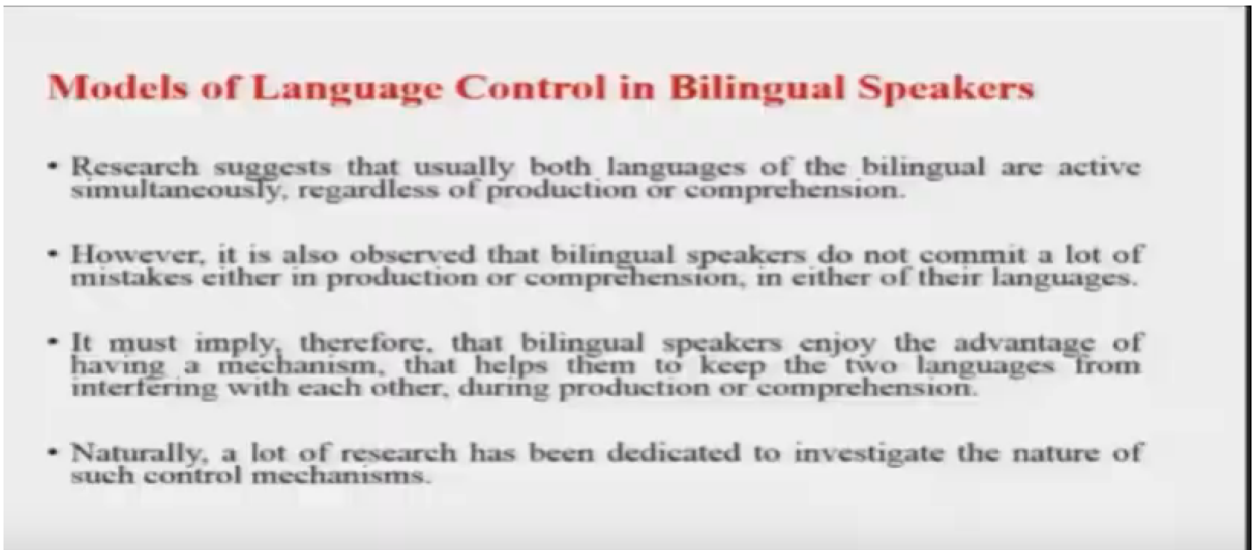
Lecture – 38
Bilingualism – 3

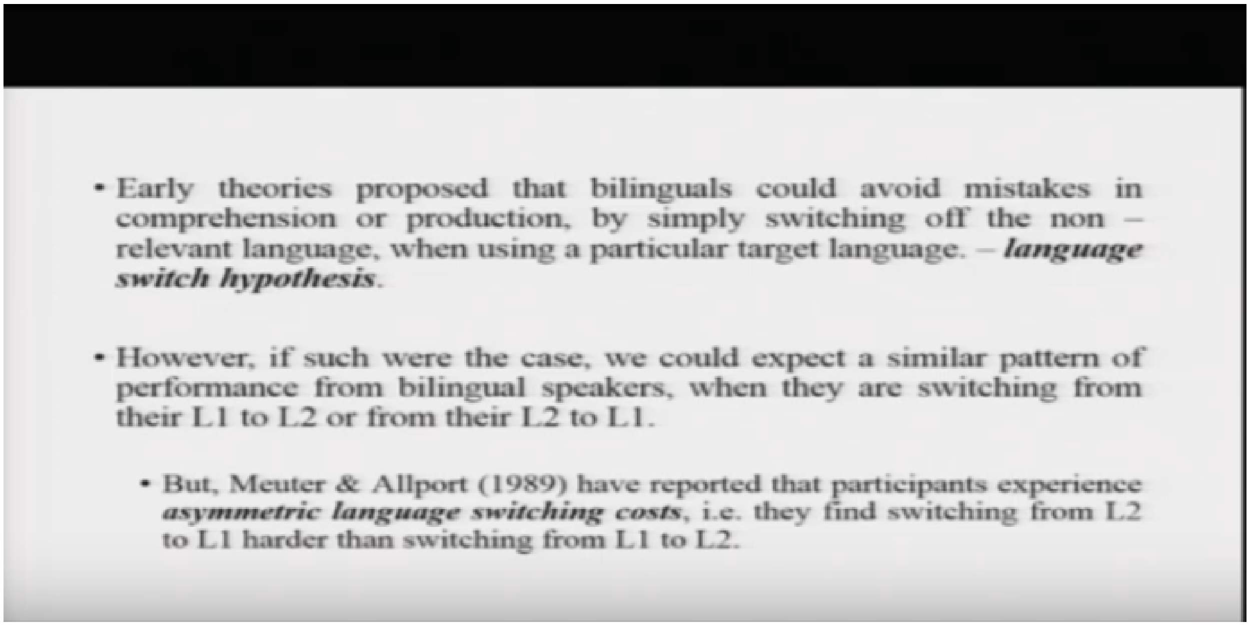
Hello and welcome to the course, introduction of the psychology of language. I am Dr.Ark Verma. And we are running in the eighth week of the course. This incidentally is also the last lecture of the course, I will be wrapping up the unit on bilingualism on this lecture, which is a third lecture, we have across the eight weeks, talked about various components in language, in this week we are talking about various aspects of bilingualism, I'm not really going into a lot of detail of that, because that will be partly a repetition of whatever we have already done. Obviously having much more details, but I've decided to keep it, slightly shallow if you may, you know so call it. In the in the earlier two weeks of this, you know earlier two lectures of this week, we've talked about the conceptual representations part, of how the conceptual representations will be for bilinguals, we talked about the word association, model the conceptual, mediation model and the revised hierarchical model. In the last lecture, I talked to you about, the co activation or the simultaneous activation, of the two languages of the bilingual regardless of the fact that the bilingual is engaged, in listening to speech or producing speech. In today's lecture, I will talk to you a little bit about, models of control or aspects of how do you know bilinguals or how bilinguals might be managing the two languages.

Refer Slide Time :(1:42)



Now, as we saw, a lot of research suggests that, usually both languages of the bilingual are active simultaneously, regardless of the modality. It is also however also, the bilingual speakers do not really commit a lot of errors, they do not really commit a lot of speech errors, they do not really commit a distinct lot of comprehension errors, which kind of in either of the two languages, suppose say for example, as a bilingual speaker or speaking in English, it's not happening that you are seeing that constantly I am breaking into Hindi or suppose if I were to start talking to you in Hindi, you not really observe that I'll constantly in the middle break into English. So, the amount of errors is also a fairly low and not distinctly higher for, a bilingual than a monolingual. Now, having said that, it could imply or it probably implies,1 already that the bilingual speakers do, enjoy the advantage, of having a particular mechanism that, helps them to keep the two languages from interfering with each other. Okay? So, that is something very interesting and this is therefore invited, a lot of curiosity and a lot of research, into the fact that how our bilinguals, keeping their two languages separate, beat production or beat comprehension today, we will be talking about some of that kind of research.

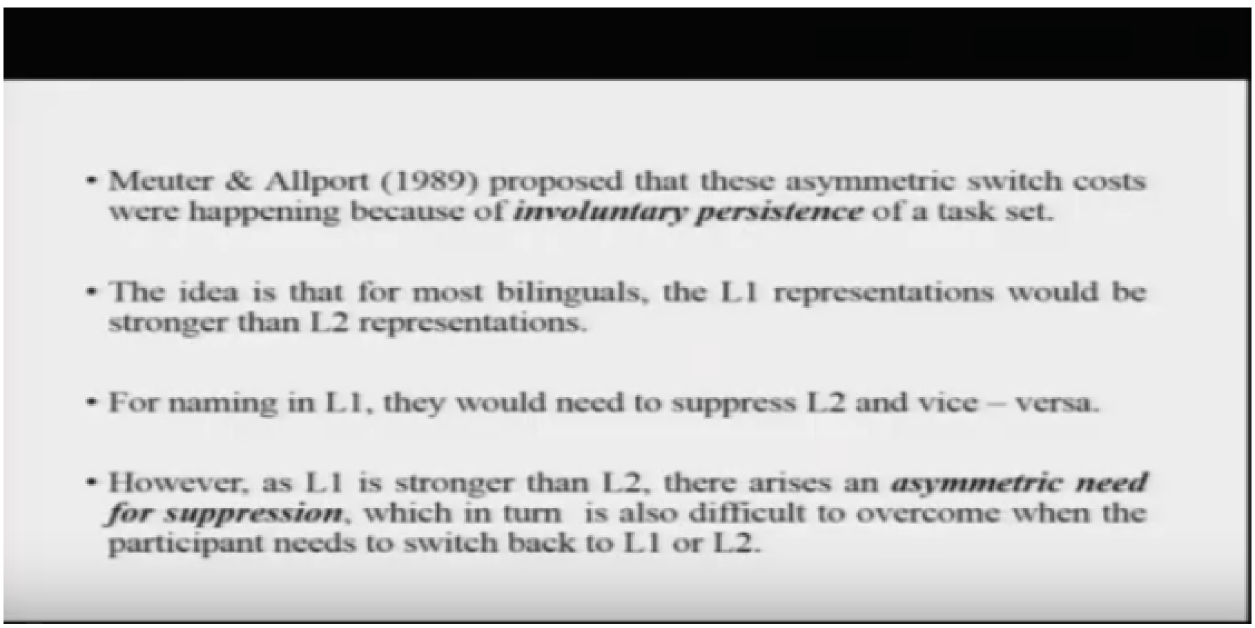
Refer Slide Time :(2:42)



Now early theories basically proposed that bilinguals could be avoiding these mistakes, in comprehension or by production or production by simply switching off the other language. So, this is basically referred to as the language, switch hypothesis, which says that when I have to talk in English, I switch off my Hindi or when I have to talk in Hindi, I'll switch off my English and in that way there are no active representations of Hindi, running around my head, if I'm talking in English or no active representations of Hindi, running around in my head when I am talking in English. This could very easily explain that there will be no speech errors and no interference and so on and this will be very interesting. But we have seen across you know the last lecture. So, many studies we have seen so much research that, say for example there is a lot of evidence about, this simultaneous activation of the two languages, also say for example, you could expect that a similar pattern, of low interference or non interference, would happen from l1 to l2 as well as l2 to l1, but it has been observed across, a bunch of studies that there is even if there is less interference, there is a lot of in degree, there will be a lot of interference from l1 to l2 rather than from l2 to l1. Now one interesting set of studies or one very seminal experiment, kind of you know brought this factor to light. And you know made this really very interesting topic for around almost a decade or a more than adequate in bilingualism research and this experiment was done by meuter and output in 1989 the mutant, mutant in Alford basically asked, their participants to name Arabic numerals, in Arabic and English. And what they find is that and they basically created what is called a language switching experiments? So, their typical design of a language switching experiment is that the numbers will come, they have to name each of them in English or Arabic, in what language you have to name basically can be said, can be signaled to you by a cue. So, what can happen is there is a screen, there's a you know a red color, you know background and there's a number you know that you have to name it in English, there's another screen there's a green color background you know you have to name it in Hindi.

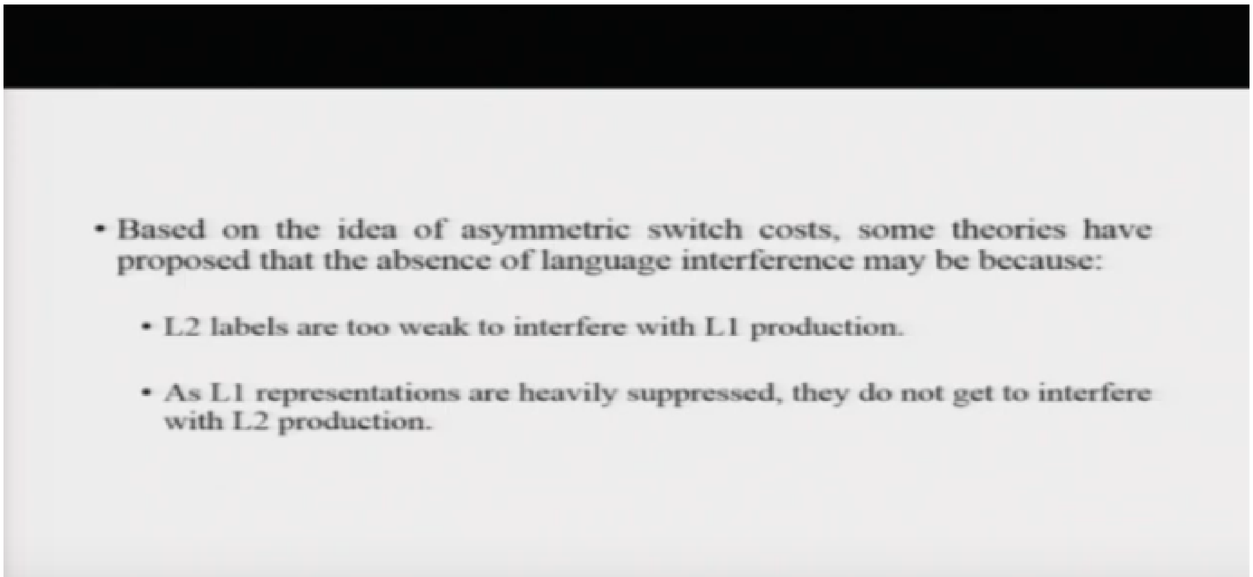
And there could be say for example English, English, English, English Hindi, Hindi, Hindi, Hindi and then English. So, there will be a passages, where you are not switching and there are passages where switching from English to Hindi and passages where switching from Hindi to English, this is typically the design of a language, switching experiment. Now participants here, are have four kinds of trials, English nonce, which transcendence on switch trials English to Hindi switch trials in need to English switch trials depending, on what is your l1 and l2 you can have l1 to l2 Ferrell's l2 l1 switch trials what nutrional word, found in their study was that participants experienced a cemetery switching, cost from l2 to l1 as opposed to switching from l1 to l2. So, what was happening is they are finding it harder to switch, from the l2 to switch from speaking in English to Hindi. And in some sense this is slightly counterintuitive, I should be, speaking in the native language be difficult. So, mutant output also call it as a paradoxical switch co-signer scenario, for basic purposes we'll just call it a symmetric language, switching costs. Okay? So, the idea is that the switching costs from l1 to l2 are not equal to the switching cost from l2 to l1, with the qualification that l2 two elements which costs are generally, then l1 to l2 switch costs. Now they propose that this is happening, because of what they referred to, as the involuntary persistence of a task set.

Refer Slide Time :(6:52)



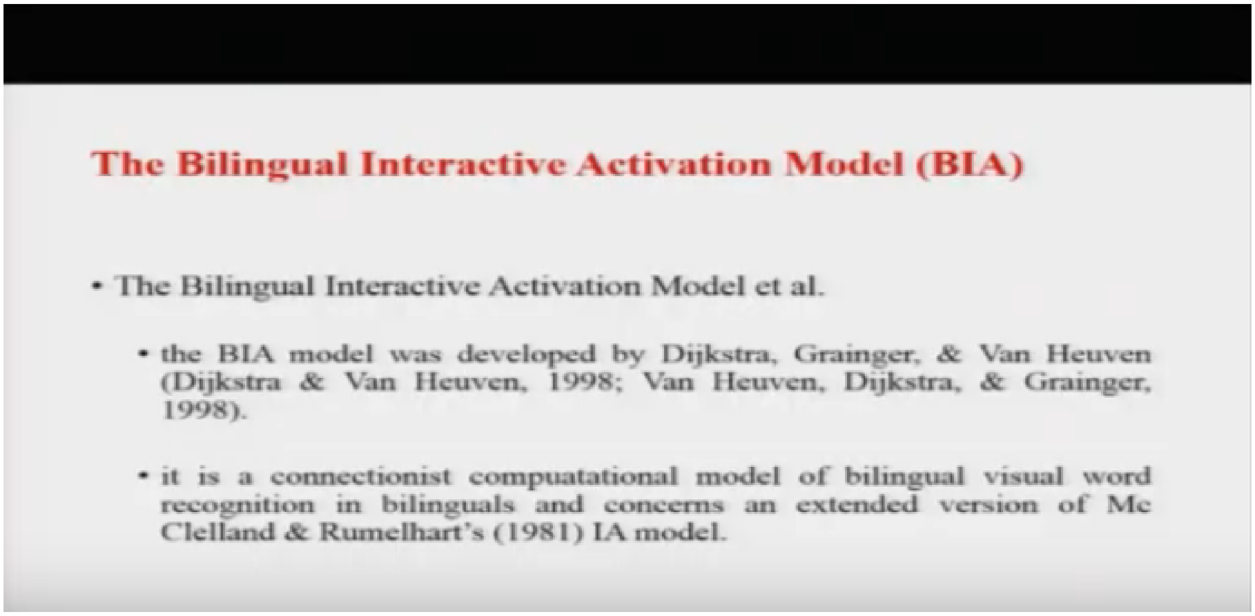
Involuntary persistence basically means that because your name English, you kind of there's sort of inertia or persistence of the English naming task set, as opposed to and it is kind of what is creating difficulty to shift into the Hindi naming tasks. So, basically it's kind of a inertia sort of a situation. Now the idea is if you kind of probe in a little bit deeper and try and understand, this the idea is that for most bilinguals the l1, representations will be stronger. And the l2 representations will be weaker. Now for once if you are kind of moving from switch naming in l1 to naming to l2 what you will have to do? Is you will have to suppress the l1 and start naming in l2, because l1 is stronger, it will have it will require, much more stronger suppression. And then you start naming in any - then when you have to start from l2 to l1 you'll also have to suppress l2 and then move to l1, suppressing l2 will take less say for example, cognitive resources as compared to what you spend in suppressing l1, why because l2 is weaker and l1 is stronger. Now when you have to name, in l2 or l1 at a later point, you have to also overcome the equivalent amount of separation that you had initially applied, if you have to name in l2, you have to overcome a large amount of separation that you had initially applied on l1 anyone and when you have to name in l1 you have to kind of you know overcome a little bit amount of separation sorry l2, you have to overcome, just a little bit amount of separation that you are applied to l2, because in the first plates, you applied a lot of separation to l1, activating l1 back when you're switching from l2 to l1, will be difficult because, you initially applied less amount of separation to l2, activating l2, from you know when you're coming from l1 to l2, may be easier, this was supposed to be, the cause why people are expecting or experiencing asymmetry did switch costs. This is basically what is called the asymmetric, need for separation and that is what is leading to this kind of problem.

Refer Slide Time :(6:52)



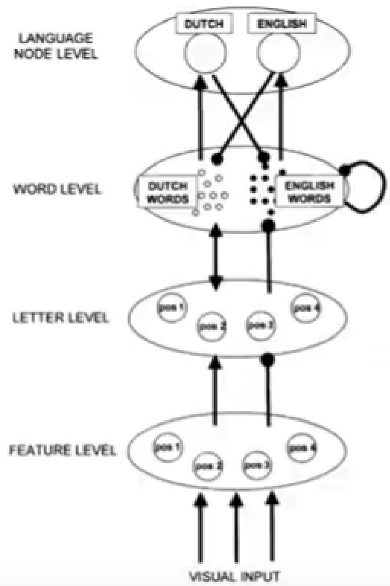
Now, based on this and this is sort of very interesting, very nice, explanation, for participants you know naming in the language switching I know, scenarios and it also led to in a formulation, of particular theories that talked about, this the importance of response, separation or inhibition, especially in bilinguals and it was kind of you know reason that by linguists might have a lot, of practice with this. Okay? Now based on the idea, of a symmetric switch cost also some theory said that. Okay? Now we can use this to explain, why people who don't experience a lot of interference. And what they said was that because l2 labels are too weak, to interfere with even production, l1 you know performance or l1 naming we anyways not experience a lot of interference as l1 representations are, heavily suppressed, they will anyways not be able to interfere with l2 performance or l2 naming. So, that's some of some of the reasons, the people gave that why people are not experiencing a lot of intrusions, as far as naming and performance, in a particular language is concerned. Let's move on to a different kind of a question here. Now, we've talked about, the traced model of you know word recognition. We know that the trace model was heavily, borrowed or heavily influenced by the interactive activation model that was initially developed by McClellan in Roman hard, in 1970s in 1981 that is.

Refer Slide Time :(10:36)



Now, we can talk about, one of the models that is relevant to bilingual word recognition or bilingual know reading. And this is a very seminal model which is called the', Bilingual Interactive Activation Model'. And this bilingual interactive activation or the BIA model was developed by Dijkstra Grainger and Van Heuven back in 1998 it's almost now more than 20 years, this is basically supposed to be a connectionist computational sort of a model, of visual word recognition, in by linguist. Let us look at this very quickly.

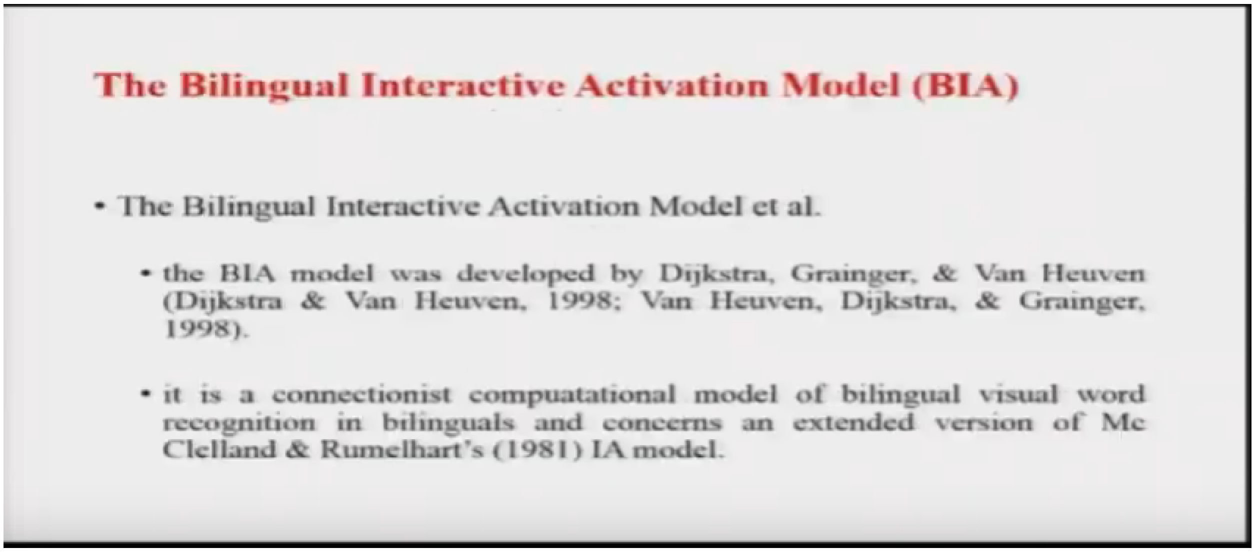
Refer Slide Time :(11:08)



The Bilingual Interactive Activation Model.

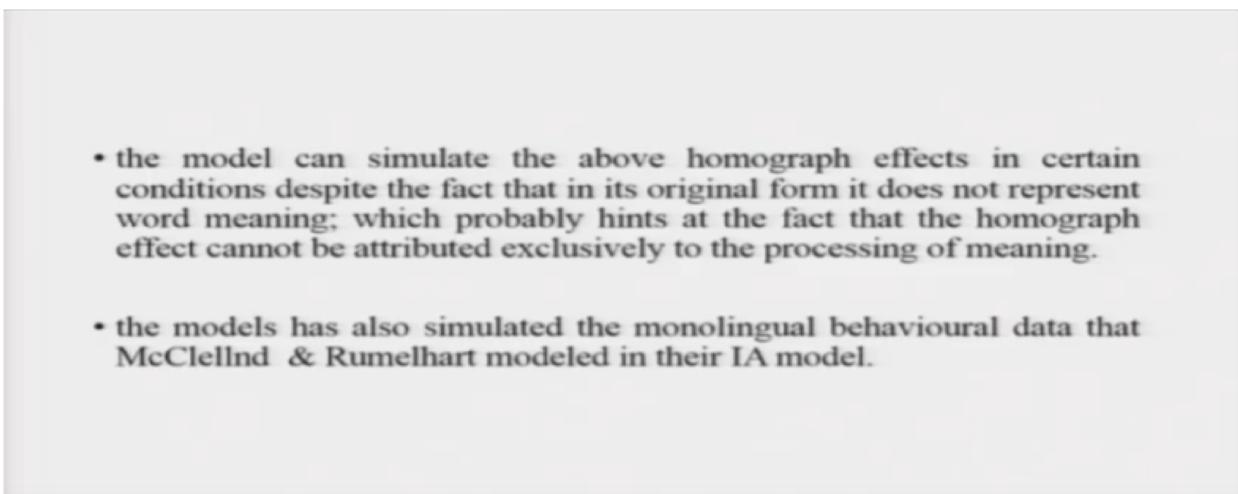
This is basically what the model looks like? And if you can see that, the model is very much like trace in its conception, there is this feature level and there's also position level nodes and then this is later level, so from feature level to later level and then there's the word level. And in the word level you can see that, there are both Dutch and English words activated in sort of the same way. Okay? You'll see that the words are inhibiting each other, so there's some that aspect of later Lane emission also there. And then, there is this language node lemming, so the decision of which language the performance has to be in and you will see, Dutch words are exciting, the Dutch language node English words are exciting the English language nodes, but what is happening is the Dutch words are inhibiting English words and the English language nodes are inhibiting Dutch word. So that cross inhibition is also, happening. Okay? And you can sort of see that, the interaction between the word level and feature level, is sort of excitatory from both sides. However, there is some sort of inhibition traveling from the letter level to the word level. So basically, when the particularly letters will be recognized, they will obviously inhibit words they are not a part of which is very much like phrase.

Refer Slide Time :(12:29)



This is the bilingual interactive activation model. Let us kind of look into the details a little bit, just to explain this.

Refer Slide Time :(12:33)



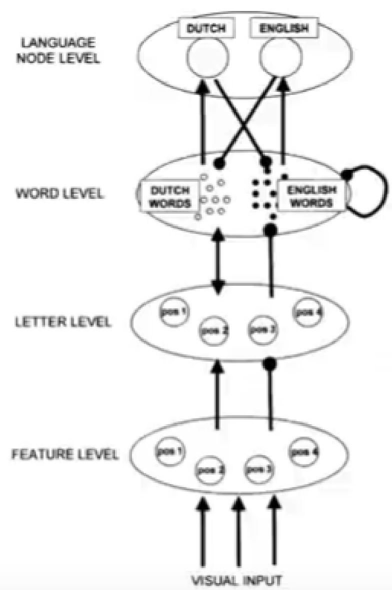
Now this model, can simulate the above homograph effects, we've been talking about, you know chef or a room or coin, those kind of effects in certain conditions, despite the fact that in its original form it is not really represent word meaning; It can just kind of handle those effects, from the virtue of letter and word level activations, which probably hints at the fact that the homograph effect cannot be attributed, exclusively to the processing of meaning. But also, to the processing of form or spelling for that matter. Now this model is also found to simulate the monolingual behavioral data that McClellan had normal Hart had for their interactive activation model.

Refer Slide Time :(13:10)

- the model contains four levels of representation units or “nodes”, which represent visual features, letters, the orthographic forms of whole words, & language, information, respectively.
- the bilinguals two languages share the feature & letter nodes, whereas the word nodes are organised in language subsets, which are fully connected between the language.
- the layer of language contains two nodes, one for each language.

As you saw, I already told you that it has four levels of representations or nodes, starting from feature level to, letter level to, world level and the language membership level. The bilinguals two languages, share the feature and later level notes. Say for example, if

Refer Slide Time :(13:25)



The Bilingual Interactive Activation Model.

Dutch English is there, the features will be very similar, because the orthography is exactly very identical and the letters will also be shared, so you have no differentiation with respect to language membership, at the feature and the letter level. So, there's, there's no language tagging here. However, from the letter level efforts, you know which are English words and which are Dutch words. Similarly you know which language schema has to be activated, whether it is Dutch or it is English. Okay? So the and the idea is that this is, this is an interactive model, much like trace was, so in the sense that representations at one particular level, can activate and inhibit representations on the other levels, higher or lower levels, activation kind, kind of you know, comes about via excited to the connections, inhibition comes to by inhibitory connections.

Refer Slide Time :(14:18)

- the model is "interactive", in the sense that representations at one particular level can activate & inhibit representations at adjacent higher & lower levels.
  - activation comes about via excitatory connections; inhibition comes via inhibitory connections.
  - also, the model assumes inhibitory connections between all orthographic word form nodes; due to which activating words mutually inhibit each other's activations. this is called *lateral inhibition*.

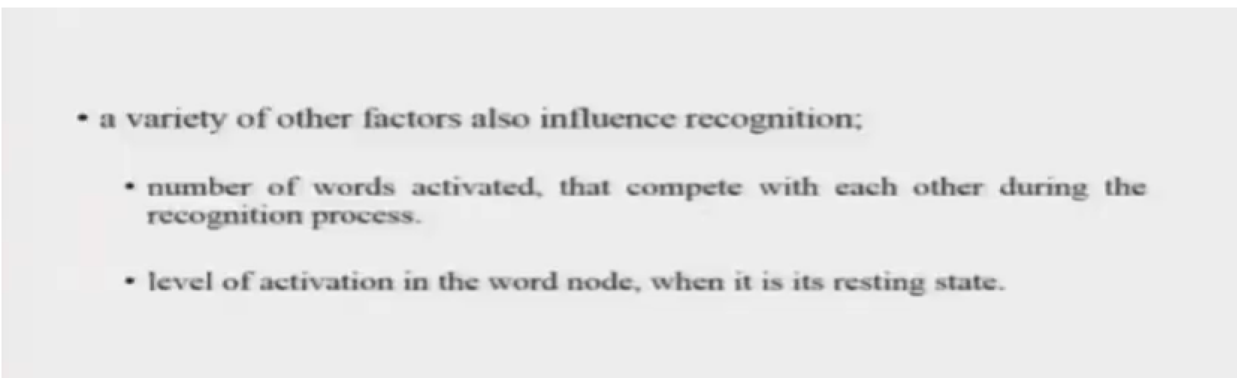
The model assumes inhibitory connections between, all orthography word form notes, due to which activating, mutually in activating words will, mutually inhibit each other. Again, there's this whole concept of lateral inhibition that we saw, in trace model as well, you see that words are kind of inhibiting each other, anyways. Now, we can take how you know the BIA power model really works.

Refer Slide Time :(14:44)

- Example: in case of a D-E bilingual, the letter nodes that are activated following the presentation of *sand* will also activate, the word nodes for Dutch words like *zand* (sand) & *mand* (basket); which also contain the majority of letters in sand.
- in their turn, activated word nodes transmit activation to the language node of the corresponding language, at which moment the latter starts to inhibit word nodes of the other language.
- all activated word nodes compete against each other, in the recognition process; inhibiting each other through lateral inhibition; until the activation level in one of the nodes reached beyond, the "recognition threshold".

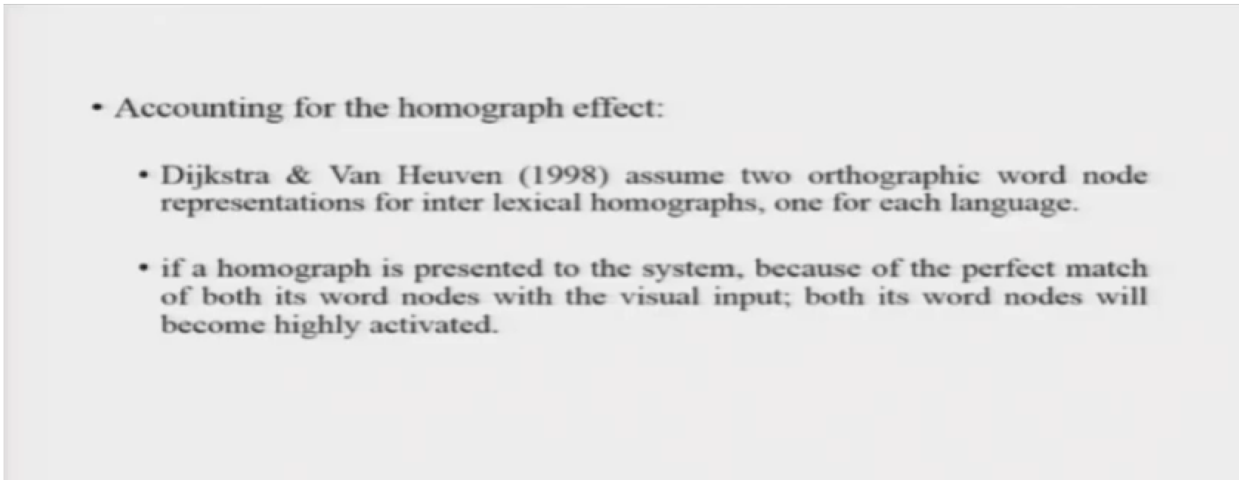
For an example, suppose we have the Dutch English word called, 'Sand'. Now, the Dutch equivalent of the word is also very similar sand, Zand and sand is this, the meaning is very similar, the only thing that is uncommon is the word Z. Okay? And say for example, you can have Dutch words like, matching Dutch words like sand and mand, mand as a basket, sand is again it means the same thing. Now, the idea is that you can have these words that share the features and the letters, so what will happen is, if you present the model with the word sand, it will activate not only the you know, neighbors in English, but it will also activate neighbors in Dutch or vice versa, because the orthography is very similar, the number of letters that are shared is very similar. Okay? So, basically what will happen is, activated word nodes will transmit active to the language node, of the corresponding language eventually, at which moment the latter will start, inhibiting the nodes of the other language. There was eventually you have to identify this particular word, as the member of a particular language, if you presented Sand, you want to recognize as a word of English, even though corresponding neighbors like sand and mand, etc, are also activated from the other language. All activated word nodes would compete against, each other in the recognition processes in witching each other through lateral inhibition, until the activation in one of the nodes reached, reaches a particular threshold or say sort of a recognition point. So, once there is enough input that you know, this is an English-language word, everything that will sort of you know, lose out in combination and you will recognize this particular word sand, as an English language. That is typically how processing in this mod will happen, now this particular model kind of also tells us that, there could be a number of other factors that will, influence word recognition you know, for bilinguals.

Refer Slide Time :(16:40)



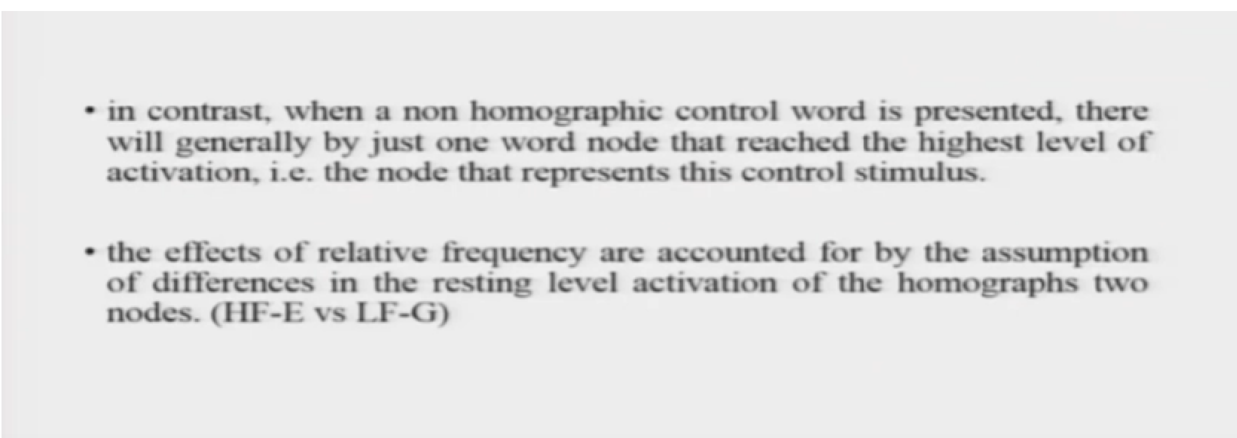
Say for example, the number of words that are activated that compete with each other, if the neighborhood size is smaller versus larger. Also, cross-linguistic neighborhood will also come into play and you'll want to say for example, have a hang of, how many neighbors are there in the other language, as well because they are also going to be competing, for the lexical activation and selection process. Also, say for example, the resting frequency or say for example, the levels of activation at each word note, suppose say for example, there is a word sand, but it is very, very high frequency in English. But, very, very low frequency in Hindi, in you know, Dutch. Then you can expect a different kind of an independent, FNS profile. Because, probably because it's not very highly active, it not really you know participate in the process so much.

Refer Slide Time :(17:26)



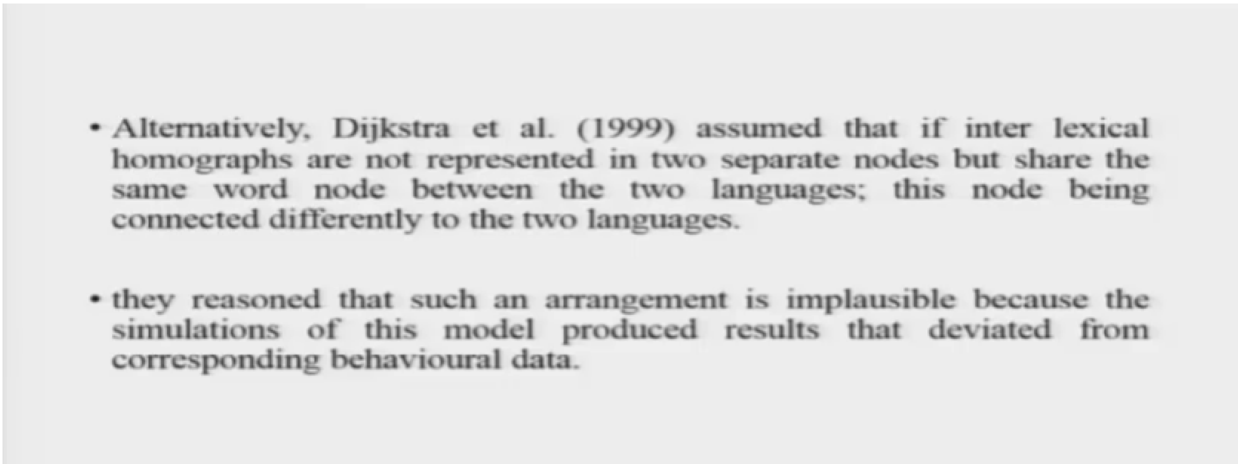
Now, how does this model account for the homograph effect? According to Dijkstra and Van Heuven, they basically assume that, there are two orthographic word node representations for intellectual homographs, one for each language. Basically, what will happen is? Homographs will be special kind of words, which even at the word level will have connections to both. So, you saw the feature level shared connections, later level shared connections, word-level you know, these are English words, these are Dutch words. In telling will homographs will be a peculiar class of words that will have connections to both the languages. Because, right from the start, they are still kind of holding membership in both the languages. If therefore, such a homograph is presented to the system, because of the perfect match, of both its word nodes and which will input, both its the words nodes will get highly activated and this will basically and because both the languages nodes are also a kind of primed, this will lead to the slowing down, of the person recognizing this as English word or a French word. Okay?

Refer Slide Time :(18:35)



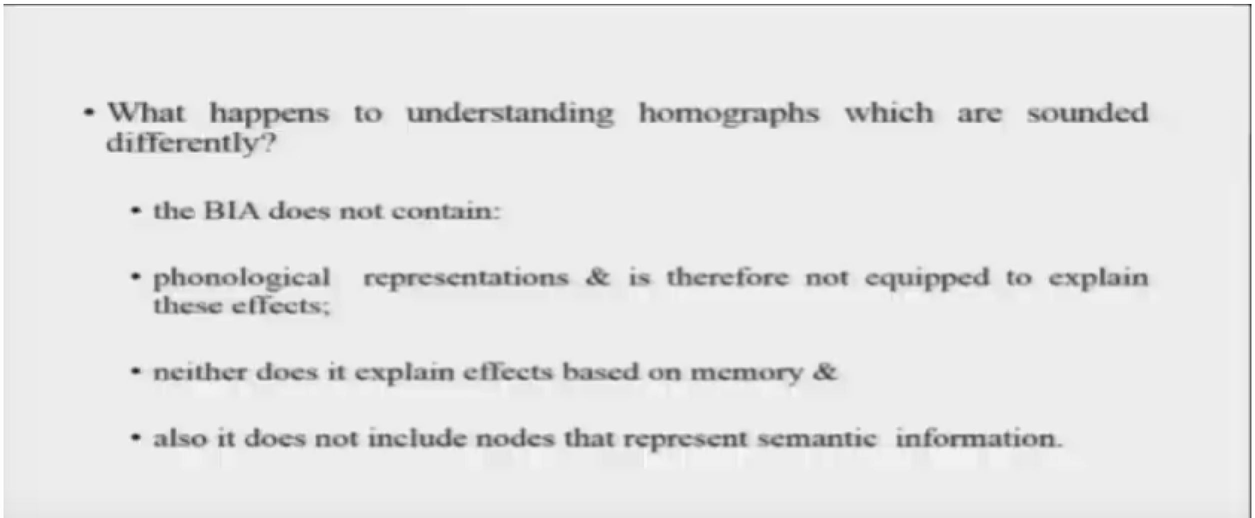
Now in contrast, say for example, when a non homographic control word is presented, there we generally be just one word node that will reach the highest level of activation and also, which we have membership in only one of the two languages. Okay? So, this is sort of how this particular model, explains the in telling will homograph affect. Also, the effects of relative frequency as I was saying; are accounted for by the assumption of differences in the resting level activation of the words, across the two languages. That's also something that I already said and is in some sense counter, in some sense rather intuitive as well.

Refer Slide Time :(19:07)



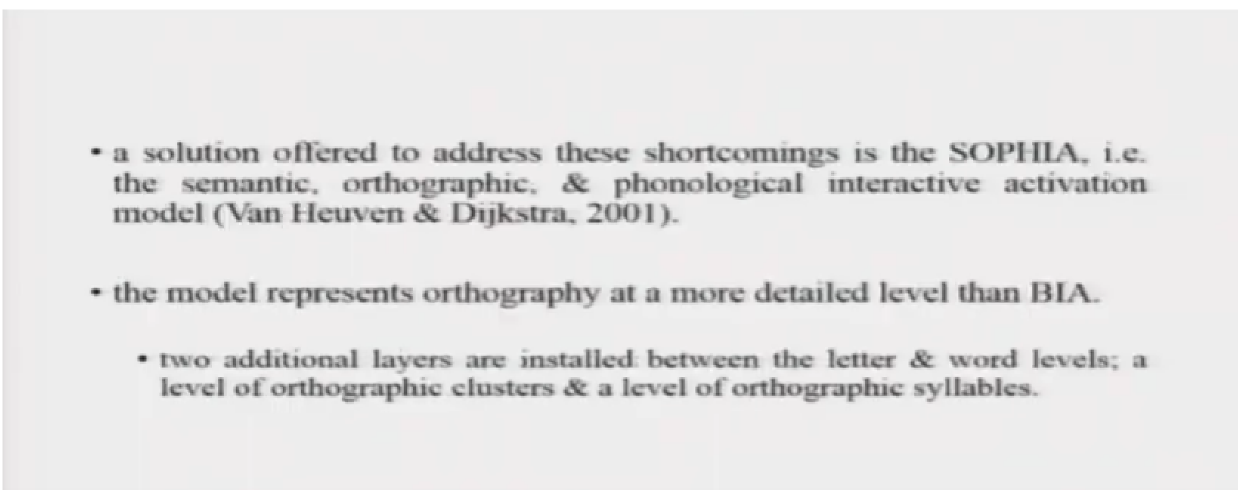
Now alternatively, about this homographs effect, Dijkstra and colleagues assume that, if in de lexical homographs are not represented in two separate nodes. But, share the same word node, between the two languages, this node will be connected differently to the two languages. The reason that such an arrangement can be slightly implausible, because the simulations of this type of model, would produce a result, I mean, they kind of tried this kind of thing, they said that this particular word, word node, very basically be sharing the language connections and when we try to simulate with this kind of pattern, they found deviant results. So the assumption is that, there will be two word nodes for just to revise for you, two word nodes for the in telling will homographs, one in English, one in Dutch. So suppose, say for example, the word is chef and we're talking on English, French, there'll be one English version of chef and a French version of Fred, of French. And basically, the interactions building up from feature level to, later lower level and then to the language note level, will basically make sure that only one of the two versions of the word chef are selected, that is how they are kind of you know, accounting for this, they're in telling we'll homograph effect.

Refer Slide Time :(20:22)



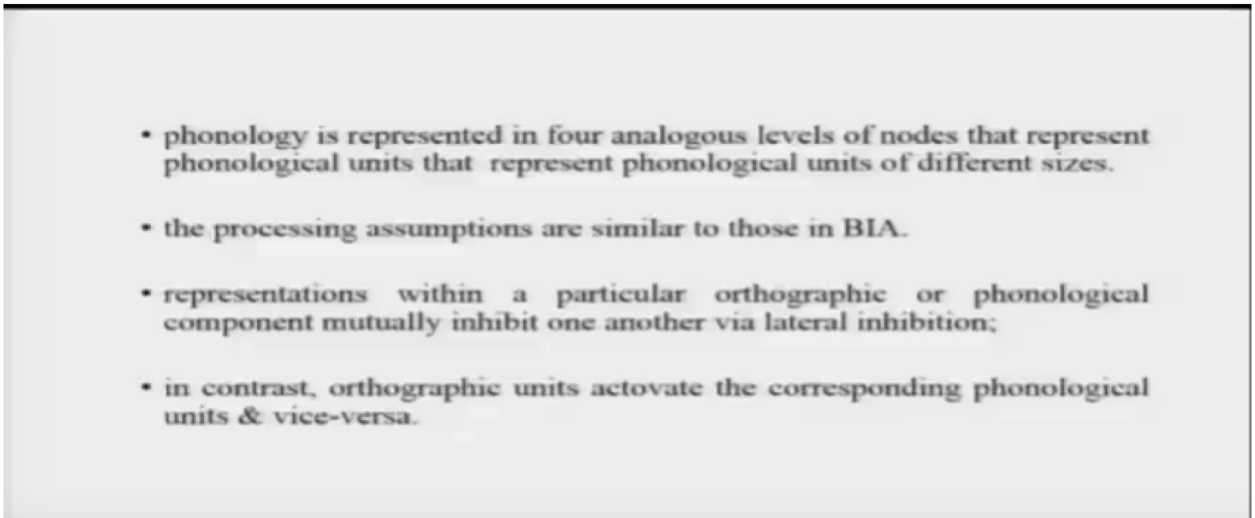
Now, what would happen if the in telling will homographs were to be sounded differently? So, the BIA does not really contain, phonological representations and is therefore not only equipped to explain this, neither it kind of can explain this on the basis of memory etc.

Refer Slide Time :(20:37)



So, a solution to this basically comes up in a sort of a different model, which is called the, 'Sophia Model'. Again, by Dijkstra, Van Heuven slightly later in 2001. And they kind of address the issue in the Sophia model, by adding two additional layers, they say, let there be a level of orthographic clusters and orthographic syllables, also there's interestingly that this model kind of specifies

Refer Slide Time :(21:03)



phonology in you know, in for kind of an analogous levels. Analogous levels of nodes that represent, phonological units of different sizes. The processing assumptions are, very similar to the and that, in the in the BIA model and basically, the idea is that within each level there is literally inhibition and interactive activity going on.

Refer Slide Time :(21:24)

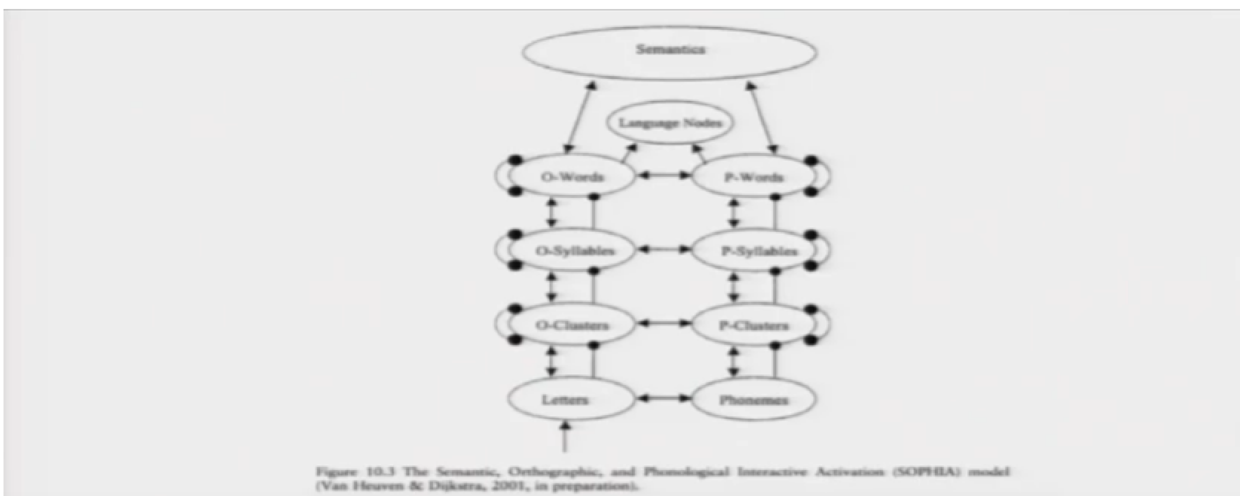
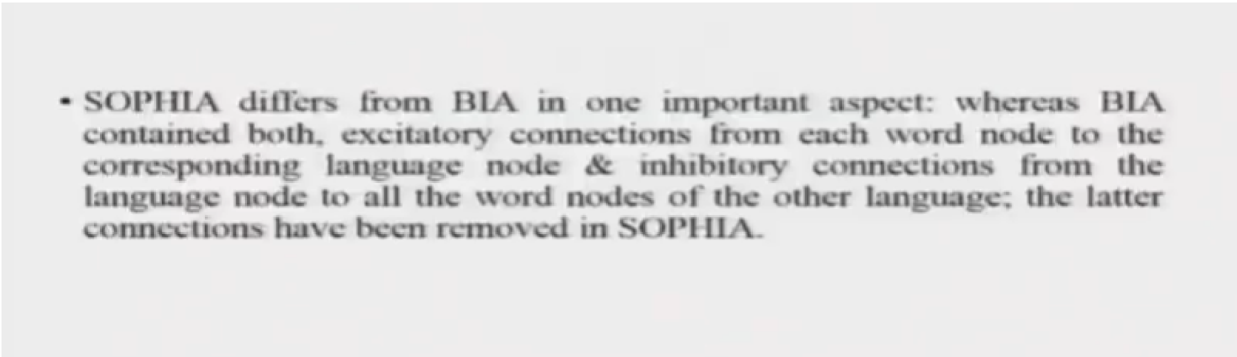


Figure 10.3 The Semantic, Orthographic, and Phonological Interactive Activation (SOPHIA) model (Van Heuven & Dijkstra, 2001, in preparation).

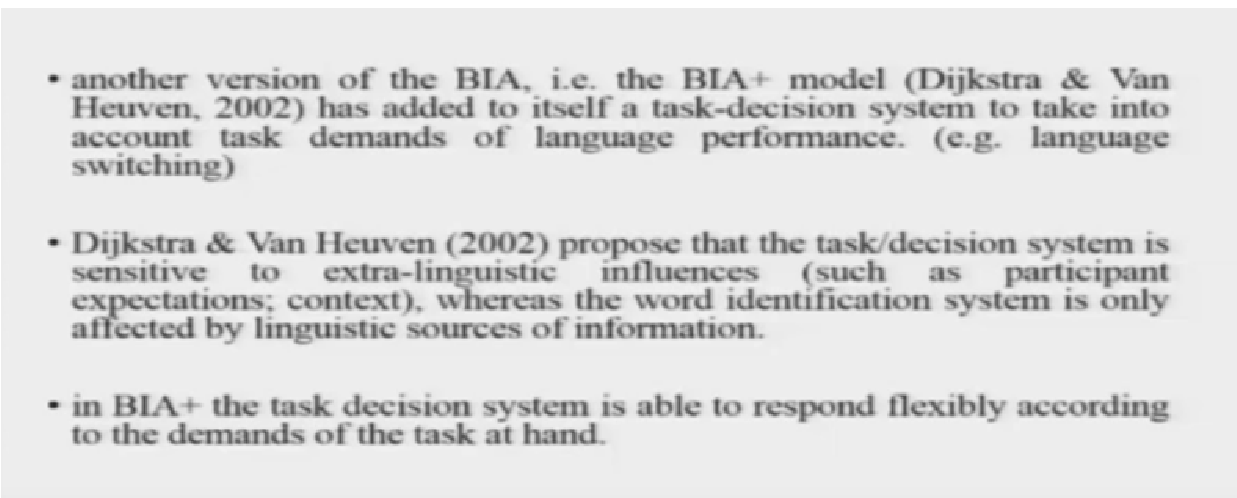
So, let's look at Sophia. This is the Sophia model, you have letters and phonemes and then you have P clusters, phonological clusters, phonological syllables, orthography clusters, orthographically syllables, in a phonological word phones, orthography word phones, then you have the language node and also connection to semantics.

Refer Slide Time :(21:41)



So, this is what I was talking about? Sophia differs from the BIA model in one very important aspect; that is whereas BIA does contained both excitatory connections, from each word node to the corresponding language and inhibitory connection from the, language note to all the words of the other language, the lateral connections have been removed in Sofia. So, there you can see, they're in the model, there are no inhibitory connections coming from the language node to words of all the you know, to the words of the other language.

Refer Slide Time :(22:11)



Another version of the BIA, other than you know this, Sophia the BIA plus has also kind of improved upon the earlier proposition. And what it has done is, it has added to itself, a sort of a task decision system. Now, this task this is a system basically, takes into account the demands of language performance. Say for example, yeasting in these kind of studies, happens in different kinds of scenarios, where the tasks are different, the task requirements are different and still you see that, bilingual sky kind of adapting to these different tasks and suppose it is in picture naming study, it is a picture word interference study, it is a lexical decision study, this is a word naming study. In all of these different tasks, the task requirements will be different and the bilingual sort of adapt to these task requirements, almost seamlessly. To explain how bilinguals might be doing this, it might be it was actually a good idea, to have something called a task or a presentation schema. Basically, what this task representations command does, it is that it is very sensitive, to extra linguistic influence not from the language, but the influences about context, speaker and other kinds of influences, where basically what happens is that the word identification system is not only, affected by the linguistic variables, but also by the context variables. Suppose you're doing a lexical decision task, in which you're doing a pure English block, pure Dutch block or a mixed block. So, as a participant you will be aware of that, I can expect knowing Dutch words in the English block, so I have to adopt a very conservative strategy in lexical decision here or I can expect, both words from English and Dutch, so I don't know whether this particular word is a, English word or a Dutch word, so I will probably, adopt a slightly, less conservative strategy. So, the system has been designed to deal with this kind of a thing.

Refer Slide Time :(24:05)

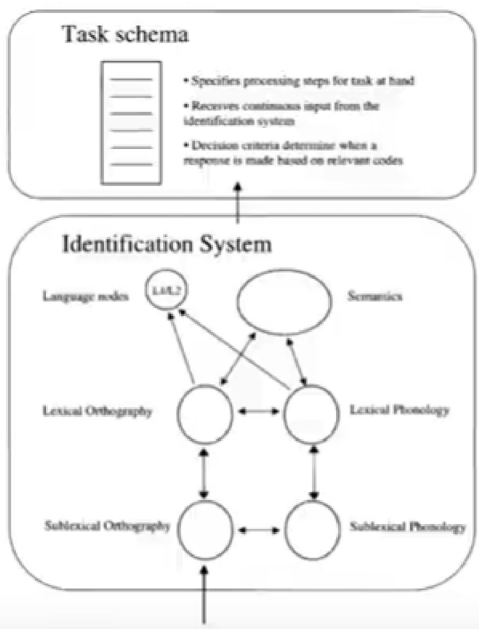
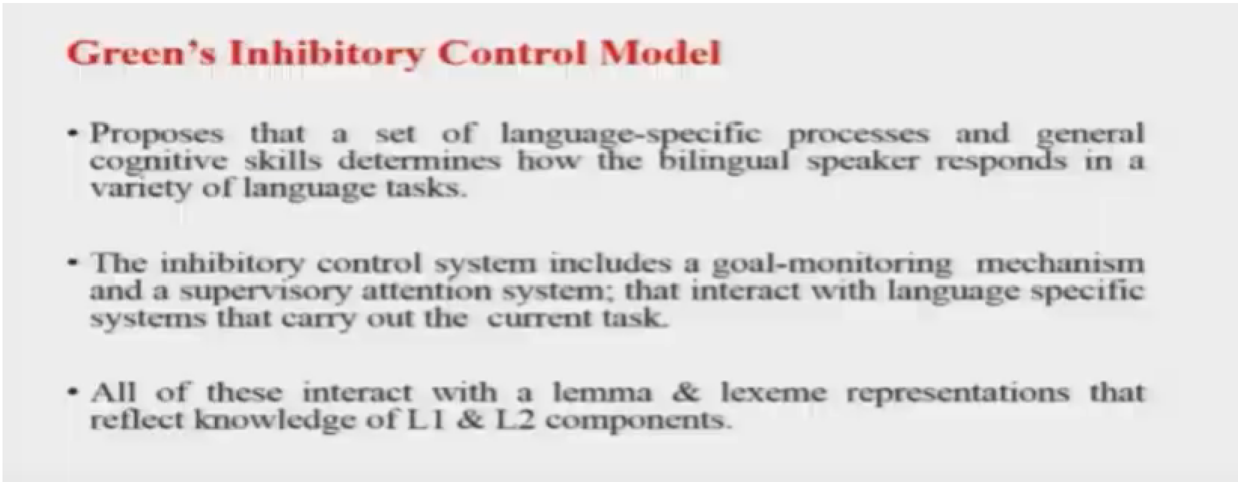


Figure 9.3 The architecture of the BIA+ model (an extension of the bilingual interactive activation [BIA] model) (Dijkstra & Van Heuven, 2002). L1, first language; L2, second language.

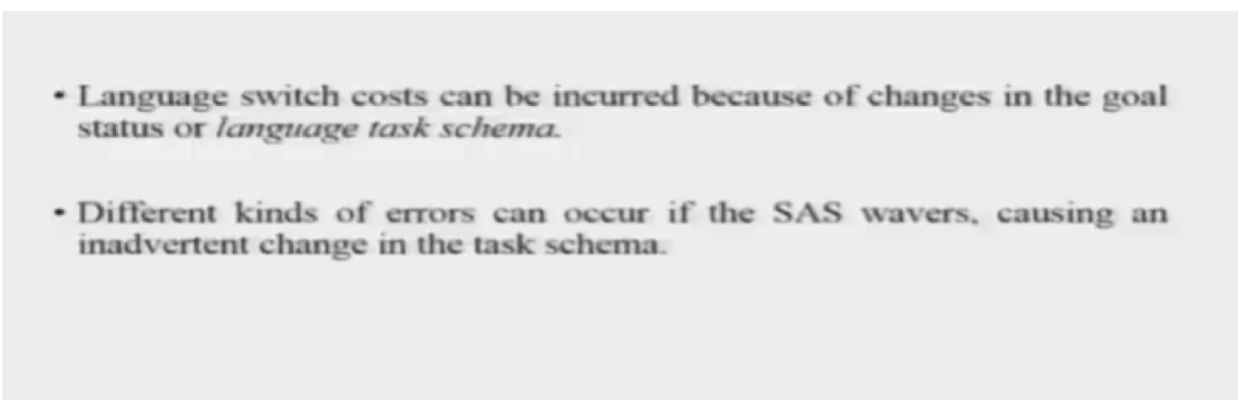
And this is how this particular model looks. So, you have sort of the same model, you have orthography, you have phonology as well by the way in the BIA plus, you have sub lexical phonology, lexical phonology, sub lexical orthography, lexical orthography, you have language nodes and you have semantics as well. On top of this identification system, you have the task schema and the star schema kind of specifies, processing steps at for the task at hand, in the lexical decision task you'll have to do this, in the naming task you have to do this and this is that, system that is receiving continuous input, from the identification system. So, on the basis of that, it is deciding. Also, the decision criteria is basically kind of determined, when a response is made on relevant codes, the codes are kind of the linguistic, as well as non-English. This is another set of you know, a bit of a model that kind of helps us understand, how bilinguals are dealing with tasks, such as identifying words from the two languages. Now, coming back to this whole notion of inhibition and you know, coming back to mutant outputs, study in 1989. We talked about, separation or inhibition being applied to a particular language. Now, green from you know that study, after that study kind of started thinking of a language specific process or language specific processes and then general cognitive skills

Refer Slide Time :(25:33)



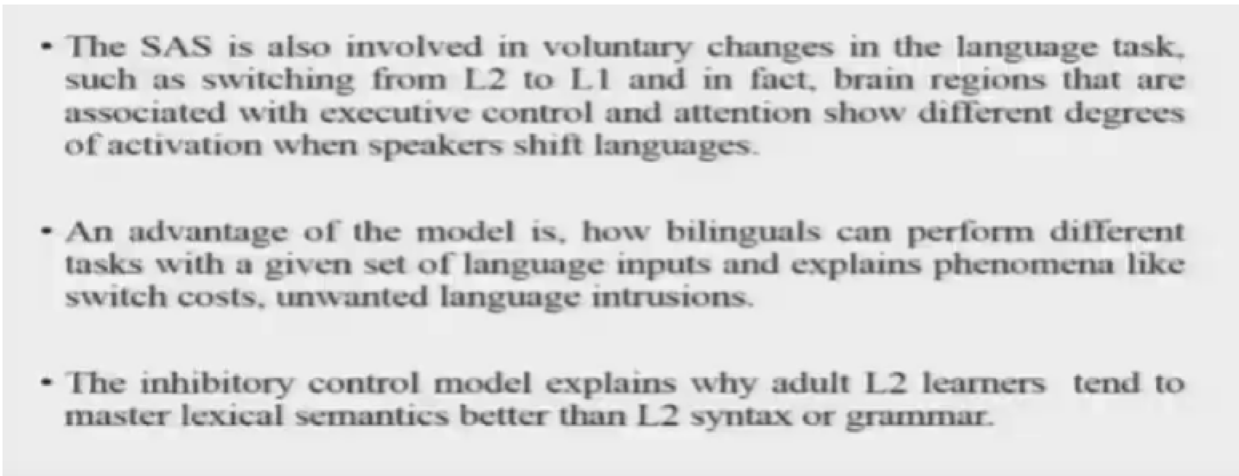
that could determine, how a bilingual speaker responds in a variety of language tasks, avoiding interference from the non target, irrelevant language at the same time. So, the inhibitory control system, so the proposal is that there is a sort of an inhibitory control system and this inhibitory control system; includes a goal monitoring mechanism and a Supervisory attentional system; that kind of interacts with the language specific systems; that are wired to carry out a particular task. Again, meet Lexical decision, word naming, picture naming, picture word interference or anything like that. All of these systems, the gold system, the inhibitory system and they say you know the, supervisor the attentional system, will interact with the lemma and legs same level representations that we basically reflect your knowledge of the l1 and l2 components. So, inhibition or the activation shell has to be applied on some you know, basic knowledge of the two languages, so there will be a leg system that has the lemon legs in level, representations from both the languages.

Refer Slide Time :(26:39)



Now, language switch costs, according in this model, can be incurred because of changes in goal status or the language task schema. So the language tasks schema basically, we'll be performing in a particular mode, when naming is happening in English or l1 and then you have to shift its mode, when it has to go from you know, from English naming or l2 naming to, Hindi naming that l1 naming. And this shift you know, this change in the gold status or the language tasks schema, might be held responsible for whatever switching costs people experience. And different kinds of errors basically can occur, if the Supervisory attentional system is not performing in an optimal fashion, causing sometimes an inadvertent change in the tasks schema. So that can also happen, if your attention wavers, if you're not conscious of the, the contextual cues, the speaker listener thing or say for example, there are other reasons.

Refer Slide Time :(27:38)



Now, the Supervisory attentional system, in this model is also involved in voluntary changes in the language tasks, suppose say for example, you in the bilingual naming task, now you see a cue that asks you to name in English, now you see a cue that you asked you to name in Hindi, so this voluntary changes are also kind of handled by this supervisory attentional system. Okay? And it kind of indexes in the brain activity, as well. Now, an advantage of this kind of a model is that it can help us explain, how bilinguals can perform different tasks, with different set of language requirements, almost completely avoiding these kind of unwanted intrusions. So, basically once you are very attentive there is enough input in the Supervisory initial system and that is vigilant okay, this is the cue I have to a shift to this language, this is the cue I have to shift to this language and the supervisor the attentional system kind of you know, can give that input to the language tasks schema, which recognizes the goal state and adjust accordingly, this is something that kind of can help, the bilingual speaker, achieve almost zero interference, from the non target language, to the target language irrespective of the kind of task that is being done. This inhibitory control model in that sense, also can explain why l2 learners tend to master lexical semantics, better than L2 in diagram one because, in this system the lexical and semantic associations are fairly well, specified.

Refer Slide Time :(29:02)

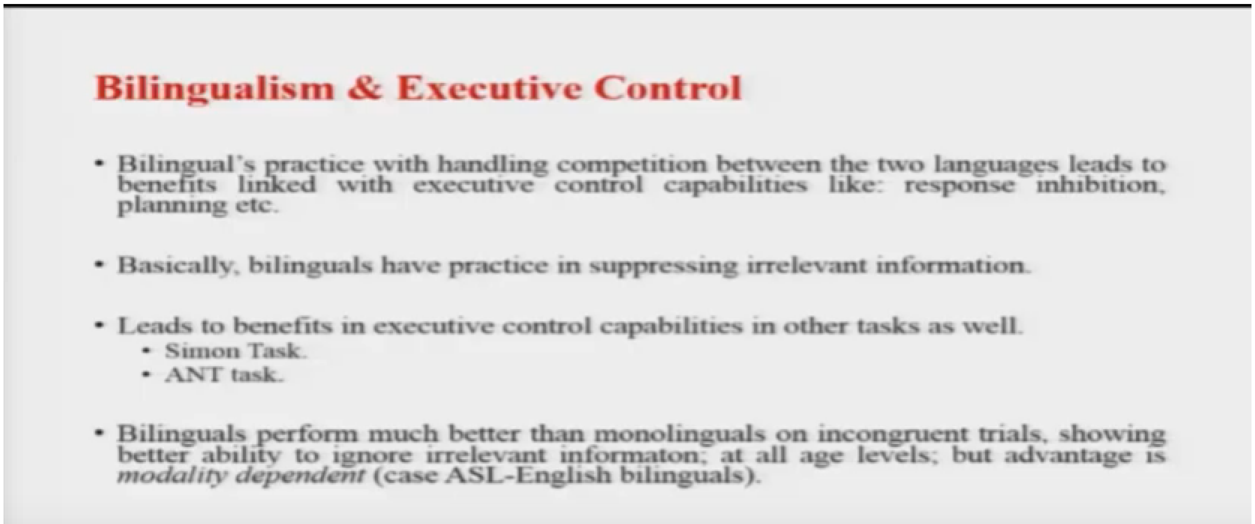
Figure 11.4 A schematic of Green's (1998, p. 69) *inhibitory control* model. G represents the system's current *goal*. The *conceptualizer* represents non-linguistic semantic representations or concepts. *SAS* stands for Supervisory Attention System that monitors the current goal and the current language task schema. A *language task schema* is a set of mental processes that can satisfy the current goal (such as *translate from L2 to L1; make a lexical decision, encode a concept in your second language*). The *lexico-semantic system* contains the lemma and lexeme representations that the bilingual speaker needs to express or decipher meanings in the two languages. I stands for *input*. O stands for *output*

This is how this particular model looks like. And you can see, say for example, there is G which is the gold state, there's the supervisor the attentional system, there is the conceptualizer, there is the I which is the input, the input directly starts with the bilingual lexico-semantic system, which kind of is typically what was happening in the BIA and then there is this language tasks schema. And finally you have the output. So, the lexical semantics system is basically the one that contains the lemma and lexeme repercentage that the bilingual speaker needs to express or decipher meanings in the two language. O is the output modality and you see that, this lexical semantics system, communicates directly with the conceptualizer. Because, the meaning you know regardless of the two languages is, being accessed as a central system and then you have the language tasks lemma, what is the task at hand and this is also feeding up to the SAS, which is keeping the entire unit, sort of vigilant and you see that the SAS is connected to the goal, which is again kind of keeping in mind, what is it that I have to do. Okay? So, this is this is sort of the s, the inhibitory control model, put forward by green in 1998.

Now, having said that, one of the last things that I wanted to talk about, was this concept of you know, we talked about, the advantages that the bilinguals you know, can you know, experience as knowing two languages. Now, you see that, you know, given that the two languages of the bilinguals are simultaneously active, in comprehension production, given that in order to you know, not let the two languages interfere a lot with each other, not lead to so many errors, bilinguals have particular mechanisms, the Greens inhibitory module, inhibitory control model is just one model there are other models as well. But, they seem to have some sort of a mastery, over a particular mechanism that will help them control, the languages from interfering with each other. Now, generically speaking, this ability can be very useful, not only in language performance, but also say for example and scenarios very where you have to do two tasks at the same time, you know, you have to kind of tap with your left hand, you know tap with your hand, as well as, kind of count something, you have to you know, drive as well as you know, talk on the phone which is obviously not advisable, but there are so many situations in daily life, where you are sometimes you know, you have to do two tasks at hand and you have to kind of control those two tasks enough may, in a way that they don't interfere with each other.

Because, piling wills have been doing it for so long you know, assuming that somebody is acquired first language from, acquired a second language from early childhood, assuming that they have got this practice with this inhibitory control and this you know, elaborated practice which the modeling was did not have access to, this is what has been proposed to lead to you know, advantages for the bilinguals, in many tasks that check for response inhibition, dual task performance you know, response shifting and as you know similar other component abilities.

Refer Slide Time :(32:11)



There are a lot of tasks you know, like these basically in response planning etc, they're in by linguists have been shown to be, advantageous, over monolinguals. Now, some of the examples, could be the ENT task that is the attentional networking task, by Posner and the task is basically that you have five arrows, one of the arrows is pointing towards a different side than the other four arrows, you have to kind of respond to the you know, what the particular arrows doing? Say for example, there is one arrow this side, four arrows this side, you had to press a button that kind of says that okay, that is pointing towards the left side, something like that. Basically, it kind of asks you to; inhibit the activation from the arrows that were pointing this side and activated representation that are responding, that the central arrow is pointing towards this side. This and there are other types of tasks like the Simon tasks, you know, which is basically sort of again, a test of response compatibility and so on. So, they're having this and so many other tasks, the ambiguous finger tasks, there as a particular figure, which can be interpreted as one or the other kind of drawing. Okay?

So, there are so many of these tasks, across which bilinguals have been shown to be, having some advantage, over moldy numerals and what traditionally the research has done is that, traditionally the research has attributed, this advantage to the bilinguals extended practice, with inhibiting and you know, with inhibiting the other language and selecting the relevant language, for the task at hand. Now, this research is also now been by the way here, now is being called into question and there are some very interesting debates going on in bilingualism literature, at the moment partly saying that, you know that is not really the case, that bilinguals do not really have this kind of advantage, over monolinguals and the reasons are varied from conceptual to you know, things like you know, pointing out methodological issues across, the studies. But again, this is a very interesting area. And a lot of research is going on in this area, with respect to whether by linguists; actually enjoy some advantage over their monolingual counterparts.

Refer Slide Time :(34:19)

References

- Traxler, M.J. (2011). Introduction to Psycholinguistics: Understanding Language Science. Wiley – Blackwell.

Now, this is apparently all that I wanted to talk about bilingualism. Now, I will end the unit of, of bilingualism in this lecture. And this is what I wanted to talk about, bilingualism. However, this is also being the last lecture of the day, I will try and conclude whatever we have done in this lecture, we started with talking about, some of the fundamental issues of language, we talked about evolution of language, we talked a little bit about acquisition of language, what how are the different components of language acquired, starting from an infant who's you know, 48 hours old to an adult, we talked then about words, we talked about you know sentences, we talked about producing words, we talked about you know, you know reading, we talked about disorders of reading like dyslexia, we talked about cognitive neuroscience, we talked a little bit about aphasia. And then and you know, we talked a little bit about, you know the neural basis of language and then finally we talked about bilingualism. The idea that I wanted to put forth in this course is, to you know get to you and get you to an appreciation of whatever the entire you know, gamut of language is whatever, whatever is the entire gamut of abilities that language kind of you know, brings with it and how we can study these different you know, sorts of you know, components of language. I hope this would have been, an enjoyable course and people would have followed, what has been done, we've not really been able to share a lot of material and you do copyright issues and stuff, so I hope that you are listening to the lectures, more than just you know, looking at the slide so and so on. The more you listen to the lecture and suppose say for example, if you can dig out and find the original you know, text that has been referenced, it will help you gain a very good understanding of what language is and might be helpful in various ways. So that will be all from me, from this course, I hope that you know, whoever of you is giving the exam, goes through mostly the lectures, then the slides and prepares for it accordingly.

Thank you.