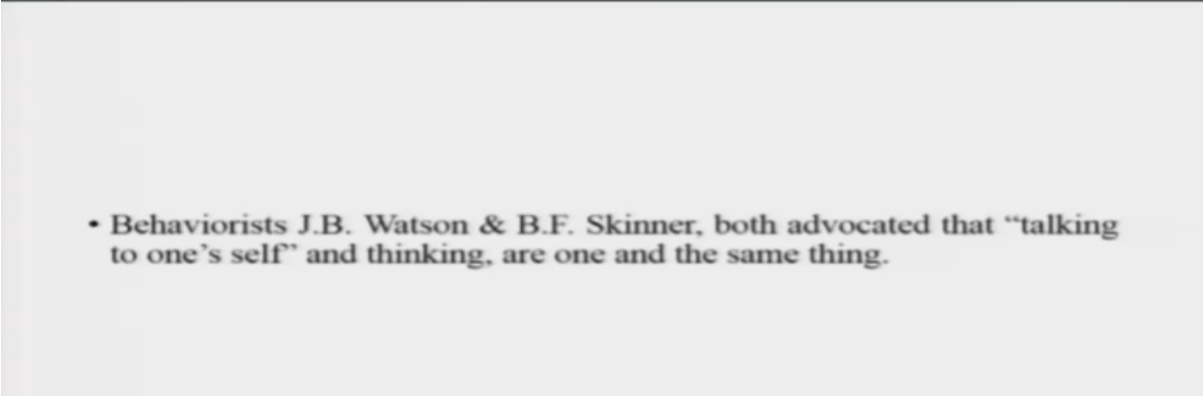


**Lecture - 05**  
**Language and Thought**

Hello and welcome to the course on introduction to the psychology of language I am Ark Verma, I am a professor of psychology and cognitive science at IIT Kanpur. In this week we have been talking about various aspects, related to introduction to language, what does it mean to know a language, whether a language is similar or different to you animal communication systems, what are the basic concepts that we need to know about, when we are setting on the scientific study of language and also, a little bit about the evolution of language that we did in the last lecture. In the final lecture of this week, we are going to talk about, the relationship between language and thought you know, as I said in the opening lecture that it's almost like a chicken and egg problem, you know which comes first, as a thought come first and then the sentence is formulated, whether the sentences formulated is exactly, the thought itself, say for example, you know we all first talk to ourselves, all of us think in our heads, all of us are constantly sort of doing a commentary, on whatever is going on in the world, sometimes that commentary is inside and sometimes that commentary kind of comes out through the movement of the physical apparatus and inwards and is heard by others. Okay? So, people have thought, in great deal, about the relationship between language, per se and thought and in some sense if you really see, how you define either also, depends upon how you see the relationship between these, these two items. So, let us, let us see, what kind of work has been done, in this particular area. Do you often talk to yourself or say for example, are you thinking that's, that's an interesting question the way its Trachsel puts it, because it says talking to oneself and thinking has sometimes been equated with each other, a lot of times people think: that they are one and the same thing. Okay?

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- Behaviorists J.B. Watson & B.F. Skinner, both advocated that “talking to one’s self” and thinking, are one and the same thing.

The other possibility is that they are slightly different things. However, behaviourists like John Watson and B.F Skinner, they were of the opinion that talking, to oneself is exactly what thinking is and they are one and the same thing. So, people wanted to test this out, in 1947, a team of medical doctors,

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- However, in 1947, medical doctors injected a healthy 34 – year old volunteer, with curare (a poison), and paralysed the throat muscles, that Watson believed were critical for thought processes.
- About 4 minutes after the injection was administered, the volunteer completely lost the ability to speak.
- Despite the loss of speech, the volunteer could still perceive everything that was happening around him.

they found a particular healthy volunteer, here the kind of convince the volunteer, so that they could inject curare, curare is a particular poison: that when you inject, in the part of the body paralyzes: that part of the body. So, the injected curare or this poison and paralyze the throat muscles, of this healthy volunteer. Four minutes after the injection was administered, the throat muscles and the neck and adjoining areas, were paralyzed and this person completely lost his ability to speak. If going by what Watson and Skinner were thinking, the loss of this ability to speak should have or could have resulted in a loss of the ability to think as well. That was not really that happened, in this particular volunteer, could clearly perceive, whatever was going around to him, at that point in time, even though the area's responsible for affecting speech, were completely paralyzed.

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- Based on the volunteer's description of his experience, the researchers concluded that paralysis of the speech muscles had no effect on the volunteer's ability to perceive, think about, or remember, the events that occurred during total muscular paralysis.

Based on this volunteers description, of his experience the researchers concluded: that the paralysis of the speech muscles or the speech producing muscles, had no effect on the volunteers ability to perceive, think about or remember what was going on during that episode when this you know, person had been injected. This could sort of you know, amount for evidence: that speaking and thinking are not dependent, on each other.

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- An alternative way of asking the same question could be whether, "talking to one's self (without moving any muscles) is equivalent to thinking".

The other approach could be: that speaking and talking to oneself are exactly one and the same thing, so that's also something that can be asked

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- However, we know that individuals who have lost the ability to speak or understand language are still able to think.
- For instance, in the case of a French monk, “Brother John”, who experienced periodic failures to speak or to understand spoken or written language as the result of the epileptic seizures (Lecours & Joannette, 1980).
- During these episodes, while Brother John was incapable of speaking coherently or writing as well, but his ability to think remained preserved.
- Subjectively, Brother John reported inability to produce the inner monologue as well.

and you can kind of Reason about, this a little bit. However, we know that there are individuals, who have lost the ability to speak or understand language you know, but they're still able to think correctly, they are still able to think clearly and be able to perform tasks that requires different kinds of thinking. Say for example, there was this case of French monk you know, “Brother John” that Traxler discusses, was experiencing these periodic failures, to speak or to understand spoken or written language, as the result of these epileptic seizures: that he was experiencing the periodically. During these, episodes what used to happen was that brother John was incapable, of speaking, coherently or even writing, but this ability of thinking remains untouched, he could think clearly, he could plan, he could act, but he could not really you know, understand or communicate using language. Subjectively, Brother John you know, this particular monk, also reported the inability, to produce inner speech. So for example, if I'm you know, if I close my mouth and I'm still saying something to myself: that is also not what Brother John was able to do, under these episodes. So that part was also not really working.

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- However, during his episodes, he could identify familiar objects, was capable of handling complex tools, carrying out instructions that he had received before the epileptic seizure began, and also performing short and long multiplication and division.
- Further, he could remember events that happened while his language abilities were incapacitated and talk about them afterwards in detail.
- “I could think clearly within my inner self but, when it came to [silently] talking to myself, I experienced difficulty finding my words” (Lecours & Joannette, 1980).

However, during his episodes, these episodes you know, he could still identify familiar objects, he was able of handling complex tools, maybe just like a hammer or a scissor, he was able to carry out instructions that was given to them before, the seizure had set in. Remember during the seizure he is not able to understand any language, but if you tell him that once your seizure starts, we have to go in let us say take this medicine, he would be able to do that. So, he must be able to plan anything and act at least in that sense. Okay? He would also perform long and short multiplication and division and in that sense you know, his mathematical ability also, preserved. Further, he could also remember, events that happened while his language abilities were incapacitated and he could later tell you stories about, what was going on? What was he feeling? What was his thought process like? Okay? So for example, there's this quote where he says: that I could think clearly within, my inner self but, when it came to talking to myself, I experienced difficulty finding my words. So, it's slightly difficult to understand, what this exactly means? But, apparently thought does not really depend on you know, these linguistic structures called, 'Words' if you were to go by this evidence. Okay?

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- Cases like these, are a demonstration that one does not need language in order to think (where thinking is defined as the ability to reason, plan, make decisions, and respond appropriately to complex environmental stimuli).
- Other examples demonstrate that you do not need to think particularly well in order to use language.
- William's syndrome, is a disorder that results in abnormal brain structure and functioning as well as mental retardation (lightwood, 1952). Severe mental limitations do not cripple the ability to use language, in patients with Williams Syndrome.

So, cases like this you know that of Brother John, are a demonstration that one does not need language to think, where thinking is you know, defined as this ability to reason, planned, make decisions etc. To act in a particular way so, it does not it say for example, thing it probably does not necessarily depend on these linguistic structures, so that is one. There are other examples as well, which demonstrate that you do not need to think particularly well, in order to use language, so this one showed you that you do not need language to think properly, let us look at some examples which will show you that you cannot, you do not need thought to use language properly. Okay? There's the other way around. So, there's this disorder called, 'Williams Syndrome' which basically results in you know, a particular kind of abnormal, brain structure and brain functioning, as well as a particular degree of mental retardation. However, interestingly severe mental limitations that patients of Williams syndrome face, they do not really appear to you know, cripple their ability to use language. So, even though the Williams syndrome patients will not be able to carry out simple tasks, add one plus one is equal two etcetera. But, they will be able to speak very fluently, they will be able to use language completely effortlessly, so actual takes this example of a woman who was, unable to do basic arithmetic calculations or retrieve a small set of objects, you know if you ask her to you know, fetch me at this pen, she will not be able to do it, but when you ask her to talk, she'll be able to talk in a perfectly coherent, comprehensible way: that would almost make you feel that there's nothing wrong with this person.

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- For instance, one woman who was unable to do basic arithmetic calculations or retrieve a small set of objects on request. She could however, talk fluently and in a perfectly comprehensible manner.
- However, some aspects of the language abilities of the Williams Syndrome Patients are certainly compromised for e.g. they react differently to syntax & aspects of semantics than normal individuals.
- Although, it is notable that the language abilities of WMS patients are more sophisticated than you would expect on the basis of their overall levels of intelligence and in comparison to patients with other kinds of mental retardation, including people with Down Syndrome.

This is one kind of patient, there are other kind of patient as well say for example, patients of Down's syndrome, which is also a genetic anomaly that causes a degree of mental retardation, there in people have found that some kind of language problems are there but, Williams syndrome people kind of do way, better than these Down syndrome patients.

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- All in all, it has been demonstrated that one does not need language to think clearly, and also that one can have decent language skills even if other aspects of non – linguistic thought are impaired.
- Such a scenario is termed as *double dissociation* in neuroscience, which implies that both, language and thought can exist independent of each other.
  - For instance: if there are patients available who have language impaired but thought is fine, and other group of patients in whom thought is impaired but language skills are fine, it would mean that the two skills are independent of each other to a particular extent and are not parts of the same skill set.

All in all, if you look at some of these cases, it has been demonstrated so you do not need language fine to be able to think properly, I do not need thought fine to be able to use language properly and this kind of a situation, is referred to in neuroscience as the situation called, 'Double Dissociation'. Suppose say for example, if you have a patient, a deficient in doing task one, but can do task two and patient B is deficient doing task 2, but can do task 1. This is treated as an evidence for understanding that task 1 and task 2, are typically based on distinct, neural abilities. Distinct meant you know, cognitive you know, abilities to know more about this you can refer to one of the you know, lectures in in different quotes that I have given, on basic cognitive processes, but the idea that I am, trying to get to you know get across, is that there is, enough evidence, clinical and otherwise that tells us that language and thought are not exactly, the same thing and that different from each other. Okay? So, at least that, is there and if you've kind of specified that one out, then what you can talk about is how are

these two related? So, different people have opined and given different interesting theories, about how, language and thought might be related, so let us kind of look at some of these theories. One of the most interesting theories about, how language and thought might be related was put forward by Edward Sapir and BL Worf and they developed this idea and they proposed that, the kind of language we are using, has a very profound influence on the way we think. So, the structures that our language has say for example: that our language permits, us to talk about the future in a particular way, past in a particular way, a language has a particular word, for describing this beautiful object or describing a particular action or putting an abstract noun in some sense, has an effect on how we think, we can think only as much as our language may allow, so that was pretty much this whole thing. And you can word it in a different way and you can say: that the proposal was that language determines thought. Okay. This was you know, this particular proposition has been named as their sapir-whorf hypothesis or as a version of linguistic, determinism, where language determines thought and other you know and the other cognitive functions might you know, act. Now, where were these, where were these people coming from, where was Edward Sapir and male wolf coming from, one of the sources of this idea probably, could have been as Traxler points out, was this you know, this description of the Eskimo language that was published by Franz Boas,

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- One of the sources of this idea, may have been an analysis based on Eskimo vocabulary, published by Franz Boas (1911); which led to the belief that while English has a single word *snow*, Eskimo language has many words for the concept of snow.
- Whorf proposed that as the Eskimos had more experience with the snow, they may have carved up the single concept to many subconcepts, and consequently developed a different word for each of them.
- The underlying idea being that while Eskimos would appreciate the different nuances of snow, as their language permits them to see that; English speaking people will not be able to see the distinctions between these nuances as their language does not have any words for these.

which kind of you know, ledge to this belief that English just has one word for snow and Eskimo language has more than one word two words, three words, different words for snow. And in because, this language has so many words for snow and this language has just one word for snow, the experiences, of the speakers of this language, with respect to snow, might be very different from as compared to the experiences of speaker of this language that is English, as far as snow was concerned. So you see, what is happening here is that? The other language is allowing, you to experience different nuances of snow and it has different words for it. But, this language is kind of limiting, your perception and appreciation of what snow is. Okay? So, this is what led? To the sapir-whorf hypothesis, was proposed that because Eskimos had more experience with snow, they may have carved up the single concept of snow, into many different sub concepts and consequently developed different words for each of these sub concepts. Okay? In that sense English, people say for example, people from these English-speaking countries or English language might not have, those many experiences with snow, so their understanding and appreciation of snow, can be just condensed into just one single word. Okay? Probably also hinting that they cannot appreciate those different aspects of snow, which the Eskimos can. Okay? So that distinction is, is being made.

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- However, that was not to be. Geoffrey Pullum, a Scottish linguist, demonstrated the flaw in these assumptions:
  - He showed that Eskimo languages *do not* have more words for snow than English does. As, Eskimo language gives just two possible relevant roots *qanik* meaning snow in the air or *aput* meaning snow on the ground. Hence, it might be wrong to assume that the speakers of English & Eskimo may perceive snow very differently than each other.
  - Indeed, there is no evidence to show that Eskimo speakers or speakers of any other language groups perceive any differences between different kinds of snow.

However, this whole idea was miss founded which became clear, when Geoffrey Pullum, a Scottish linguist: that demonstrated the flaw in these assumptions. He kind of demonstrated that a, Eskimo languages do not, have more words for snow than English and B, there is no evidence that speakers of a Eskimo language, was the speakers of English, really have any differences, with respect to we are not perceiving and interacting or you know, thinking about snow. So he kind of you know showed that say for example, Eskimo language only has two words for snow. One is connect that is snow in the air and another is output that is snow on the ground and that's typically at the, the most distinction they make between, two kinds of snow, let us say. Okay? English has just one word for snow, which is again not really very different. So that the point being: that this whole idea, of language really limiting somebody's you know, your perception and thought, with respect to particular objects, might not really be a very feasible idea, might not really be something practical to hold on. Okay?

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- Moving on, many researchers have also looked for evidence of linguistic determinism, albeit in different areas. For instance, emotion and color perception.
- Although they seem to have got some initial success, but it has been observed that people from all around the world, speaking different languages recognize the same basic emotions, as happiness, sadness, anger & disgust.
- These commonalities in perception of emotion, and a similar organisation of emotional vocabulary across languages both point towards a shared representation of human emotions across cultures, despite differences in languages and culture.

So, let's move on, its see that was that, many researchers have also, in essence looked for evidence of linguistic determinism, in other area say for example, in areas of say for example, emotion perception or colour perception. Say for example, there are commonalities, in perception of both amount of emotion and a similar organization of emotional vocabulary, across human cultures, different in despite differences in language and culture, say for example that already you know, thumps this whole idea, of that because different languages have different words for these emotions, they are probably in, in some sense mutually unintelligible or people experience emotions in different ways; that's, that's



not really the case. In perception of colours it's slightly more easier to see, you can say for example, if you read you will find that most languages have seven or fewer basic colour terms and then other the, other terms are mostly combination of these basic colours.

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- As with emotion perception, perception of colors and color words also work in the same fashion.
- Most languages have 7 or less basic color terms. Those having only two, will first have words for white and black; and then words for red, yellow or green. After that blue, brown, purple, pink, orange and gray, more or less in that order.
- Similarities, in color classification also comes from the fact that most people across language groups seem to have common physiological mechanisms for color perception, for example we all three types of cones that react to color in pairwise opposing systems, as black – white, blue – yellow and red – green (Goldstein, 2006).
- Given this, it is easy to understand why people, even though they speak different languages, perceive color in different ways.

Say for example, in the languages that just have two terms for colour, will be black and white, then the other words might come in so, you have black, white and then you might have another term for red and then for yellow or green and similarly other third-level colors like blue, brown which are again, mixes of these basic colours, start coming up. So, in, in that sense, there is this thing: that people have similar terms for classification of colour in you know, these different languages. Sometimes you know, these similarities in how people are classifying colors or perceiving or categorizing colour, probably comes from the physiological, commonalities across the human species as well, we know that, there are cones in the eyes that, you know help us perceive colour, we know that there are these you know they, they do it in a sort of opponent, process mechanism, so for example black, white, blue, yellow, red, green I've talked about this in a different course I'm not really going into a lot of detail. But, there is a certain degree of commonality, in how people universally perceive and categorize colour and that is, what is reflected in the language anyways? So, given this, if you have this background, it is easy to understand, why people, even though who speak different languages, may perceive, the colour in a very similar ways. Okay?

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## *Whorf makes a comeback...*

- Let us look at what Alfred Bloom has to say,

*“The claim that the language or languages we learn determine the ways we think is clearly untenable. But it does not necessarily follow that language is merely a code system which neither affects the process by which thinking proceeds nor the nature of the thoughts manipulated in that process.”*

Now, that is, that is said it almost seems like you know, the Sapir-Whorf hypothesis, is untenable and we don't really want to have any version of that, but if you look more closely, there are interesting instances that appear: that kind of point words that, there might be at least some truth, in what Sapir-Whorf, were trying to say at that point in time. Say for example, Alfred Bloom says: that the claim that language or languages we learned determine the ways, we think is obviously untenable. But, it does not really follow that language does not, interact with the subject matter at all, it's not necessarily follow that language is just, a code system that neither affects the processes by which thinking proceeds, nor it affects the nature of the thoughts manipulated, in this you know, in this communication process. So, obviously language does, interact with the content, it does interact with how this content is drawn up and that is, something that people have probably started finding evidence for, we take up some of these examples, you can say that, say for example by the strong, aspect of linguistic determinism is not really feasible, you can say that, people are have found some support, towards the fact: that say for example, language may be affecting you know, may be influence and some of these non-linguistic perceptual and thought processes. Okay?

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- While linguistic determinism, may not be feasible; that language may affect thinking in some ways has found support in more recent research.
- Researchers have started to believe that language may affect non – linguistic perceptual and thought processes, o that speakers of one language may differently than speakers of other languages on a range of perceptual and cognitive tasks.

Or the speakers of one language made differently perceive, certain particular aspects, than speakers of the other language and it can be, it has been tested in a range of different perceptual and cognitive tasks.

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- Chinese offers two examples: counting skill and counterfactual reasoning.
- For example:
  - Chinese number words are more transparent than English, especially from 10 onwards, the numbers for 11 – 19 are equivalent to saying, “ten – one”, “ten – two”, “ten – three” and so on.
  - As a result, Chinese children learn to count through teens faster than English speaking children, because of the more transparent relationship between the teens and the single digit numbers.

So, let us take up some of the examples of this kind, say for example let us take Chinese, two things, counting skills and counterfactual thinking. Say for example, in Chinese the numbers starting from 10, are represented in a very, transparent manner, so we have 10, 11, 12, 13, 14 in English, in Chinese the equivalents are like 10, 1/10, 2/10, 3/10, 4 and so on. Obviously this latter, version is much more transparent and it makes it much more easier for children to acquire, this kind of counting. So, Chinese speakers of Chinese, acquire counting after teens slightly more easily than the English speaking children and that might have consequences, for the way they, count large number of stuff and so on. Okay. So that, that is something there. Interestingly there is also an example in pirahã, which does not really have number terminology, per say. So, they do not really have words, corresponding to Arabic numerals like 1, 2, 3, 4 etc. What they have is? They have words for less or more, they have fewer and more than, so they generally, probably are not really counting exact number of things, but they have a sense of that, you know grossly, things are of the same quantity or something is lesser than this quantity or more than this quantity.

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- Further, the greater accuracy at naming number words could come in handy when the children were to count sets of objects etc.
- Similarly, Piraha offers a more dramatic case of number terminology affecting cognitive abilities (Everett, 2008).
  - Piraha does not have words corresponding to Arabic numerals (one, two, three ,etc.); instead they have words to quantify objects as fewer or more.
  - This lack of number words in the language does not prevent Piraha speakers from perceiving that different sets of objects have different quantities of individual objects; they can match sets of different numbers of objects.
  - However, the lack of number words does seem to affect Piraha speaker’s ability to remember the exact quantity of different sets of items.

Now, what, what does this imply it implies? It implies: that apparently the lack of these number words, leads to the pirahã people's inability, to specifically remember, the exact number of or the exact quantity of particular objects, they might be able to say for example, tell you: that you know, this bunch of fruits, is more than this bunch of fruits or lesser than this bunch of fruits. But, maybe they will not be able to tell you count because, their language does not have words: that this is 5 or this is 7 or this is 9 and this is 5, something like that. Okay.

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- More specifically, when the task involves direct perception of the objects involved, and does not require maintaining information in memory, Piraha speakers do equally well as speakers of other languages; however, when the task requires participants to maintain the number of objects in memory, Piraha speakers are at a disadvantage.
- It may be concluded, therefore that while language may not affect perception directly, language allows speakers to encode knowledge in a form that is relatively easy to maintain; and hence facilitates aspects of cognition.

More specifically, you see that when the task involves direct, perception of objects involved and does not require maintaining information in memory, pirahã do as well as speakers of other language. But, when the task requires maintaining objects in the memory, in such a way that they have to say you know, they have to anchor, the a quantity, can bring that back in a different task: that is where the pirahã suffer. Okay? And it's not really completely counterintuitive in a sense that you see: that the number terms actually, act as anchors, for that specific amount of quantity, if you do not have number terms, you will obviously not be able to talk about the exact, amount of that quantity: that is what I'm trying to kind of? Say that's what you know, really happens here and in that sense, it may be concluded refer by language may not affect perception directly, languages allow, a speaker to encode knowledge in a form, anchor quantity in a form in the case of pirahã, such that it is relatively easy to maintain. Okay? So at least, there is some evidence that language kind of affects, particular cognitive functions, in particular ways, not completely but, in particular ways. Okay?

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- On a different note, while Chinese speakers may be better in counting; they struggle when the task involves *counterfactual statements*.

- Acc. to Bloom, Chinese counterfactuals are expressed using less direct means (1984, p.276):

*"A Chinese speaker might state explicitly "John did not take linguistics" and then follow that statement by the past implicational statement, "If he did, then he was excited about it" and the remark would again be accorded a counterfactual interpretation – i.e., be interpreted as roughly equivalent to the English, "If he had taken linguistics, he would have been excited about it."*

Another example, interesting example, in Chinese is that Chinese language mandarin in essence probably does not really have counterfactual statements say for example the Blum demonstrate this very interestingly he says a Chinese speaker might state explicitly, John did not take linguistics and then later if he did, then he was excited about it. In English, it would say for example, he will not be able to say this, in Chinese the what they will say is, if he had taken linguistics he would have been, excited about it. So, in the former sentence you see there is a statement of implication, John did not take linguistics, if he did then he was excited about, if he took linguistics, so that's a supposition that is there, you see in Chinese, if he had taken linguistics, he would have been excited, this is the Chinese version of it. So, some sort of counterfactual, thinking is not permitted,

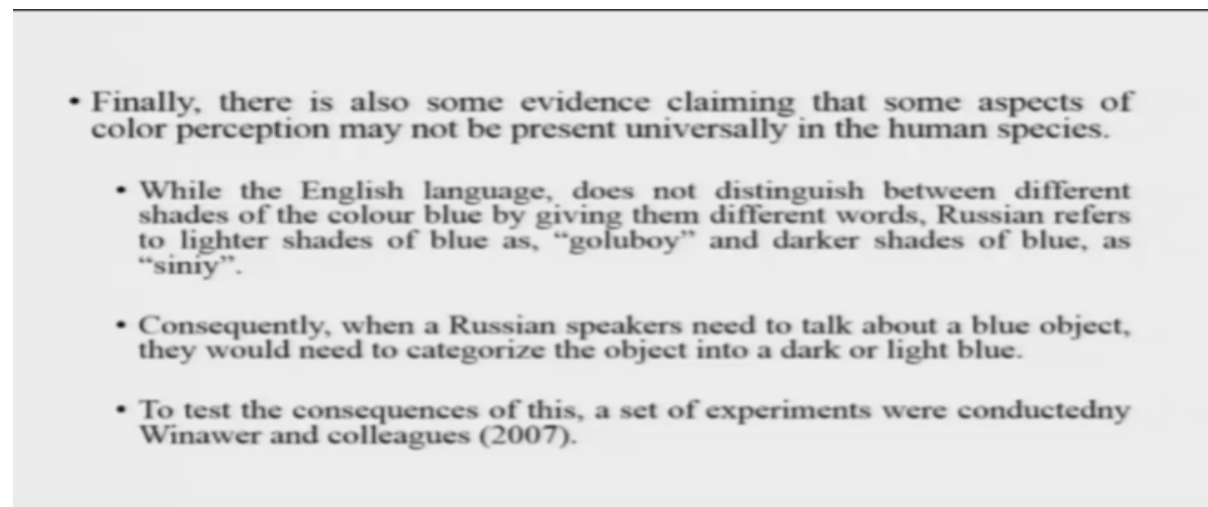
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- When English and Chinese speakers were tested on counterfactual reasoning, Bloom showed that while about three quarters of the English speakers were willing to accept a counterfactual statement, only about one quarter of the Chinese speakers were willing to do so.
- Bloom reasoned that such a pattern would have happened because the Chinese speakers could not very well understand the questions, as they were formulated as counterfactual statements, for e.g. "If all circles are large, and if this small triangle were a circle, would it be large?" instead of Chinese equivalent to, "If all circles are large, and if this small triangle is a circle, is the triangle large?".
- So, the forms that the two language allow for, makes some aspects of reasoning more easy for the speakers of the language, for instance English as opposed to Chinese.

by the language let us look at this in more detail. So, when English and Chinese speakers were tested on counterfactual reasoning, Bloom showed that while about three quarters of the English speakers were willing to accept, a counterfactual statement, only about one-quarter of Chinese speakers were found to be willing to do so. Bloom reason: that such a pattern would have happened because, the Chinese speakers could not completely comprehend, the questions that were being asked, the

questions that were asked for say for example, if all soakers are large and if this is a small trying, if and if this small triangle were a circle, would it be large. would so for example, you have to assume: that if this triangle became a circle, will it be like so sort of counterfactual operation has to be done here, in Chinese however, it will be much more simpler, if it was you know the Chinese equivalent, is if all circles are large, if this small triangle is a circle, is this triangle large. So, here there is no supposition, the formal case is slightly more difficult for the Chinese students to understand because, the language does not permit that kind of counterfactual reasoning. So, the forms that the two languages allow for, you can conclude that makes some aspects of reasoning more easy, for the speakers of that language. So, aspects of counterfactual reasoning, might be more difficult for Chinese students in comparison to other English speaking students. Okay?

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We can move further, finally there's also some evidence that some aspects of colour perception, may not be universally, present across human species. So, say for example, while the English language is not distinguished between different shades of blue, Russian has different words for light blue and dark blue. Say for example, the lighter blue colours are referred to as, “goluboy” whereas dark blue colours are referred to as, “siniy”. So, consequently when Russian speaker, needs to talk about a blue object, he we need to decide whether he is going to talk about light blue or dark blue, whether he's going to use siniy or goluboy. They tested this out whenever in colleagues in 2007 and what they did was they gave, they had this two you know, groups of speakers, Russian speakers, English speakers and a very interesting task, the task involved them having a placard, on this placard there was three squares, he's a top square and the two squares, at the bottom. So, this top square could either be light blue or dark blue and these bottom could both be light, both be dark or one light and one dark. So, either ways it could be there and the task was that the people who were, supposed to check,

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- A group of Russian & English speakers were tested. They were given a card that had three colored squares printed on it, with one square on the top and two squares adjacent to each other below.
- The speakers' task was to indicate which of the bottom two squares was the same color as the top one. Sometimes, all three squares were of lighter shade or darker shade; and sometimes two squares were either light or dark, with the third one being from the opposite category.
- If language has no effect on the same perception of color, there should be no difference in the performance of English as compared to Russian speakers; but if it has the English speakers should find the task more difficult than the Russian speakers.

which of the two squares from the bottom, it was exactly same as the square on the top. So, you have to look at this square, compare this square, with this, this Square and tell us which of these squares is exact same colour. Now, if language were to have no effect on the perception of colour and that's, what these speakers and these researchers assumed, there should be no difference, in the performance of English versus: that of Russian speakers. But, if it has, English speakers should find the task more difficult, than the Russian speakers. Because the Russian speakers will probably be able to distinguish very quickly, because they have different words for the two colours.

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- Indeed, Russian speakers were found to be faster and more accurate judging the squares, where some of the colors were on opposite sides of the "siniy"/"goluboy" boundary and slower when all the colors were either "siniy" or "goluboy", whereas
- English speakers had no problems were just as fast and accurate no matter what arrangement of colors appeared on the cards.

Indeed that was something that they found, so Russian speakers were found to be faster and more accurate on judging the squares, where some of the colors were on opposite side. So, as soon as there was distinction to be made between goluboy siniy, because the Russian people had words, they could do it completely, they actually found it more difficult when they were on the same side. English speakers, had no problems and were just as accurate no matter whatever arrangement of colors appeared, because they were kind of you know, just having one word and they, they were not really in this business of distinguishing these two colours. Now, this kind of you know, gives us an example, of that maybe language does impact, other cognitive functions or performance of other cognitive functions, in certain you know, slightly similar way is not really very strong ways, as spair, Worf and would have imagined. Okay?

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## Take home message...

- All in all, research on the relationship between language and thought demonstrates for the most part, that while language does not really affect the way one perceives the world, though it might make certain tasks easier or more difficult.
- Though, the evidence for and against are both to be treated carefully, keeping in mind the task, test materials and the participants.

So, all in all, the take-home message is that the relationship between language and thought demonstrates for the most part that language does not really affect the way one perceives the world, but it might make certain tasks easier or more difficult it might, affect in more you know, less powerful ways in that sense. Though the evidence both for and against, are both to be treated carefully, keeping in mind the kind of task that is being done, the people that are you know, the subjects and also you know, the test materials that have been used. So, one has to kind of take you know, all of this with a pinch of salt and I am not really sure, whether this debate is actually solved, so there is constant work between language and thought and the different kinds of experiments people are still doing, in order to h out, this relationship between how language and thought related to each other.

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## References

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

So, this will be the end of this week, I have tried to talk to you about, different aspects of what the basics of language have to be about and kind of did some homework for, some of the lectures that are going to come later as well. Thank you.