Introduction to Cognitive Psychology
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Lecture – 06
Models of Perception-02

Hello we are back again with this session on Perception. Now in the last session we looked at some models of bottom up processing where we define perception through a data driven process. So, bottom up processes actually help in perception or predict perception by looking at how perception gets built from stimulus single stimulus and addition of the single stimuli gives rise to the perception.

Another modular perception which is prevalent in cognitive psychology is the top down model of perception. Now at the beginning of this lecture I gave you the difference between what is the top down and the bottom up process of perception the top down process is a theory driven process, where expectations of people generate perception whereas, the bottom up process is a data driven process where characteristics of the stimuli certain features of the stimuli lead to whatever perception, we are looking for or whatever percept or the meaning that we are generating from the stimulus which is coming from sensation.

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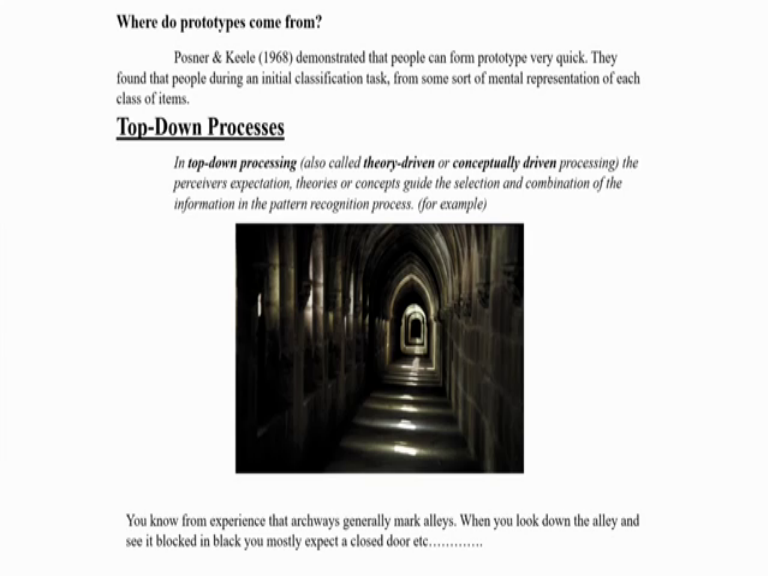

So, let us begin a study of the top down processes of perception. The top down process of perception also are also called the theory driven or conceptually driven process of perceptions. Here expectations of the perceiver are the main responsible feature for the development of meaning or the development of percept from the sensations cha passed on through the visual system.

So, the whole process of perception right from the meaning of the percept to pattern recognition has on the back side or on behind these processes the expectation of the viewer. Look at this alleyway the same thing that we saw in a model or in the first model of bottom up processing. Now there the explanation of this visual scene was given in terms of the structure of the alleyway, in terms of the shading the light which is falling on this alleyway, the kind of windows it has the kind of background it has and all those features combined together gave a meaning of what this picture depicted.

In the top down process we again look at the same alleyway and we try to explain the meaning that is generated through the top down process; 2 things that are evident that are really the main frame or the backbone of the top down process is the expectancy effect and the context effect. So, the basically the context effect the effect of context in which a perception is made and the expectancy of the viewer are responsible for the top down process.

So, coming back to the explanation of this visual scene using the top down process this visual scene is explained in terms of memory or in terms of the idea that people would have viewed structure similar to this or maybe this particular structures somewhere.

So, basically in terms of in terms of the top down process the experience that are this is an archway with Margulies comes from the fact that, you expect certain kind of certain kind of visual features a certain kind of objects in the visual field based on your memory based on your previous experience with visual scene like this which you have seen in the real world.

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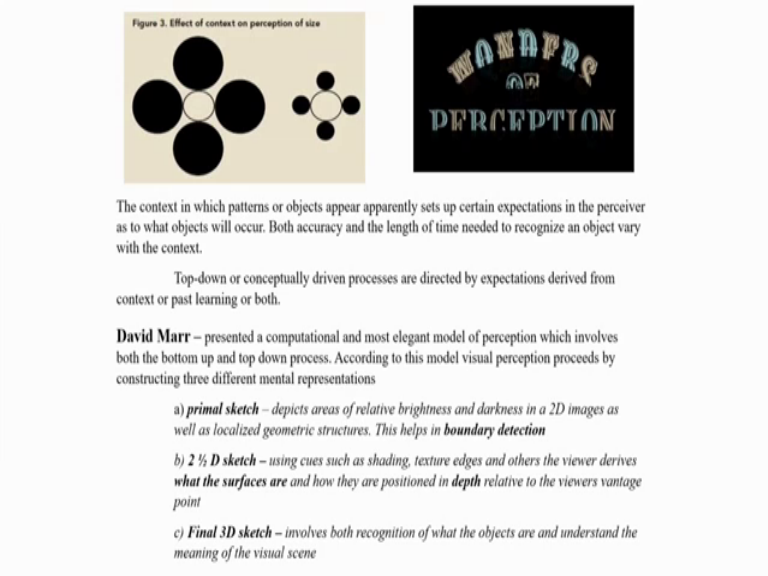

As I said the 2 factors which the bottom up process cannot explain in terms of perception are expectancy effect and context effect. Let us look at context effect let us look at the figure on the top as you can see if I ask you the question whether the size of the middle ball the ball or the circle at the middle of both the figures are the same. And most people would actually get up with this answer that they are not same, but amazingly the size of both the balls or both the circles which are in the middle of the black circle is same.

The reason being that the one on the left has bigger balls and in the context of that it appears the circle in the middle is smaller in size whereas, it is not and on the right since we has smaller balls surrounding the circle it seems to be different. So, context where an object is in the environment has a lot to do with perception.

Similarly, the figure on your right if I show this figure most people would go ahead and read this figure and the actual meaning of this would figure would be wonders of perception. Now amazingly word wonders of perception is not clear, but what really happens is the brain sees that or from your past experiences you see that this is the most plausible this is the most plausible answer which is out there.

And so one wonders of perception is being is being interpreted because you expect the brain expects and the brain sees this this particular a idea that it should be wonders of perception. Also since this is a class of perception. So, we do see the bottom half of this figure to be meaning perception because the context in which we are studying is

perception. So, should be wonders the perception. So, these are the 2 figures are these are 2 examples of how perception progresses or pa meaning of perception is done through the top down model.

The context in which a pattern or object appears apparently sets up certain expectations in the perceiver as to what objects will occur. Now both accuracy and the length of time needed to recognize an object vary with the context. So, the more complex the context the more time it will require for somebody to go ahead and make the meaning of the perception.

Now, elegant and computational model of top down process of perception was given by David Marr; now what this Marr's theory or Marr's idea is that the model of perception proceeds by cons perception proceeds by constructing mental representations or mental schemas. Now perception Marr's believes is a special purpose computational mechanism which progresses through certain modules and these modules are the module for analyzing color the module for analyzing motion the module for analyzing shading and this part of the theory or this part of his idea is the bottom up process.

He further says that with these modules the modules for basic information about the stimulus combines with the module for expectancy and context and that generates perception. So, in brief Davis Marr model is basically a model which combines both bottom up and top down processes to explain perception. What Davis Marr believes that visual perception is are actually mental representation or mental sketches based on 3 kind of representations which exists within the observer within the person who is perceiving.

Now, there are 3 steps to it there are 3 different steps to it when you perceive something when somebody sub appears perceive something, the first step takes place and this is called a perceptual or the primal sketch in the primal sketch depicts or from it from the primal sketch one can get information related to the relative brightness and darkness 2 D images localized geometric structures and boundary conditions.

So, this kind of a basic information is related to the 2 dimensional world related to the basic brightness and darkness and geometrical structures as what is gathered up from the primal sketch. So, according to Davis Marr model perception progresses through a complete through a list of steps and the first step the primal sketch is made and this

primal sketch is actually a 2 dimensional model or a 2 dimensional percept, which has information on to it relate relating to brightnesses and darkness and geometric structures.

Now, once an which basically helps people in detecting boundaries between objects in figures within figures and backgrounds. Now once the primary sketch or the primal sketch is ready the next step is constructing a 2 and a half D sketch now in the 2 and a half D sketch using cues from the environment again. So, both step one the primal sketch and 2 and a half D sketch are actually the bottom up processes of perception or the bottom a part of perception which this model a goes ahead and explains.

So, the first 2 steps actually uses date data from the stimuli. So, in 2 and a half D sketch what really happens is that shading and texture and other information for example, surfaces and relative depth are gathered from the environment or from the environmental cues onto the percept and that gives an idea about where the object is in the environment where the localization of the object and the kind of object it seems to be.

So, the first to step in Mars Marr's theory of perception are bottom up process. Once a 2 and a half D sketch is made at the point when this sketch is complete, viewers have an idea of where the object is what does it look like what are the basic features of this object what are the basic characteristics like the color the shape the shading the boundaries the brightness the darkness those kind of information's get available to the visual processing area.

Once these 2 steps are complete a third and final step called the final 3 D sketch is produced where recognition of an object is made in terms of the context and expectation. Here the mean meaning of the visual scheme and the recognition of object is made and this happens through a top down process.

So, basically mars model combines both the top down process and the bottom up process for making any kind of percept and in very simple words, what his model suggests is during the primal sketch and a 2 and half D sketch information relating to stimuli from basic 2 D information to some sort of 2 and a half D information, which is related to shading localization of object in the world depth perception relative depths are gathered.

In the final step of his process which is a top down process which is a top down method what really happens is that viewers expectation and memory come into play and leads

people to perceive to make a final percept to make a final recognition of out of the object in front of him of what the object is and this information is derived from memory.

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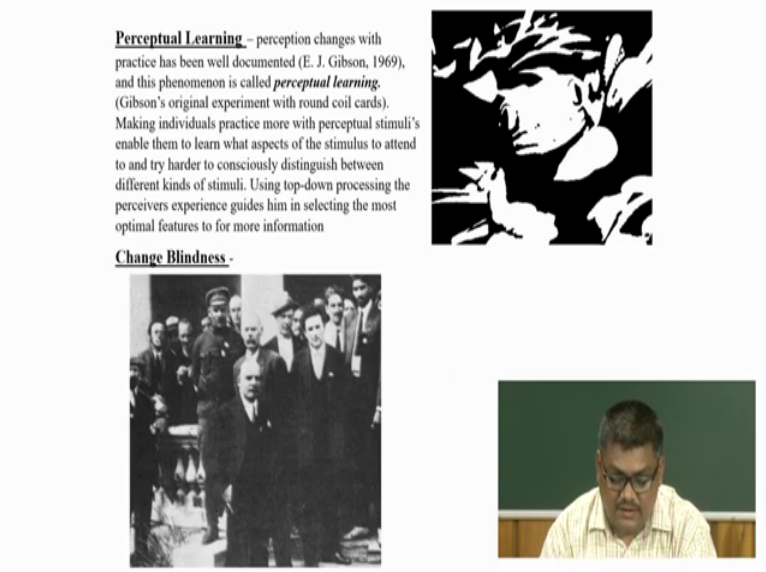

Now, some examples of how this top down process really works I am going to relate now one of the best examples of or one of the best examples of the top down process is something called perceptual learning. If you look at the figure on the right side when you look it for the first time you would not be able to see anything, but as you move along as you go ahead and see it time after time for multiple times what starts to emerge is a figure of a person and happens, because as you keep on seeing it a number of times some meaning is generated out of it. So, what perceptual learning really means is that perception changes with practice as we go on practicing as we go ahead and practice a lot what really happens is that we are able to generate perception.

Now, very recent experiment was done by Gibson to prove perceptual learning what Gibson really did was he did an experiment a very simple experiment in which a coil like this was given to subjects this kind of coil was shown to subjects.

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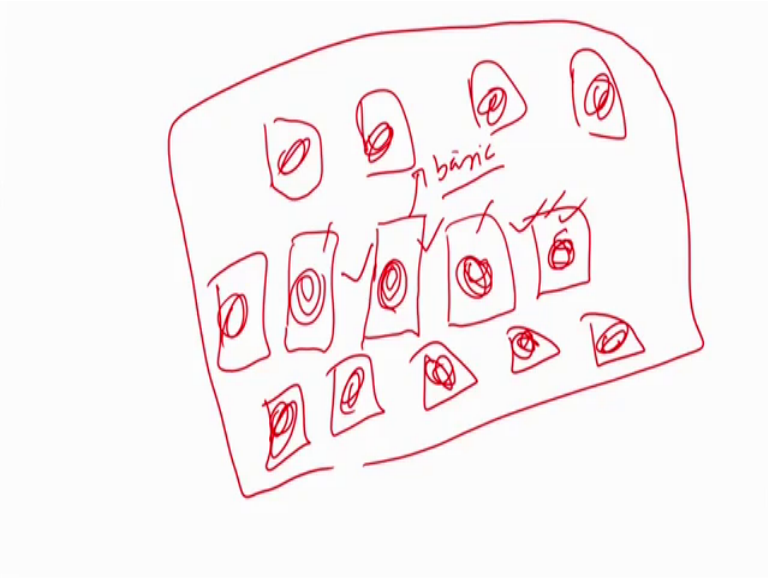

What subjects were required to do is to remember these later on subjects were shown 4 different coils of this type, but these have different orientations. So, these kind of coils. So, this is my basic coil and these coils which differ from the basic coil in some or the other way in terms of orientations in the term of number of coils in the term of where the starting point is was shown to people. Later and they were asked to report whether these 4 coils how many of these 4 coils actually matched the basic coil.

Later on a number of different coils with different orientations were shown to subjects and they were asked and within this this whole picture was hidden 4 different 4 versions of the initial basic coil. And subjects were asked to reproduce how many times did they actually go how many copies of the original coil was available. Now it was seen as that with number of practices that the increase in the number of practices subject starts making less and less error and when feedback was taken from subject, what happened is most subjects related to the fact that as they kept on practicing as they kept on seeing the basic coil and practicing it they started learning that or started observing those features of the stimulus which they did not see it at the time at the first time.

So, as they came familiar became familiar with the subjects more and more they started noticing parts of the stimulus, which they had not noticed on the first advent and then the first interaction with the stimulus.

So, this is an interesting feature or this is an interesting I would say an example of top down process, where what happens is that the more number of times you interact with something the more features you would see and your expectations are developed accordingly and more easier the learning becomes.

Another interesting thing or another interesting example of top down process of learning of perceptual learning is something called change blindness. Now it is the inability to detect changes in objects or seen especially when given different views of that object. So, basically if something is shown to you and many versions are many different versions of this particular object is shown to you from different angles people are not able to detect this change and this is what is called change blindness?

Now, look at the figure which is on your left and you would see that one of the person right here changes, but if I do not tell you this that this is going to change you will not be able to observe.

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Similarly, if you look at the figure here what happens is the person at the back of at the back of the screen will change, but if I do not advise you or if I do not give you this clue that is going to change if you do not expect it is not going to change.

Now, change blindness is a direct example is one of the best example to show that the brain sees what it wants to see an expectation place a lot of role into perception you have

seen a lot of movies. So, what really happens is that often you would have found that in movies there are scenes which are inconsistent with the movie and no matter how many times the editor cuts it. So, there are parts of the movies which still remain.

But most people do not see these deviations in in the scene these deviations in the movie example in one movie in one scene there was a white vase and in a next scene the vase disappeared and this was quite funny, but the thing is that this was this particular thing was not edited I mean there vase got away or the what vase not shown in the second scene whereas, the third scene the vase reappeared. So, somehow the editor who was editing the movie forgot this and people since when they were watching the movie they were actually watch watching the gist of the movie.

So, they had in a certain expectation and since this vase which was there in front of them it was not in their expectation or they were not expecting it or they did not see that much. So, they could not notice this change. So, change blindness is another interesting feature of the top down process.

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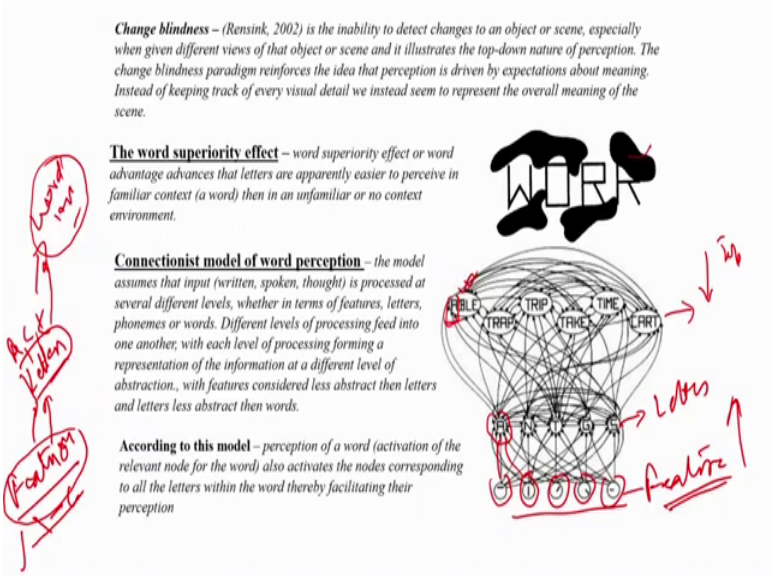

Another interesting example of the top down process is something called the word superiority effect look at, the word which is given to you on the right what is this word it seems like the word is WORR, but it is not as most people if I give write most people who know English and most people who are literate if I give them they will say it is WORK. Now since this part that you are seeing is covered by a black spot and so

expectation believes that since WORR is no word and people will not go ahead and write. So, this is since I am talking about word superiority this has to be a word and it has to be work. So, that is another interesting phenomena work superiority effect is another interesting phenomena which suggests or supports the idea that top down processes of perception exist.

Now interesting experiment was done to test word superiority effect.

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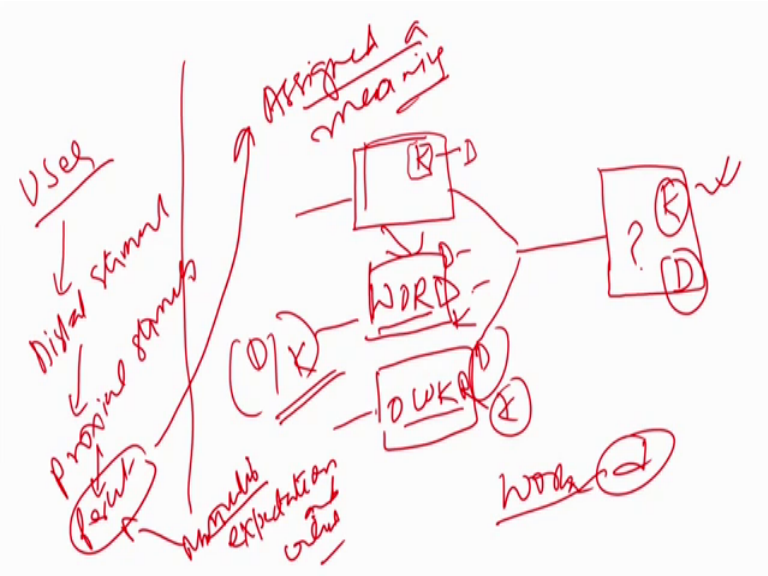

So, here what happened is people were shown interface like this in which the letter K or D was presented to them for very brief periods of time. And later on they were tested the letter K and D was presented to them and they were tested in the sense that whether or in which context do they or are they able to un to identify this K and D.

So, the experiment ran in this way initially they were letter k or D was present to people for a very brief period of time. Later on they were shown this kind of 3 different segments in which. In the first segment the blank side was represented and in the slide there was a single letter K or D written on it and people were asked to recall back whether K or D was presented.

In the second case a word was written a part of the word for example, the WOR was written and this D or K was presented to people and they were asked to report that whether D or K, the whether D or K was presented in the initial design. And later on a

non-word was presented to them and it was asked whether the D or K occurred in my presentation slide. And interestingly it was found out that when this D or K was presented in the context of a word it was produced or more less number of errors are generated by participants which mean that in the context of a word perception is easy.

Another interesting feature or example of what superiority if effect or top down processes of perception is something called the connectivist model of word perception. Now what this model says is that per the perception of word actually goes through or progresses through several stages, whether it is word or whether it is a sound which is perceived the perception happens through several stages. And these stages can be either excitatory or inhibitory for example, what perception starts at the level of features where at the first step the features of the word for example, whether it is a curved line whether it is a slanted line whether it is a dash line a circle is presented or is part of the word is first perceived.

And from here from the feature level it goes to the little or the level of letters. Here these features are combined together to form individual letters for example, a c k and so on and so forth and at a higher level there is a word level where the actual word is basically being presented. So, this kind of perception really takes place.

Now, what is the what is the reason or what is the meaning of all this it basically says that from the feature level to the letter level a lesser number of connections are there whereas, from the letter level to the word level more number of corrections are there. So, what really happens is if the perception happens of the word level it is easier for people to perceive letters it or then, when it is at the level of features what really it says is that perception of a word the activation of relevant node for a word activates the node corresponding to the letter within the word thereby facilitating their perception.

So, for example, if it is able that I am looking at if a word is able that I have to see what happens is this kind of connections start this kind of this is the feature level. So, the first identification of first perception is the bottom of process this starts at this level and from there this is called the letter level here this is integrated together. So, for example, if I am looking for a the word a which is not present here. So, b at least presented to you a is not presented and if I am looking at whether a is presented or a it should be the word here or

not and if a is presented to you what really happens is that these all these features are evaluated.

Now, since a does not has this feature. So, this connection from here to here is an inhibitory connections whereas, since this is present in a this is an excitatory connections and. So, since these with these many features or number of letters can actually be generated for example, a and T G c. So, what happens is for each of it we will have an excitatory or inhibitory connection.

So, those connections which suggests that this is the part of the word that you are looking at or part of the feature of the word that you are looking at is present will be excitatory connections in part of the word, which is not for example, this is something which is not present in a and. So, these connections from here will be inhibitory.

Similarly, from these letters the on this word so if a is not present a is the most apt answer here example NBLE is not a word. So, a is the most possible answer TBLE is another no word and. So, T is not a fit here GBLE is no word. So, G is not fit here and SBLE is another no word. So, basically the only word which is available in this case is a and so a is the only perception which happens and so this happens through expectation.

So, at this level the first if the perception happens from this level it is generally a top down process and if the perception happens from this level up it is generally the bottom up process. So, what mainly top down process suggests is that it is not only the stimulus features of the words that helps us in perception the word perception progress is not only through basic features of the word it also progresses through something called the level of expectation. That is why when we actually read in terms of reading when we are reading something even if some word or meaning of word is not clear to us based on the context on where the word is we generate the meaning and we are able to understand the meaning of the sentence.

So, this is this is an expectancy effect where what happens is the context in which the word is presented where it appears gives us a meaning of that word or some bleak meaning of this word. So, this is the top down process of perception where what we actually looked at those features of the word are those parts of the word where perception happens through peoples expectation and context effect. In what context a word is presented what is the expectation of people that helps us in the overall perception.

Another interesting theory which was given or which was proposed by someone called J J Gibson is called direct perception. Now it is an interesting theory of perception which says that the user does not have to do anything for perception. Remember most of her idea of perception starts with the fact that the user or the perceiver gets information from the distal stimulus, does something on the proximal stimulus generates a percept and dependent on the motivations or dependent on the expectations and context this percept is assigned a meaning.

Which means; that in this case up till now the theory suggests that the user does something on to the incoming stimulus and based on that a meaning is generated? Contrary to this view a theory of.

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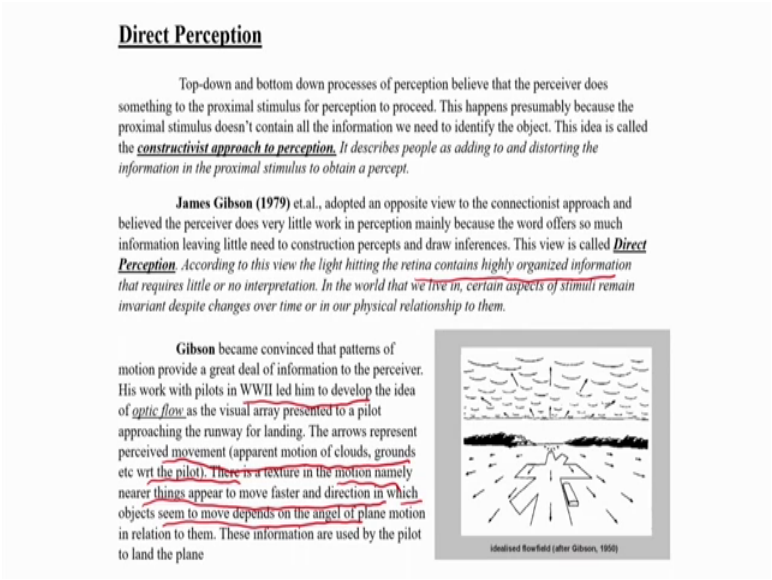

Perception was presented by J J Gibson which is called the theory of direct perception what does the theory say; this theory basically goes ahead and says that the world has a lot of information.

We do not need to do anything to that information for perception to progress. So, in a way what J J Gibson goes ahead this says is that perception is a direct process and the environment that we are in the environment, that we are perceiving has enough information onto it enough information onto the onto the onto the proximal stimulus which is falling on the retina.

So, the proximal stimulus which is part of the distal stimulus which is falling on the retina has. So, much information and the user has to actually go ahead and perceive he does not have to make a percept does not has to use context effect, it does it has to use some kind of a building a process using or using Marr's method Marr's theory of perception, but the environment on it is own the user can sit back and relax the environment provides enough information for perception to progress.

So, the top down process and bottom up process of perception believes that the perceiver does something to the proximal stimulus for perception to proceed. So, it is called the constructivist approach it describes people as adding to and distorting information in the proximal stimulus to obtain a percept. So, what the user does is adds or subtracts information from the proximal stimulus to generate a percept which later on through the process of bottom or top down combine gives up the meaning Gibson adopted an opposite view to this to the connectivist approach and gave up his idea of something called direct perception his.

Gibson believes that the perceiver as I said has nothing to do or very little to do in perception according to this view the light hitting on the retina contains highly organized information and the information that is falling onto the eye onto the retina is. So, great or is has so much information or has. So, much bits of information that the observer is not required to do anything.

Now, to prove whether Gibson was right whether observer does not require to do anything or another observer does not require any kind of interpretation; or any kind of work on to the proximal stimulus to generate the percept an experiment was done to prove this and this experiment was done by someone called Johnson in 1973.

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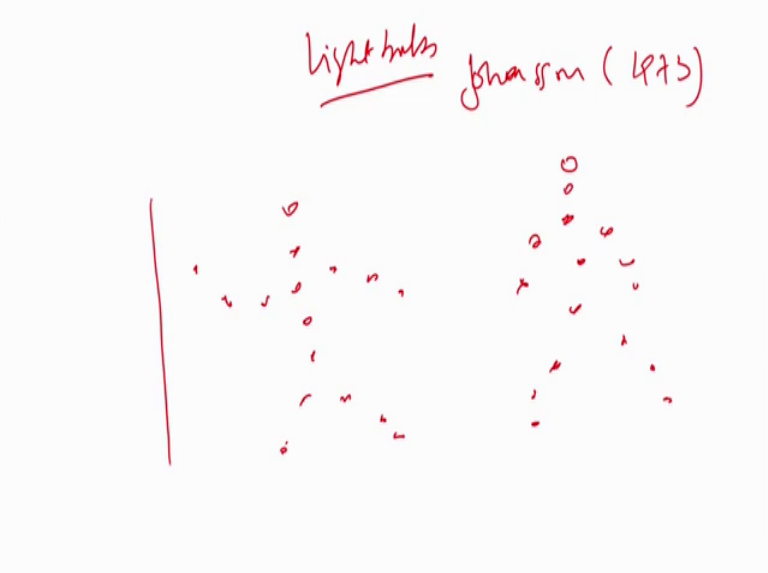

So, Johnson 1973 he did an experiment he did an experiment with light bulbs what was the experiment. So, what he did what Johnson really did was that he attached light bulbs to actors. So, these actors actually wore the light bulb. So, these are 2 actors and they have light bulbs attached to them. So, they are in 2 different configuration can assume that these are light balls. So, when an experiment like this was done these actors were actually taken into a dark room and in this dark room these actors were asked to do several pose poses and take several processes do several acts.

There were observers who are observing this particular people or these actors who were wearing light bulb shirts and from just from the way they acted just from the movement of the light bulbs, they were able to perceive or they were able to generate meaning or tell exactly, what was going on what was the actor doing this was not the only amazing fact about it.

What actors could also tell or what observers could also tell from the actors who were acting was whether this actors were males and females and kind of other specific stimulus. It basically means that with very least information available from the environment with not building any information actors, by just looking at observers by just looking at the actors acting or displaying certain forms or displaying certain acts, they were able not only detect who the actors were or what are the act they were doing, but also the gender of the actor the kind of act they were doing the kind of movement

that they were doing and several other features of it and. So, this particular experiment really proved that we really do not need a lot of information processing for perception to takes place.

But there is caveat to the Gibson theory it is not always correct the explanation which has been provided is that the bottom up and top down processes actually allow cognitive structures to see what the perception is whereas, the Gibson in view actually tells you to act in certain ways to adapt that information and act in certain ways. So, this is the difference between the Gibson in view and the view of the bottom up and top down processes.

So, basically what Gibson design or Gibson theory comes up and says that he developed the Gibson developed his theory of direct perception when he was training world war 2 pilots and what he realized or he gave the concept of optic flow if you look at the stimulus here what he did was and I in a number of experiments with pilots who were taking training or who were going ahead and landing planes what Gibson explained that the pilot when he sees information, when he sees out of his windshield he gets enough information from the environment, which is approaching him the texture the structure the kind of movement, which is there the ground movement the ground color all these information was enough for to tell the pilot of how to land the plane. So, what Gibson proposed is that the idea of something called optic flows or visual arrays.

And as you can see here this is a pilot who is landing and when he is landing just before landing he sees all this information about texture structure kind of relative speed for example, things which are closer to the pilot will move at higher speeds than the then the things which are far away and these kind of information's, which the pilot gets is enough for him to land the plane he should not be or he need not be concentrating on information which is really providing by his display system. So, that is where he gave this idea of optic flow there.

So, the arrow in this particular thing represent perceived movement the apparent motion of clouds ground etcetera with respect to the pilot now there is a texture of the motion namely near as things will appear faster and directions in which object seems to move opposite depends on the angle of plane and movement. So, this particular example was

one of the best example which Gibson used to propose the idea that there is something called direct perception.

The observer does not need too much information the observer does not need to work on the information, which is being which is being presented to him the environment presents a lot of information to him and that information the observer only has to understand that information not even make meaning out of it and just follow that information and that is what Gibson's idea of perception direct perception was there.

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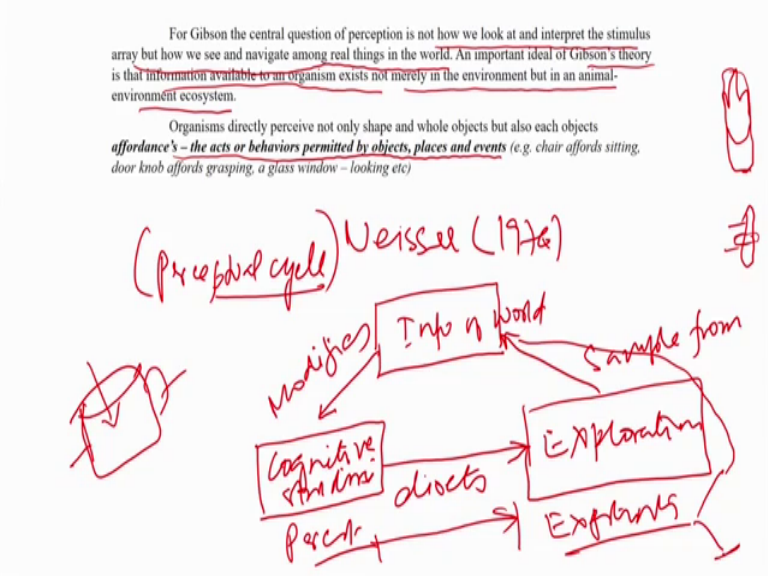

So, what Gibson says is that the information that is available from the environment for the observer exists in an animal environment ecosystem. So, basically the environment provide some information to the animal and the animal provides certain kind of cognitive structures or selects which information from the environment to take to take and based on these 2 kinds of interactions the perception progresses.

So, the animal decides the animal only has to decide what information to take from the environment and this decision process is the core of perception whereas, the environment on it is own can provide a lot of information and this decision process is the main key to act actually any kind of perception according to Gibson views.

Now, for Gibson the central question of perception is not how we make an interpreter stimulus array, but how we see and navigate among real things. So, it is what Gibson

believes is it is all about functions is not important to study in terms of perception of how and what we interpret from stimulus arrays what a particular stimulus really means that is not important, what really important is known that an object is there how do we navigate through it.

So, navigation in the environment is more important than having any percept then realizing or then understanding what the percept really means. So, the basic idea of Gibson in view is to understand what the environment how to navigate the environment rather than knowing what the environment has. Now important idea of Gibson in theory is the information available in an organism exists not merely in the environment, but in the environment in an animal ecosystem as I was just explaining to you what really happens is that the job of the animal here the job of the person who is perceiving here is to decide what to take in from the percept which is available.

What he has to do is that the environment gives enough of information to the person the person only has to decide what information to take and what information not to take and concept which is related to Gibson in theory or the Gibsonian idea of perception is the concept of affordance.

Now, what really it means is that organism's directly perceived shape or whole object and then objects gives have a something called an affordance. Now what are affordance really means is that an object which you are perceiving it directs you to do certain act on it and that is called an affordance for example, think of a chair now when you look at a chair or when you think of a chair the idea that the chair gives to you the affordance that the chair gives to you is sitting.

Similarly, if you look at a button a light button now a light button gives you the affordance to be pressed down or looking at if you have printers at home and if you think about the printers power button the red light the green light, which is on it is off when it is off when you press it gives you the affordance to be pressed down. Similarly doors handle or the handle of glass doors give you affordances or tell you what to do. For example, if I have a handle like this it gives you the affordance to put your palm on to it and push whereas, if I have a handle like this it gives the affordance to basically hold it and pull it towards yourself because this requires you to wrapping your hand here whereas, this requires you to push it with this hand.

Now, often this is a little bit confused or people confuse with this kind of affordances or affordances are what an object requires or desires to be done. So, basically here the definition is given as affordances are the acts or behaviors permitted by an object place or event. For example, door knobs tell you to there is a round door knob. So, it the doorknob tells you to grab it and to turn it down. Similarly the affordance of a chair for sitting or any other affordances of a light ball to push through pushing or light switches to be pushing it down or affordances of door handles to be either pulled or pushed and these are what affordances are.

So, what Gibson says is that objects in itself affordances objects have affordances and these affordances guide people's behavior of what should be done and what should not be done. Now the obvious question is on one hand we have Gibsonia view and on the other hand we have the bottom up and top down the classic approaches to perception.

So, is there a merger between them how can this theory coexist what is the way in which these theories can co-exist. So, a model was proposed by Neisser in the year 1976 which takes care of both the theories which in which adds up both the theories to develop the final percept and this is theory is called the perceptual cycle.

Now, what this theory or what this approach goes ahead and tells is that this perceptual cycle says there are the integration of the Gibsonian view and the view of the classical approach to perception combines to this way. For example, the information of the world is here and this is modified by cognitive structures through perception that forwards or directs exploration in certain way and this will further suggest what should be taken from the environment or sample from the environment.

So, what does this theory really say it says that the information of the world whatever information perceptual information is available into this world that is modified or that is being perceived or that gets perceived through a classical approach of perception using different cognitive structures? So, the visual cognitive structures of perception structures of attention these structures or higher order structures leads to perception either using the bottom of the bottom up or top down approach it leads to perception it leads to the generation of the percept.

When the percept is generated this percept leads us to explore the environment to explore to do certain acts. When we do certain acts when we do a particular act based on the

perception we present a behavior we do a behavior we commit a behavior and when I ca behavior is there we explore this exploration tells us what is possible and what is not possible once a behavior is done it directs which type of behavior or which type of actions can be done through the percept. So, if I perceive something what that particular thing when behaving with it what particular thing information what behavior is allowed and what behavior is now and once we know what behavior is allowed and what we behavior is not we feed this again to the environment and from there it again gets modified in this way.

So, basically information from the world is actually gets modified and generates a percept, which is later on this percept is tested in the environment in terms of whether what behaviors are possible on this percept, what behaviors can this percept generates and which of this behavior allowable or not those behavior which is allowable gets added up into the information in the world of a particular thing and whatever behavior is not allowed is deleted here or is not added and that information is also added. For example, think of a tea cup now the kind of a tea cup if you have there are certain behaviors which is allowable when we see it we see a tea cup. So, when we are looking at a tea cup then it there is a certain orientation with it and there are certain features that it allows.

Example a it allows off to drink tea, but if we try to do something else with it by moving the Geon in certain way that is not allowed in certain behaviors for example, drinking is a behavior which is allowed and other behaviors using this as something else or using this for looking at things or doing something else with it the behaviors are not allowed and that is fed in environment and based on that our perception is improved or enrich.

So, the next time we deal with this cup or this kind of a percept we know what is to be done and what is to be not done and the perception then becomes automatic the whole of this perceptual processes is done. So, as to make this whole idea of perception automatic so that something what is allowable is accepted and what is not allowable is not accepted and it goes into memory. So, that a next time a new instance of this behavior a new instance of this percept is generated it does not take that much time for perception.

So, basically perception in this section of perception we looked at we started with the classical approach, where we looked at some classical theories the gestalt ideas of how what perceptual organization is and how this perceptual organization really works, what

is the figure background concept and how the figure and background decides how what should what is to be perceived what information is to be generated and what is information is to be left behind.

Now, this idea was added on to some models or added on to this where some models of perception we started up in the next lecture on some models of top down processing, where sorry bottom up processing, where we looked at models of template matching prototype matching. So, these models actually showed how perception progress through a data different data driven approach in which we look at basic stimulus features is take this feature combine them together and once we have combined all these features together how does the percept develop out of it?

In this particular lecture we looked at another approach of perception in which the data driven approach is supported by something called the theory driven approach. So, perception is not only taking in data from the environment combining together and generating a percept this perception process is also held or is also influenced by something called the expectation in and something called the context in which a particular object is present. So, context and expectation adds on to the data driven approach to give you the final perception.

For example if you look at something which is new which you have not looked before a part of information, which is coming to you will look at it is shading, you will look at the kind of brightness the figure and all those basic information's plus you will also look at your memory to look at to understand, what is this particular thing and based on that you combine these 2 information together to generate this idea of perception.

Now, in addition to that there is an idea or there is a whole theory of direct perception which says that the object by itself by being, where it is in the environment offers you some information as to what it is and where is the place at which is present the kind of information that is relied, when you are looking at it should also in addition provides you what kind of things you should do with it and you should not do with it.

Take an example let us say we have UFO which has landed somewhere and crash landed somewhere. So, when you see further; obviously, we have some idea of what an UFO is. So, next time when you see something which is circular and flying which has landed

somewhere you both your pa the top down process and bottom up process will work together.

So, when you go to the crash site you see something which is circular something which has which has stands on it from where there is some kind of air movement coming in where the fans would be on an on an UFO where it would take off and things like that. So, you combine these information's together to get the concept or what a UFO is plus in terms of the fact that in numerous movies you have seen that a disc life shape, which has fans and which has doors and which is of a certain way should look like a UFO should be UFO that information combined with you actually presently seeing that particular UFO in a particular environment combines together to give the concept that this is a UFO .

What direct perception would come in and say that being where it is being where the UFO is in itself allows you to do certain acts. For example, from your experiences you understand that there is a door. So, in the in an UFO where from where people from other environments will come, certain behavior you it will it will lead you doing that behavior and certain behavior it will it will not allow you to do.

For example if there is no door in a in an or there is a crack in the UFO it will give you an affordance to basically go ahead and push it and realize the door because most of the movies do not tell you where is the door in the UFO . So, this affordance will tell you if the crack is there from where the light is coming on from the UFO you will have this affordance that this is the door and that itself should be enough for you pushing in and your expectation of what should be inside will guide you of what you are going to see, when you go inside that place, when you go inside that UFO maybe green mans coming in and then and maybe taking you for a probe a aerial probe or whatever you wish to come up with, but this is how perception progresses.

So, the whole idea of perception is what I have presented in this lecture in the next lecture we will go ahead and look at what is attention and look at the theories of attention.

Thank you.