Psychology of Bilingualism and Multilingualism
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Week - 07
Lecture – 31

Hello and welcome to the course Introduction to The Psychology of Bilingualism and Multilingualism. I am Dr. Ark Verma from the Department of Cognitive Sciences at IIT Kanpur. In this week, I will start to talk to you about bilingualism and multilingualism and the relationship with other cognitive functions. I am going to begin with the impact on bilingualism in language and thought. Now, in the previous lecture, we talked about the relationship between language and thought and also why it could be important for researchers to consider how bilinguals into individuals best, you know, consider bilingual individuals to best understand the phenomena.

We will take forward the following discussion by looking at the studies that have actually investigated the issue across languages and bilinguals. Now, one of the very interesting differences between the languages is about how they encode gender information, but in terms of gender distinctions, and the degree to which grammatical gender correlates with biological gender. Now, more specifically, when I am using the term gender, I am basically referring to a grammatical distinction, which marks individual words in which word classes such as nouns, pronouns, articles and adjectives and verbs such as masculine, feminine and neuter. Now, these labels are somewhat misleading because they suggest a correlation between natural gender and biological gender.

Remember, grammatical gender is basically the gender of objects and, you know, things when we are referring to them in language, but they may or may not be highly correlated with the actual gender or biological gender of the particular being. On this front, while there are languages wherein biological and grammatical gender are closely related, but there are also languages where there are there is absolutely no correlation between grammatical and biological gender. The same reflects in the fact that gender of the name of one and the same object may differ across different languages. For instance, the sun is masculine in Spanish, neuter in Russian and feminine in German. Now, to investigate this in a cross linguistic study, Guiora studied the effect of languages gender loading on the development of gender identity in its speakers.

The idea is gender loading of a language typically refers to the extent to which it forces the speakers to, you know, take the gender of their addresses into account in order to

choose the correct word form. So, for example, there are languages which will basically, you know, decide that when you're talking to a person, you know, a male person or a female person, you have to use that particular gender. And that basically because you're sort of learning it imbibed in your language, because you're learning it in your first utterances, probably helps develop the gender identity of the speaker as well. So, according to this, the researchers actually hypothesize that the speakers of a language with that which have a very high gender loading would develop a gender identity at a much younger age than the speakers of languages with a lower degree of gender loading. This hypothesis was actually tested in an experiment where in the performance of three groups of children aged between 16 to 42 months born and bred in three different monolingual language environments was compared.

The languages were Hebrew, English and Finnish and the participants were tested in Israel, USA and Finland respectively. Now, in this study, the critical distinction between these three languages was the degree of language loading. In Finnish, the gender of the participants in a conversation actually has no effect on word form, whereas in English and Hebrew, the gender does influence the word form to an intermediate and large degree respectively. Now, the dependent variable in the study that the authors sort of were measuring was the children's performance on a non-verbal gender identity test, which is known as the Michigan gender identity test. The results that they obtained actually supported the author's hypothesis and a clear effect of the ambient languages, gender loading on the attainment of gender identity among children was observed.

Interestingly, the growth curves in the test performance actually differ for the three language groups. The children raised in the Hebrew environment showed a faster attainment of gender identity than children who were raised in an English environment, who in turn showed faster growth of the gender identity than children who were raised in a Finnish environment. So, it is pretty clear that given the different gender loadings of these languages, you know, which are Hebrew, English and Finnish, they're actually impacting how the gender identities are developing in their young speakers. So, these results actually led to the conclusion that language specific linguistic structures actually help, you know, to which a child is exposed to actually help as a driving force in the development of certain cognitive structures. Here in this case, we are talking about development of a person's gender identity.

Now, moving forward in another study, Boroditsky and colleagues in 2003 actually sought to investigate whether talking about animate and inanimate and therefore gender neutral objects such as cupboards, bikes, candles, etc. as if they were masculine or feminine might actually mislead people into thinking that inanimate objects may also have a gender. If indeed this were to be the case, it could be because unlike grammatical

gender distinctions between the names of animate and inanimate objects, other grammatical distinctions, say for example, singular and plural, do relate to actual differences in an environment. Say for example, if I'm trying to say, oh give me, you know, two bikes or give me four bikes or give me a few flowers and give me many flowers, it actually corresponds to real differences in the real, I mean, in the number of flowers or in the number of bikes. But basically, if I am referring to, you know, these objects with different gender markers, it may or may not correlate with their actual gender and this is basically what is very curious for these researchers led by Boroditsky.

Now, if this is actually, you know, going to have an effect, this would suggest that the learners of this language, the grammatical gender of an inanimate object's name would also reflect in an inherent feature of the object. Once you start, you know, addressing, say for example, if you start referring to the sun as she or, you know, or the mobile phone as he and something like that, you start referring to inanimate objects with gender markers, it might mislead people into thinking that that is an inherent feature of that object itself, specifically in terms of gender. Hence, when people were building a gender nouns concept, learners may search for the properties of the nouns referent that match it, you know, matches genders, it is the sun's wand for a German learner, because the sun is feminine in German, or its power for a Spanish learner for, because the sun is masculine in Spanish. So basically, what starts happening is while you start, you know, addressing these inanimate objects with gender markers, people start appropriating or basically, you know, juxtaposing feminine or masculine qualities with these, you know, genders, these objects as well. So to investigate the same, Boroditsky and colleagues actually examined the mental representations of inanimate objects in Spanish, English and German English bilinguals were all highly proficient in their second language, which was English.

In Spanish and German, remember, nouns have a gender but not in English. So these participants were presented with 24 object names in the second language, which was English, and were asked to name for each of them in English, the first three adjectives that would come to mind. Interestingly, the translational equivalence of the selected English object names had opposite genders in Spanish and German. So half of them would have a masculine gender in Spanish and feminine in feminine, half of them will have a feminine gender in Spanish. Similarly, half of them will have a masculine gender in German and half of them will have a feminine gender in German.

Now the critical question that these guys were actually after was whether the grammatical gender of the object in L1 German or there in or in L1 Spanish would actually be reflected in nouns that they would come up with in L2 English. So the question basically became whether German speakers give relatively many masculine adjectives to the English object names with masculine German equivalents and whether

Spanish speakers give relatively many feminine adjectives to the very same English object names, because the gender marking is, you know, slightly opposite in German and Spanish, and it is neutral almost in English. So would this really happen? Would the reverse pattern occur for English object names with feminine German but masculine Spanish equivalents? Now English speakers who were naive with respect to the purpose of the experiment rated the adjectives generated by these participants as being feminine or masculine. So again, the participants who are generating these are not rating them. A third group of individuals which are English speakers for whom everything is neutral are rating them, oh this adjective sounds more feminine or sounds more masculine and so on.

Now the results of this experiment actually confirm the hypothesis of the researchers implying that there is certainly an influence of L1 grammatical gender on people's mental representations of inanimate objects. More specifically in response to for example an object key which has a masculine translation in German but a feminine translation in Spanish, the German speakers produced adjectives like hard, heavy, jagged, metal, serrated and useful, whereas Spanish speakers actually produce more feminine type adjectives say for example golden, intricate, little, lovely, shiny and tiny. Similarly to the objects such as bridge which is feminine in German but masculine in Spanish, German speakers replied with beautiful, elegant, fragile, pretty and slender whereas Spanish speakers replied with big, dangerous, long, strong, sturdy and towering. Now you can see here that the way you know that the way of addressing these inanimate objects with gender markers actually has a you know some sort of a you could say a subliminal effect on people's adjectives that they are generating for these objects because these objects are referred to in the masculine or in the feminine in their first language. Now based on this evidence and others assembled over a series of experiments where the experimenters ruled out the possibility that the effects were due to just the experimental group's differential experience in culture rather than in language.

So basically the researchers and later you know studies after that were able to actually show that language in some sense that you know the way the gender of particular objects living and non-living are being marked in their specific languages actually has an impact on people's you know viewing of these objects as gender. Now another very interesting you know another very interesting aspect in which languages differ is the way in which they mark number and you know in the way in which they mark quantities. So they actually differ in the way languages mark grammatical number and for example Lucy in 1992 has shown that the number marking system of individual languages actually depends on two features of nouns. For example whether or not their referents are animate and whether or not they refer to discrete entities because then you could be actually be able to count them. Now if you look at English and I'm sure you know a bunch of you watching this lecture are proficient in English.

If you look at English closely nouns of both animate discrete class and the inanimate and indiscrete class actually can always take a plural suffix when quantified and can be preceded by directly by a numeral say for example they can be referred to as count nouns whereas inanimate and indiscrete nouns say for example so-called mass nouns such as sand water and flour cannot be pluralized and they would require an extra unitizer or classifier to be quantified. Say for example if you are if you want to talk about sugar you won't say oh I need two bags of sugar or if you want to talk about water you would say oh I need three glasses of water. So basically what you're doing is you're using a unitizer so that it you know the amount of water or the amount of sugar can be discretized and then you're basically being able to quantify them by putting these numbers in front of them. Now this is something very interesting which is slightly different from the other languages that you know exist. For example in Yucatec which is native Mexican language and Japanese, plural marking of animate and discrete nouns is actually optional and inanimate and indiscrete nouns cannot actually acquire any grammatical number nor they can be preceded by any kind of numeral but just as inanimate and discrete nouns in English are quantified with a classifier instead.

So you need to add a classifier when you are sort of you know trying to classify or quantify these objects. Now according to Boroditsky these languages actually talk about objects as if they were substances or in the words of Athanasopoulos and Kasai all inanimate out all inanimate nouns in such classifier languages are actually semantically under specified with regards to individuation and they are basically treated like mass nouns in English art. Now Athanasopoulos actually tried to investigate the consequence of the differences in grammatical number, grammatical number marking between for the performance of intermediate and advanced Japanese learners of English on a picture matching test which was introduced earlier by Lucy. For comparison English and Japanese monolingual speakers were also used so you have three groups you have advanced learners of advanced learners of English who are Japanese so their first language is Japanese second language is English you have monolingual English speakers and you have monolingual Japanese speakers. Now these participants were actually tested with the presentation of a set of six drawn pictures on each trial so their screen would show six drawn objects and all of these pictures would depict scenes that contain either objects and animals corresponding to the above three types of nouns referred to as animals, implementables like which would be objects and substances like we talked about sand or water and so on.

Now one picture from each set was basically considered as the target picture to which the other five alternates had to be compared so one picture is there and then there are other fives you have to compare this one picture to the other five object pictures which

are alternates. The target picture in each of the alternate pictures either differed in number or in the case of a substance noun the amount or the number of portions depicted in the entity say for example there could be four mounds of sugar and there could be one or two pencils and so on and so forth. Now the task that the participants were were asked to perform was actually to pick out the most you know to pick out the alternate picture that was most like the target picture they have to sort of compare and basically say which alternate picture is most similar to the target picture. Now based on the results of previous studies you know done by Lucy and others, Athanasopoulos has actually predicted that English monolinguals would regard the alternates that contained a difference in the number or the amount of substance as more like the target picture than differences in the number of animals and implements. So it's basically about a quantity for English speakers but in the nature of substances for the others.

As a consequence alternative pictures containing six substances should be picked relatively often. So for example if there are you know two bowls and maybe two mounds of sugar they might be picked up equally often. In contrast something different can be expected for our Japanese speakers. Japanese monolinguals were predicted to regard both alternates that contained a difference in number and amount of substances and alternates containing the difference in number of implements as more similar to the target picture than alternates containing a difference in the number of animals. So you can see because implements or you know these objects are also being considered similar to substances they would actually liken these in the same group and they would compare on that account.

Following that what would happen or what we would expect is that alternate pictures containing implement and substance differences would be picked equally often. Now the data actually confirmed these predictions replicating Lucy's main findings for a different pair of languages. Here what happened is that the English monolinguals actually picked out the substance alternates about twice as often as the implement alternates whereas the Japanese monolinguals selected the substance and implement alternates almost equally often because they were treating them as a similar group. So they are basically this is basically coming from the fact that they are treating these two classes of objects very similarly or they are quantifying them in a very similar manner. Again we can see that the way an object is sort of quantifying objects in the different world actually in some sense affects our classification and categorization of objects as similar or different which again sort of tells us that being a bilingual you're sort of going to be party to these two you know different kinds of you know ways in which you look at the world say for example quantifying it and that has a real bearing on how we sort of go about and you know carve out our world.

Now finally in the in the in other words what we are seeing here is that the English monolinguals are actually demonstrating a rather special sensitivity to differences in both the numbers of animals and implements whereas the Japanese monolinguals are only especially sensitive to a difference in the number of animals again as we're seeing it. Now this is all right and this is something now we've that we've talked about but we're all right and this is something now that we've talked about a bit but more interesting was the idea that the data obtained from the two groups of Japanese English bilinguals these data actually demonstrated that the advancement the intermediate Japanese learners of English showed very similar response patterns to English and Japanese monolinguals respectively. So basically what they are doing is they are actually to a certain extent preserving the kind of quantification scheme that their specific languages are keeping. So all in all if you look at the results you know in totality it basically tells us that the language's system of grammatical number actually affects the mental representation of animate as well as inanimate objects. So in a sense if you see you know the the way language is actually carve out our real world whether it is in terms of number markings or whether it is in terms of gender markings it actually has some influence in the way we are actually looking at the world and we are basically classifying the world and this is very interesting because this you can see that it still sort of follows the weaker version of the linguistic you know determinism hypothesis which we refer to as the linguistic relativity hypothesis.

With this I would leave you on for you know the subject on language and thought and talk to you in a different in another lecture about a different way in which language actually influences our cognition. Thank you so much.