So, the failure of the more successful university basically generated more Schadenfreude the in the, you know in these participants. So, much of this Schadenfreude there was basically occurring because of the participants anger based on you know the inferiority of their own videos it is. So, because they know that the university is not doing very well and it is it is slightly inferior to the other one to the major university. So, when this major university is losing these people are deriving some joy out of it.

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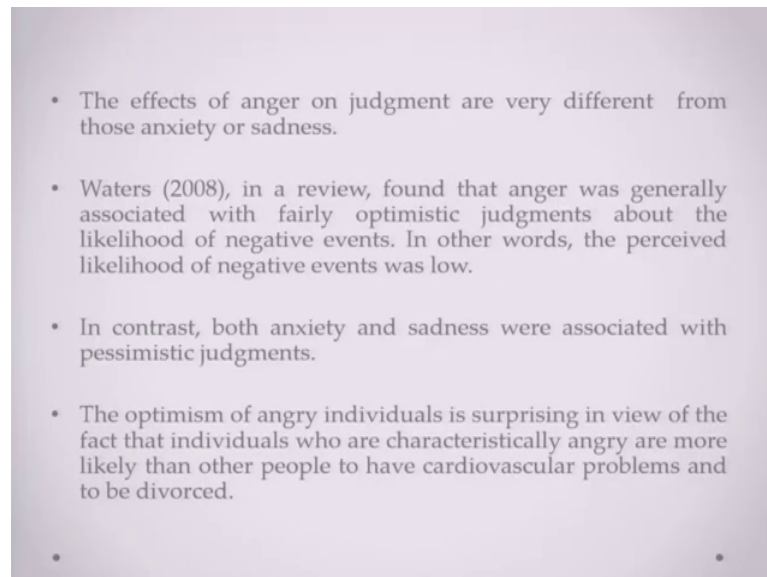


So, this is a little bit about how anger can be you know construed in some cases as a positive emotion, let us come back to the conventional thing anger is; obviously, a negative emotion anger is something that kind of is difficult to handle.



So, events associated with the anger the or events that kind of caused or triggered anger are; obviously, remembered as unpleasant events in addition the consequences of anger basically you know aggression violence etcetera and also leads to more negative emotional states you know it kind of fuels this entire vicious cycle.

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- The effects of anger on judgment are very different from those anxiety or sadness.
  - Waters (2008), in a review, found that anger was generally associated with fairly optimistic judgments about the likelihood of negative events. In other words, the perceived likelihood of negative events was low.
  - In contrast, both anxiety and sadness were associated with pessimistic judgments.
  - The optimism of angry individuals is surprising in view of the fact that individuals who are characteristically angry are more likely than other people to have cardiovascular problems and to be divorced.

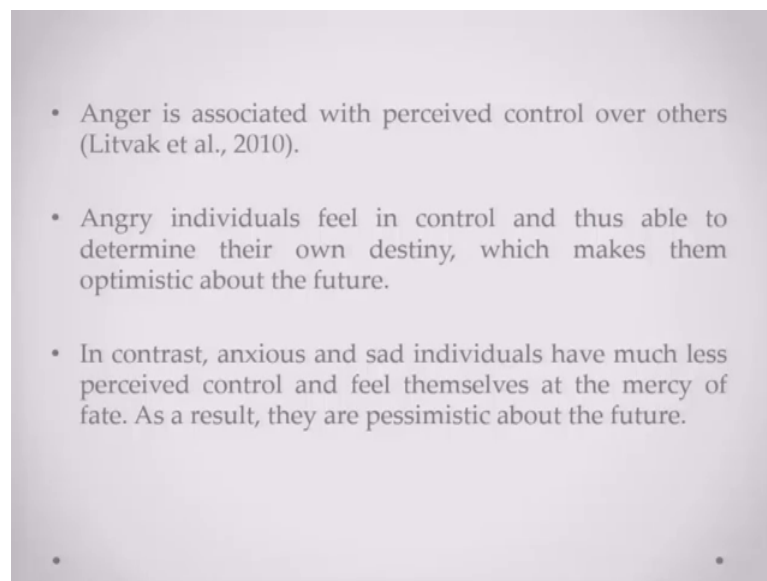
Now the effects of anger on judgment are very different from those of anxiety or sadness now that is very important to remember. So, Waters in 2008 he kind of you know mentions in a review that anger was generally associated with fairly optimistic judgments about the likelihood of negative events people who are you know who show display a lot of anger who are generally more angry, they kind of make more optimistic judgments about how things will happen it is just kind of puzzling though.

In other words basically what us says that the perceived likelihood of negative events is also low and in contrast both sadness and anxiety basically are associated with more pessimistic judgment. So, is amazing that how anger is kind of biasing people to make more positive judgments.

Now, optimism of agree angry individuals I mean again I am saying is a slightly surprising in the view of the fact that these are individuals who work you know those individuals who are characteristically angry I have a more I have much more chance of having cardiovascular problems or getting divorce in those kind of things.

One of the that I could actually share with you is that probably because anger is emotion which is closely linked with power and you know you cannot be angry at a person who whose less power whose more powerful the new things like that. So, maybe that that relationship is kind of contributing to this aspect that angry individuals make more optimistic judgments about how life will pan out for them so, that thus basically very interesting also as I was saying you know there is aspect of power.

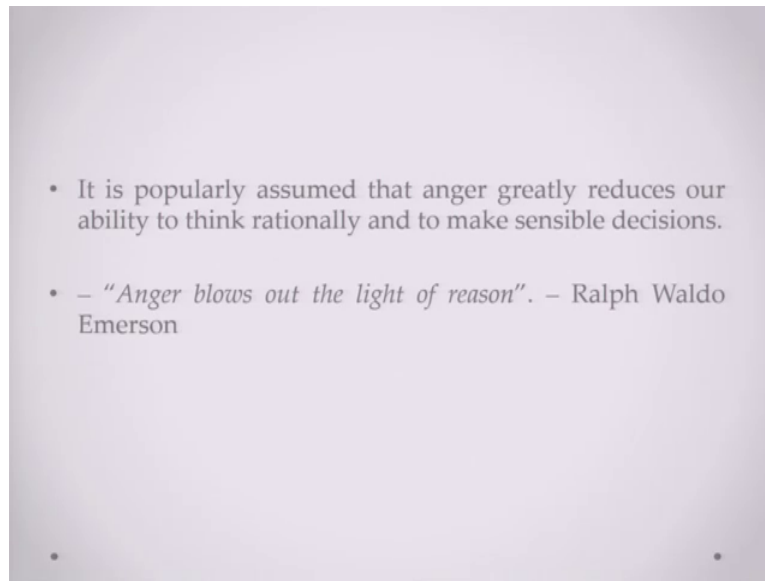
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So, anger is associated with perceived control over others you know those people who can afford to show anger, who can afford to express anger, perceive themselves more in control of others as compared to individuals who are sad or anxious so, that is one thing.

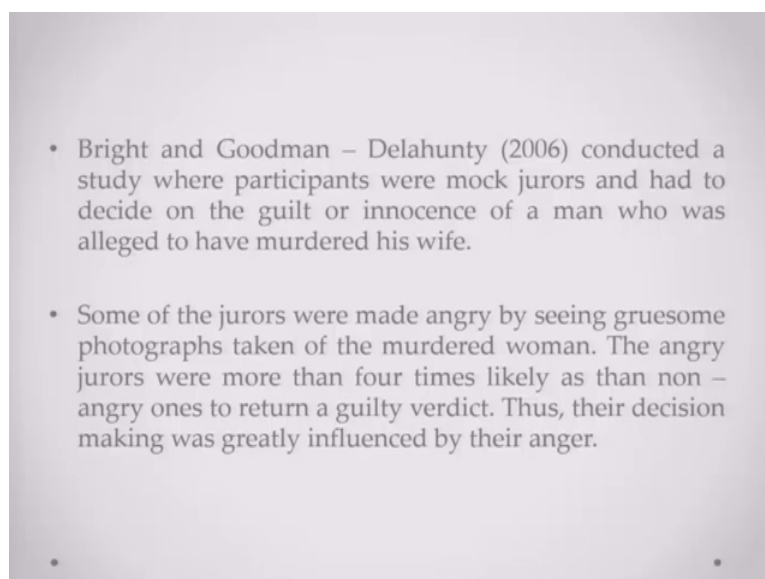
So, angry individuals the feeling you know they feel in control and thus they the kind of thing that they can determine their own destiny which makes them optimistic and more confident about the future. In contrast anxious and sad individuals they have much less perceived controls and they basically feel themselves at the mercy of fate you know whatever the situations will pan out we will have to live through them and those kind of things. So, as a result they are more pessimistic about the future they kind of do not really have a lot of positive things to look forward to in life. So, I mean that is just the contrast that you could make.

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Now it is popularly assumed that anger greatly reduces are ability to think rationally and to make sensible decisions. So, there is this quote from Ralph Waldo Emerson in a particular movie and it says anger blows the light out of the reason you know anger blows out the light of reason. So, the idea is if you are angry you are not a capable of making rational correct you know properly measured judgments let us look at some evidence about this.

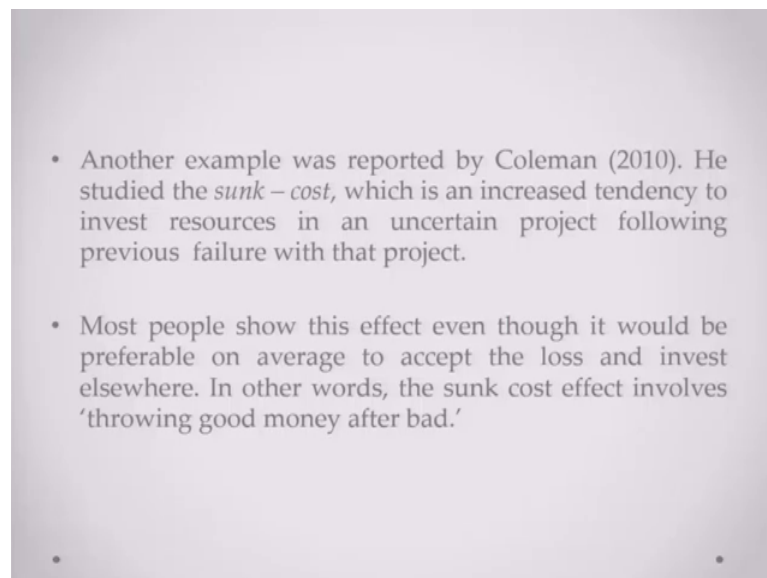
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So, Bright and Goodman - Delahunty in 2006 they kind of they wanted to conduct a study where participants for mock jurors and they had to decide on the guilt or innocence of a man who is alleged to have murdered his wife.

Now, so, this judgment was supposed to may supposed to be made, now some of these jurors will basically made angry by showing them gruesome photographs taken of the murdered woman the angry jurors you know. So, the kind of anger is induce what was found was that is and the jurors were more than 4 times likely you know than the non angry ones to avoid guilty verdict. So, it is certain that the decision is you know decision making is being influenced by the fact by the fact that they are angry so, that is one evidence.

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Another example was reported by Coleman in 2010 fairly recently he studied the sunk cost heuristic you know sunk cost is basically it is an increased tendency to invest resources in an uncertain project following previous failure with that project. So, if you think here this is not really training out well, but you kind of still pumping in money in those in that project. So, that you know it does not all go bad it is like you know putting good money after bad, but some money has already been lost, but you kind trying to put in more money, so that you recover that aspect.

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- Coleman (2010) used a hypothetical problem in which students decided whether to do a course for which they had paid in advance or (at no extra cost) switch to a course offering a better chance of success.
- The key finding was that the sunk – cost effect was greater in angry participants than in those in a sad or neutral mood. Thus, anger increased the tendency for students to make a suboptimal decision.

So, Coleman in 2010 used hypothetical problem in which the students could be decide whether to do a quotes for which they had already paid in advance without an sunk cost or they could switch to a course offering a better chance of success. So, this was the thing the key finding was that the sunk cost effect was greater in angry participants than those in a sad or a neutral mood. So, thus and it is kind of increasing the tendency for students to making to make a sub optimal decision. So, they are kind of you know following the sun cost heuristic.

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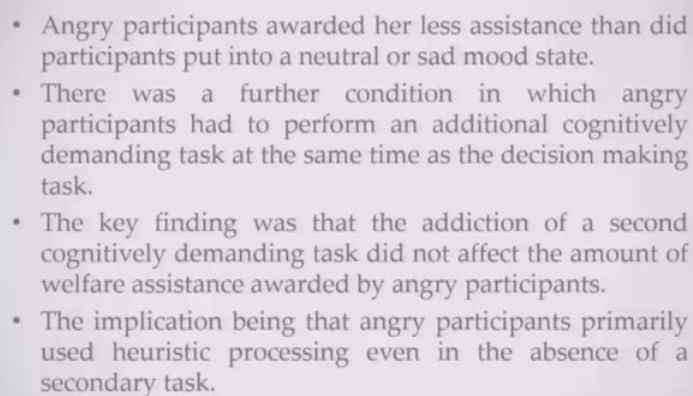
- Why does anger often impair the quality of decision making?
  - Acc. to Litvak et al. (2010), anger leads to increased use of heuristic processing and reduced used of analytic processing.
- Convincing evidence that anger increases the use of heuristic processing was reported by Small & Lerner (2008).
  - Participants were given a decision making task; and had to decide how much welfare assistance should be received by a fictitious Patricia Smith, who was a 25 year old, divorced woman with three children.

Now, one could wonder one could ask this question and why is it happening that you know anger is impairing the quality of decision making. So, there are some answers which can be discussed.

So, according to Litvak and colleagues 2010 anger leads to increased use of heuristic processing we are talking about sad individuals using analytic processing. So, anger is leading to the increased use of heuristic processing and reduced use of analytic processing. So, what is happening is that they are not weighing the options completely they are kind of in some is probably overconfident and they you know optimistic in their judgment. So, they are kind of taking shortcuts and just doing what the anger is asking them to do.

Convincing evidence that anger increases the use of heuristic processing was provided by Small and Lerner in 2008. So, it was a task where participants were giving a decision making task and they had to decide how much welfare assistance was should be received by fictitious a fictitious character who was a 25 year old divorced woman with 3 children.

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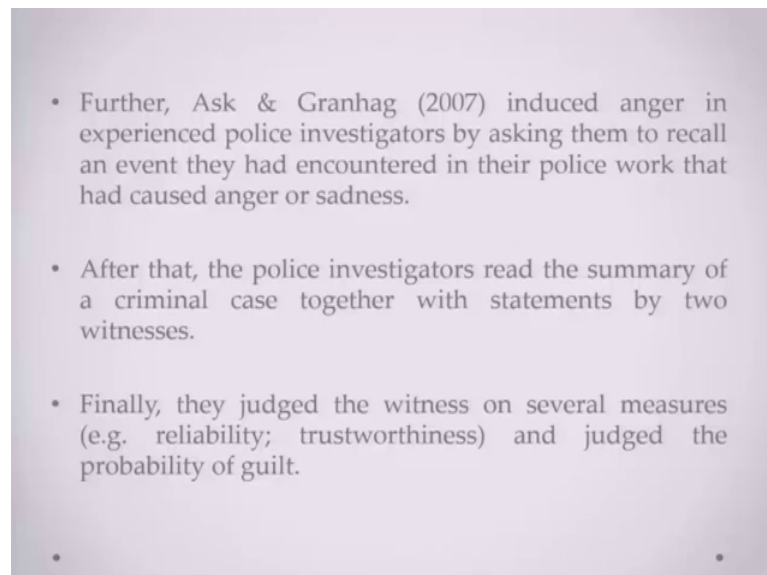
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- Angry participants awarded her less assistance than did participants put into a neutral or sad mood state.
  - There was a further condition in which angry participants had to perform an additional cognitively demanding task at the same time as the decision making task.
  - The key finding was that the addition of a second cognitively demanding task did not affect the amount of welfare assistance awarded by angry participants.
  - The implication being that angry participants primarily used heuristic processing even in the absence of a secondary task.

Now angry participants somehow awarded her less assistance they did not really look into the entire you know situation the, whatever the conditions were than the neutral or the sad mood state participants. There was also a further condition in which these angry participants had to perform an extra additionally cognitively demanding tasks, at the

same time as they were making these decisions this was basically done in order to check whether these extra tasks has you know coerces them to use a different method.

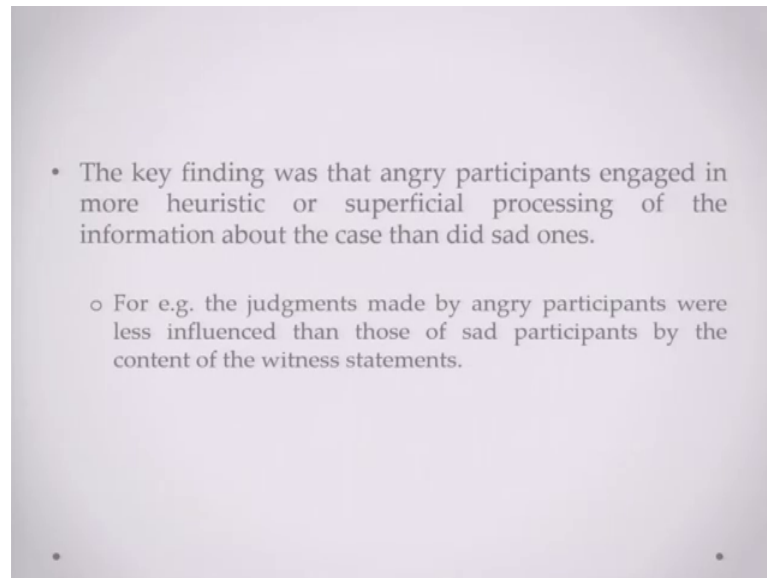
But the key finding was that the addition of second cognitively demanding tasks did not really affect the amount of the welfare assistance that this lady was awarded. Now this implication is the implication of this management setting is that angry participants primarily are using a heuristic processing even in the presence or absence of a secondary task. So, basically the whole point is that you know they just wanted to follow a particular and if a shortcut and they are actually going by it.

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- Further, Ask & Granhag (2007) induced anger in experienced police investigators by asking them to recall an event they had encountered in their police work that had caused anger or sadness.
  - After that, the police investigators read the summary of a criminal case together with statements by two witnesses.
  - Finally, they judged the witness on several measures (e.g. reliability; trustworthiness) and judged the probability of guilt.

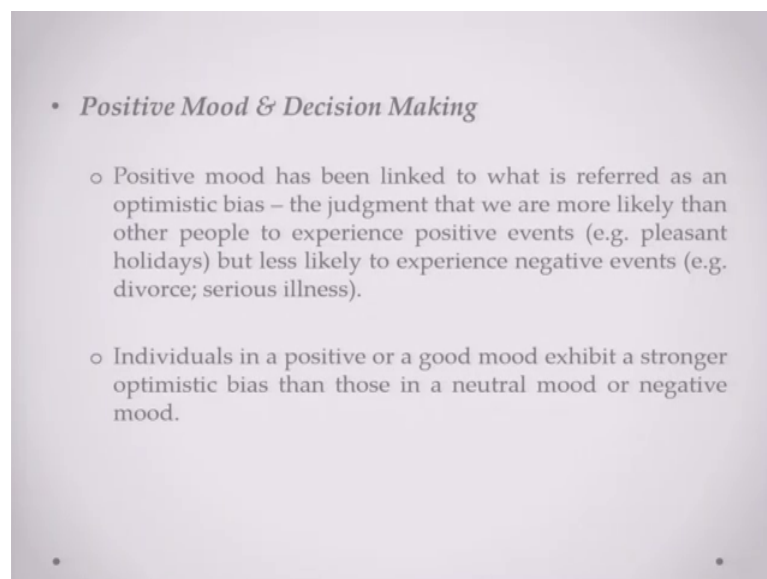
Now further ask and Granhag in 2007 the induced anger in experienced police investigators by asking them to recall an event that they had encountered during this police were and that would have caused anger or sadness so, 2 kinds of emotions are invoked. After that, police investigators read the summary of a criminal case together with the statements by 2 witnesses now fine they had to judge these witnesses on several measures like reliability trustworthiness and so on and they had to judge the probability of the guilt of the 2 among the 2 witnesses.

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Now, the key finding here was that angry participants engaged in more heuristic or superficial looking of the facts superficial processing of the information about the case than did sad one. So, here you can see how angry and sad people are processing the same information that has been given to them. For example, the judgments made by the angry participants for less influenced and those are the sad participants by the content of the witness statement they are just kind of made of their mind and they are not really getting into the detail of the statements.

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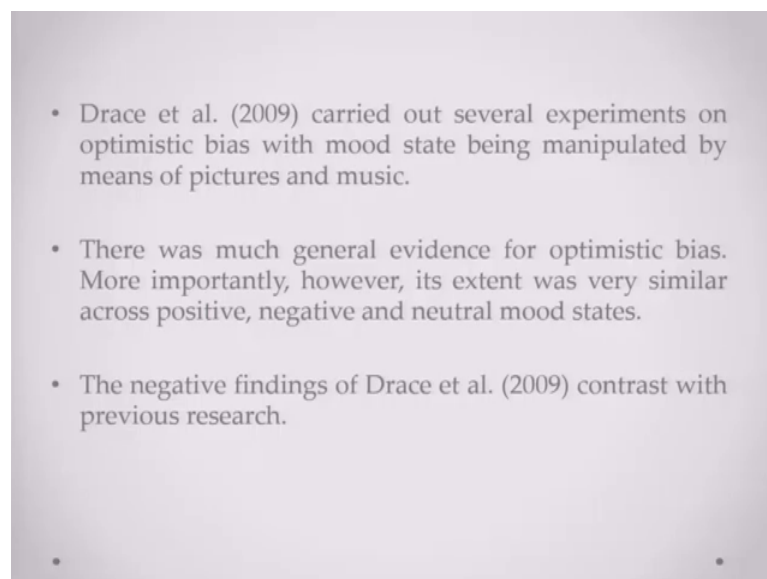


So, this is an proof of the fact that anger is not really a very conducive emotion to decision making. So, that that was about anger let us move to positive mood happiness optimism what does it do for decision making let us talk about that.

Now positive mood has been linked to what is referred refer to as an optimistic bias you know generally people over happier who are more positive they tend to show what is called an optimistic bias they judge you know the judgment is that they are more likely than other people to experience positive events, but less likely than other people to experience negative events.

Individuals in a positive or a good mood they would continuously try and continue this state they will try and maintain the state of happiness they will try and avoid anything that could actually you know end this happiness that could disturb this happiness.

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- Drace et al. (2009) carried out several experiments on optimistic bias with mood state being manipulated by means of pictures and music.
  - There was much general evidence for optimistic bias. More importantly, however, its extent was very similar across positive, negative and neutral mood states.
  - The negative findings of Drace et al. (2009) contrast with previous research.

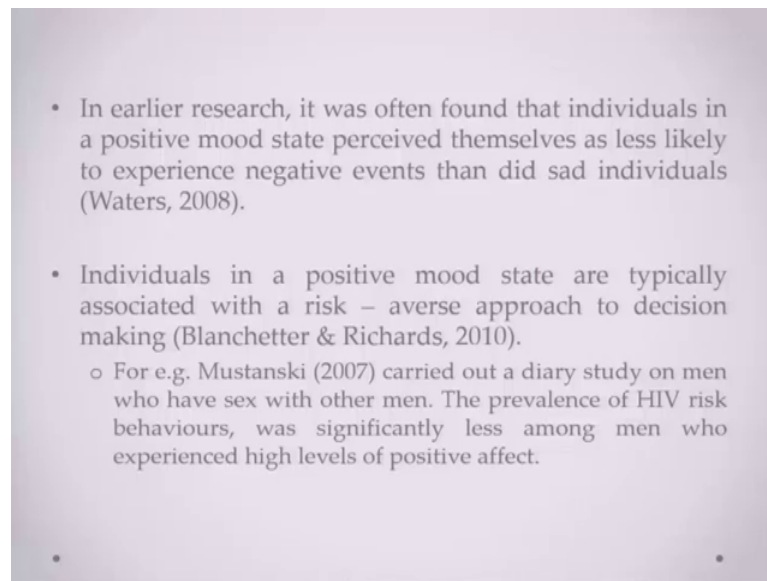
So, Drace and colleagues in 2009 they carried out several experiments on the optimistic bias with mood state being manipulated. So, the idea was they wanted to test the optimistic bias, but they wanted to manipulate the mood of the participant and see how this optimistic bias changes with different mood there was.

So, there was much general evidence and they kind of were using you know pictures and music to induce these moods there was much general evidence for optimistic bias in their study in the tasks they did more importantly; however, the extent of this optimistic bias

was very similar across both positive negative and neutral mood state. So, for people who are generally happy their optimism kind of extends across the board.

The negative findings of Drace and colleagues; however, contrasted with previous research. So, in this study you see there is no difference in the kind of optimism bias that is existing across people who are having positive states negative states or even neutral states.

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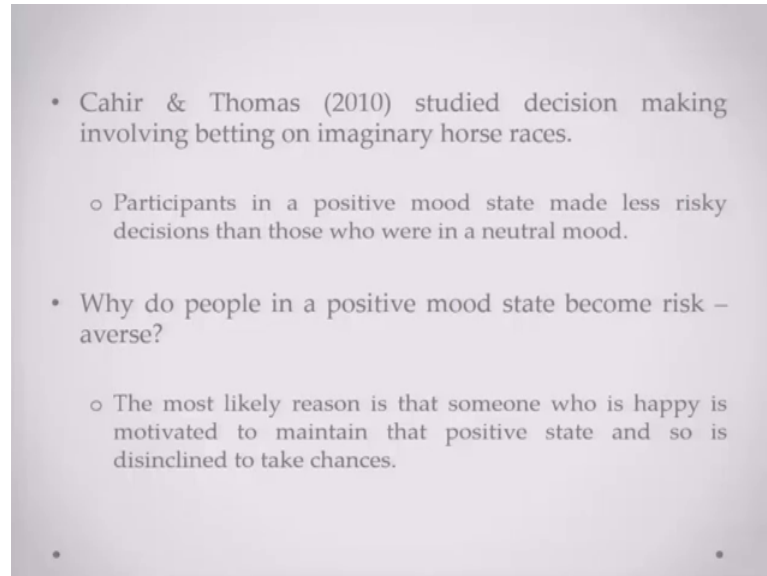
Now, that is not really what the literature had been saying till recently. So, it is just one negative study whether earlier research has been showing consistently that individuals in a positive mood state perceive themselves as less likely to experience negative events than did sad individuals. So, that is something that is established and what is kind of wrote about this in 2008.

Also individuals in a positive mood state are typically associated with the risk averse approach to decision making. So, they do not really want to take risk that could disturb their current state of happiness for example, Mustang ski in 2007 he carried out a diary study on men who were having sex with other men and you kind of you know we are trying to see the prevalence of HIV risk behaviors.

They found that the HIV risk believer was much less among the men who experience high levels of positive effects. So, they were actually taking care that they do not get the

disease taking all the precautions that were supposed to be taken in order to avoid ending their happy state. So, that is that is interesting to look at is not it.

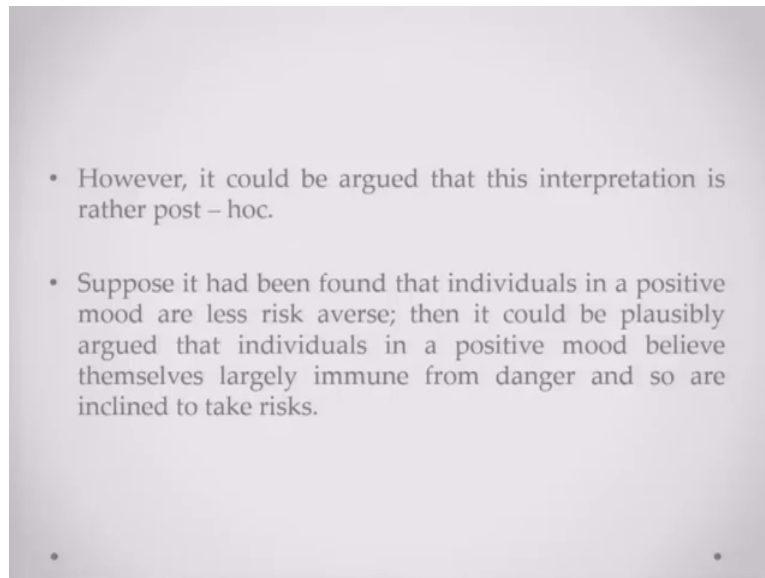
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Now, talking to talking about a different study Cahir and Thomas in 2010 they wanted to study decision making involving you know imaginary betting on horse races. So, they found that participants in a positive mood state made less risky bets, you made less risky decisions than those participants who are in a neutral state or in a sad emotion.

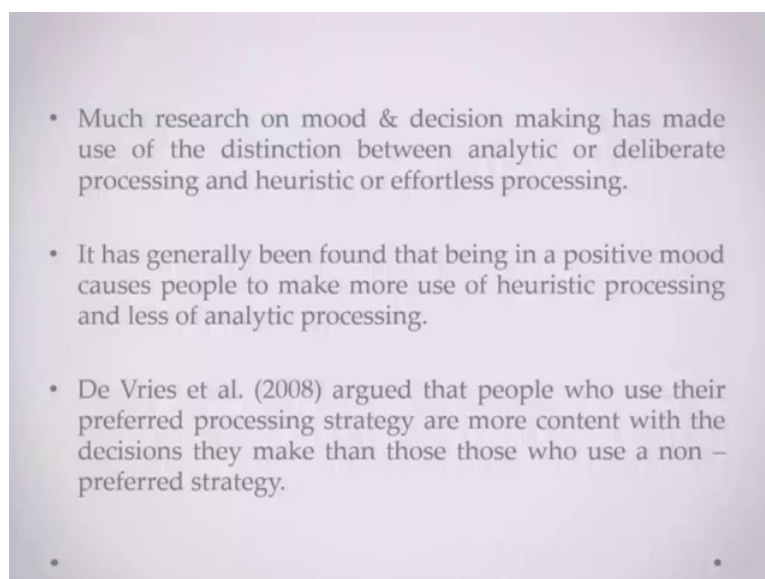
For example, why are people why are people in positive state not taking risk why are they becoming more risk averse to resume that we are sad people are going out of their way to take risk 78 percent of them kind of choosing job A the more riskier job why are. So, happy people not doing that what is the reason is you know the most likely reason probably is that someone whose happy is actually motivated to maintain the state of happiness they would do anything to avoid being any less happier and that is probably what is you know kind of summing up these people's behavior.

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So, but the thing is that you can you know somebody could argue that this is rather post hoc kind of in explanation and you see the result when you kind of saying that this is happening because. Suppose it had been found at individuals in a positive mood are less risk averse; then it will be plausibly argue that individuals in a positive mood believe themselves largely immune from danger they are so very confident, you know much like the angry people they are so very confident that they are inclined to take more risk with again there is not a real really clear evidence weighing on either side of this you know balance.

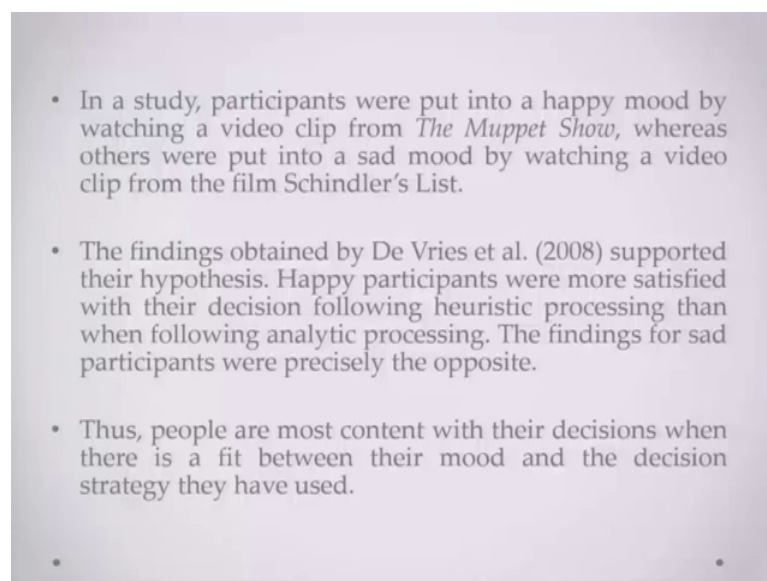
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So, that is, but much research on mood and decision making has made use of the distinction between analytic and deliberative processing and you know heuristic processing. So, the idea is they actually wanted to test how people in positive mood make their decisions.

So, De Vries and colleagues they argued that people who use their preferred processing strategy are more content with the decisions they make than those who are you know using a non preferred strategy.

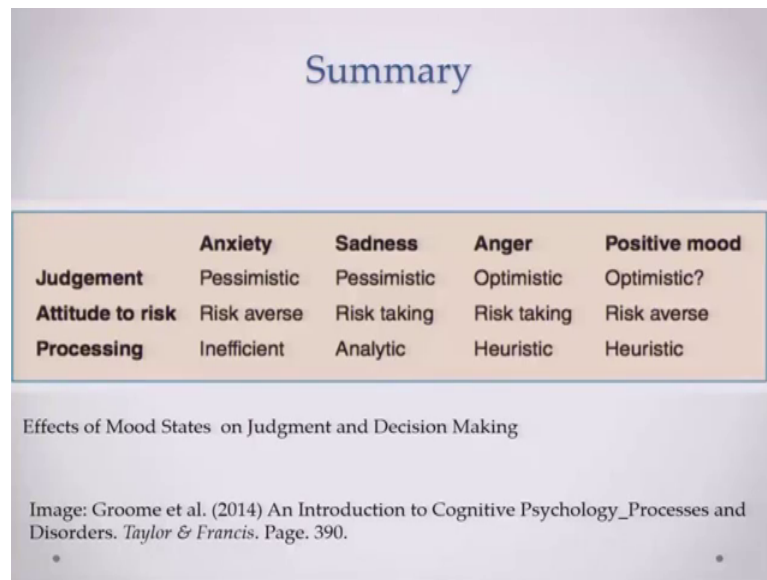
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- In a study, participants were put into a happy mood by watching a video clip from *The Muppet Show*, whereas others were put into a sad mood by watching a video clip from the film *Schindler's List*.
  - The findings obtained by De Vries et al. (2008) supported their hypothesis. Happy participants were more satisfied with their decision following heuristic processing than when following analytic processing. The findings for sad participants were precisely the opposite.
  - Thus, people are most content with their decisions when there is a fit between their mood and the decision strategy they have used.

So, they did this study participants were put into a happy mood by watching them by showing them a video clip from the movie *The Muppet show*, from the serial the Muppet show, whereas others were put into a sad mode by showing them a clip from *Schindler's List*.

The findings that is and that De Vries and colleagues obtained supported their hypothesis happy participants would more satisfied having made you know the heuristic intuitive judgments and the findings were sad people were precisely though opposite they were happier if they were kind of you know making use of the analytic and deliberative process of making decisions. So, people are generally you know more content with the decisions when there is a fit between their mood and the strategy they are you know they are employing.

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	<b>Anxiety</b>	<b>Sadness</b>	<b>Anger</b>	<b>Positive mood</b>
<b>Judgement</b>	Pessimistic	Pessimistic	Optimistic	Optimistic?
<b>Attitude to risk</b>	Risk averse	Risk taking	Risk taking	Risk averse
<b>Processing</b>	Inefficient	Analytic	Heuristic	Heuristic

Effects of Mood States on Judgment and Decision Making

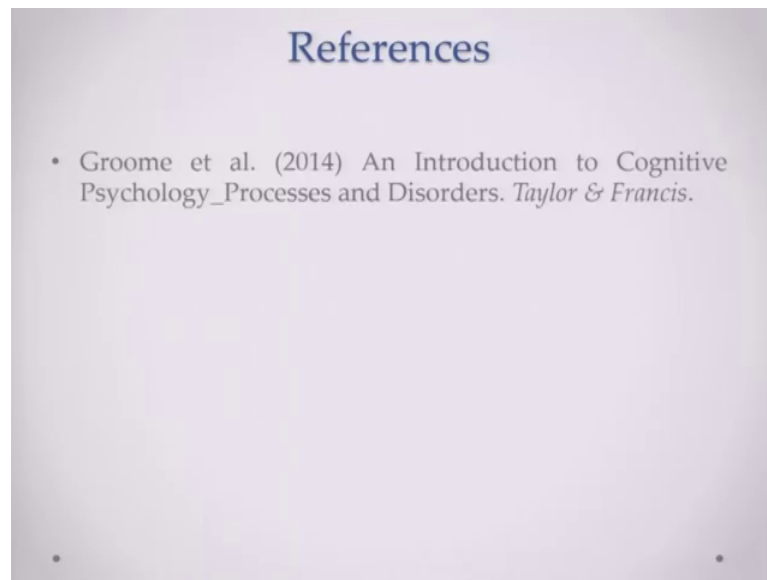
Image: Groome et al. (2014) An Introduction to Cognitive Psychology Processes and Disorders. Taylor & Francis. Page. 390.

So, let me summarize this for you we have talked about 4 kinds of emotions anxiety, sadness, anger and positive mood and there are 3 kind of aspects we have talked about what kind of judgment these people would make? What is the attitude towards risk? And what are the processing styles they are following? So, you can see here anxious people pessimistic judgment risk averse inefficient heuristic based processing.

Sad people pessimistic judgments risk taking behavior because they want to come out of it at any cost, but they follow analytic and deliberative processing. Angry people are generally optimistic they are risk taking and they kind of follow the heuristic kind of approach heuristic approach to processing.

Now positive mood people are they are they optimistic are they happier, what is the case the generally optimistic, they are also risk averse and they are also using heuristic methods of you know making decisions.

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So, this is from my side about emotional states mood states and decision making we will talk to you above in the next class about different topic at again in cognition and emotion.

Thank you.