

# NEUROLINGUISTICS

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BY

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# OBJECTIVES

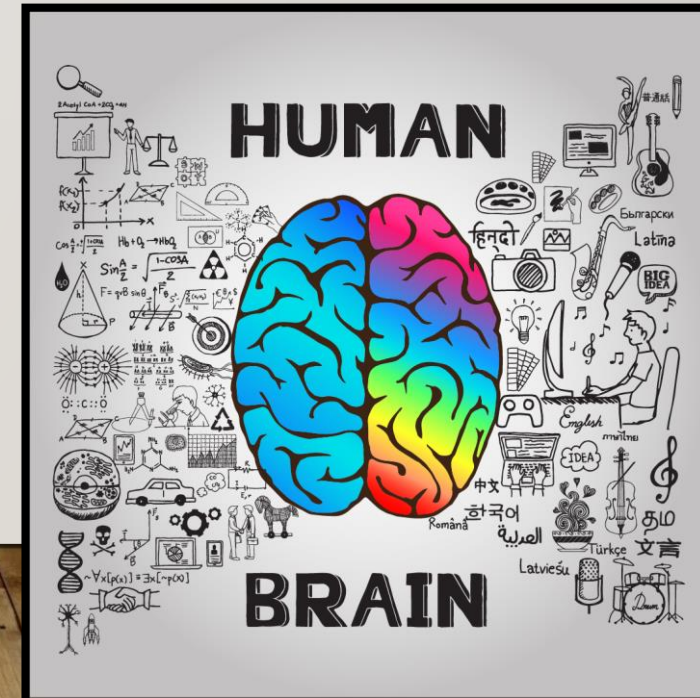
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- To explain the relationship between language and the brain
- To introduce the factors that can affect language learning other than age

# NEUROLINGUISTICS

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- Is the study of the relationship between language and the brain
- The left hemisphere – controls the right side of the body
- The right hemisphere – controls the left side of the body
- One half of the brain is stronger than the other
- **Left brain stronger → right hand will be strong → right-handed**
- **Right brain stronger → left hand will be strong → left-handed**



# MYTHS

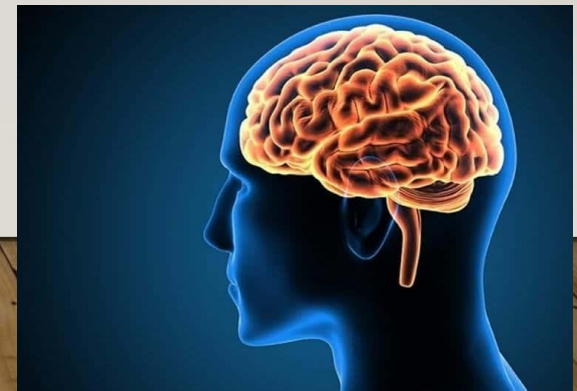
## Right-handed

- Good speaker, professor, lawyer, and salesperson
- Punctual
- May be strong in math
- May like to have or do things in order
- May remember people's names
- Like to plan things ahead of time
- If something happens to the left side of the brain → may have problems speaking and may not know what day it is, the right side of the body will become weak



## Left-handed

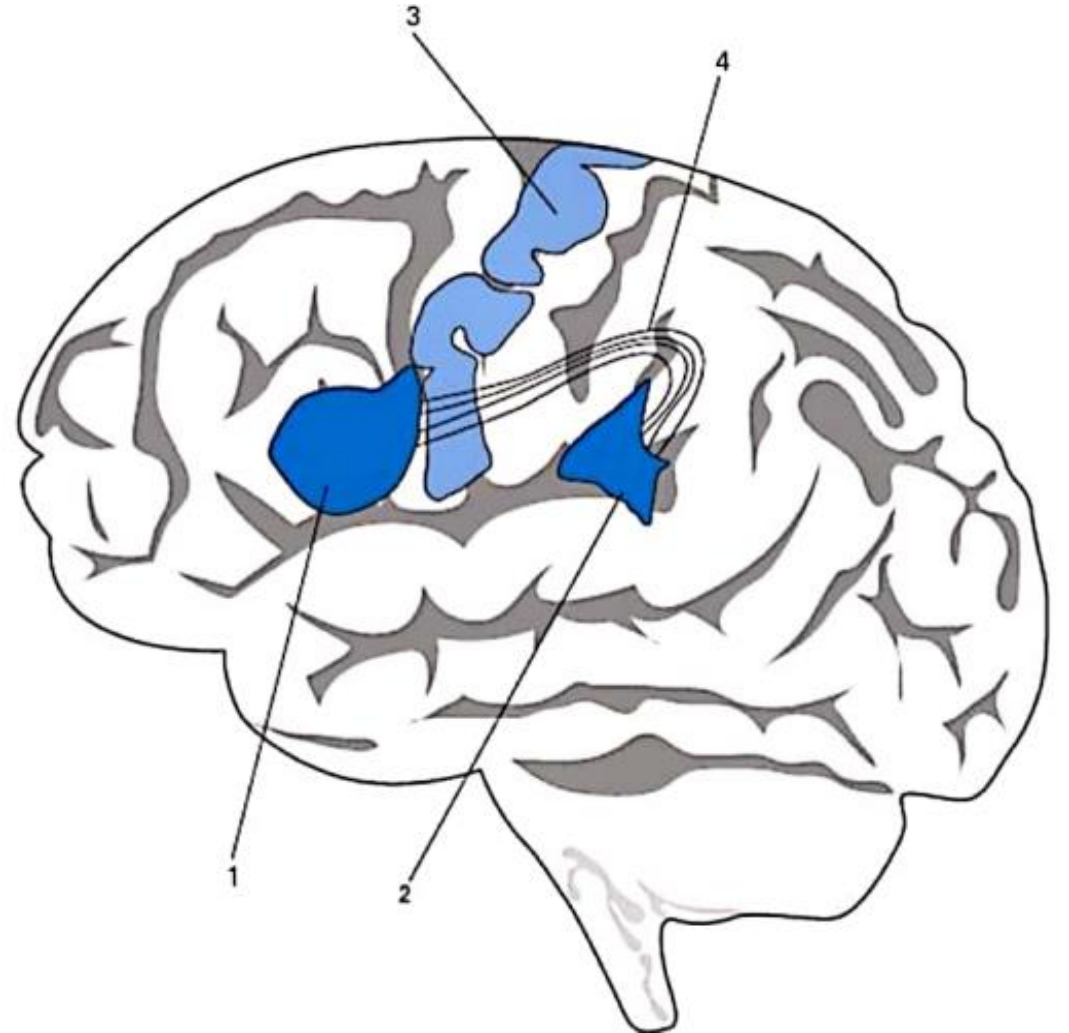
- May prefer art, music, and literature
- May become an artist, a writer, a film director, or a photographer
- May recognize faces but not remember names
- May not love numbers or business
- If something happens to the right side of the brain → may not know where he or she is and may not be able to do simple hand movements
- Prince William, Julia Roberts



# LANGUAGE AREAS IN THE BRAIN

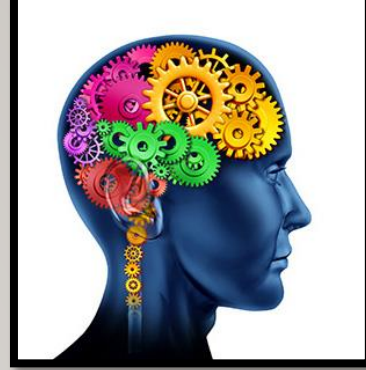
Main four areas:

- 1. Broca's area
- 2. Wernicke's area
- 3. Motor Cortex
- 4. Arcuate Fasciculus



# BROCA AND WERNICKE'S AREA

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## 1. Broca's area

- *'Anterior speech cortex'*
- Paul Broca (1860s) – damage to this part of the brain was related to extreme difficulty in producing speech.
- Damage to this same part on the right hemisphere had no such effect
- **Argument:** language ability must be located in the left hemisphere
- Broca's area – involved in the production of speech

## 2. Wernicke's area

- *'Posterior speech cortex'*
- Carl Wernicke (1870s) – damage to this part of the brain was found among patients who had speech comprehension difficulties
- **Findings:** It is confirmed the left hemisphere is the location of language ability
- Wernicke's area – involved in the understanding of speech

# MOTOR CORTEX AND ARCUATE FASCICULUS

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## 3. Motor Cortex

- Area that controls movement of the muscles (moving hands, feet, arms, etc.)
- Part of the motor cortex (close to Broca's area) – controls the articulatory muscles of the face, jaw, tongue, and larynx
- Penfield and Roberts (1959) – involved in the physical articulation of speech

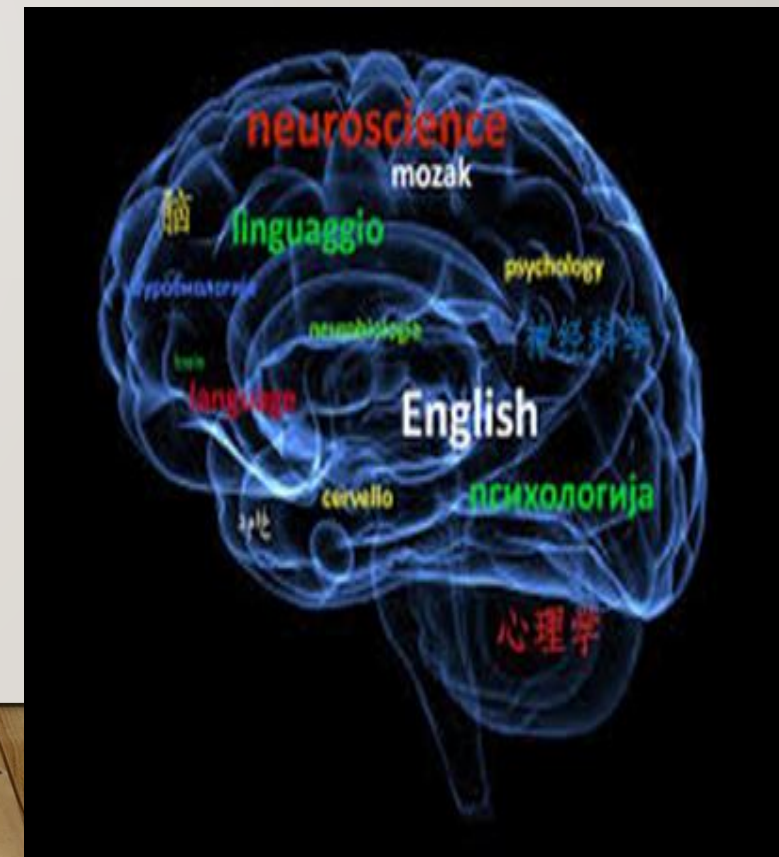
## 4. Arcuate Fasciculus

- Is a bundle of nerve fibers
- Carl Wernicke (1870s) – this part forms a crucial connection between Wernicke's and Broca's areas

# LOCALIZATION VIEW

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- Brain activity as a process



# APHASIA

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- An impairment of language function
- Due to – localized brain damage that leads to difficulty in understanding and/or producing linguistic forms
- **Most common causes** – stroke (when a blood vessel in the brain is blocked or bursts), traumatic head injuries from violence or an accident
- **Mild** to **severe** reduction in the ability to use language
- Different types of aphasia based on the symptoms of someone having difficulties with language



# BROCA'S APHASIA

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- Serious language disorder
- Known as Motor aphasia
- Comprehension is typically much better than production

## Characteristics:

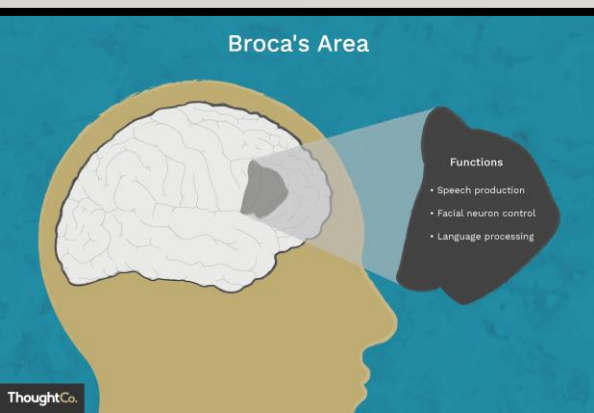
- Reduced amount of speech, distorted articulation and slow, effortful speech
- Spoken language – mostly lexical morphemes (nouns, verbs)
- Agrammatic speech – grammatical markers missing (plural –s, past tense –ed, articles, prepositions)



# CONT

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- **Q:** What did you have for breakfast?
- **A:** *I eggs and eat and drink coffee breakfast* - Aphasia was not severe
- Quite severe will result in → speech with lots of hesitations and long pauses (*my cheek..... very annoyance.....main is my shoulder*, difficulty in articulating single words (to say '*steamship*', the difficulty is '*a stail...you know what I mean...tal...stail*'



# WERNICKE'S APHASIA

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- Results in difficulties in auditory comprehension - sometimes called 'sensory aphasia'

## Characteristics:

- Able to produce very fluent speech however often difficult to make sense of
- Anomia – difficulty in finding the correct word. Word-finding strategies – describe objects, talking about their purpose (the thing to put cigarettes in – for ashtray)
- Strategy for the word 'kite' for an object in a picture

*it's blowing, on the right, and er there's four letters in it, and I think it begins with a C – goes – when you start it then goes right up in the air – I would I would have to keep racking my brain how I would spell that word – that flies, that that doesn't fly, you pull it round, it goes up in the air*

# CONDUCTION APHASIA

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- A less common type of aphasia
- Associated with damage to the arcuate fasciculus

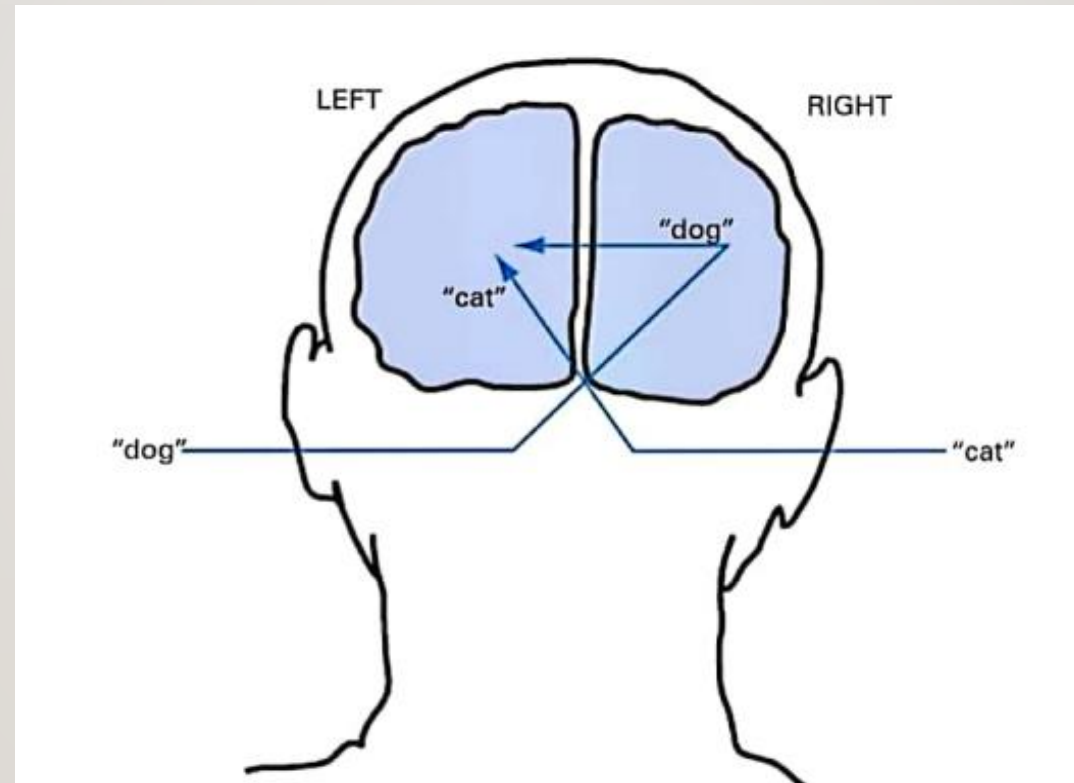
## Characteristics:

- Sometimes mispronounce words, but typically do not have articulation problems
- Fluent but may have disrupted rhythm because of pauses and hesitations
- Comprehension of spoken words is normally good
- Repetition of words is difficult ('vaysse' and 'fosh' for 'base' and 'wash')



# DICHOTIC LISTENING TEST

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# FACTORS AFFECTING SECOND/FOREIGN LANGUAGE LEARNING

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# FACTORS AFFECTING SECOND/FOREIGN LANGUAGE LEARNING

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- Age of Acquisition and the Critical Period Hypothesis
- Intelligence
- Aptitude
- Learning Styles
- Personality
- Motivation and Attitudes
- Learner Beliefs



# AGE OF ACQUISITION AND THE CRITICAL PERIOD HYPOTHESIS

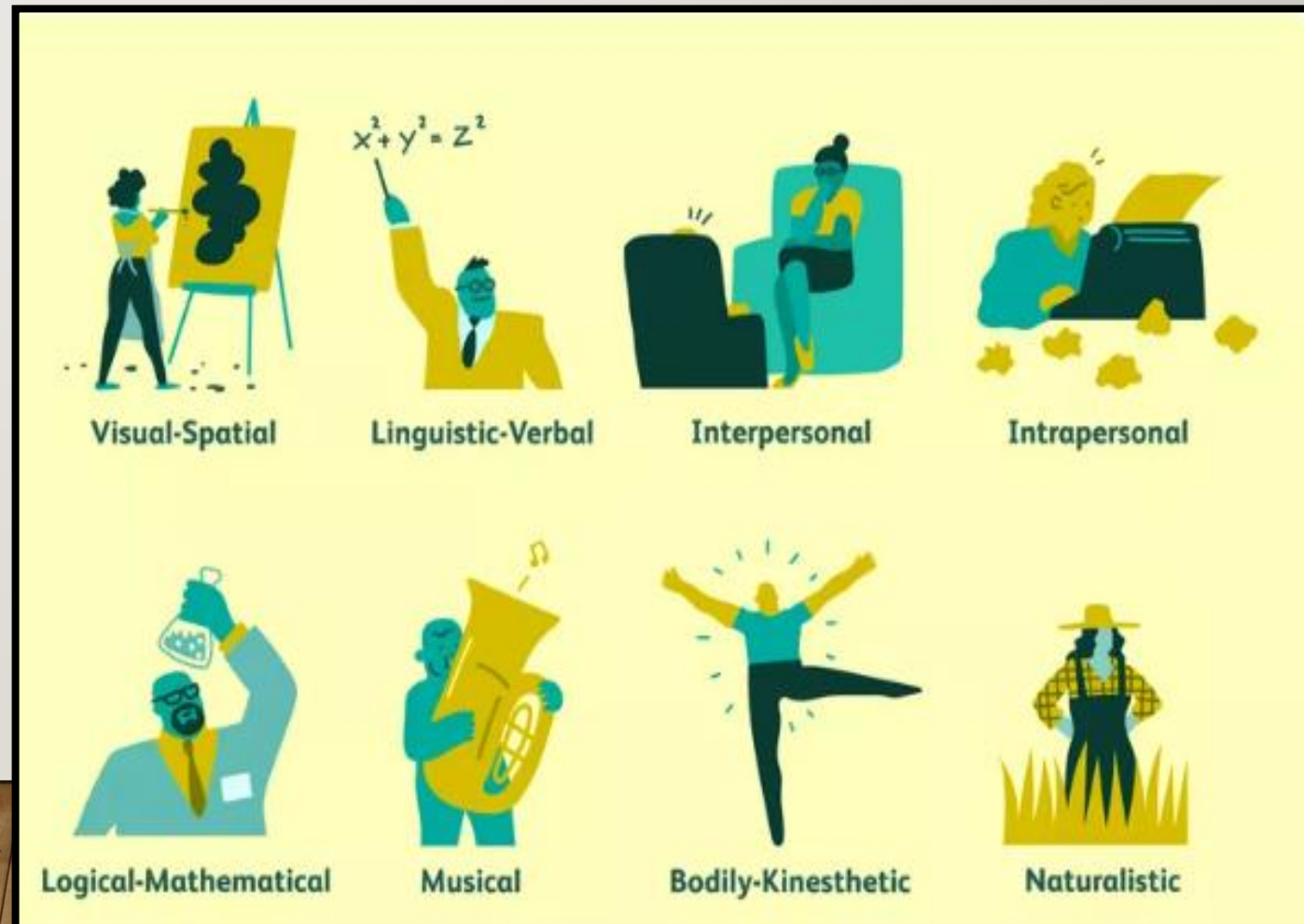
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- Sponge, language faculty, innate ability
- Left hemisphere - Lateral dominance or lateralization (one-sidedness)
- It is sometimes called the “sensitive period”
- Critical period for the first language acquisition – lasts from birth until puberty
- After this period – language learning is hard or impossible
- E.g. *Genie*



# INTELLIGENCE

- Performance on certain kinds of tests
- IQ tests
- Gardner (1993)



# APTITUDE

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- Specific abilities thought to predict success in language learning
- The ability to learn quickly (Carroll, 1991)
- Learners with high aptitude - greater ease and speech



# LEARNING STYLES

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- Individual's natural and preferred way of absorbing, processing and retaining new information and skills (Reid, 1995)
- Visual learners
- Aural learners
- Kinaesthetic learners



# PERSONALITY

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- Introvert and extrovert person
- Inhibition – discourages risk-taking
- Learner anxiety – worry, nervous, and stress, willingness to communicate



# MOTIVATION AND ATTITUDES

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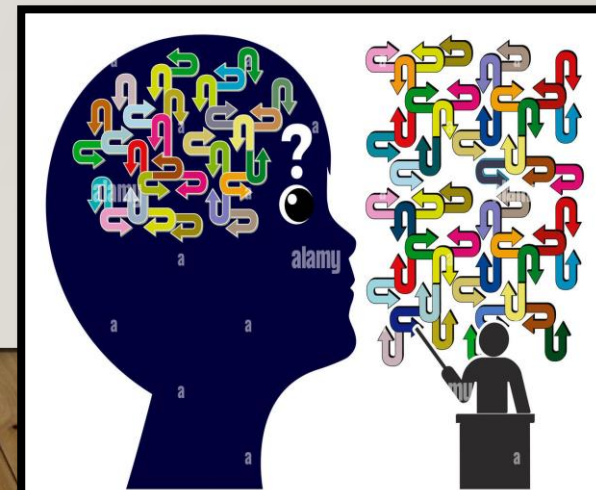
- Learner's attitudes toward the second or foreign language and its community
- Research cannot prove that positive attitudes and motivation cause success in learning, however, evidence shows that positive motivation is associated with a willingness to keep learning
- ***Instrumental Motivation*** – for practical goals
- ***Integrative Motivation*** – for personal growth and cultural enrichment



# LEARNER BELIEFS

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- Learners, especially older learners, have strong beliefs and opinions about how their instructions should be delivered
- based on previous learning experiences
- the assumption (right or wrong) that a particular type of instruction is the best way for them to learn



# CONCLUSION

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- Not all students are the same
- Awareness of the factors affecting language learning is important
- Instructors play an important role to assist in language learning

# THANK YOU FOR LISTENING

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