

Bilingualism: A cognitive and psycholinguistic perspective
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Part - 01
Module - 08
Lecture - 19
New research trends in bilingualism

Hello and welcome back. We are now at the last phase, last part of the course we have reached module 8. So far we have looked at various aspects of bilingualism in all its nuances. And now in this part in this last module, 8th module we will look at the, we will kind of take stock of the all the developments that have taken place.

All we have looked at in a nutshell in summarized form. Also in this module, we will try and see the trend that is following from here that the new trends, the new domains of research that this discipline has given rise to and where things are moving that is what this module will look at.

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New trends

- So far we have seen bilingualism in its many different avatars, starting from social, gradually moving to cognitive and neural aspects
- like any academic discipline, its an ever changing, ever evolving field.
- So, when we talk about new trends, we mean what is new today.
- And what is new today is also not a sudden change, but rather a point on the continuum, an evolutionary stage of the same.
- Where we stand today also points toward the near future of this discipline.

So, let us get started. First part of this module, we will focus on the new trends, new trends as in new research trends in bilingualism. So, starting with when we looked at course in the very beginning, we looked at the social aspects. If you remember, we started with language contact and how languages come into, how one community moves into another

and languages come in touch and as a result of which many things happen, bilingualism is one of them.

So, we started with the social and socio-cultural background in a historical setting, we looked at all of these pointers and then from there onward, we looked at bilingualism in all its various aspects. So, various avatars, let us say. So, starting from the social and then gradually we moved on to the cognitive aspect of bilingualism because we you know, we saw that bilingualism of course, is a social phenomena, but it does not remain only out there, out there in the society, so to say.

So, when we say that a society as a whole is bilingual, what it means is that, more often than not, the individuals within that society are also bilingual. We also looked at the possibilities of social bilingualism and individual bilingualism and their interaction. So, individual bilinguals may or may not be part of a socially bilingual setup, whereas, social bilingualism more often than not entails individual bilingualism.

So, all of these are, they cannot remain only in the social domain, they also make an impact, they also have, they make inroads into the mental aspects of the individuals. Mental aspects, by mental aspects we mean cognitive aspects. So, we looked at the various cognitive repercussions of being a bilingual in a been a bilingual society, how various ways of looking at the world, the world view that is enshrined in a language, how language cognition interacts in a bilingual person's mind and so on.

And then also, we also looked at the neural aspects of these entire processes. So, starting from the society to the mental cognitive to the neural aspects, this is a journey we have undertaken till now. Now, even though till module 7, we have tried to cover as much ground as possible within the sphere of bilingualism.

But like any other academic discipline, this is also not a stagnant field, this is any academic discipline grows all the time. Every now and then there are new newer way of looking at things. So, that is an that is a hallmark of any academic discipline. So, similarly for bilingualism. So, the field is changing so rapidly, sometimes it is very difficult to keep up.

So, with this background, I want to give a brief overview of the research trends that is happening now. Now, when we say about trends, what we mean is trends as they are today. Because as I said, it is a very, very rapidly changing discipline, each and also because not

only it is rapidly changing, not only because it is like any other academic discipline, but also because which is an more important aspect of this discipline, is that it is an interdisciplinary domain of study.

So, on the one hand, it takes into account the sociological aspects of bilingualism. Then you also have a input from cognitive sciences as well as from the neurosciences. So, any new development in either of these various disciplines affects how we look at bilingualism today. So, that is why when you talk about new trends, what we mean new is what is new today. It may not remain new tomorrow.

And all of these new things that we will talk about shortly also are not sudden changes. As we have seen over a period of time, how changes have been building up. So, it is an gradually evolving field. So, these changes have been taking shape over a period of time. And this is as a result, it is a point on the continuum rather than a sudden you know shift. There is no shift as such. There are gradual changes. So, evolutionary, this is just an evolutionary stage of the ever-changing nature of this.

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So, while we look at the new trends, this is just a pointer towards the future, future way of looking at the discipline, future trends and the where the research is going. So, that is the with that kind of a very short introduction to this module, let us go ahead. So, the entire module will be divided into these two broadly specified domains. One is the new developments within bilingualism research itself.

So, bilingualism research, as I just said, that there are changes happening in all the connected domains. So, sociological research, neurosciences, cognitive sciences so, that is one. So, developments in these areas have given rise to developments within bilingualism research and that is what is taking it forward to newer pastures, that is one.

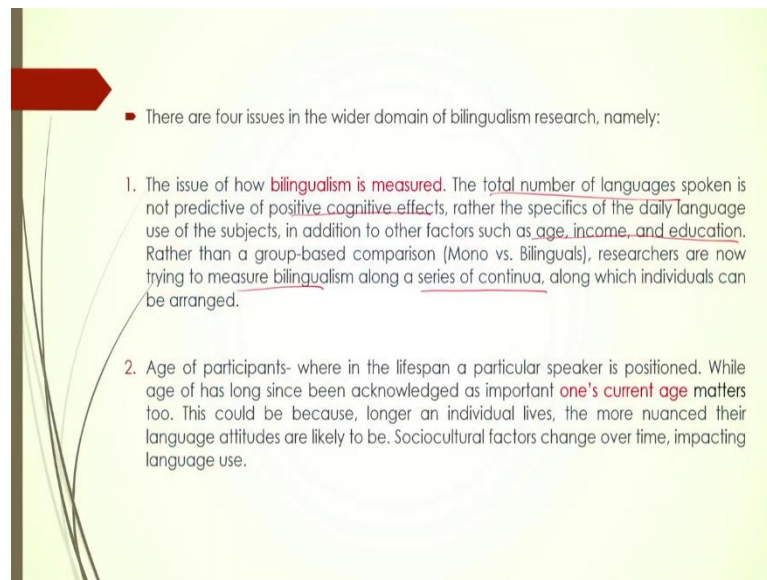
Simultaneously, the impact of these domain has also shown its effect on the other sister domains. Sister domains as in within linguistics, within language studies, there are many other domains which do not take bilingualism as a main point, but they look at for example, first language, what happens in a bilingual society to the first language; ok fine, bilinguals are doing this, doing that, but then nobody is talking about the first language. So, that is also one another sister domain, that is what we mean by sister domain.

Similarly, many other such connected domains within language sciences. So, the idea we will look at is what happens to the first language.

Can the findings from bilingualism be translated into third or more languages? Because this is a natural question, ok if this is how bilingual language acquisition happens, will the same process be repeated when we learn a third language or a fourth language or what happens when you are living in a totally multilingual setup?

Do we follow the same trends? Do we follow the same processes? Do we process those languages in the same way as the bilingual and so on? So, as a result, new trends in multilingualism research has also been taking place and there are some new models that have been proposed.

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- There are four issues in the wider domain of bilingualism research, namely:
 1. The issue of how **bilingualism is measured**. The total number of languages spoken is not predictive of **positive cognitive effects**, rather the specifics of the **daily language use** of the subjects, in addition to other factors such as **age, income, and education**. Rather than a group-based comparison (Mono vs. Bilinguals), researchers are now trying to measure **bilingualism** along a **series of continua**, along which individuals can be arranged.
 2. Age of participants- where in the lifespan a particular speaker is positioned. While age of has long since been acknowledged as important **one's current age** matters too. This could be because, longer an individual lives, the more nuanced their language attitudes are likely to be. Sociocultural factors change over time, impacting language use.

Now, we will again start with again go back to bilingualism before we move on to multilingualism and others. So, there are four issues in the wider domain of bilingualism research that we can ultimately bring it down to four main points. The four main points where the changes are happening, the changes are being advocated let us say.

So, one issue is how bilingualism is measured. Now, if you recall in the previous modules, we have talked about the measurement of bilingualism using various kinds of methods. On the one hand, we have different kinds of questionnaires. On the other hand, we have the experimental paradigms, various different types. Now, and also what are the various variables that are to be taken into account.

So, all of these details are going undergoing a lot of change as of today as we speak now. So, the total number of languages spoken is not just the number of languages that is that a person speaks that can predict a positive cognitive effect that is one thing. So, bilingual measuring bilingualism is not only about measuring how many languages and when the second language was learnt.

However, there are many other factors like age, income, education and so many other things that have now been brought to the focus. Not that they were not in not discussed before, but more than ever today, there is a lot of discussion around these things, around these variables that measuring bilingualism does not only need to be talked about in terms of age of acquisition however, many other intertwined factors.

We will see some of them when we discuss them in detail. So, basically, the idea today is to measure bilingualism along a series of continua, right, not just some static factors over a period of time, like only proficiency or only age of acquisition, how age of acquisition and proficiency interact with each other is another domain that is of interest today.

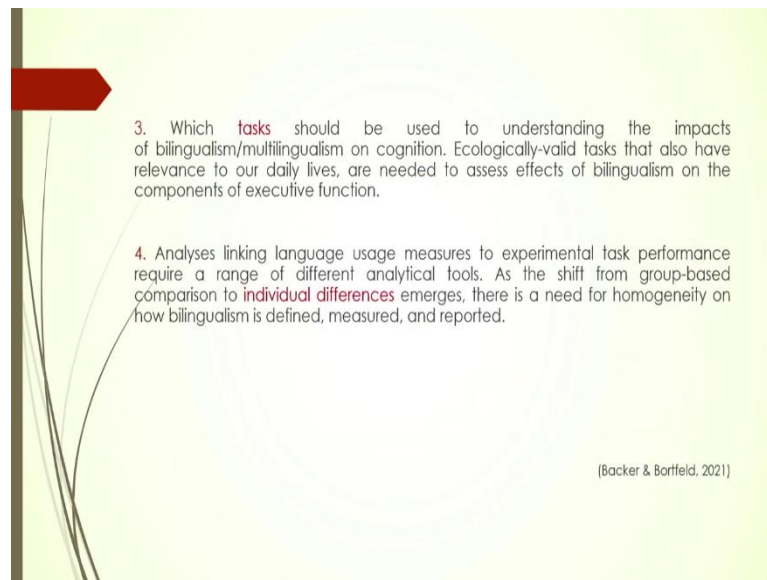
So, it is not enough to say that a person is high proficient bilingual or a person is early bilingual versus a person is late bilingual. So, there are interactions even within those variables that is what we are talking about here. Similarly, the another interesting idea within bilingualism research that is now quite popular is the idea of the lifespan of a bilingual because throughout life a bilingual does not remain the same. There are changes.

So, philosophically we can always say that you know we are completely different person today than we were 20 years back because the whole thing changes, the cells the at the cellular level things change so much so, that we become a new person every few years. This is true in a very different way for bilingualism as well.

So, bilingualism over a lifespan is another domain that is coming up in a big way and this is acknowledged in creating by creating different kinds of bilingual population and looking at them in that way. So, age of age has been of course, acknowledged as an important variable.

However, one's current age also matters, current age as in. So, you have been a bilingual for 10 years, but you are 10 year old and you have been bilingual for 10 years, but you are 60 years old are not the same thing. So, current age taking care of the lifespan of a bilingual and many other intertwined factors is another domain that is now being looked at.

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Similarly tasks, we have also we have discussed this task related controversy in the previous module as well. So, carrying that idea forward, there is a lot of discussion going on today about which tasks should be used to understanding the impact of bilingualism, multilingualism on cognition because there is this idea that tasks automatically you know have an equivalent towards the processes, mental processes.

So, how far the task given to the participants actually mimic the processes that goes, undergoes in the bilingual's mind. This is a very subtle nuance that is now being looked at. So, very careful sometimes ecologically valid tasks also have been brought to focus. What do you mean by ecologically valid tasks?

Often what happens in sciences that is true for any scientific domain is that there is a set of rules, there is a set of almost prescribed formats, prescribed methodology through which we pass any kind of population or any kind of analysis. So, the method remains the same, population may change, the variables may change and so on.

That has started getting questioned because, what our what task is valid for in European population may or may not be valid for let us say African population or Asian population or rural versus urban population. That does it mean that as a result of which it the we often see that there is a lack of replicability.

The population keeping the bilingualism age of acquisition, nature of bilingualism or let us say the proficiency level or you know language control, all things being similar, you still have variance in the results across population when between European and the Asian population.

So, what is happening here is not that the Asian population or the population under study from any Asian country are inferior in some way or the other. It simply probably means that it is not ecologically valid; certain tasks are too far removed from the psyche of the population that is being studied.

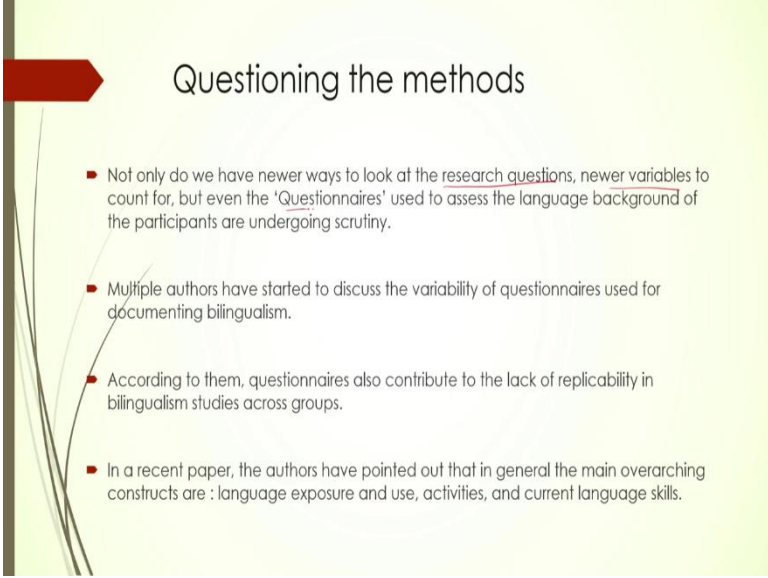
So, those things are now getting their due share of attention. So, that is what we mean by ecologically valid tasks that are now getting created let us say or at least getting attention. So, soon we will probably have culture specific or domain specific tasks that are suitable for certain populations.

Without compromising, of course, without compromising the scientific aspect of it. Its not that the you cannot go too far off the mark, but taking care of all of these. So, these are very crucial matters and very nuanced and subtle things and need to be taken into account very very carefully and work has already started on that.

Similarly, analysis linking language usage measures to experimental task performance also require a large number of different analytical tools. Now, while we are at it individual differences are often not taken into account because we need to have understanding of bilinguals as a group. So, if you are a bilingual with you know various factors or age of acquisition, proficiency etcetera then this is how we can expect this is what we can predict.

However, a very significant thing about bilingual population is the individual differences. No two bilinguals are same even within the same socio-cultural background. So, that is again another emerging domain that is being looked at. So, these are the four, of course it is not exhaustive list, but these are the four main domains where the churn is happening. The newer questions newer methods are being proposed.

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Questioning the methods

- Not only do we have newer ways to look at the research questions, newer variables to count for, but even the 'Questionnaires' used to assess the language background of the participants are undergoing scrutiny.
- Multiple authors have started to discuss the variability of questionnaires used for documenting bilingualism.
- According to them, questionnaires also contribute to the lack of replicability in bilingualism studies across groups.
- In a recent paper, the authors have pointed out that in general the main overarching constructs are : language exposure and use, activities, and current language skills.

Some of these we can look at in detail some of, but not all because this is again as I said it is a vast area. So, one of the most important areas of important domains is the questioning the methods itself because methods is what decides how the results will ultimately come out to be. So, as a result a lot of important scholars have voiced their opinion about methods the kind of methods that we use; one of them is questionnaires.

So, not only we have looked at we have to take a new look at the research questions; newer variables to count for; even the questionnaires used to assess the background. Remember when we discussed about the various groups of bilingual population we start with a questionnaire. Questionnaire is to assess the background, linguistic background of the population linguistic background may include the language when they learnt their respective languages, at what age, the proficiency level and so on and so forth.

So, even today we also have questionnaires that could assess the language switching pattern and so on. So, these are the questionnaire part of the experiment. So, after the questionnaires we have collected data from the participants then the participants go ahead for the experimental part of the work. Now, these questionnaires are very very crucial because it gives us the background information about the participants and as a result this needs to be taken with utmost care.

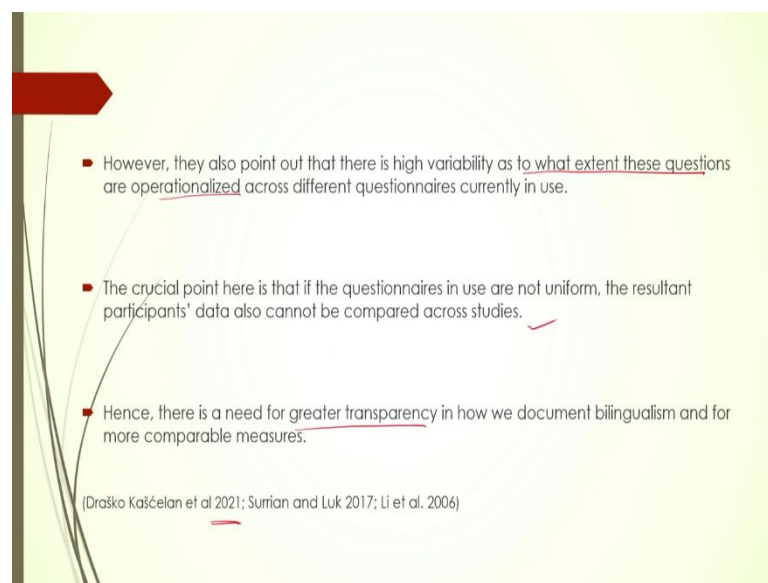
Now, the multiple authors have started to discuss the variability of questionnaire's use. Though there are certain standard questionnaires like LEAPQ, LHQ and so on there are

few standard questionnaires. However, that notwithstanding that, even then there are lots of different types of questionnaires that are used by different groups of researchers. So, as a result of which that this kind of amount of variability in the questionnaire itself then this will contribute to the lack of replicability.

Lack of replicability is one big issue that we discussed in the within the area of bilingual advantage. Why we do not see the same kind of advantage or disadvantage or null results is because of as researchers are now pointing out there because of questionnaires as well because questionnaires are variable; in a recent paper the authors have pointed out that even though the questionnaires are variable the variant there are different kinds of a constructs there are that are overarching.

So, all questionnaires basically try to take care of these factors. So, language exposure, use, activities and current language skills.

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These are the primary questions that all questionnaires address. However, to what extent these questions are operationalized across different questionnaires is where the variation is. These are the questions, but to what extent each of these questions and their sub questions are taken care of in each questionnaire is where the variability lies.

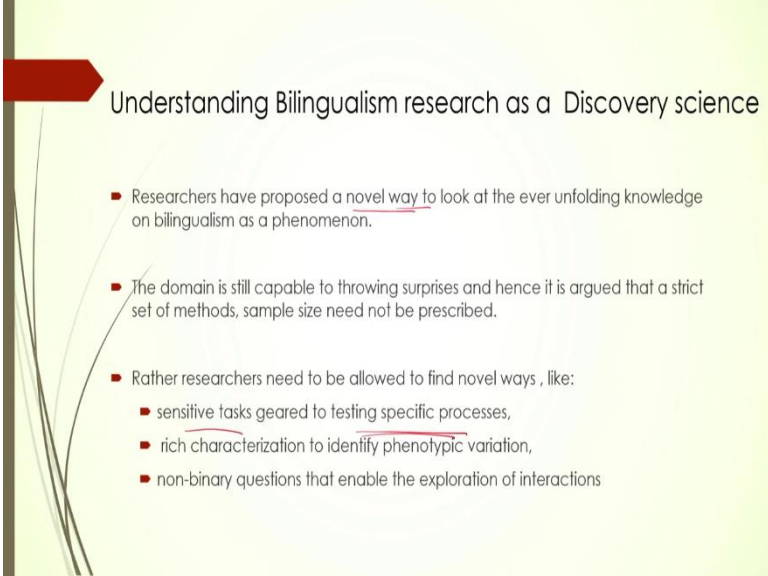
So, if questionnaires are not uniform how can we compare the different populations across studies this is simply not possible because not each questionnaire has taken care of the

same crucial question. What could be crucial in one particular community may not be crucial in another community. Similarly, the other way around also is true.

Certain things are universally correct, but are we using the same pattern of questionnaire across different populations and across different studies? If not then there will be a lot of variation. So, and this probably also adds to the lack of replicability. So, this is why it is a very crucial question to answer, to look at and to find a solution to. And most of these questions are I am quoting only the very recent papers in the last couple of years, 2-3 years let us say, that is these are the questions that have been raised.

Hence, there is a need for greater transparency. The authors are now researchers well known names, well known influential authors are now asking for transparency across studies in terms of creating the questionnaire and using the questionnaire.

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Understanding Bilingualism research as a Discovery science

- Researchers have proposed a novel way to look at the ever unfolding knowledge on bilingualism as a phenomenon.
- The domain is still capable to throwing surprises and hence it is argued that a strict set of methods, sample size need not be prescribed.
- Rather researchers need to be allowed to find novel ways , like:
 - sensitive tasks geared to testing specific processes,
 - rich characterization to identify phenotypic variation,
 - non-binary questions that enable the exploration of interactions

So, there has to be transparency and also a lot of similarity that is that should be there. So, if a group in India let us say are using one particular kind of questionnaire making certain changes for example, LEAPQ has now an Indian version. There are some well known names in cognitive sciences in they have actually made some changes to for to make it suitable for Indian context.

Now, we have to also see if this can be replicated in another country. So, we have to be very very careful about what we incorporate and what we do not and report them in the

research findings, that is one. Keeping these things in mind there are now and yet another group of influential researchers have now talked about bilingualism as a discovery science.

Now, what is discovery science? Discovery science is something that you know in any scientific discipline you would need to you need to you cannot really prescribe a set of rules because that is that way you are restricting the possibilities of finding out the entire truth. So, one has to be very open the method should be open ended. There has to be a baseline, but at the same time you should be always open for trying out newer methods.

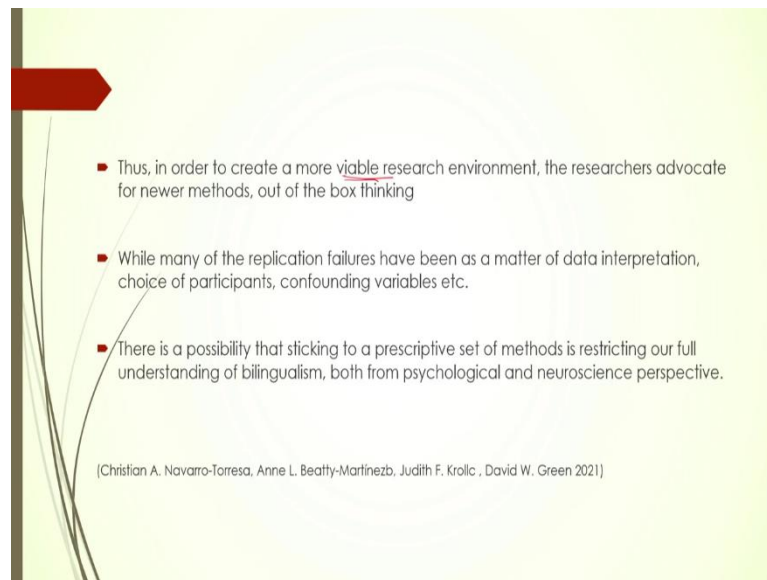
Only then you will know you will discover the entire truth. So, that is basically what discovery science is all about. So, they as a result have proposed a novel way to look at the ever unfolding knowledge on bilingualism as a phenomenon. Every other day we have a new paper talking about the same phenomena unfolding very differently across population.

So, in order to tap into that we need to also look at different kinds of methods to look to arrive at the conclusions. So, because the domain is still capable of throwing surprises. So, strict set of methods, sample size etcetera cannot be and should not be prescribed. So, what how should we go about? They also have given some ideas about what to do rather than what not to do. So, sensitive tasks geared towards testing specific processes, one needs to create a very fine tuned set of tasks.

What that could be specific for a particular sensitive towards a particular question, sensitive towards the particular setup, sensitive towards a particular set of population, that is what they mean. So, specific processes need specific look at the questionnaires or the methods that is used. Similarly, to identify phenotypic variation there has to be a rich characterization as well.

Also, non-binary questions because typically yes, no questions are binary questions. So, you cannot always have a binary question. Sometimes there could be more than 2 or 3 possibilities of answer for a particular question. So, those things need to be also taken into account. Often there are questionnaires as well as methods that have that give us two extreme points of the spectrum.

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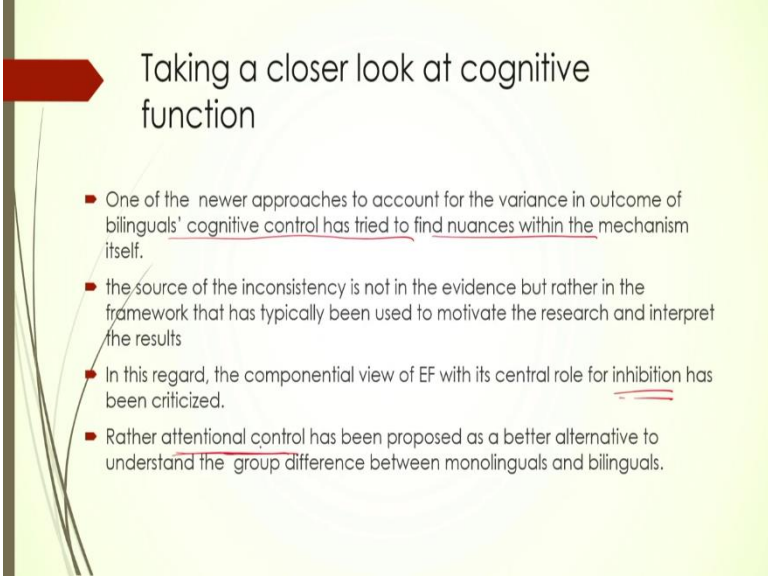


Possibilities that could exploit the midpoints as well need to be taken into account. So, in order to do a create a more viable research environment, now they use, they now they advocate out of box thinking basically, out of box thinking as in creating newer methods of finding, the finding answers to the old questions.

So, many of these replication failures have been a matter of data interpretation, choice of participants, confounding variables there is a possibility also that the sticking to a prescriptive set of methods is a big problem as well. So, this is as you can see this is the paper that talks about this and you so, all the big influential authors are now talking about this as a possibility that we need to go out of the set, need to go out of the prescriptive set.

We have not that they are bad, but we have moved ahead in time. So, the prescriptive set of questionnaires and the methods and the data elicitation processes, even data analysis processes probably had their you know time. Now, we need to take a relook is what they are saying.

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The slide features a light green background with a dark red arrow pointing right at the top left. The title 'Taking a closer look at cognitive function' is centered at the top. Below the title, there are four bullet points, each preceded by a small red square. The text of the bullet points is as follows:

- One of the newer approaches to account for the variance in outcome of bilinguals' cognitive control has tried to find nuances within the mechanism itself.
- the source of the inconsistency is not in the evidence but rather in the framework that has typically been used to motivate the research and interpret the results
- In this regard, the componential view of EF with its central role for inhibition has been criticized.
- Rather attentional control has been proposed as a better alternative to understand the group difference between monolinguals and bilinguals.

So, this was about the on the methods side. Now, we are looking at the cognitive function as well. So, again going back to the 7th module, we looked at various tasks that bilinguals are regularly put through there to look at the cognitive functions of a bilingual to find out the advantage or disadvantage or the null results in certain cases. Typically, we look at the executive function tasks.

So, executive function that includes attention, inhibition, working memory and so on. Now, there are new insights that are coming out from researchers that we need to take a relook as to which aspect within executive function need to be focused. If you remember, we talked about the various models, inhibitory control model, adaptive control hypothesis and so many other models that look at the primary focus of those models have been the inhibition that is part of executive function.

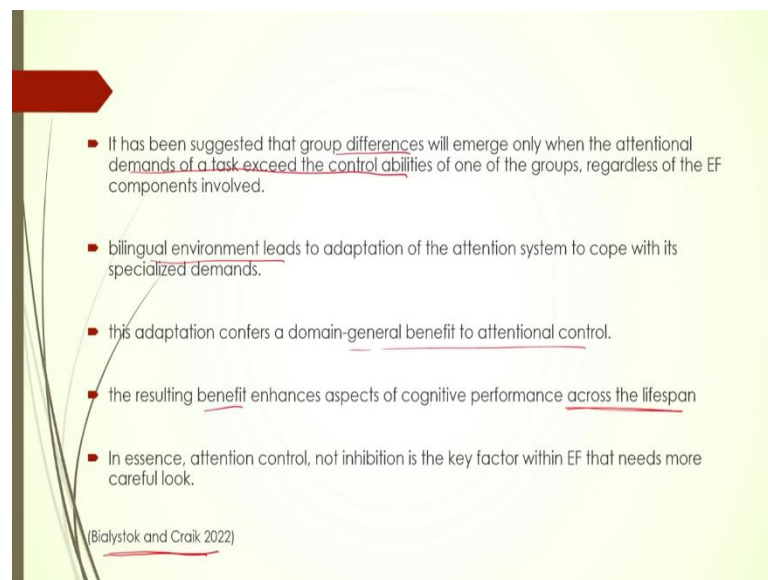
So, inhibition is a very important aspect within executive function that has been connected to how bilinguals perform different tasks. Primarily to because the link is that if you are a bilingual, if you are a high proficient bilingual, then you are constantly inhibiting your second and the language that is not in use at the moment. In that in turn strengthens your inhibitory processes, which in turn reflects in your other kinds of multitasking capacities.

So, how you inhibit the non-relevant responses, so that is what has been the primary finding or let us say that has been the mainstay of the argument. Now, there is a change, that one of the newer approaches to account for this variance is that bilinguals' cognitive

control has tried to find nuances within this mechanism, ok. So, it is not the framework it is not the evidence is not problematic, but the framework with which we look at the evidence is problematic according to this.

So, till now as I said that inhibition has been the central focus, but now there is proposal that rather than inhibition, we must look at attention control. Attention control and inhibition both are part of executive function, but so far inhibition was getting more attention than attentional control. Now, there has been a proposal for a shift and say that they are saying that attentional control has may be a better way of you know better alternative to inhibition in order to account for the differences in the results that we see.

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So, it has they have suggested this is a recent paper by Bialystok and Craik. Bialystok has decades of research experience in her kitty. So, this is from her group. So, they are now saying that group differences will emerge only when the attentional demands of a task exceed the control abilities of one of the groups.

So, the attention control ability of the group is what is more important. So, in the day to day life of the of the group, how much demand is placed on the attention control abilities of that group is what is the deciding factor, that is what they are saying. So, this again takes us to bilingual environment. So, different kind of bilingual environment puts different kinds of demands on the attentional mechanism.

This is not very different from the adaptive control hypothesis. Adaptive control hypothesis also says similar things that different bilingual scenarios, different kinds of language switching scenarios, puts different levels of demand, cognitive load on the bilingual person's inhibitory control.

What they are now saying is what Bialystok and her group is now saying is that it is all fine, but the effect of the bilingual environment probably has more to do with attentional control, other than with inhibitory control in terms of specialized demands. This adaptation as a result confers domain general benefit to attentional control and that is exactly why this is exactly how they explain the differences in outcome given all other important variables being constant.

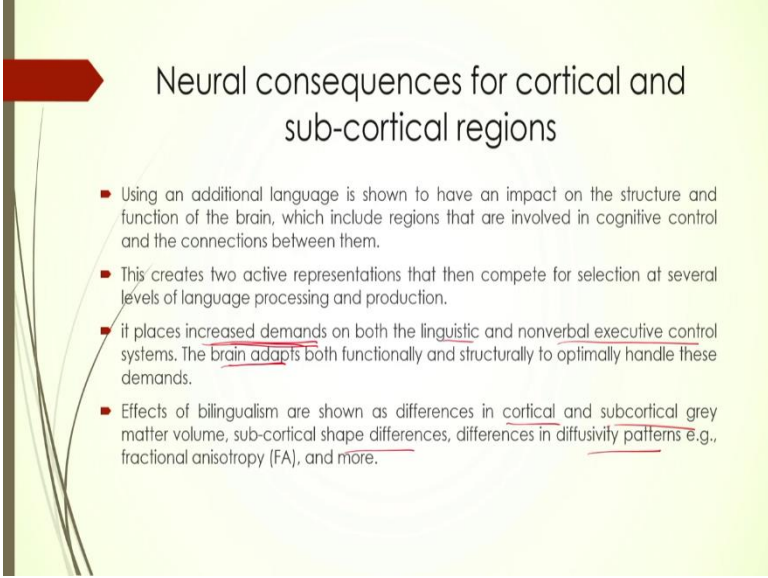
For example, in lot of studies that have looked at the WEIRD population, WEIRD as if you remember western educated industrialized rich democratic societies, basically western societies. So, participants of western societies often show a similar kind of control mechanism in terms of their language control as well as domain general executive control.

However, we do not always find that; one of our own studies have shown that even high proficient bilinguals who have learned two languages from childhood, not simultaneous still successive bilingual, but quite comparable proficiency in both the languages and the society also practices dual language code mixing scenario.

Even then the there was a difference between domain general and domain specific control mechanisms. So, probably if we look at the attentional control mechanism of the people focusing more on that rather than inhibition, probably we might find better answers. So, this is what they also say. So, the resulting benefit enhances aspects of performance across the lifespan. This is also very crucial as we just saw, bilingualism through lifespan is becoming a very important and salient variable nowadays.

So, this is another domain that has now been. So, in terms of how we look at; so, how we look at the function mental mechanism as to which aspect within executive control should be given more under more focus.

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Neural consequences for cortical and sub-cortical regions

- Using an additional language is shown to have an impact on the structure and function of the brain, which include regions that are involved in cognitive control and the connections between them.
- This creates two active representations that then compete for selection at several levels of language processing and production.
- it places increased demands on both the linguistic and nonverbal executive control systems. The brain adapts both functionally and structurally to optimally handle these demands.
- Effects of bilingualism are shown as differences in cortical and subcortical grey matter volume, sub-cortical shape differences, differences in diffusivity patterns e.g., fractional anisotropy (FA), and more.

So, on the one hand we looked at how tasks and questionnaires and all those methodological changes need to be made. At the same time, we are also now looking at a scenario where the functions mental functions that are being studied can also be also merit a relook.

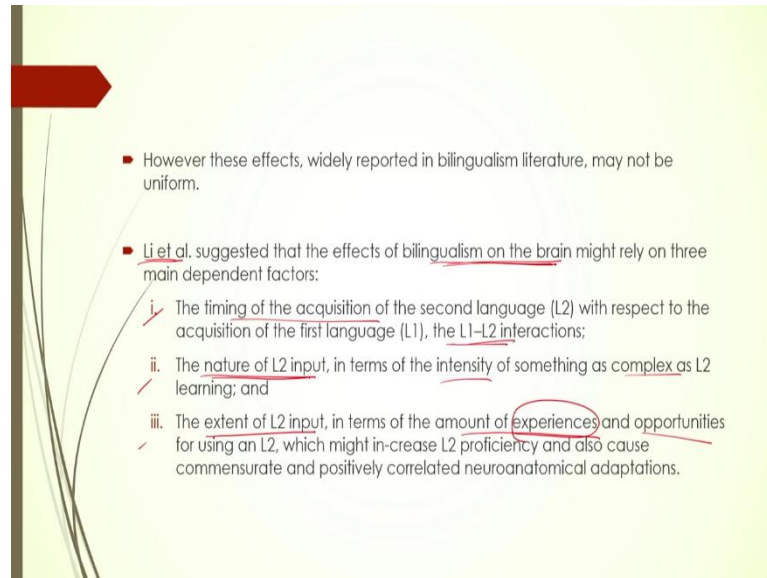
Now, let us look at the consequences. We have also seen that there are consequences of being a bilingual in terms of neural correlates. So, we have different sort of networks created, we have in even in terms of anatomical physiological changes between a bilingual and a monolingual person's brain and so on. So, there are changes, there are neurological consequences in the cortical and sub-cortical regions.

Now, using an additional language has this kind of scenario so, basically being a bilingual places increased demand. So, how we have understood, how we have looked at this, and how we have justified the differences is that bilingualism increases demands on both linguistic and nonverbal executive control. And as a result, the brain adapts both functionally and structurally.

If you remember, we have looked at higher number of grey matter, how higher amount of grey matter and higher connectivity in the bilingual brain as opposed to monolingual brain. So, this is why it happens. So, increased demands on both language and nonlinguistic executive function that in turn makes changes in the brain, both functionally and anatomically.

Now, these changes are seen in the cortical as well as sub-cortical domains in terms of grey matter volume, subcortical shape differences, difference in diffusivity patterns and so on. So, all of these we have seen before.

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However, now, there are more, there are finer look at these aspects as well that says that it is not just being a bilingual, but within that also there has to be some layered understanding as to which aspect of bilingualism leads to what kind of a functional and anatomical changes in the brain.

So, one of them, one recent study, Li et al suggested that effect of bilingualism on the brain, there are variables that need to be looked at even within that. So, there are three variables that he talks about. One is the timing of the acquisition of the second language with respect to the first language and then the L1- L2 interaction. It is not a simple fact of being a bilingual, but we are looking at now the nuances within bilingualism itself.

And then the second point he talks about is the nature of L2 input, how the L2 input was given whether it was you know the intensity or whether it was as complex as the L1 or you know many other variables have also been talked about so, intensity of something as complex as L2 learning and so on.

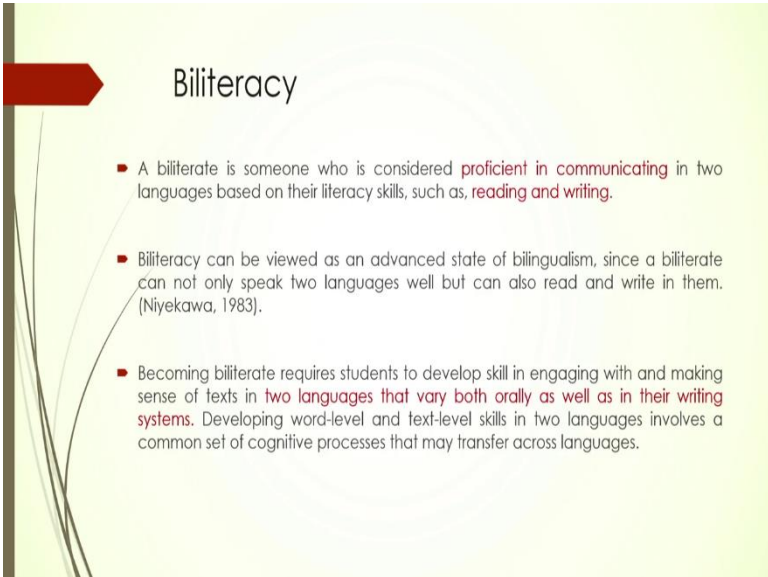
And then the extent of L2 input, in terms of the amount of experiences and opportunities for using an L2. So we will see whether it is questionnaire or method or a or you know

looking at the executive function till the brain, everybody is now all the researchers in various domains across countries are now looking at the experience factor of the bilingual.

So, it is not simply to say that is that this is a bilingual community. However, the experience of being a bilingual, which is not a simple thing at all, experience can range from the kind of the language distance between distance between L1 and L2 linguistically, culturally and so many others. So, this again, in terms of brain changes also, neuronal changes as well, experience seems to be a very important pointer.

This is what Li and his group suggests. So, how the language is used, how many, what kind of opportunities of using the L2 at there and so on. So, these are certain factors within the neuroanatomy of bilingualism as well.

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Biliteracy

- A biliterate is someone who is considered **proficient in communicating** in two languages based on their literacy skills, such as, **reading and writing**.
- Biliteracy can be viewed as an advanced state of bilingualism, since a biliterate can not only speak two languages well but can also read and write in them. (Niyekawa, 1983).
- Becoming biliterate requires students to develop skill in engaging with and making sense of texts in **two languages that vary both orally as well as in their writing systems**. Developing word-level and text-level skills in two languages involves a common set of cognitive processes that may transfer across languages.

Another connected domain, which is the biliteracy is also becoming quite prominent these days. This is not; again, it is also not entirely new. However, a lot of activities have been reported in the literature now in these domains. So, biliteracy is connected to bilingualism, but slightly different. When we talked about bilingualism, if you recall in the very beginning, we how did we define bilingualism?

For the benefit of the course, for keeping things simple, we agreed to use a definition like a bilingual is a person who can speak and understand two languages and who has the

opportunity to use both languages in his day to day life. That is what bilingualism is all about.

So, this means that the largely the focus has been a speaking and understanding. And even in while discussing the various processes, bilingual language processing, we also again we focused on the hearing and speaking aspect of bilingualism. And less focus was on reading and writing.

We did talk about it a little, but not as much as bilingual language processing. So, that is what we talking about. That is what we mean by biliteracy. Biliteracy is taking things a little further and taking it to the domain of reading and writing. So, bilingual you speak and understand at the same time, you can read and write in both the languages. Now, these are not one does not entail the other. Biliterate person is more often than not is a bilingual, but a being a bilingual does not entail automatically biliteracy.

For example, a lot of people in Indian scenario, it is even more understandable, more readily relatable. In India, it is very common to find people who are not literate, who are not educated, who never been to school. But they can speak more than one language, bilingual, multilingual, trilingual, you find them, they are not biliterate.

However, most of us in the educated domain of the society, biliteracy is also common. So, these are two different, but closely connected areas. So, a biliterate is somebody who is considered proficient in communicating in reading and writing as well. So, proficient in communicating in two languages in through reading and writing.

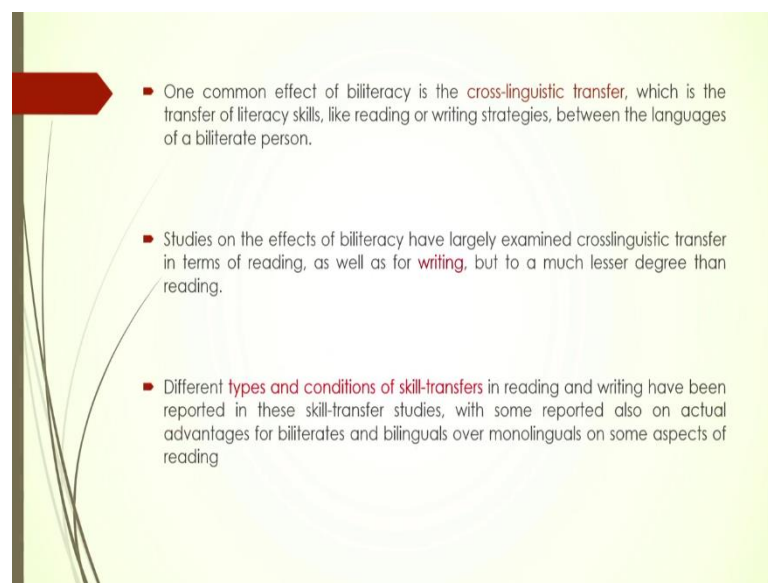
So, this is often understood as an advanced state of bilingualism. So, you not only speak, but you also add two more skills to your existing kitty. So, they can, they this idea has been around for quite some time. However, as you can see, there are 1983 also people were talking about them, but today the more and more experimental research is happening in these domains. We have discussed some of these in the last module.

Now, there are many nuances, there are many variables within these domain as well, because becoming bilingual biliterate requires to a develop a skill in engaging and making sense of the texts in two languages. Now, these texts can be different just as languages can be different in terms of linguistic distance, cultural distance. When you talk about text, there are other further nuances.

One is the script. Scripts can be different. So, with a bilingual who is speaking in English and Chinese, for example, the scripts are very very different. So, that also will be added variable to look at when you talk about biliteracy. So, developing word level and text level skills in two language involves a common set of processes that may transfer across languages. So, transfer we have already discussed before.

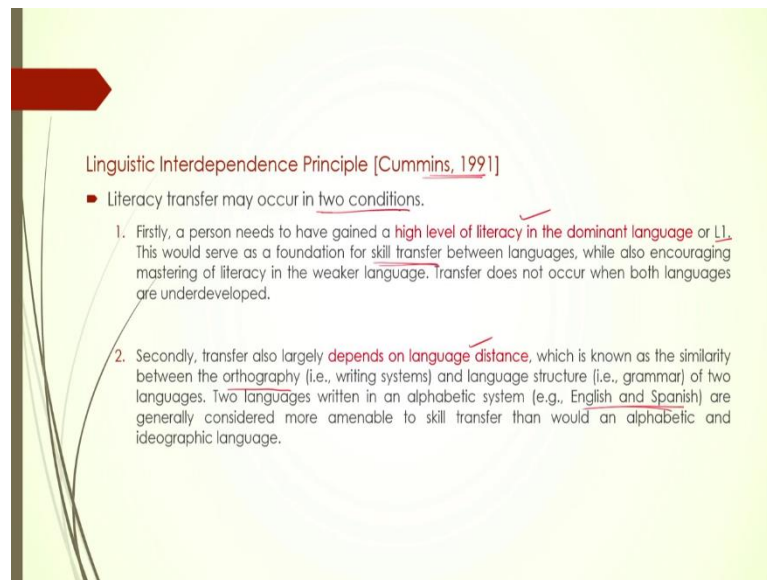
The transfer happens in case of bilinguals, from one language to another, it can be L1 to L2 or L2 to L1. Similar transfer is possible in case of writing as well.

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Now, this is what we just talked about. So, transfer of literacy skills, like reading and writing strategies, this happens this is this takes place in case of a biliterate person. Now, the effect of biliteracy have largely examined cross-linguistic transfer in terms of reading and writing. But even within this, reading has gotten more attention than writing. Writing as a bilingual writing, that is, our writing of bilinguals has is a recent phenomena, that is, recent phenomena in terms of experimental work that is being now looked at.

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Linguistic Interdependence Principle [Cummins, 1991]

- Literacy transfer may occur in two conditions.
 1. Firstly, a person needs to have gained a high level of literacy in the dominant language or L1. This would serve as a foundation for skill transfer between languages, while also encouraging mastering of literacy in the weaker language. Transfer does not occur when both languages are underdeveloped.
 2. Secondly, transfer also largely depends on language distance, which is known as the similarity between the orthography (i.e., writing systems) and language structure (i.e., grammar) of two languages. Two languages written in an alphabetic system (e.g., English and Spanish) are generally considered more amenable to skill transfer than would an alphabetic and ideographic language.

So, the types and conditions of skill transfer between two languages while writing is something that has been now being that is now being looked at. While discussing this, we probably need to go back to rather old, but still many of his idea still hold today, which is called Linguistic Interdependence Principle by Cummins 1991, very influential work. He talked about literacy transfer in two conditions.

So, when do literacy transfer happen? So, you see, the ideas have been around for quite some time, not entirely new. So, there are two things that he primarily focuses on, that you need to have high level of literacy in one language. At that time in 1991, dominant language was considered to be the first language as well.

So, first language, mother tongue, more dominant language, they all were the same things. But today, things have changed. We know now that your most dominant language need not be your L1, which is true for many of us. The language we started our life with is hardly used anymore today. So, because of the change changed scenario we find ourselves within.

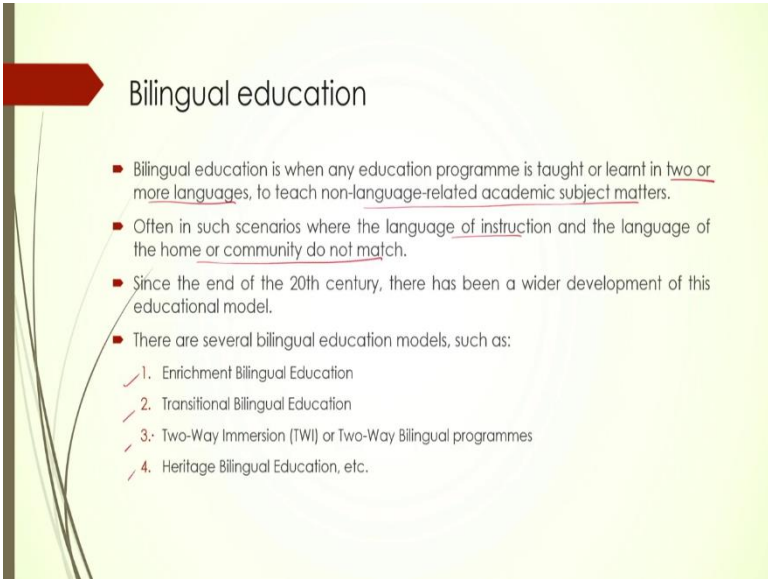
In any case, the depending on the high level of proficiency in one language, we will decide which way the transfer will happen. So, transfer is basically skill transfer. He talks about skill transfer between languages. So, it happens from the more dominant to the less dominant language. In his time, it was the L1, but today it is also L2, that is one.

So, more dominant language typically or the language in which your proficiency is higher; typically will decide the skill transfer direction, that is one. Secondly, also this transfer will depend on the language distance. We saw that language distance and cultural distance play a very important role in language processing. Similarly, this also plays a role in writing, in case of writing and skill transfer in writing systems.

So, if the orthographies are similar, writing systems are similar. For example, Devanagari is used in many languages in our country, even in languages that are not Indo-Aryan. So, Devanagari is the script is same. However, if there are differences in the script, there will be different kinds of, this will also create a nuanced outcome in case of skill transfer.

So, I give the example of Chinese and English. Similarly, you can have different kinds of things. For English and Spanish, both are alphabetic system. However, many other languages are not. Chinese is not, for example.

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Bilingual education

- Bilingual education is when any education programme is taught or learnt in two or more languages, to teach non-language-related academic subject matters.
- Often in such scenarios where the language of instruction and the language of the home or community do not match.
- Since the end of the 20th century, there has been a wider development of this educational model.
- There are several bilingual education models, such as:
 1. Enrichment Bilingual Education
 2. Transitional Bilingual Education
 3. Two-Way Immersion (TWI) or Two-Way Bilingual programmes
 4. Heritage Bilingual Education, etc.

So, these are certain domains of research that is now coming up, following Cummins influential work in 91. Today or today, we are looking at the same issues in a slightly more nuanced way, but in terms of bilingual writing, how things change. Now, let us move on to bilingual education. Bilingual education has become, again it is not entirely new, it is been around for some time, but now it is more common.

It is now found in many countries in the world, owing to a number of large migrations across countries and this has become a necessity. So, bilingual education is what is bilingual education? This is when any education program is taught or learnt in two or more languages, right. So, to teach non-language related academic subject matters. So, for example, if there is a school that teaches the subjects in both English and Hindi, let us say.

So, some classes are taken in English, some classes are taken in Hindi on the same subject. So, geography can be taught through English, geography can be taught through Hindi, that is called a bilingual education system. So, often in such scenarios where language of instruction and the language of the home community do not match is when we say this.

Bilingual education has been around in the US for a very long time. And this education system primarily targeted the bilinguals. If you remember, if you go back recall in the initial parts of the course, where we talked about that bilingualism was considered a stigma because typically those people will be found to be bilingual who were not in the same strata of the society, they were in disadvantaged in many ways, who were migrants and so on.

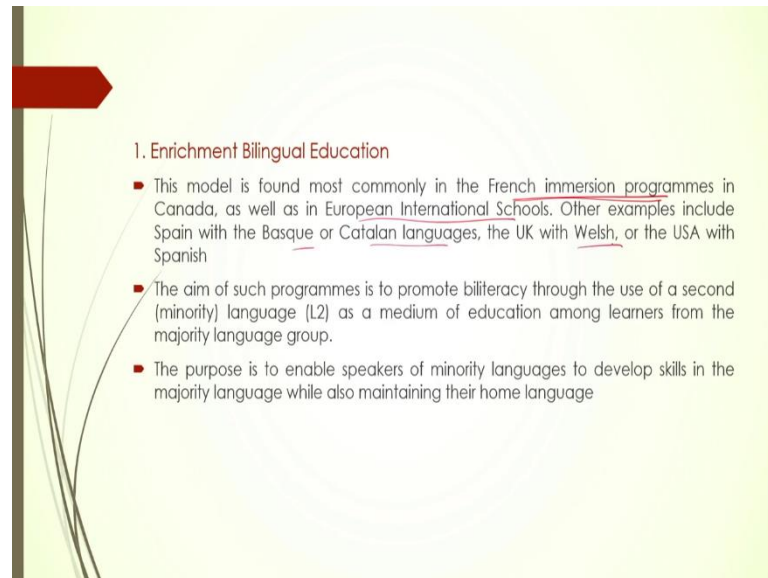
So, for the benefit of those people, for example, lots of Mexican and Hispanic people are there in the US for whom the language of whom is Spanish or Portuguese, but the language of education is English. Now, this as a result creates a problem in the for the students, they often do not cope up; as a result of which to tackle this problem bilingual education came up.

And now, there are a number of schools in the US that teaches the subjects both in their home language as well as in their in the official language, which is English. So, gradually, the so, as the focus here is that the student should not lose out on learning the subjects just because the language is an unfamiliar, language is not there, the their proficiency in the L2 is not so good.

Something similar has been is now getting incorporated in Indian system as well with a new education policy. This is something that we will be incorporating very soon. So, this will help alleviate the marginalized groups more than anybody else. So, since the end of the 20th century, lots of developments have taken place in the bilingual education model. So, these are the several models that have been around for some time now, one is called

the Enrichment Bilingual Education, Transitional Bilingual Education, Two-Way Immersion and Heritage Bilingual Education and so on.

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Because this is as I said, it is not a very new field, it has been changing and it has been evolving over a period of time. So, we have various methods of imparting bilingual education to the various levels of education within school system, even college some some places. The Enrichment Bilingual Education, this is most commonly found in the French immersion programs in Canada. We have talked about Canadian scenario before as well.

So, there are French areas and then there are English areas. So, French immersion programs are very popular and very common there. And it is also found in the European International Schools. And other examples are of course, they include Spain with a Basque or the Catalan languages UK with Welsh, USA with Spanish as I had just mentioned.

So, these are the same different domains, different places and different language systems, education systems that use the different kinds of enrichment bilingual education. So, what is the aim of such programs? The aim of such programs is to promote bi-literacy through the use of a second language as a medium of education.

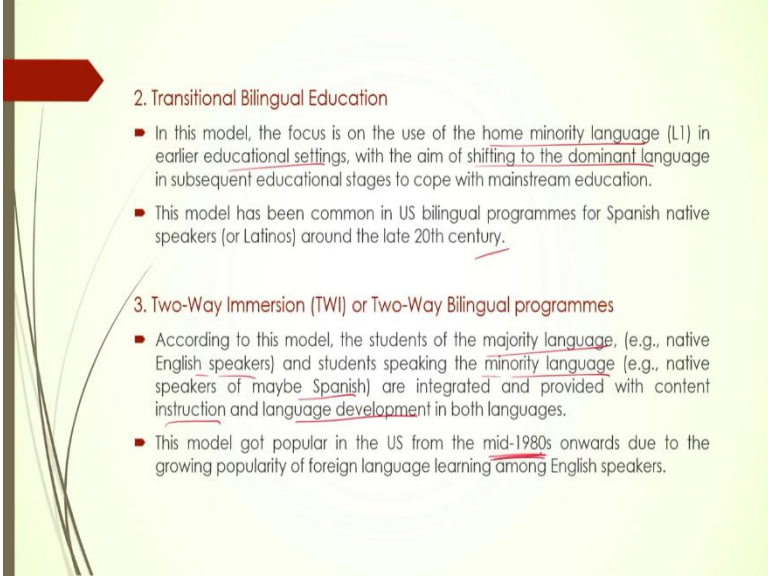
So, the idea is not only to give them education in about subjects beyond languages in two language, but at the same time to promote bi-literacy. So, that they grow up learning to

read and write in both the languages. The official language as well as their mother tongue. So, the purpose is to enable speakers of minority languages to develop skills in the majority language while maintaining their home language.

So, they do not have to compromise on their home language. In fact, this has been used in USA as well not only with Spanish, but also with Ebonics. There were schools that particularly cater to African-American students whose home language was Ebonics and the official language in the school was English.

And at for a period of time, they used both Ebonics and English Standard English for education. The idea was in that case, the idea was to help them gradually move from Ebonics to standard American English. So, these are the various purposes and various models for which all come under enrichment bilingual education.

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2. Transitional Bilingual Education

- In this model, the focus is on the use of the home minority language (L1) in earlier educational settings, with the aim of shifting to the dominant language in subsequent educational stages to cope with mainstream education.
- This model has been common in US bilingual programmes for Spanish native speakers (or Latinos) around the late 20th century.

3. Two-Way Immersion (TWI) or Two-Way Bilingual programmes

- According to this model, the students of the majority language, (e.g., native English speakers) and students speaking the minority language (e.g., native speakers of maybe Spanish) are integrated and provided with content instruction and language development in both languages.
- This model got popular in the US from the mid-1980s onwards due to the growing popularity of foreign language learning among English speakers.

Then there is this transitional bilingual education. The focus is on the use of home minority language earlier education settings with the aim of shifting to the dominant language gradually. So, you start with Spanish gradually you can move to entirely you entirely English dominated language.

So, this has been there. Then two way immersion is also another model. So, according to this model, the students of the majority language that is the native English speakers and

student speaking the minority language. Let us say Spanish are integrated and provided with content instruction and language development in both languages.

This is something that is a comparatively newer development where you see not only you target the minority language speakers, the language the those people who speak a different language at home as opposed to the language in school. This is the here both groups are given adequate training in order to understand both the languages. This also started pretty early, but now it is quite common. So, mid-80s onwards due to the growing popularity of foreign language learning among the English speakers.

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There are similarly other models as well heritage bilingual education. This has been associated with education through indigenous language like aboriginal languages for example, in Australia. This is quite popular in Australia and New Zealand and so on. So, heritage bilingual education, heritage languages, indigenous languages are used.

So, till now the other models that we saw were also were not indigenous languages. So, to say, they were well established language in mainstream language to some extent in other countries. But in that country in US for example, Spanish is a minority language in the US, but not in Spain.

However, when we talk about aboriginal languages, aboriginal languages are those languages, those groups that are minority even within their own country. For example, in

Australia, aboriginal languages in Australia, hence heritage bilingual education is a completely different thing than compared to the other ones.

So, various educational approaches have resulted in a range of bilingual models like this content based instruction, language across curriculum and so on. There are many of these things, every other commonly quite within very short span of time we have added lots of new models into this and this is the latest that we have, we could curate for you from a nineteen 2021 publication.

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The slide features a title 'Heritage language speakers' in a dark font, preceded by a red arrow pointing right. Below the title is a list of five bullet points, each starting with a red square. The text is set against a light green background with a vertical brown bar on the left side. A small reference note is located at the bottom right of the slide.

- Heritage languages (Valdés, 2000) are the minority languages in a society and are typically learned at home during childhood.
- The field of heritage language (HL) acquisition has emerged over the past two decades while investigating bilingual language scenarios.
- Heritage speakers are typically not trained, literate readers of their Heritage Language since for many heritage speakers the language is imparted and used almost exclusively orally.
- Even in scenarios where the HL and the majority language share the same script and overlap in phoneme-to-grapheme correspondence, chances are, heritage speakers may be slower in reading the HL.
- Heritage Speakers experience, on a continuum, reduced quantities of input as well as contexts in which they are likely to hear/use the HL. This may affect knowledge of particular vocabularies and discourse conventions pertaining to distinct registers.

(See also: Bayram et al., 2020)

Another connected development has been in terms of heritage language speakers, in terms of focusing research on heritage language speakers. So, heritage languages are minority languages in a society and are typically learned at home during childhood. Now, heritage languages in today's terms, heritage languages are not only the indigenous or as we call them tribal languages in India, but also those languages that are not minority in their own place, but in a different place they are heritage language.

So, for example, Ao Naga is spoken in Guwahati will be considered a heritage language. So, this is used only at home and this is a minority in the current socio-cultural scenario. So, the field of heritage language acquisition has emerged over the past two decades while we discussed, while we investigated bilingual language scenario. Remember, we talked about in the bilingual language processing module; we looked at how heritage language speakers' data differ significantly from the other groups.

So, the heritage speakers are typically not trained literate readers of their heritage language. Since for many heritage speakers, the language is imparted and used exclusively orally, which is the case for many smaller groups. Many in many parts of the country within Indian scenario or across the world, many heritage languages till today are not written.

So, they are still in the oral tradition. So, that automatically makes them a very separate group to look at. And even in scenarios where heritage language and the majority language share the same script, which is the case many cases in India where heritage languages are written in Devanagari script or you know Manipuri written in Bangla script for example.

So, this also has happened. So, even in that case overlap in phoneme to grapheme correspondence are also there. Chances are still that the heritage language speakers may be slower in reading the heritage language. In fact, there are further nuances to it. For example, when we write an indigenous language which does not have a script of its own and we use another language's script for example, using Bangla for writing Boro for example, there are inherent problems there.

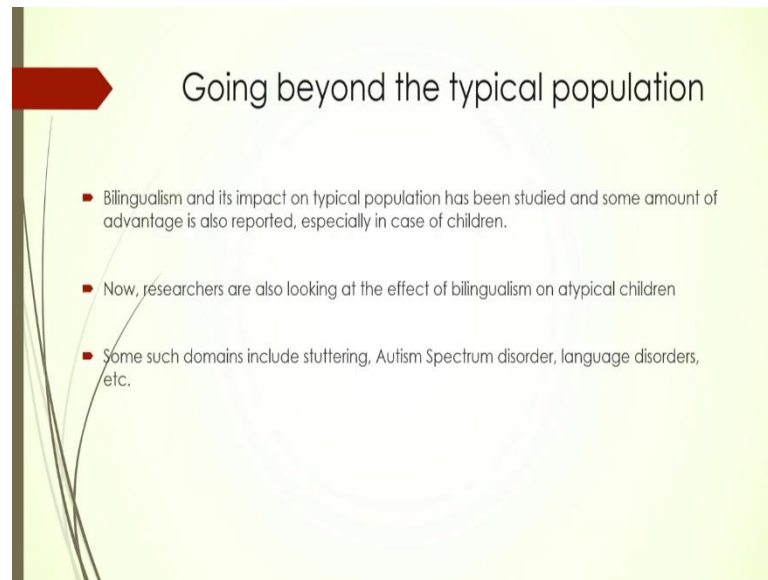
One problem is the diacritics, the sounds that do not exist in the Bangla script that are not represented in the Bangla script, how to take care of those in Boro while writing in Boro or tonal languages, any other tonal language for that matter right. So, there are further nuances. So, heritage speakers experience on a continuum reduced quantities of input as well as context in which they are likely to hear or use the heritage language that is another important domain.

What do we mean by this is that even though heritage language speakers are keeping the language alive, they use it at home or within the society itself, the domains of usage of the heritage language is often compared to the main language compared to the major language quite smaller.

So, academic discourse for example, does not happen in a heritage language. Political discourse may or may not. Certain nuances in science, education, technology and you know judiciary; these are the domains where heritage language cannot be used. As a result, what happens when you are comparing heritage language with the majority language, there are significant differences.

So, even though they are bilinguals and high proficient bilinguals, there are still certain differences that cannot be ignored. So, that is why heritage language speakers have come into the have come under focus in a major way today.

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One of the papers that one of the recent publications that talks about is this on the paper actually talks more about this one can go and read the paper itself, but we just met some of the major points. Now, after taken care of taking care of all of these various issues within bilingualism itself, we are till now talking only about the normal typical population, whether it is adult or children.

We need to we need to have a relook in terms of methods and analyzing the data, choosing the participants and the variables and so on. We are still sticking to the typical population. Now, changes have happened in the atypical population as well, studying atypical population as well. So, some of these studies we will just we will talk about.

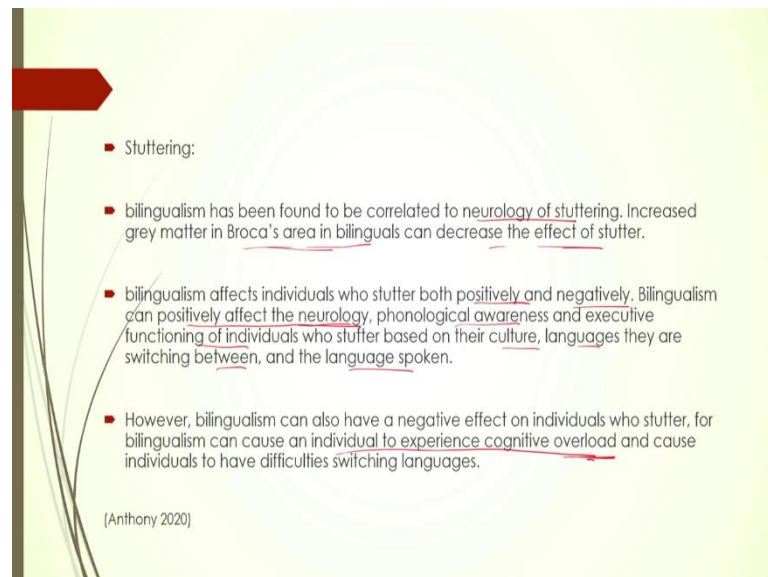
Now, bilingualism has an impact on typical population that has already been studied and some amount of advantage is reported, most of these advantages are non-critical as in there non-controversial, let us say, in case of children. So, children bilingual advantage among children is more ah solidly supported than the other age groups.

So, taking that forward researchers are now looking at if the similar kind of advantages of bilingualism can be found on A-typical population as well. A-typical population is that

population, that group of people that are that have some amount of disorder in either linguistic disorder on cognitive or developmental disorder.

So, they are called atypical children. So, A-typical children may have developmental disorders that effects language as well as executive function mechanism. So, those are the people that researchers are now looking at if there is there can be an advantage or if bilingualism could be an alleviating factor in minimizing in means some of the problems. So, some such domains include stuttering, autism spectrum disorder, language disorder and so on.

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We will start with stuttering. Stuttering is not very uncommon, it is not exactly a disorder per se, but it is a disturbance in speech, let us say. So, recent studies have looked at the correlation between bilingualism and stuttering or specifically the neurology of stuttering. Now, increased grey matter in Broca's area in bilinguals, this is already established. We already have seen that in bilingual brain, the there is an increase of gray matter in the Broca's area.

Now, they are now looking at researchers are now looking at if this has an effect to decrease the effect of stutter. So, does higher because stuttering has to do with the motor control of speech right. So, there is a lack of motor control on of speech. Now, we also know that Broca's area controls the articulation in human speech.

So, if there is higher amount of grey matter in the Broca's area, could it be correlated to or could it have let us say some amount of advantageous effect on stuttering is what the research question now is. Now, bilingualism affects individuals who stutter in both positively and negatively that is what the finding suggest. Bilingualism can positively affect neurology in terms of phonological awareness and executive functioning of individuals who stutter, right.

So, based on their culture languages, they are switching between and the language is spoken. So, these are the domains in which some amount of impact has been found out in case of bilinguals because bilingualism has any positive impact in terms of brain, in terms of higher amount of grey matter, these have been found to have positive effect on neurology and also in terms of language, in terms of phonological awareness, executive function and so on.

However, this is not without negative impact as well. Bilingualism can have negative impact on individuals with stuttering because this causes an experience this causes an individual to experience cognitive overload. So, bilingualism speaking two languages also adds to the load, cognitive load an individual experiences at any given point of time.

Now, when you when a person is suffering from stuttering, added cognitive load sometimes have been found to actually increase the problem, right. And also when they have to switch between languages, this causes an extra effort, extra problem in terms of switching language.

So, this research in this area is still in its infancy. Only few studies have taken place so far, some of these are very decent studies. And but there has there seems to be some correlation. Correlation between bilingualism and stuttering, both in positive and negative way.

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ASD

- Children with ASD exhibit significant deficiency in terms of Executive Functions as compared with typical children.
- On the other hand, bilingualism is found to enhance the same function in normal population.
- Keeping this in mind, researchers are exploring if bilingualism can come to the rescue to ASD children.
- It has been reported that bilingual advantage among school age children with ASD in some lab based tasks, including card sorting task.

(Aparna Nadig & Maria Gonzalez Barrero 2019)

We have to wait and see how this area moves ahead. In terms of autism spectrum disorder, ASD is Autism Spectrum Disorder. Now, we already know that children suffering from ASD, they exhibit significant deficiency in terms of executive function. This is already established that children suffering from ASD suffer in terms of EF as well as language; language in terms of both comprehension and production.

There are changes, the ASD is a actually a spectrum. There are high functioning ASD as well as low functioning ASD. But typically, the population has a problem with executive function as well as language. Now, on the one hand so, there are this there are these problems. But on the other hand, bilingualism is also found to enhance the same function in normal population, right.

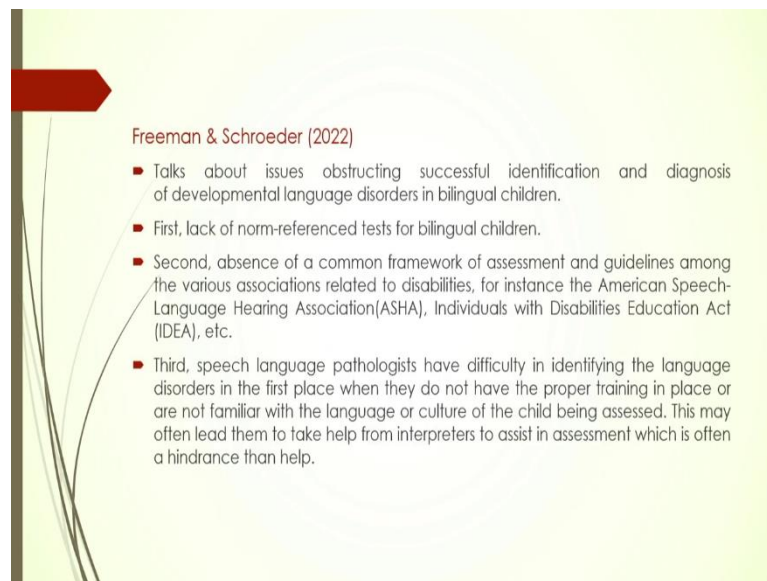
So, keeping this in mind, now researchers are looking at, the if the high functioning autistic children, this will not be possible with children who are very very low functioning. Low functioning autistic children are those children who have very very less command over language. They have almost no language at all. And they also have very severe problem with executive function. So, there it is very difficult to check the bilingualism, effect of bilingualism on their executive function.

However, some studies have looked at high functioning bilinguals who bilingual autistic children who speak two languages. And they have tried to see if there is a correlation between the linguistic competence of those kids on the and the other kind of executive

control mechanisms, typically using card sorting task and other task that we have already seen before.

So, one recent study has reported that bilingual advantage among school-age children with ASD. In some lab-based tasks, and they have found some amount of a positive correlation in only in terms of the high proficient, the bilingual, the speaking ASD children.

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Similarly, there are other studies, recent studies that talks about issues, obstructing successful identification and diagnosis of developmental language disorders in bilingual children. This is an ever-evolving domain. And this is a separate domain altogether, the identification and diagnosis and the recovery pattern and the various kinds of tools that can be used for improving the conditions.

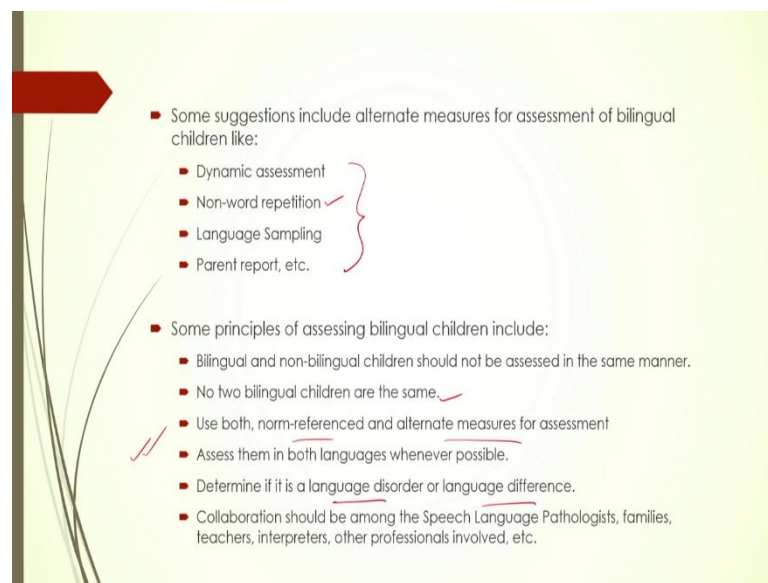
This is a very different domain. However, there are some things that are relatable to bilingualism. So, one of the issues is of course, successful identification and diagnosis. So, a lack of norm referenced text is a big problem for bilingual children within the language disorder, population of language disorder, children with language disorder.

Secondly, absence of a common framework of assessment, because most of these frameworks are most of these questionnaires or texts or tests, test batteries and so on are not really created for bilingual children. They are more often than not created for

monolingual children, keeping in mind monolingual atypical children into account. However, there is no bilingual specific assessment tool. So, that is one area.

And speech language pathologists have difficulty in identifying language disorders in the first place when they do not have proper training. That is another problem that has been repeatedly been voiced by researchers.

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So, in this case, keeping all this in mind, because on the one hand, we see that there are some researchers who are working on these areas connecting bilingualism to various kinds of language disorders. And on the other hand, we have a severe lack of not only test batteries and tasks, but also well-trained personnel.

The keeping all of these things in mind, there are these suggestions that are now coming up into to tackle this problem. One is the dynamic assessment. So, not sticking to the prescribed state of assessment tools and non-word, word repetition is a very common task used for assessing language disorder in children.

So, this is now there have been, there are suggestions that non-word repetitions could also be utilized, then language sampling, parent report, etcetera. Some principles of assessing bilingual children are these. There are new suggestions. So, bilingual and non-bilingual children should not be assessed in the same manner. Right now, they are assessed in the same way and also keeping in mind the individual differences.

Because most of its not only about bilingual, it is not only about atypical children, but in all the research that we have looked at till now, there is a certain set of rules, certain set of task that are used for everybody. And now, there is a relook at that. And similarly, the relook has been suggested for atypical children as well. So, non-reference and alternate measures of assessment and so on. Language disorder or language difference, there are all kinds of new ideas that are being proposed now.

So, this is where we will conclude the part 1. In the next part, we will look at other issues that have come up recently within these new trends of bilingualism research as well as we will move on to multilingualism, third language acquisition. We will talk about some new model that have come up as well as we will look at other related issues, ok.