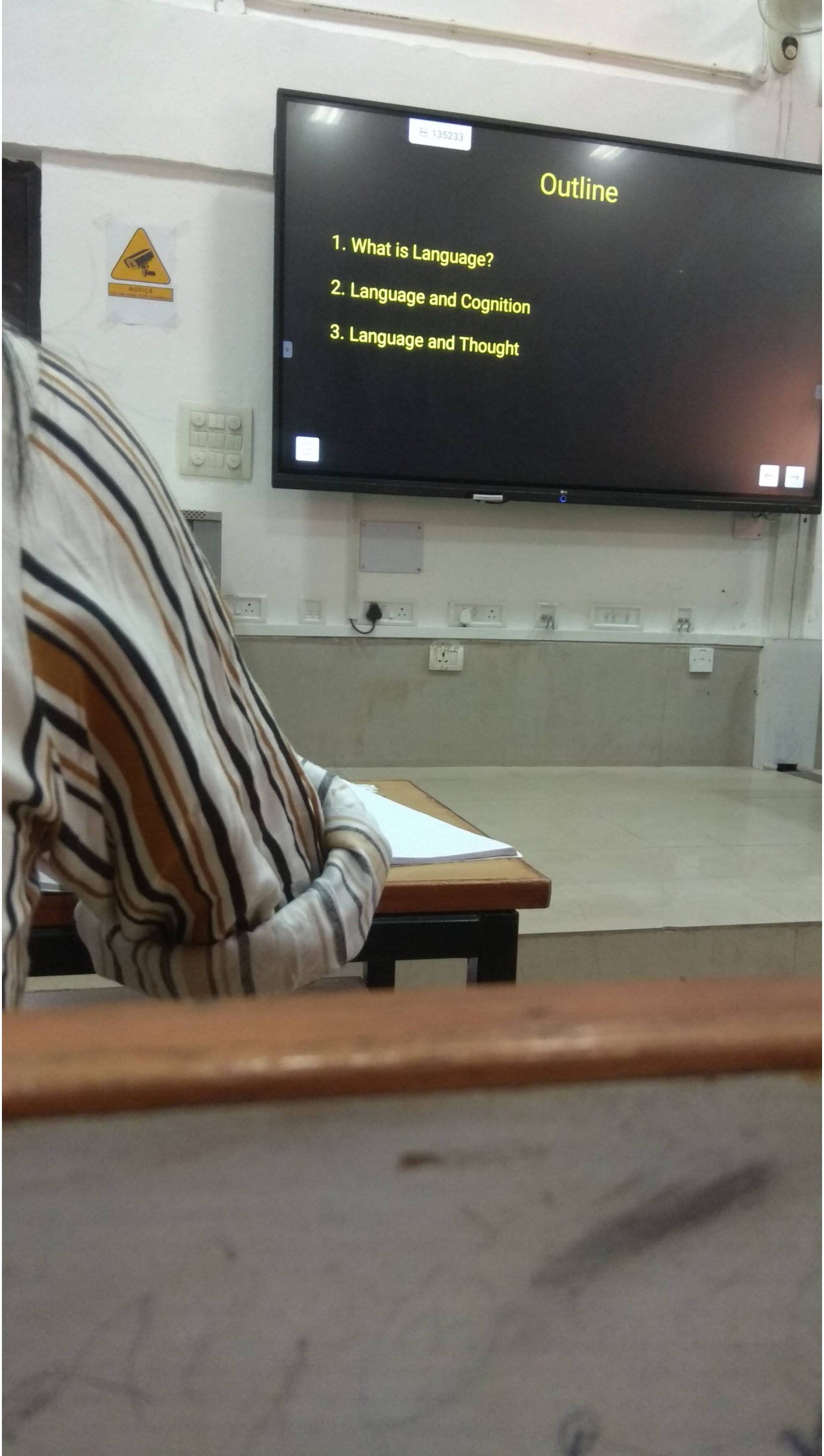
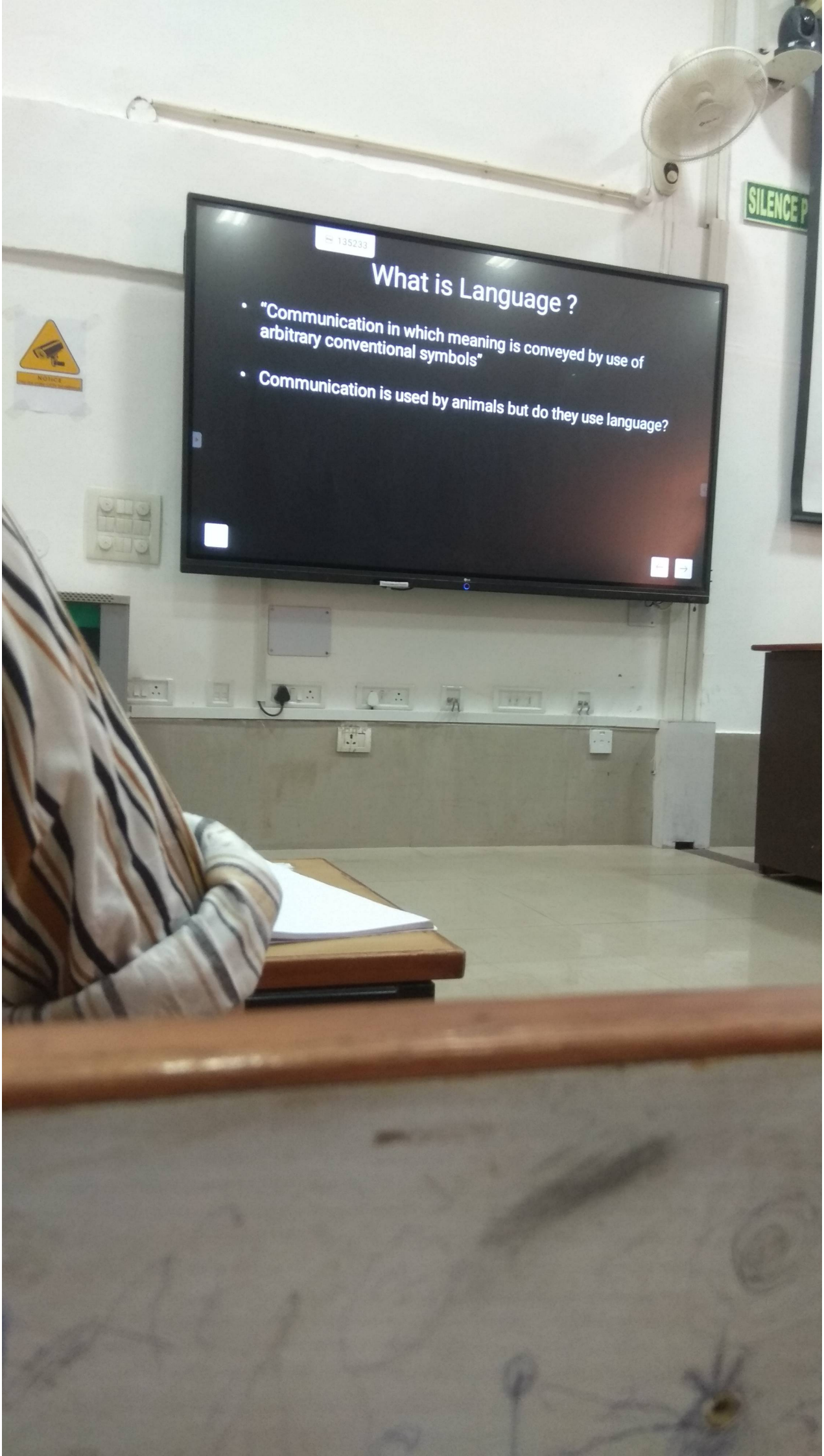
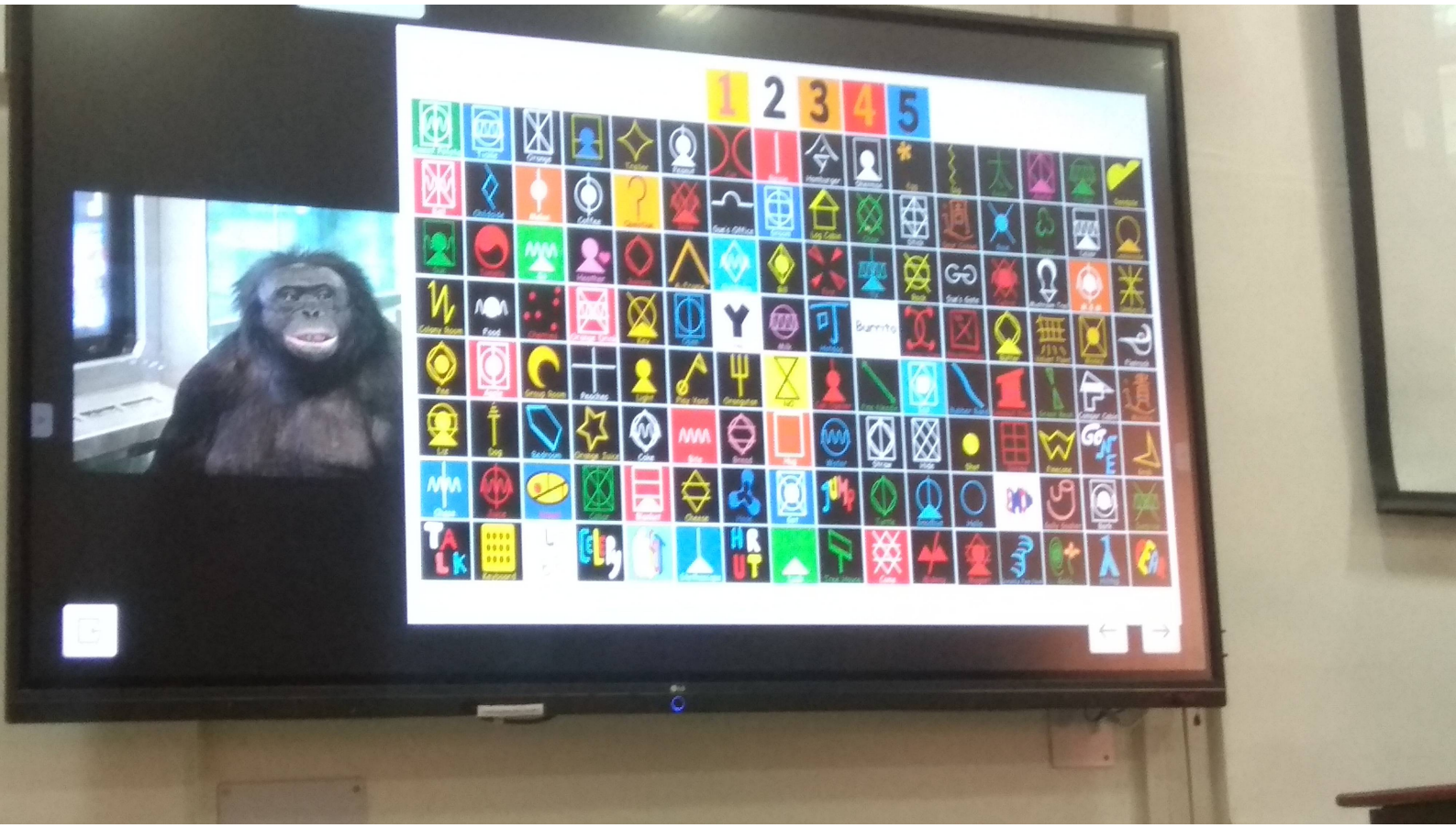
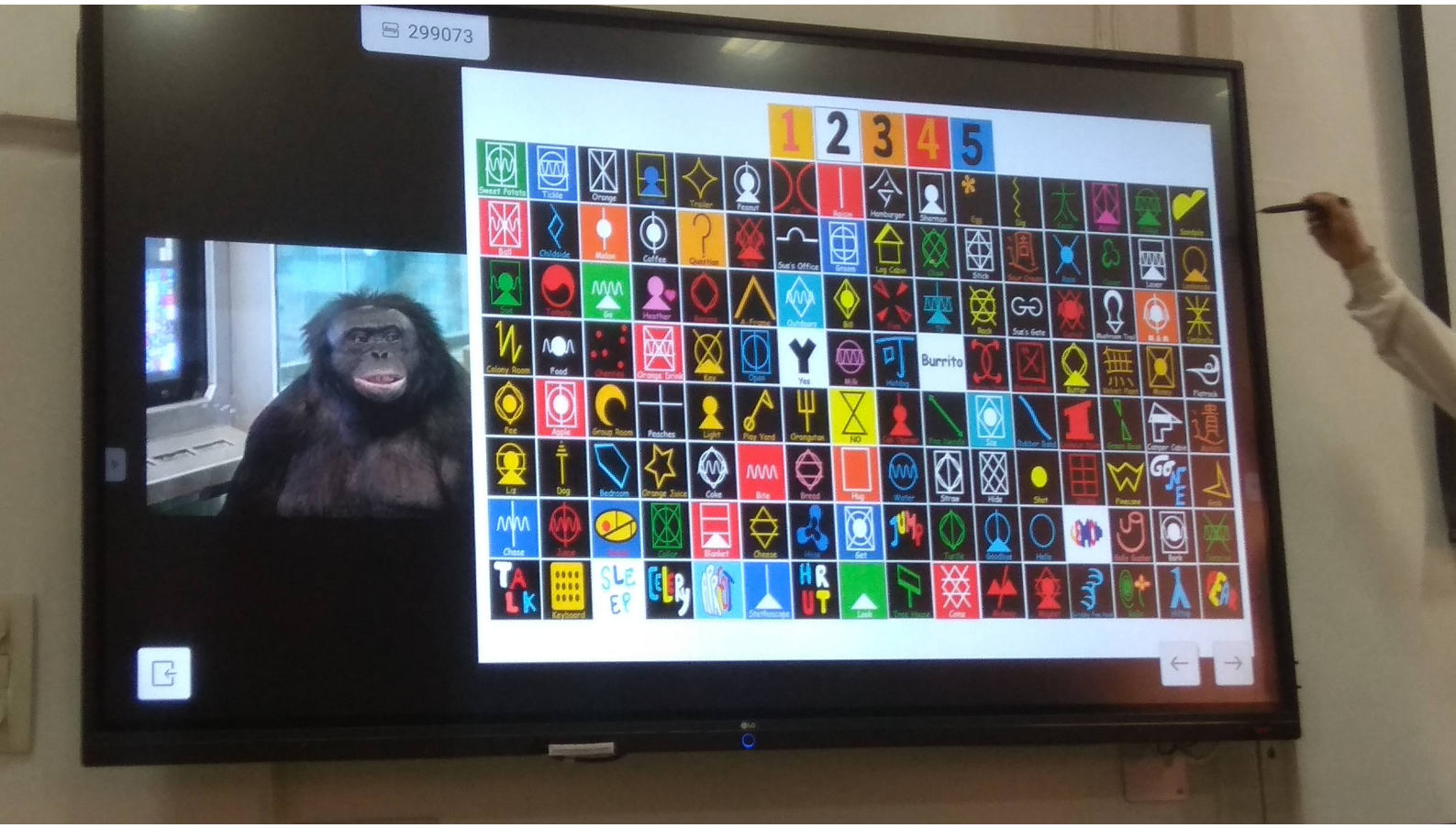
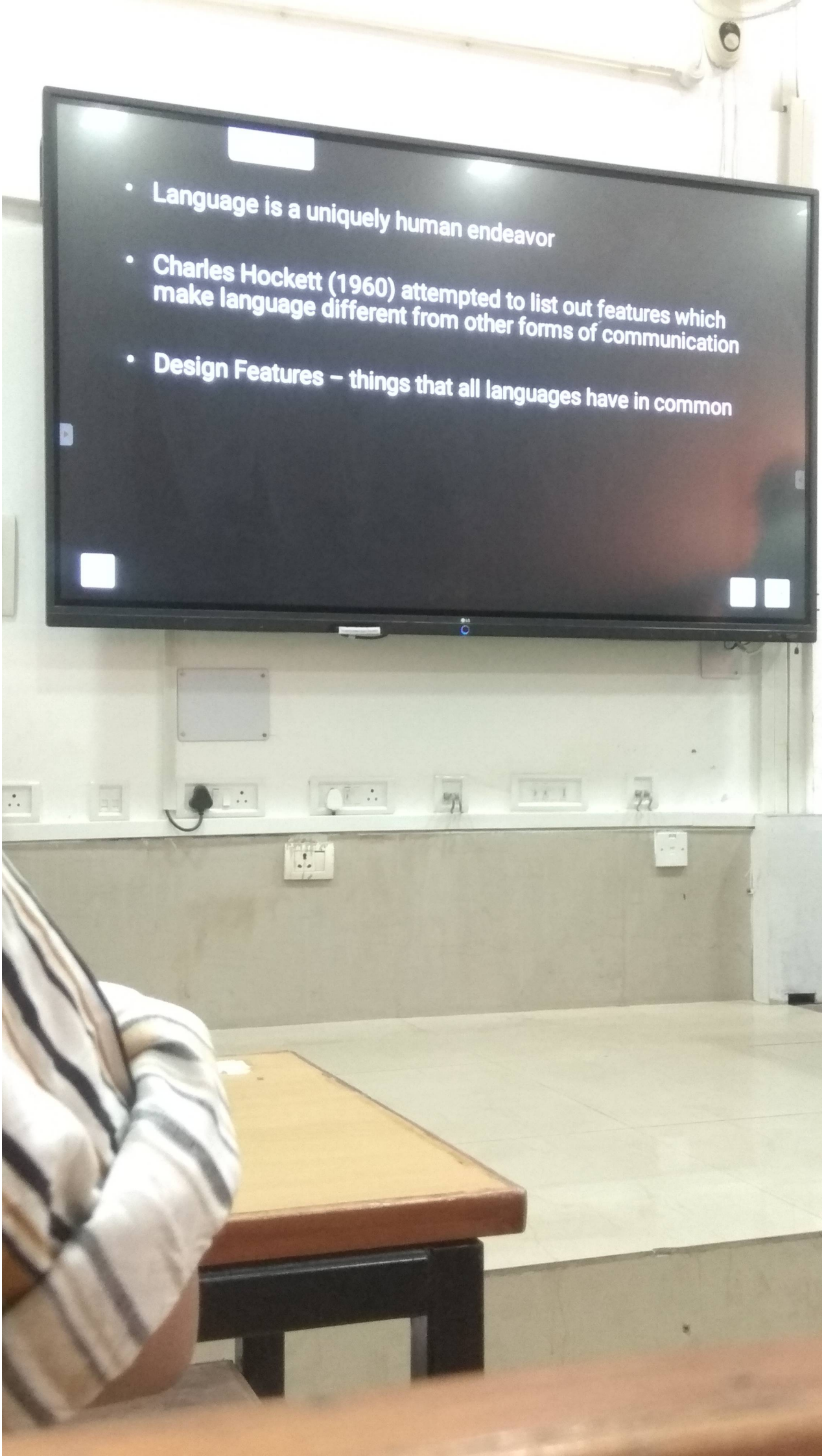
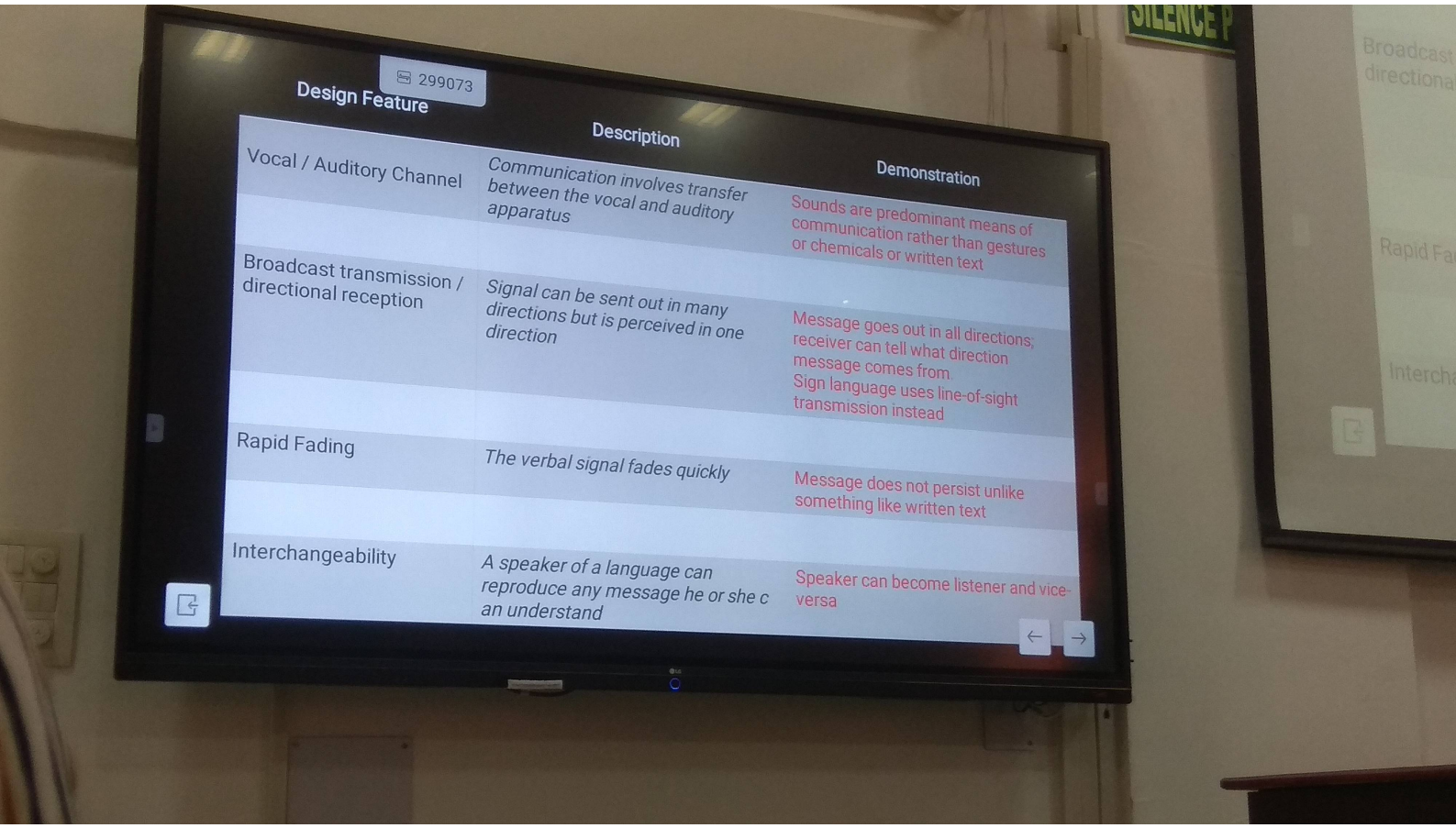

135233
Outline
1. What is Language?
2. Language and Cognition
3. Language and Thought
NOTICE

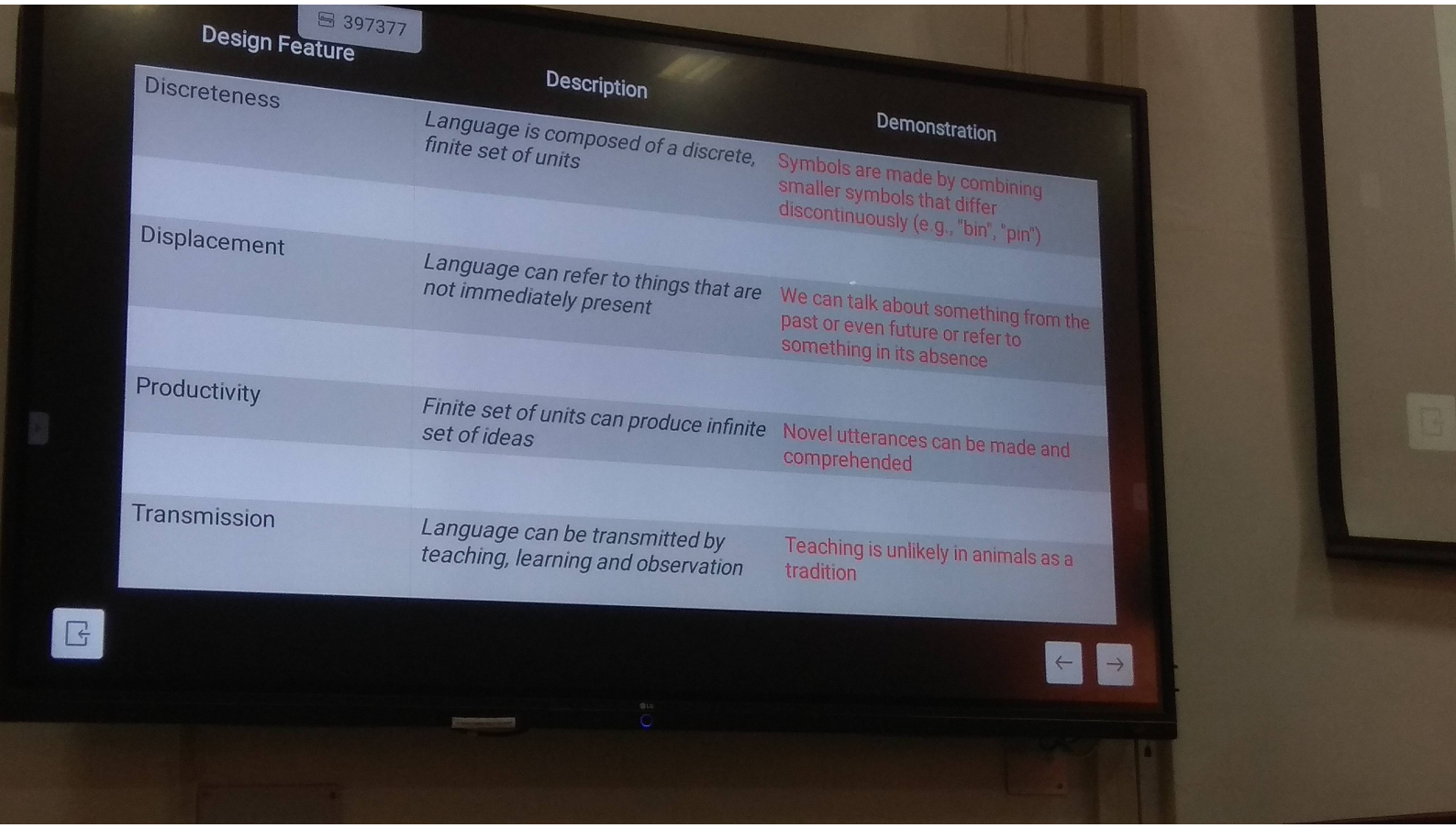

135233
What is Language ?
"Communication in which meaning is conveyed by use of arbitrary conventional symbols"
Communication is used by animals but do they use language?
SILENCE P

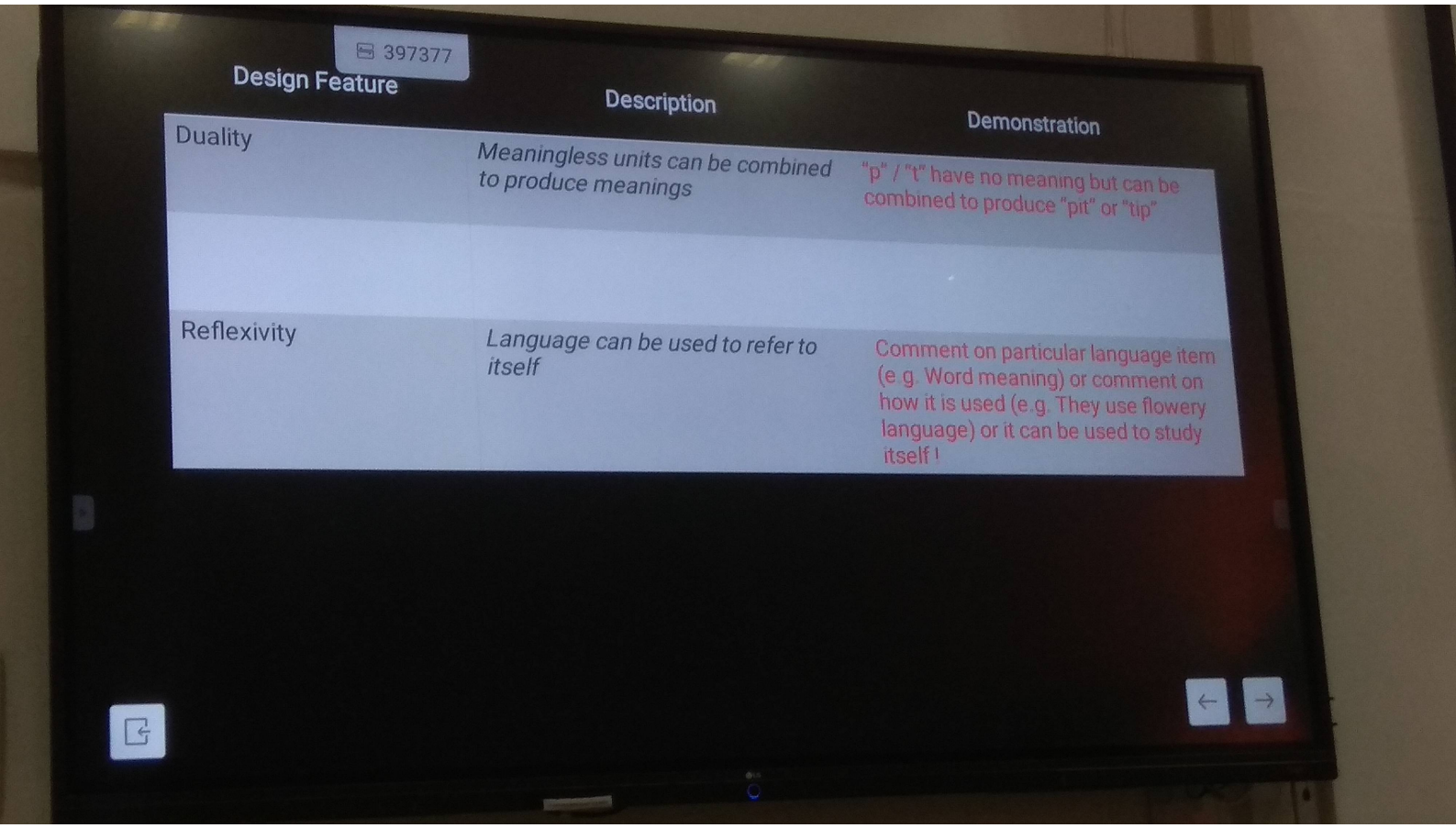

1 2 3 4 5

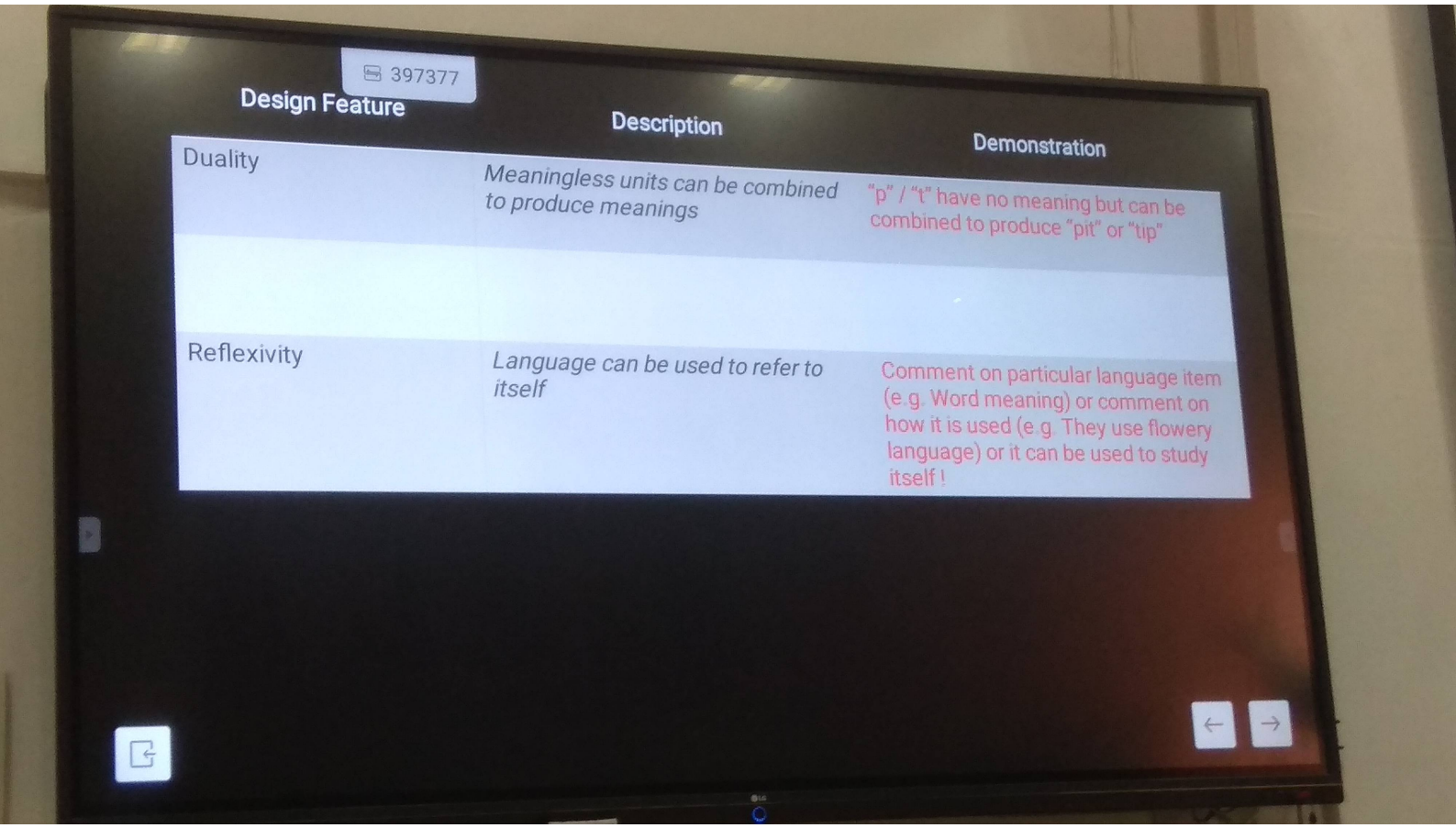

299073
1 2 3 4 5
Burrito
TALK
SLEEP


• Language is a uniquely human endeavor
• Charles Hockett (1960) attempted to list out features which make language different from other forms of communication
• Design Features – things that all languages have in common


299073
Design Feature
Description
Demonstration
Vocal / Auditory Channel
Communication involves transfer between the vocal and auditory apparatus
Sounds are predominant means of communication rather than gestures or chemicals or written text
Broadcast transmission / directional reception
Signal can be sent out in many directions but is perceived in one direction
Message goes out in all directions; receiver can tell what direction message comes from.
Sign language uses line-of-sight transmission instead
Rapid Fading
The verbal signal fades quickly
Message does not persist unlike something like written text
Interchangeability
A speaker of a language can reproduce any message he or she c an understand
Speaker can become listener and vice-versa


397377
Design Feature
Description
Demonstration
Discreteness
Language is composed of a discrete, finite set of units
Symbols are made by combining smaller symbols that differ discontinuously (e.g., "bin", "pin")
Displacement
Language can refer to things that are not immediately present
We can talk about something from the past or even future or refer to something in its absence
Productivity
Finite set of units can produce infinite set of ideas
Novel utterances can be made and comprehended
Transmission
Language can be transmitted by teaching, learning and observation
Teaching is unlikely in animals as a tradition


397377
Design Feature
Description
Demonstration
Duality
Meaningless units can be combined to produce meanings
"p" / "t" have no meaning but can be combined to produce "pit" or "tip"
Reflexivity
Language can be used to refer to itself
Comment on particular language item (e g. Word meaning) or comment on how it is used (e.g. They use flowery language) or it can be used to study itself !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Design Feature
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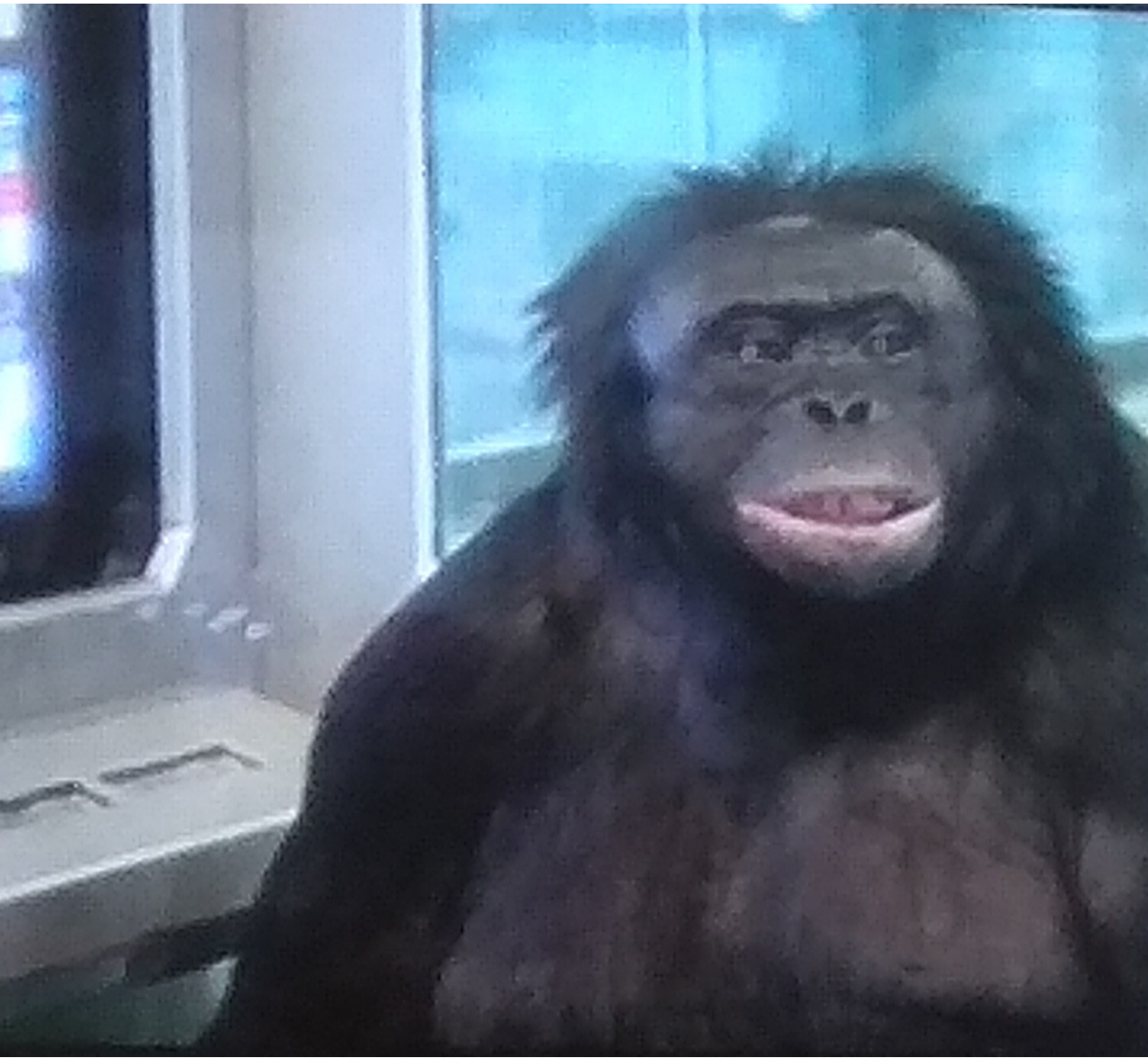
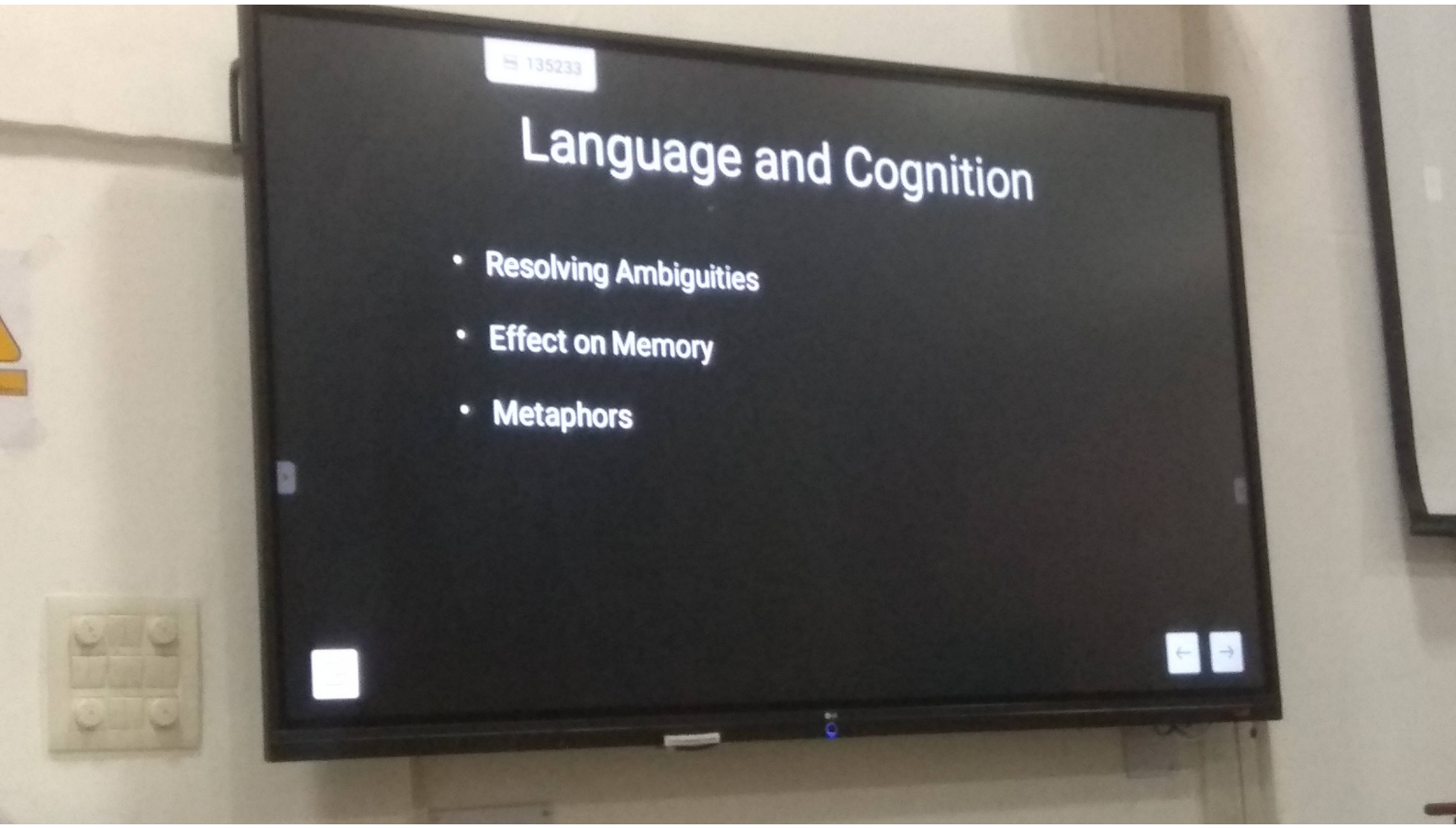
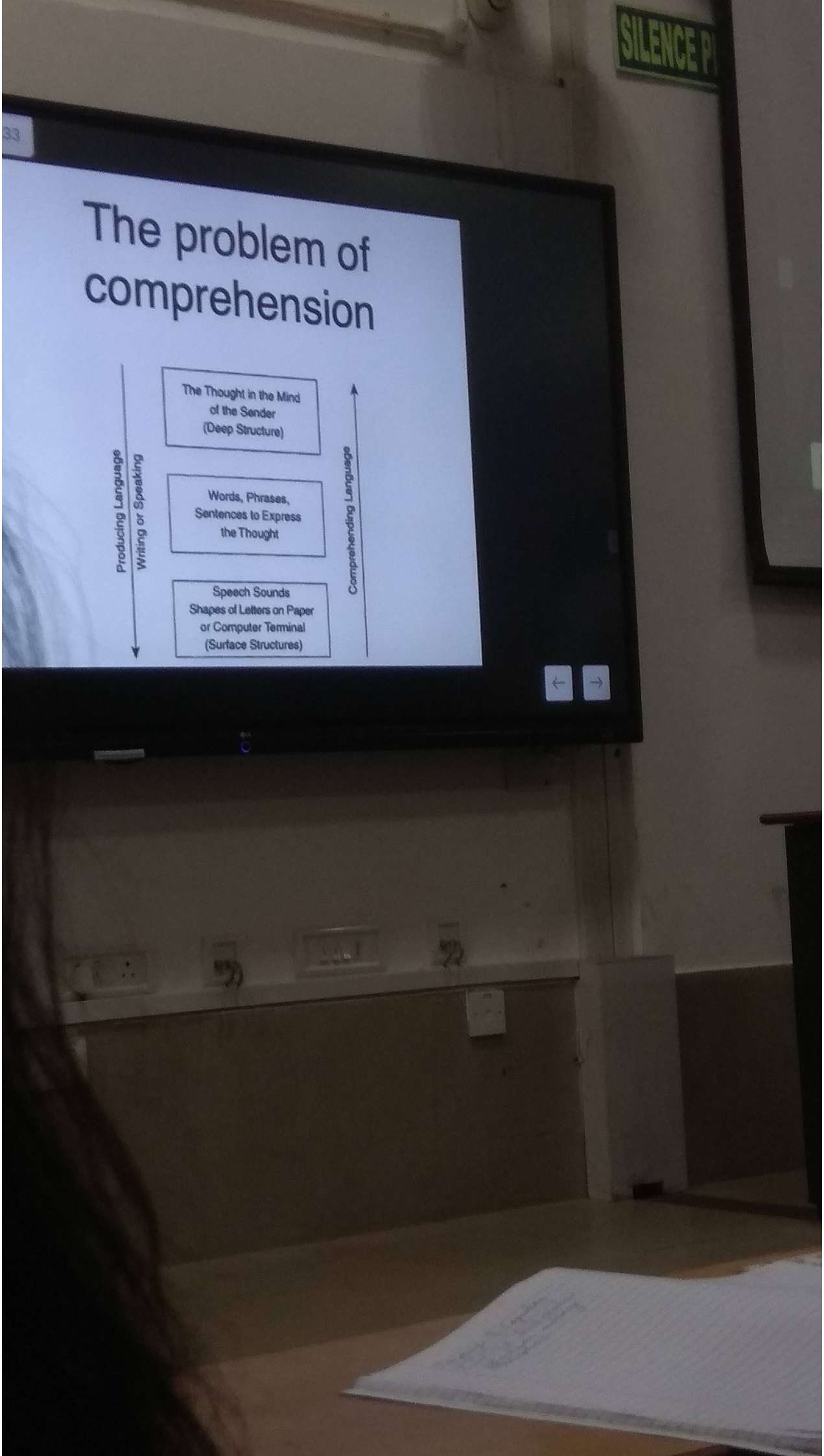
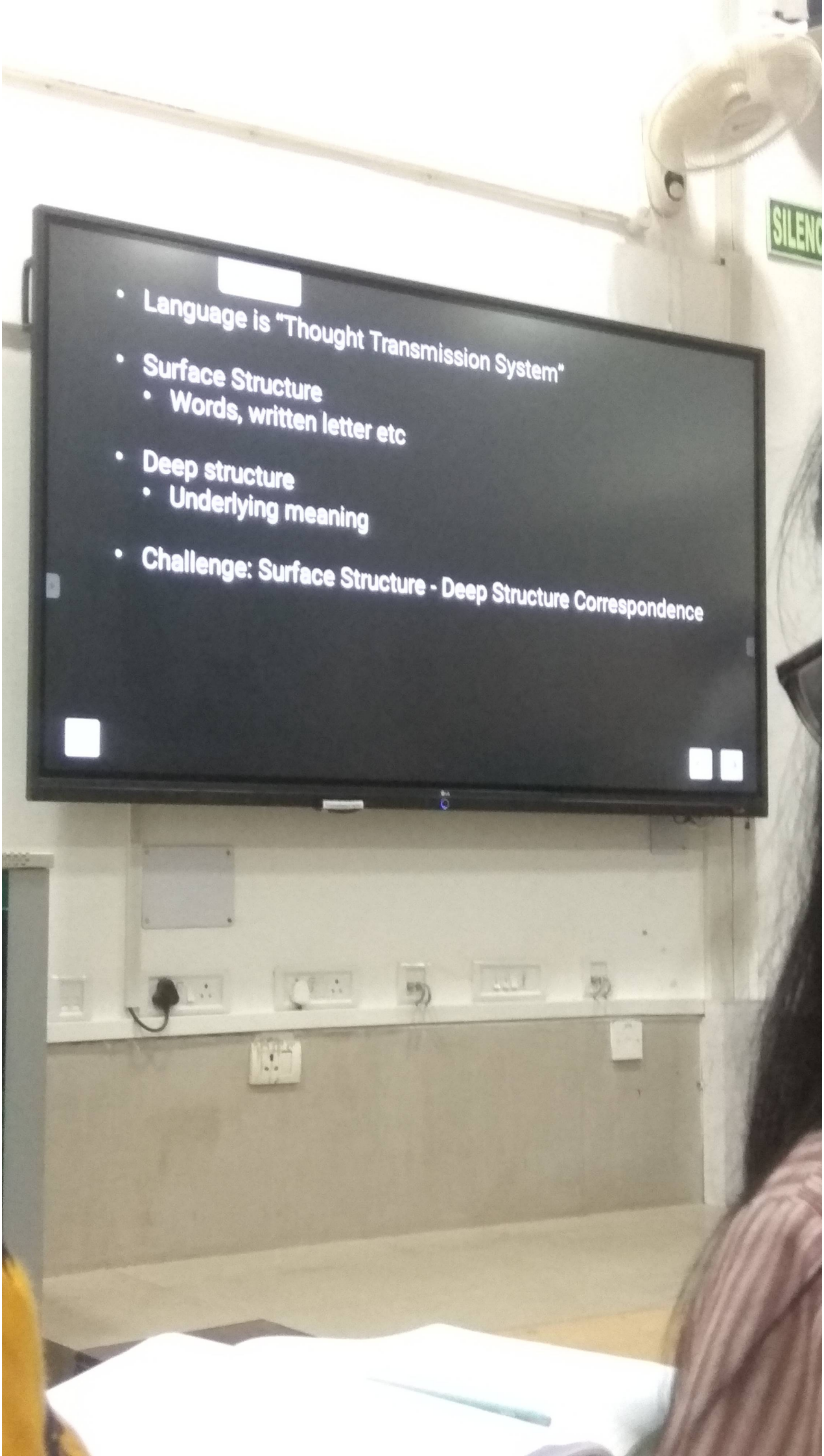
397377

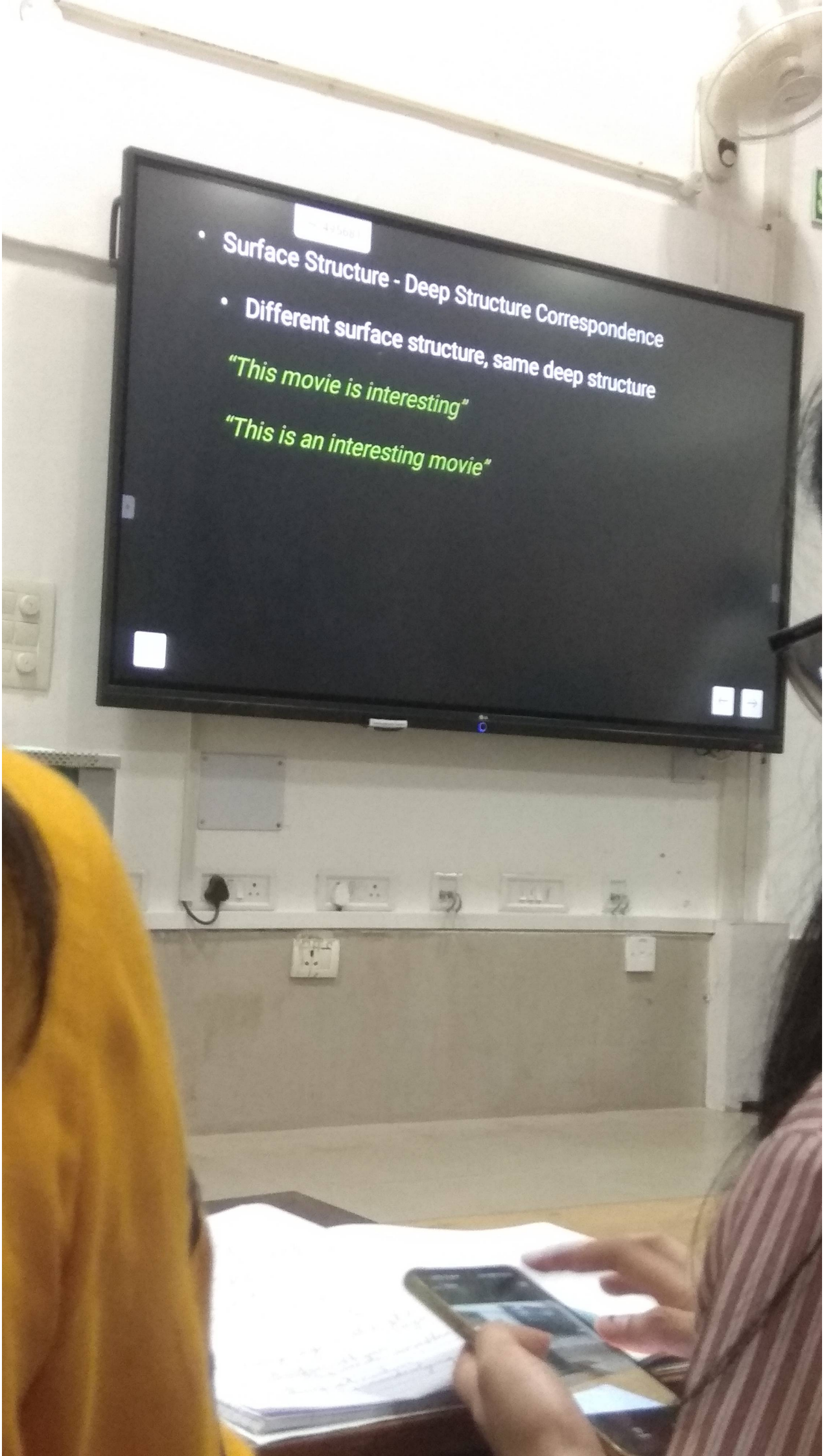
	Crickets	Bee dancing	Western Meadowlark	Gibbon calls	Signing apes	Language
Vocal-auditory	Auditory only	No	Yes	Yes	No	Yes
Rapid fading	Yes, repeated	?	Yes	Yes, repeated	Yes	Yes
Interchangeability	Limited	Limited	?	Yes	Yes	Yes
Feedback	Yes	?	Yes	Yes	No	Yes
Specialization	Yes?	?	Yes	Yes	Yes	Yes
Semanticity	No?	Yes	In part	Yes	Yes	Yes
Arbitrariness	?	No	If semantic, yes	Yes	Largely yes	Yes
Discreteness	In part	No	?	In part	Yes	Yes
Displacement	No	Yes, always	?	No	Yes	Yes, often
Productivity	No?	Yes	?	No	Debatable	Yes
Cultural transmission	?	Probably not	?	?	Limited	Yes
Duality of patterning		No	?	[Cotton-top tamarin: Yes]	Yes	Yes
Prevarication					Yes	Yes
Reflexiveness					Debatable	Yes
Learnability					Yes	Yes

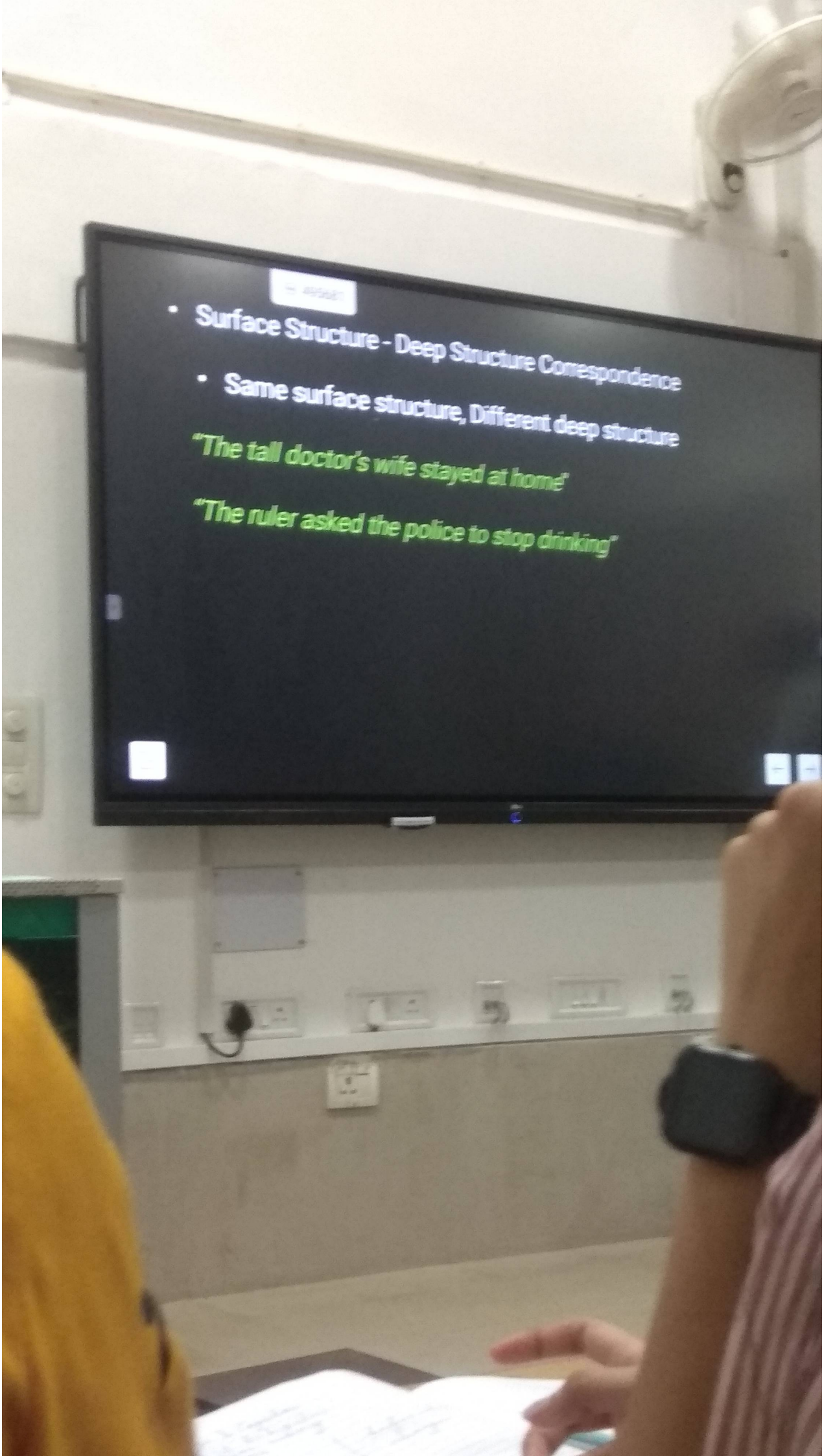


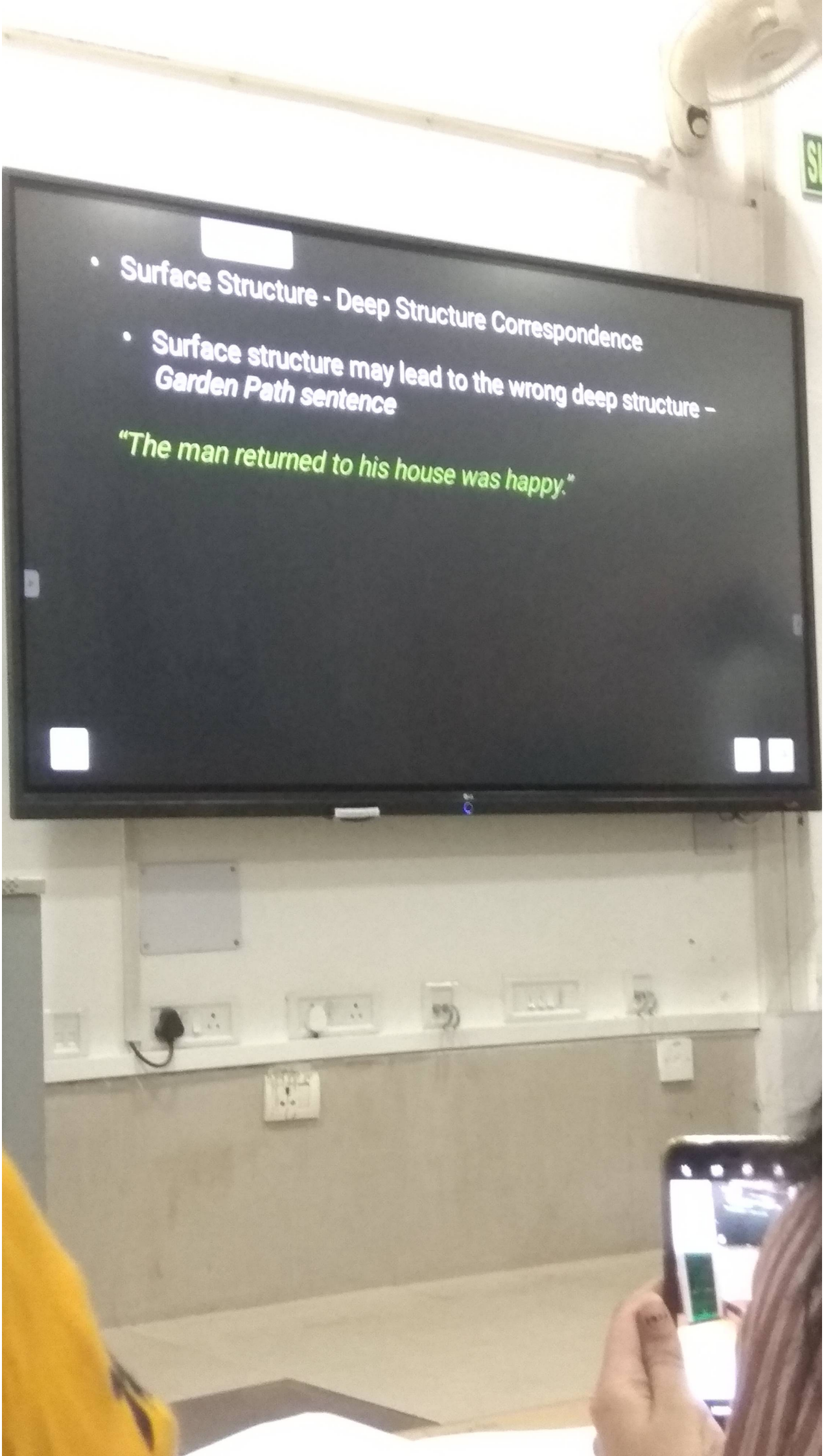

135233
Language and Cognition
Resolving Ambiguities
Effect on Memory
Metaphors


SILENCE P
33
The problem of comprehension
The Thought in the Mind of the Sender (Deep Structure)
Words, Phrases, Sentences to Express the Thought
Speech Sounds Shapes of Letters on Paper or Computer Terminal (Surface Structures)
Producing Language Writing or Speaking
Comprehending Language


Language is "Thought Transmission System"
Surface Structure
Words, written letter etc
Deep structure
Underlying meaning
Challenge: Surface Structure - Deep Structure Correspondence
SILENC


Surface Structure - Deep Structure Correspondence
Different surface structure, same deep structure
"This movie is interesting"
"This is an interesting movie"


Surface Structure - Deep Structure Correspondence
Same surface structure, Different deep structure
"The tall doctor's wife stayed at home"
"The ruler asked the police to stop drinking"


Surface Structure - Deep Structure Correspondence
Surface structure may lead to the wrong deep structure – Garden Path sentence
"The man returned to his house was happy."

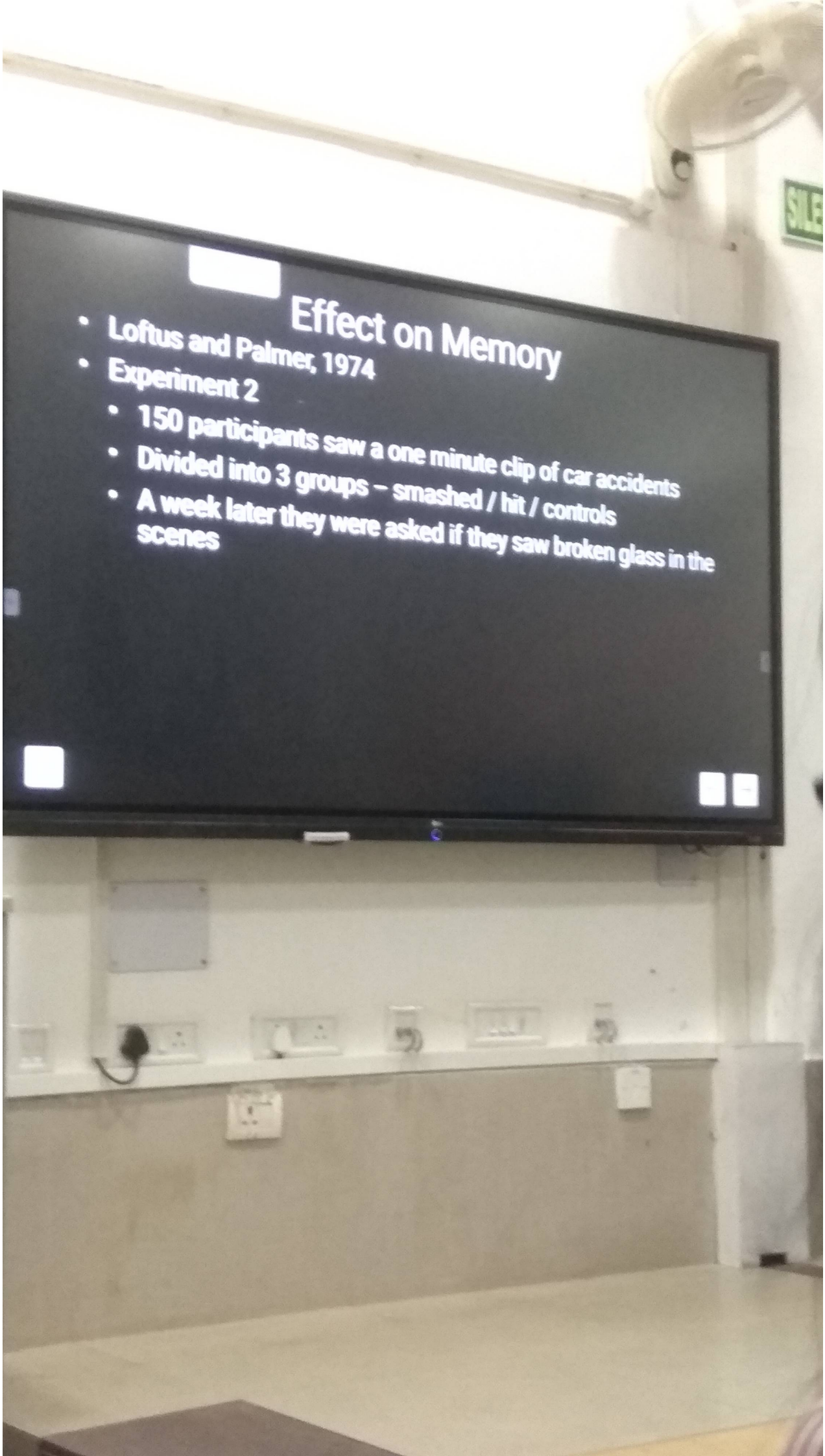
495681

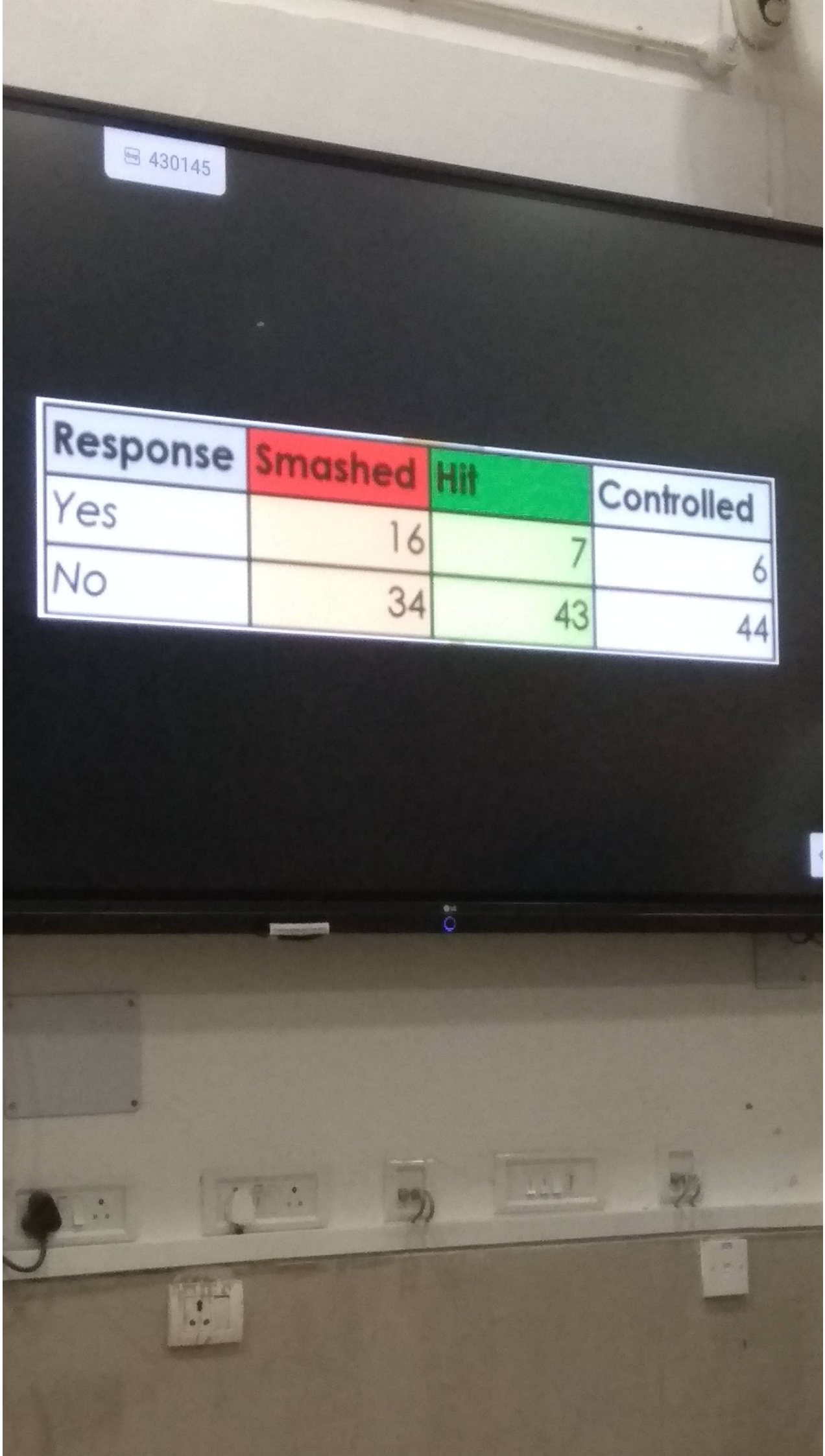
Sentence	Initial likely partial parse	Final parse
The old man the boat.	The man, who is old...	The boat is manned by the old people.
The man whistling tunes piancs.	The man, who is whistling melodies...	The man, who is whistling, also tunes pianos.
The cotton clothing is made of grows in Mississippi.	The clothing, which is made of cotton, is made of...	The cotton, of which clothing is made, is grown in Mississippi.
The complex houses married and single soldiers and their families.	The houses (meaning buildings or families), which are complicated, got married to...	Soldiers (both married and single), and their families, are housed in the complex.
The author wrote the novel was likely to be a best-seller.	The author composed the novel...	The author wrote a comment, saying the novel was likely to be a best-seller.
The tomcat curled up on the cushion seemed friendly.	The tomcat curled itself up on the cushion...	The tomcat that was in a curled-up position on the cushion seemed friendly.
The man returned to his house was happy.	The man came back to his house...	The man, who was returned to his house, was happy.
The government plans to raise taxes were defeated.	The government is making plans to raise taxes...	The plans of the government to raise taxes were defeated.

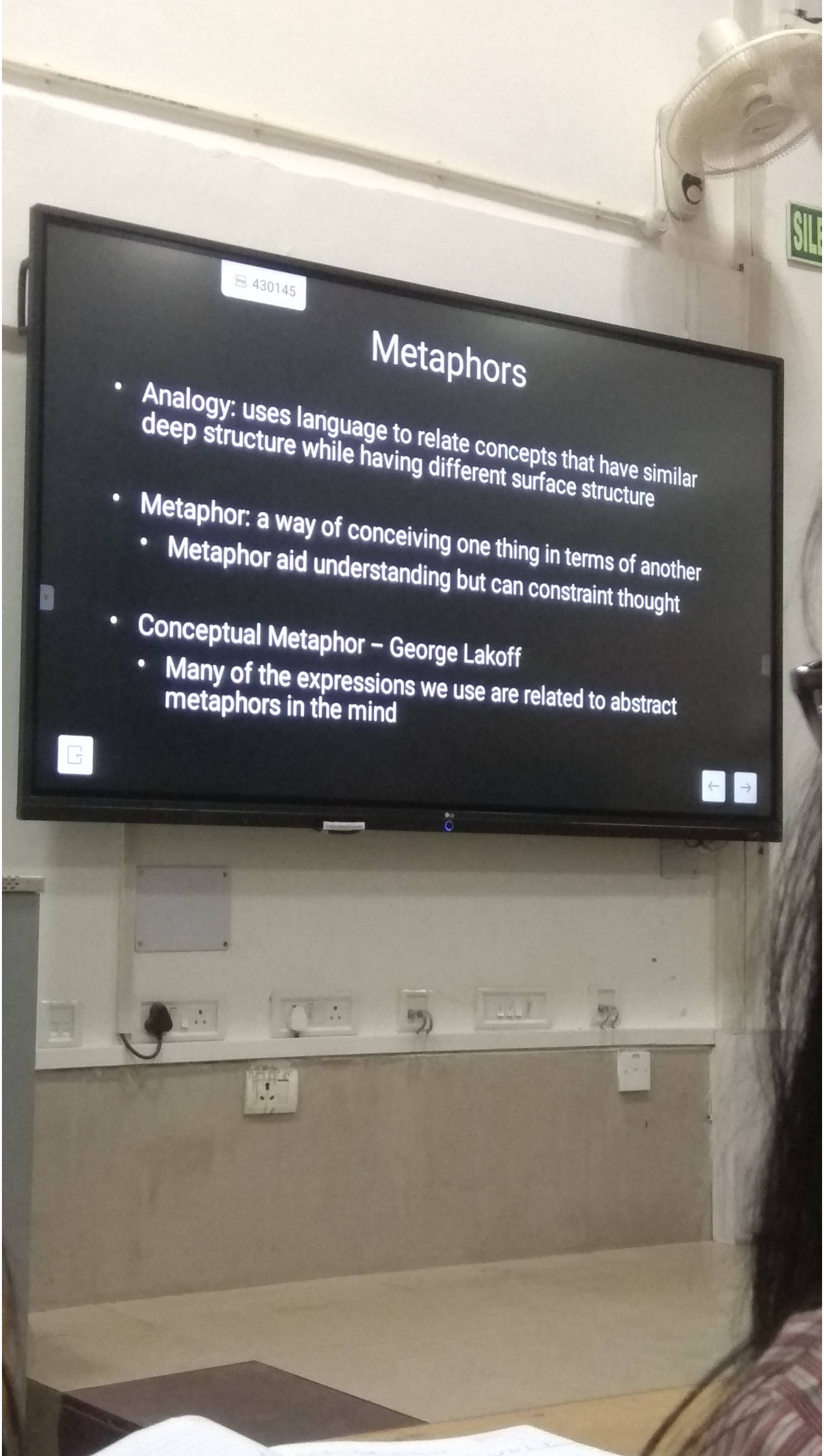
Effect on Memory

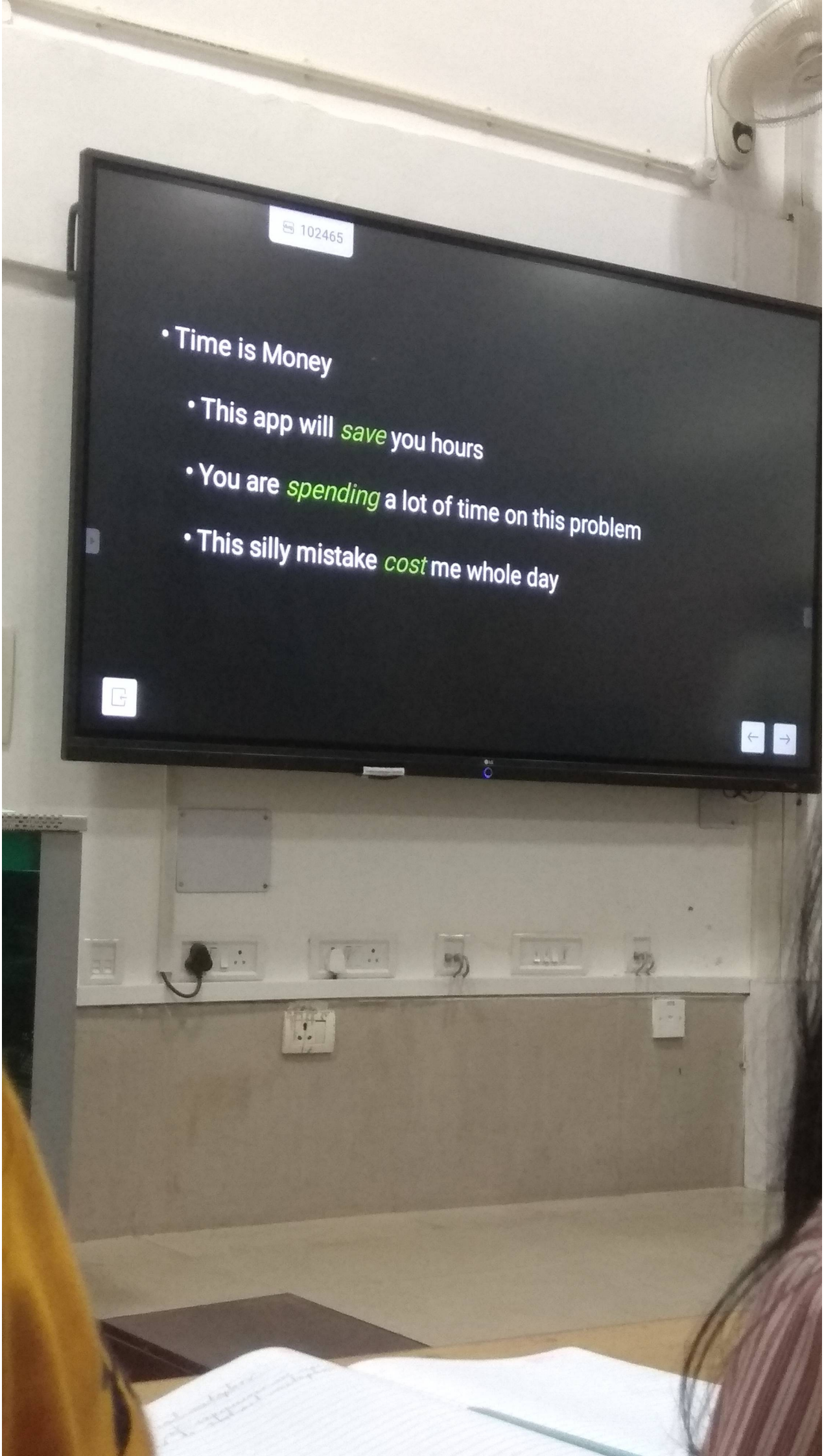
- Loftus and Palmer, 1974
- Experiment 1
  - 45 participants watched clips of car accidents
  - After every accident clip they were given a questionnaire to fill out which included the leading/critical question:

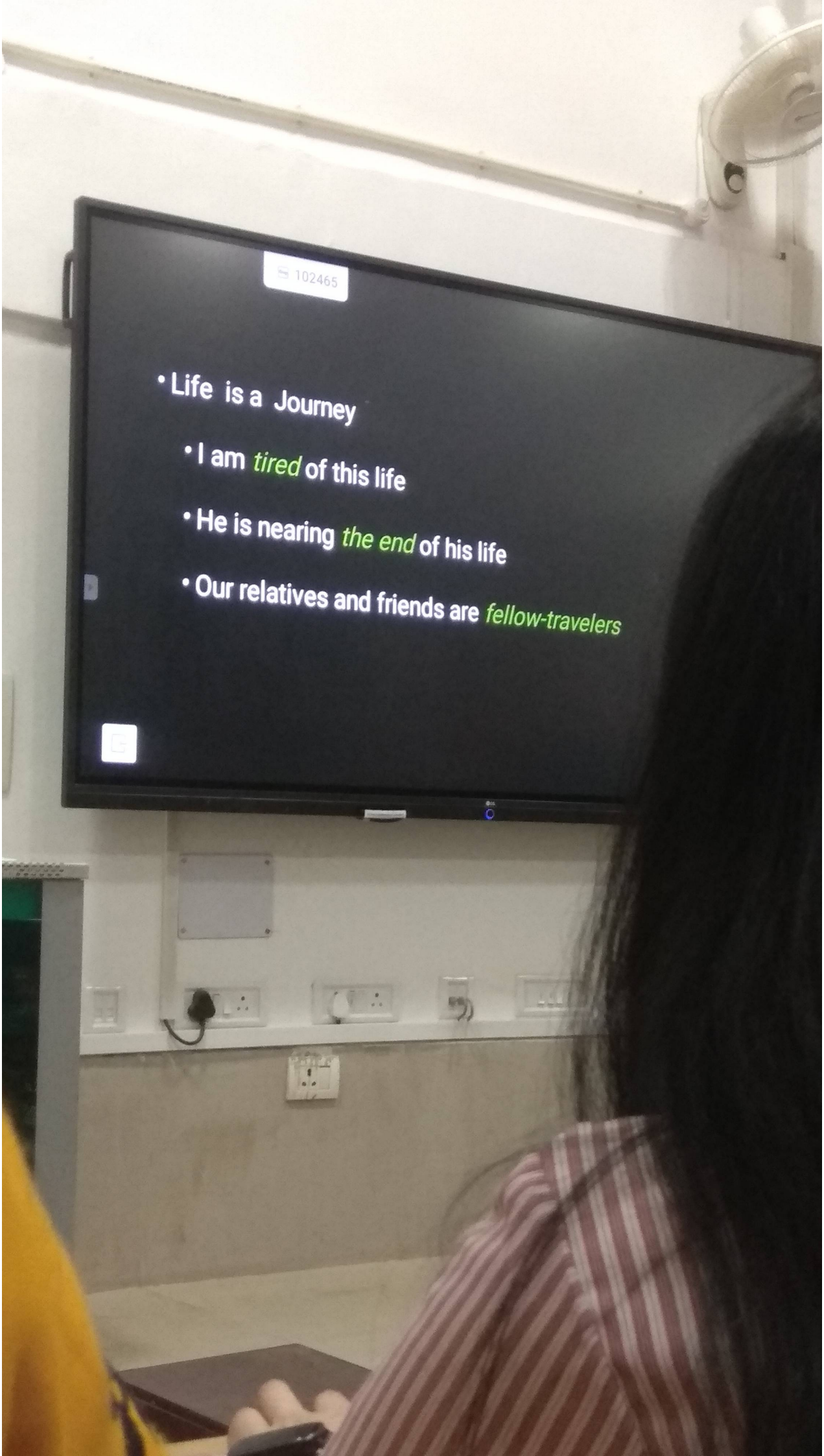
'About how fast were the cars going when they (contacted, hit, bumped, collided, smashed) into/with each other?'

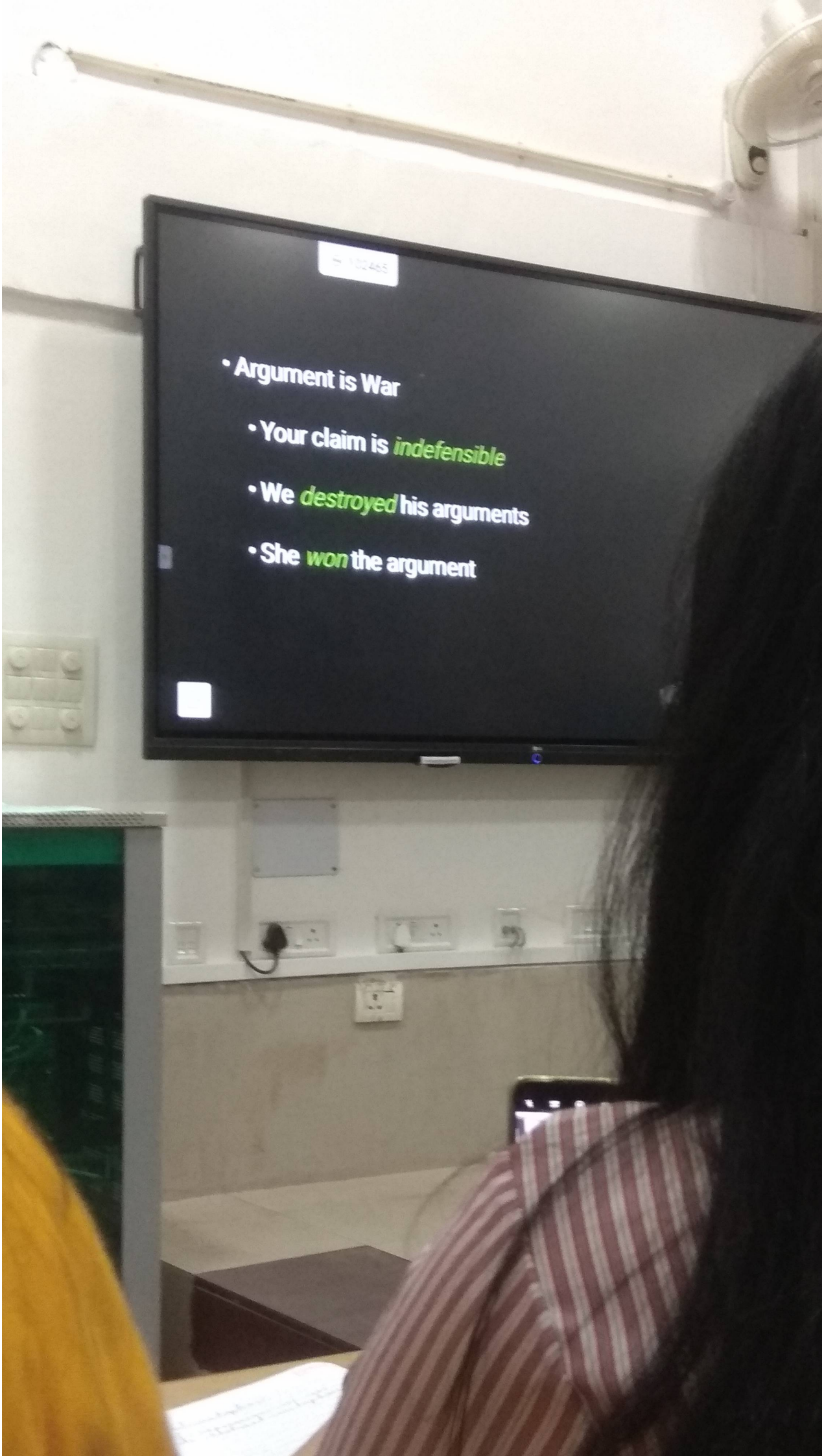

Effect on Memory
Loftus and Palmer, 1974
Experiment 2
150 participants saw a one minute clip of car accidents
Divided into 3 groups – smashed / hit / controls
A week later they were asked if they saw broken glass in the scenes


430145
Response
Smashed
Hit
Controlled
Yes
16
7
6
No
34
43
44


430145
Metaphors
Analogy: uses language to relate concepts that have similar deep structure while having different surface structure
Metaphor: a way of conceiving one thing in terms of another
Metaphor aid understanding but can constraint thought
Conceptual Metaphor – George Lakoff
Many of the expressions we use are related to abstract metaphors in the mind


102465
• Time is Money
• This app will save you hours
• You are spending a lot of time on this problem
• This silly mistake cost me whole day


102465
• Life is a Journey
• I am tired of this life
• He is nearing the end of his life
• Our relatives and friends are fellow-travelers

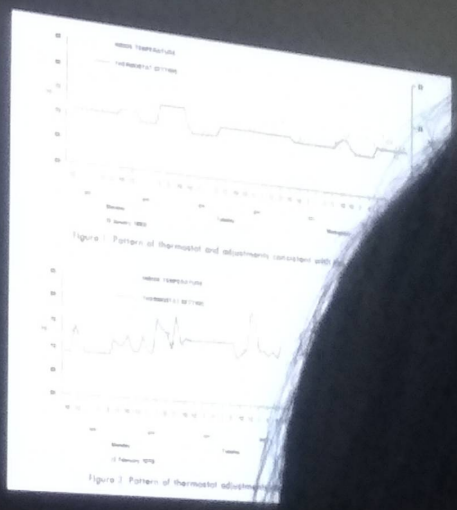

• Argument is War
• Your claim is indefensible
• We destroyed his arguments
• She won the argument

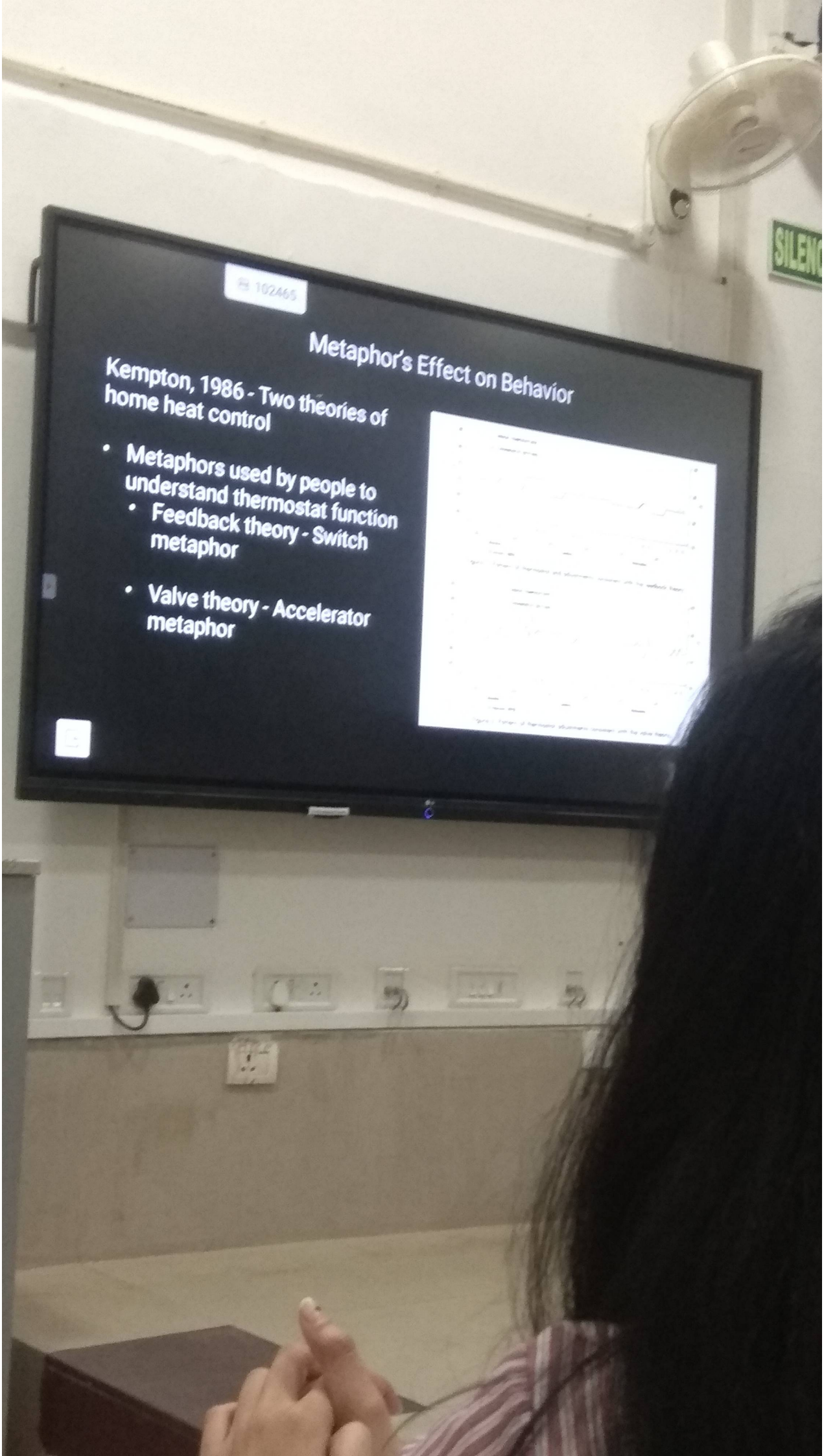
102465

Metaphor's Effect on Behavior

Kempton, 1986 - Two theories of home heat control

- Metaphors used by people to understand thermostat function
  - Feedback theory - Switch metaphor
  - Valve theory - Accelerator metaphor




102465
Metaphor's Effect on Behavior
Kempton, 1986 - Two theories of home heat control
Metaphors used by people to understand thermostat function
Feedback theory - Switch metaphor
Valve theory - Accelerator metaphor

102465

Metaphor's Effect on Behavior

Kempton, 1986 - Two theories of home heat control

- Metaphors used by people to understand thermostat function
  - Feedback theory - Switch metaphor
  - Valve theory - Accelerator metaphor

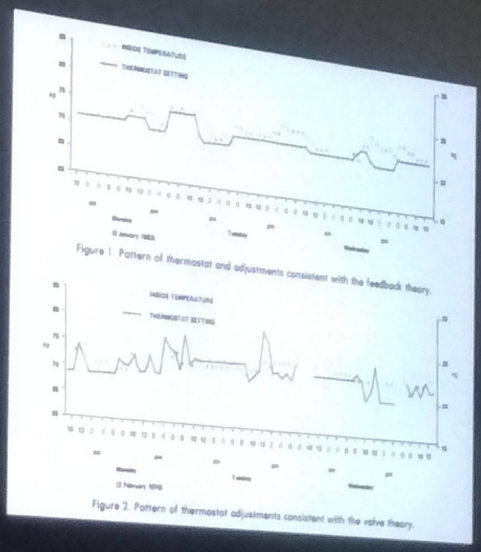
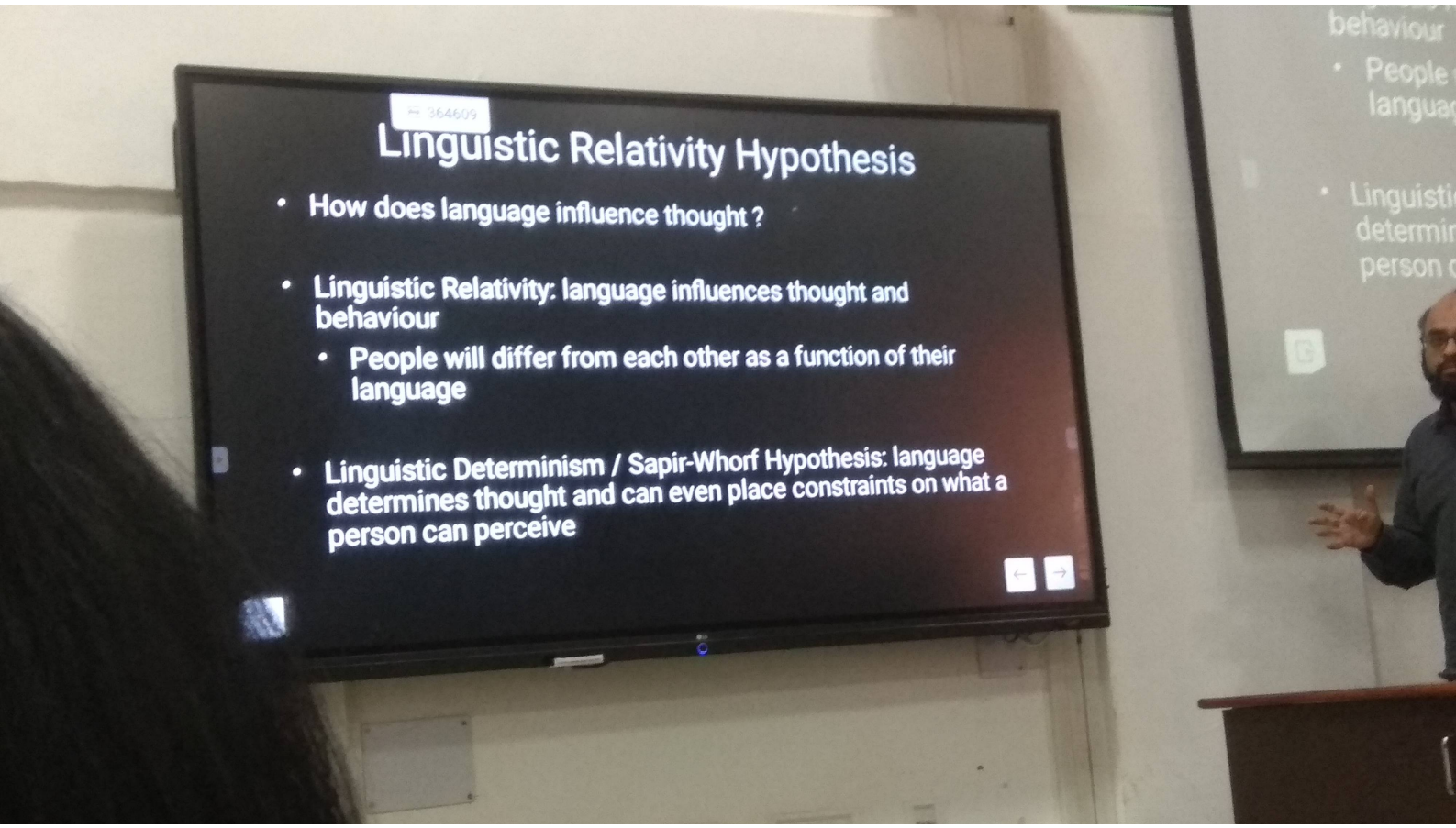
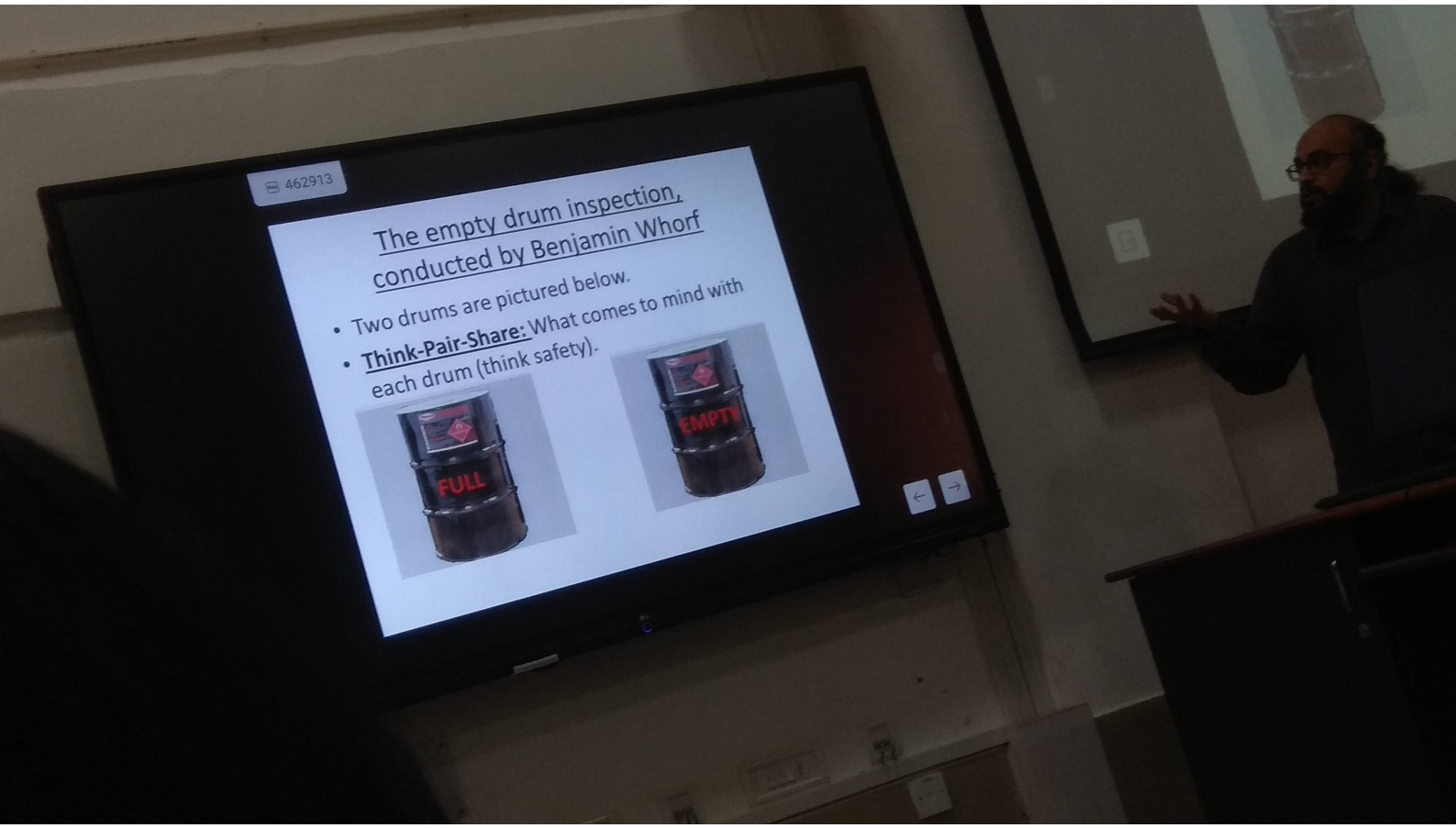
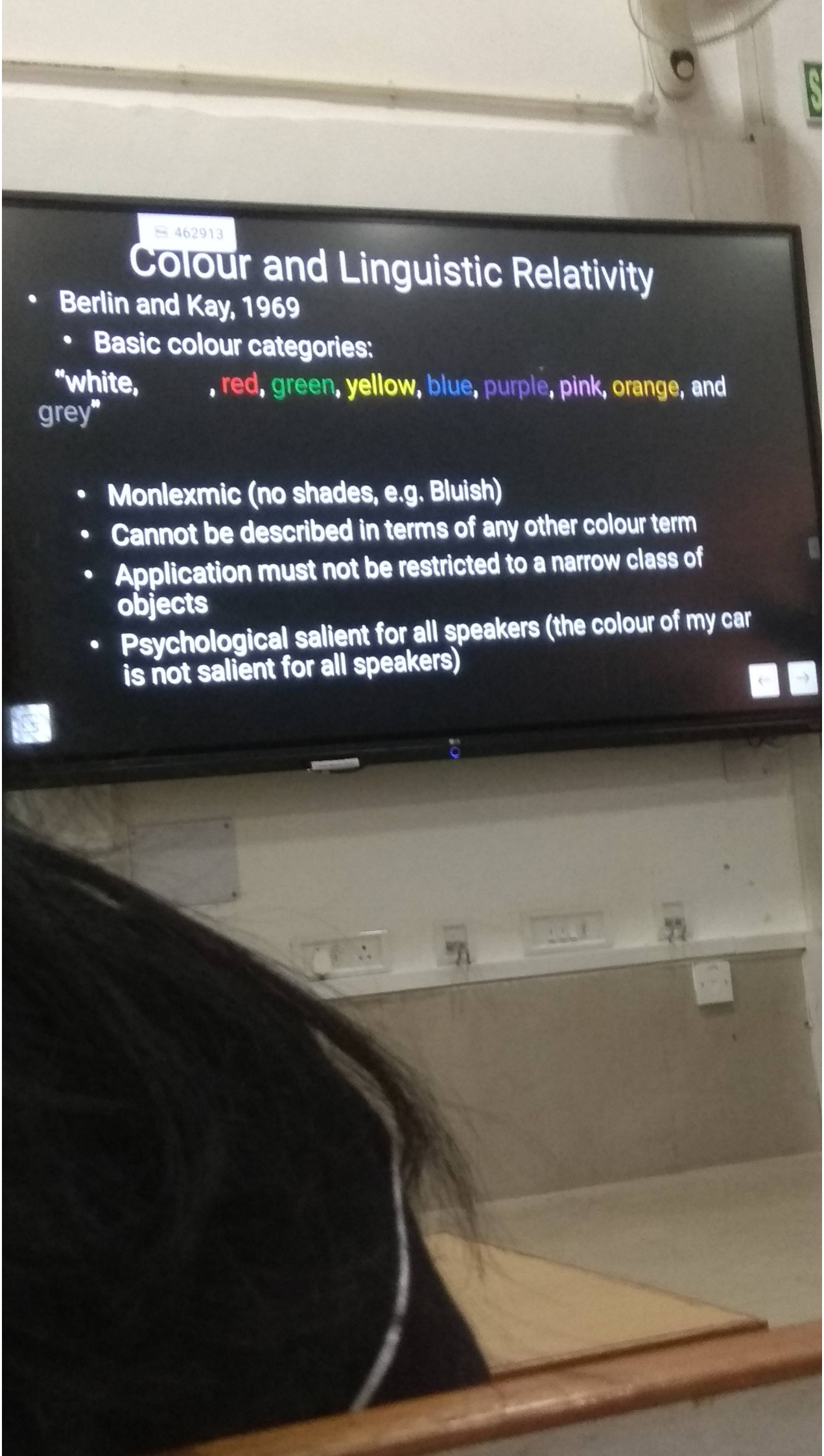


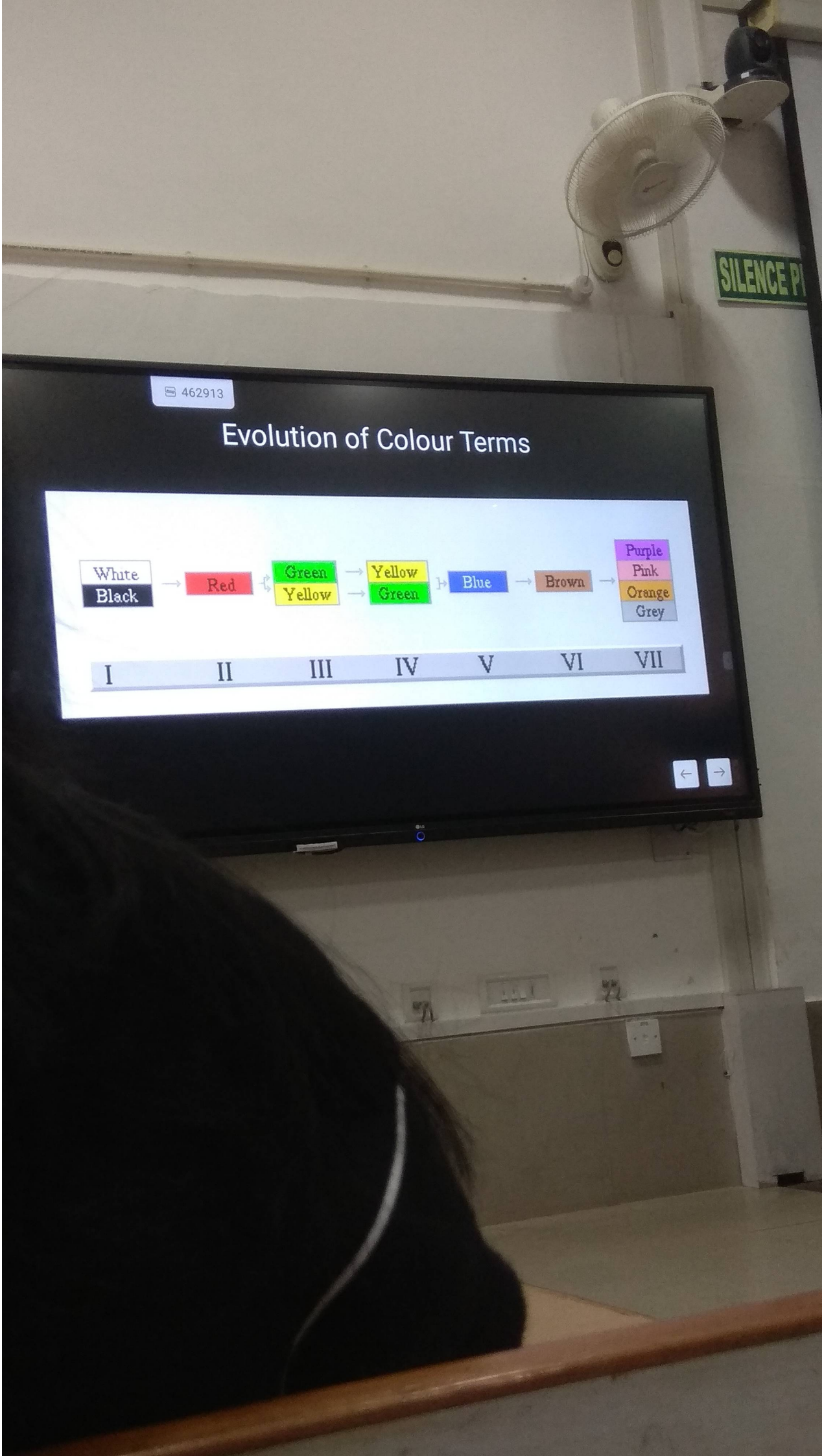
Figure 1 Pattern of thermostat and adjustments consistent with the feedback theory.

Figure 2. Pattern of thermostat adjustments consistent with the valve theory.


364609
Linguistic Relativity Hypothesis
How does language influence thought ?
Linguistic Relativity: language influences thought and behaviour
People will differ from each other as a function of their language
Linguistic Determinism / Sapir-Whorf Hypothesis: language determines thought and can even place constraints on what a person can perceive


462913
The empty drum inspection, conducted by Benjamin Whorf
• Two drums are pictured below.
• Think-Pair-Share: What comes to mind with each drum (think safety).
FULL
EMPTY


462913
Colour and Linguistic Relativity
Berlin and Kay, 1969
Basic colour categories:
"white, , red, green, yellow, blue, purple, pink, orange, and grey"
Monlexmic (no shades, e.g. Bluish)
Cannot be described in terms of any other colour term
Application must not be restricted to a narrow class of objects
Psychological salient for all speakers (the colour of my car is not salient for all speakers)


462913
Evolution of Colour Terms
White
Black
Red
Green
Yellow
Yellow
Green
Blue
Brown
Purple
Pink
Orange
Grey
I
II
III
IV
V
VI
VII
SILENCE P


495681
Berinmo Colour Names
Wap
Wor
Wap
Mehl
Nol
Kel

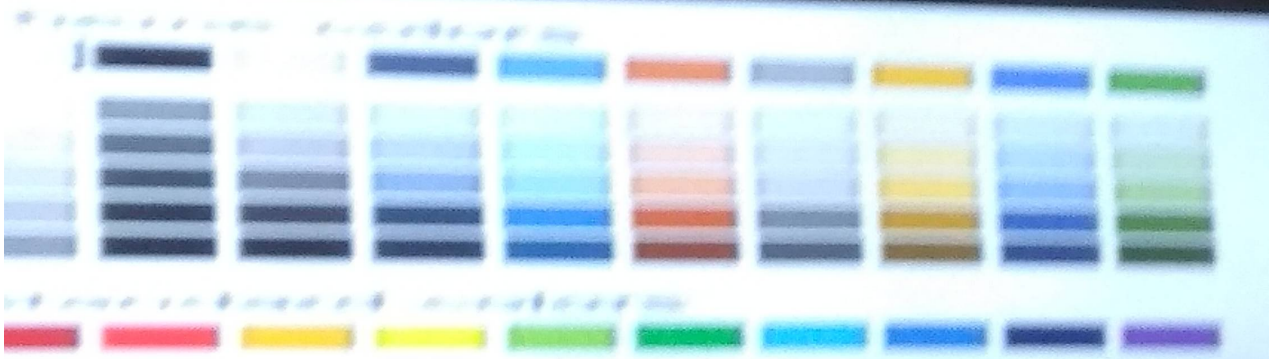

495681
Berinmo Colour Names
Wap
Wor
Wap
Mehl
Nol
Mehl
Kel
Kel

guistic Relativity: An Evaluation

n Heider, 1972

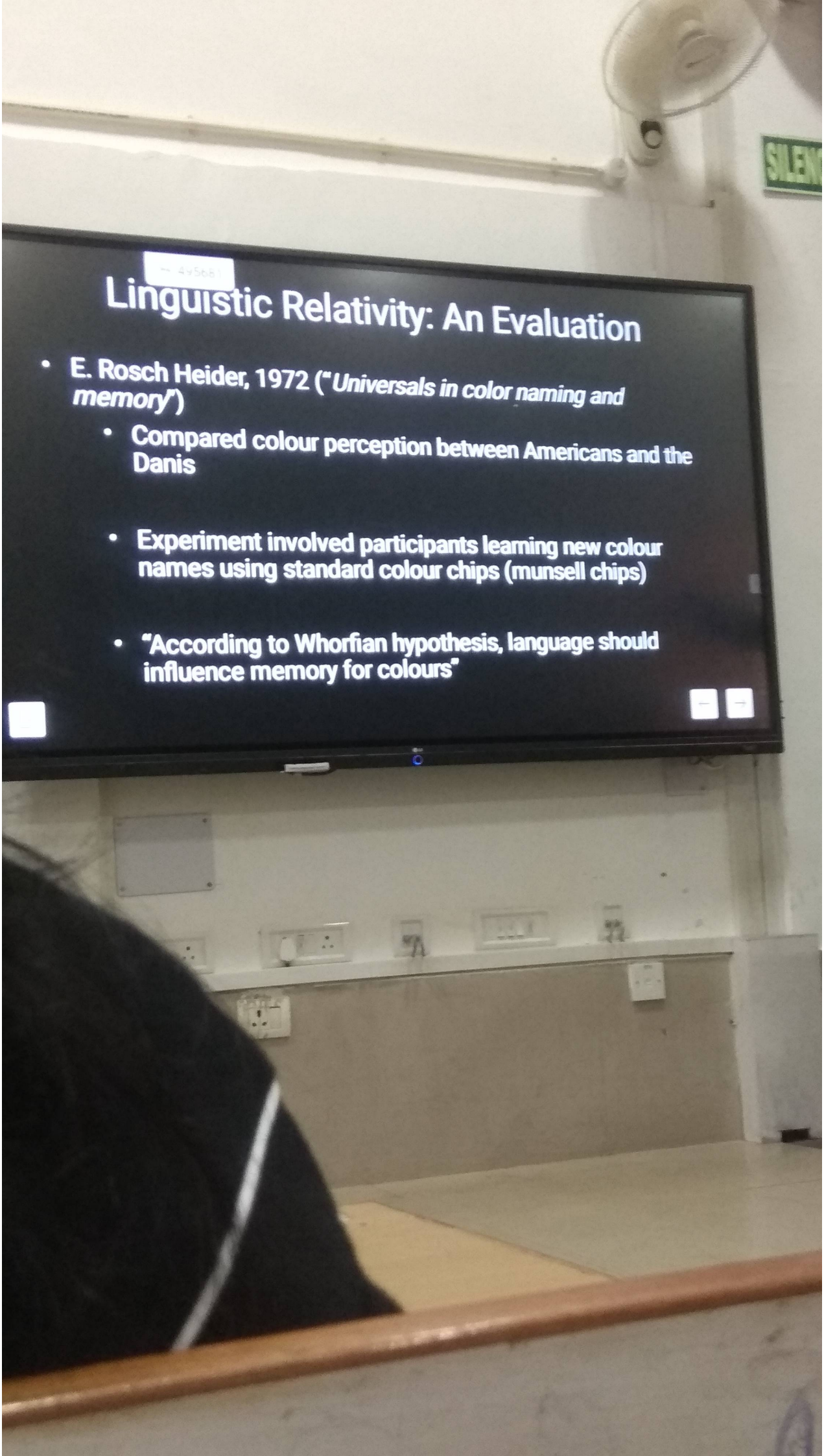
tribe in Papua New Guinea have only two words for
r

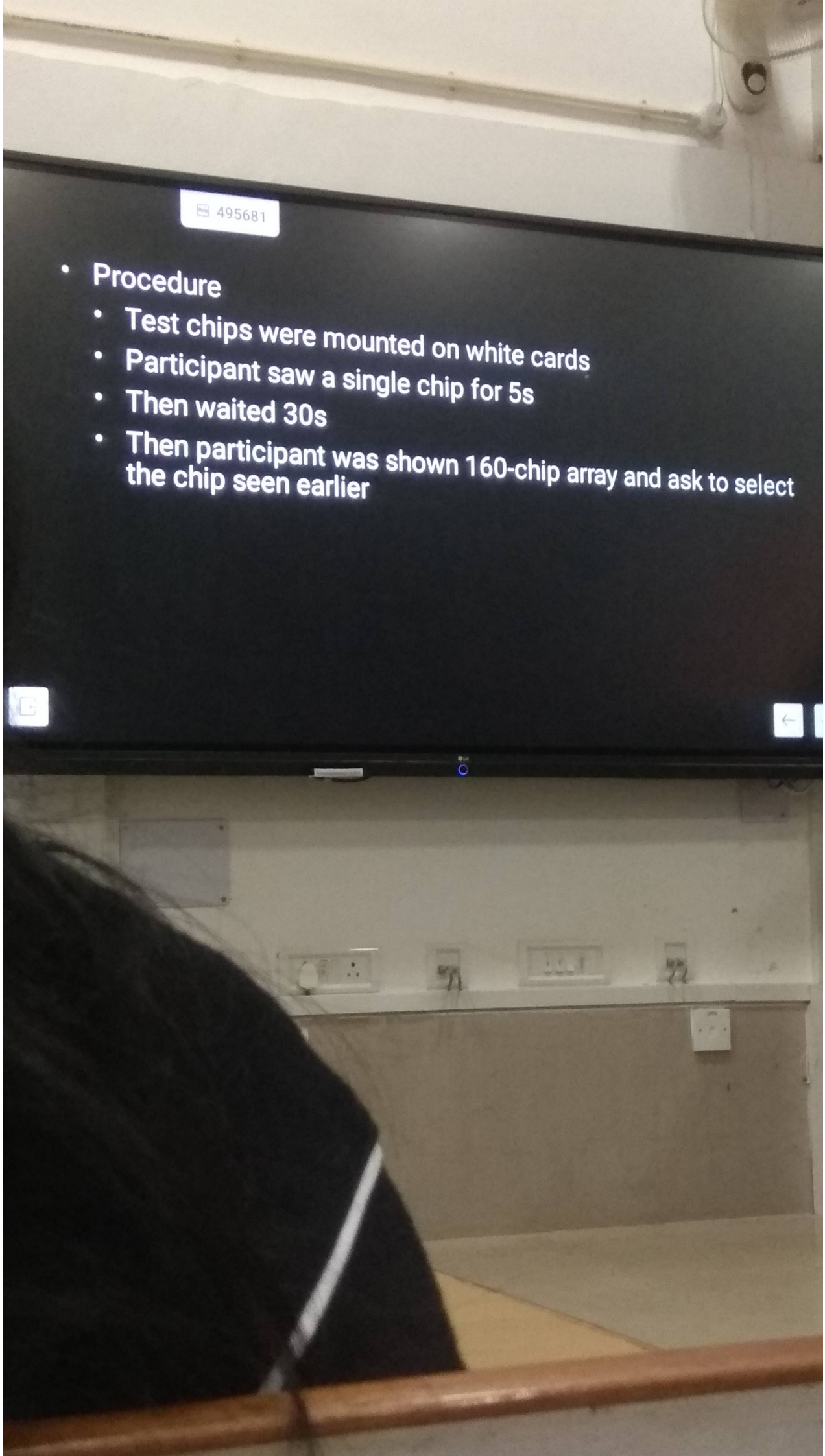
lli for cool/dark shades (e.g. Blue, green, black)
ola for warm/light colours (e.g. Red, yellow, white)

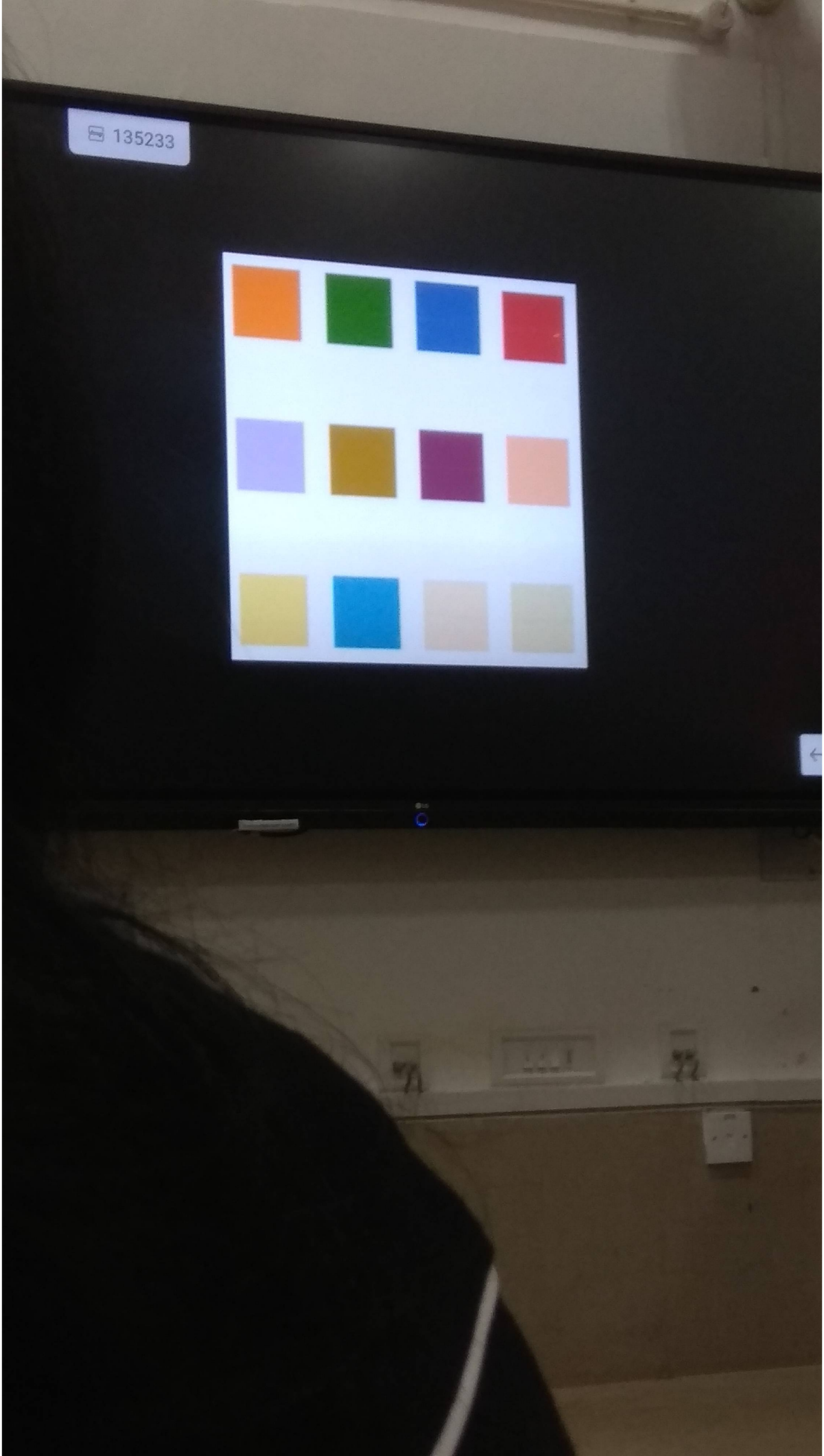


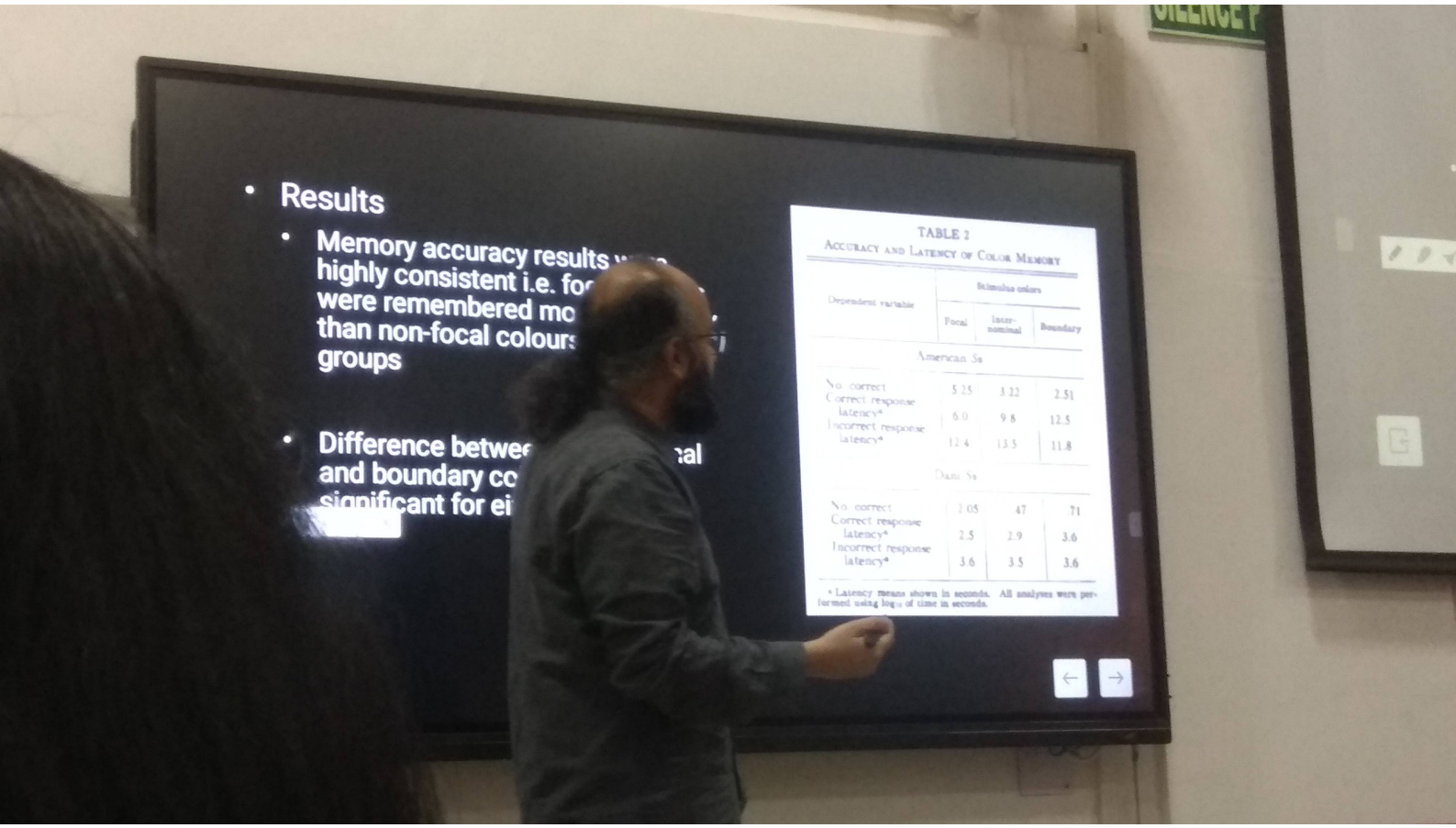
Linguistic Relativity: An Evaluation

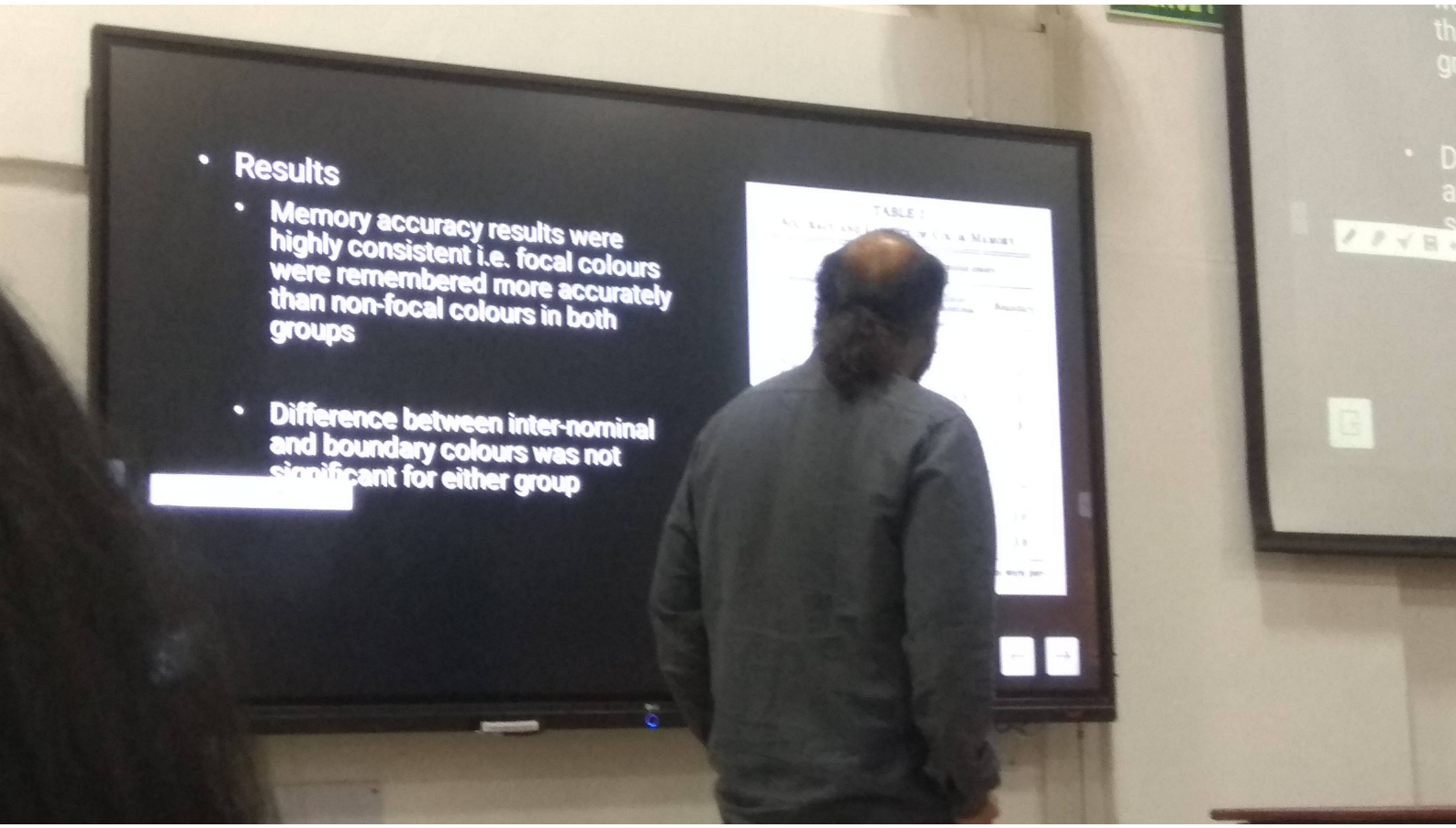
- E. Rosch Heider, 1972
  - Dani tribe in Papua New Guinea have only two words for colour
    - *Mili* for cool/dark shades (e.g. Blue, green, black)
    - *Mola* for warm/light colours (e.g. Red, yellow, white)

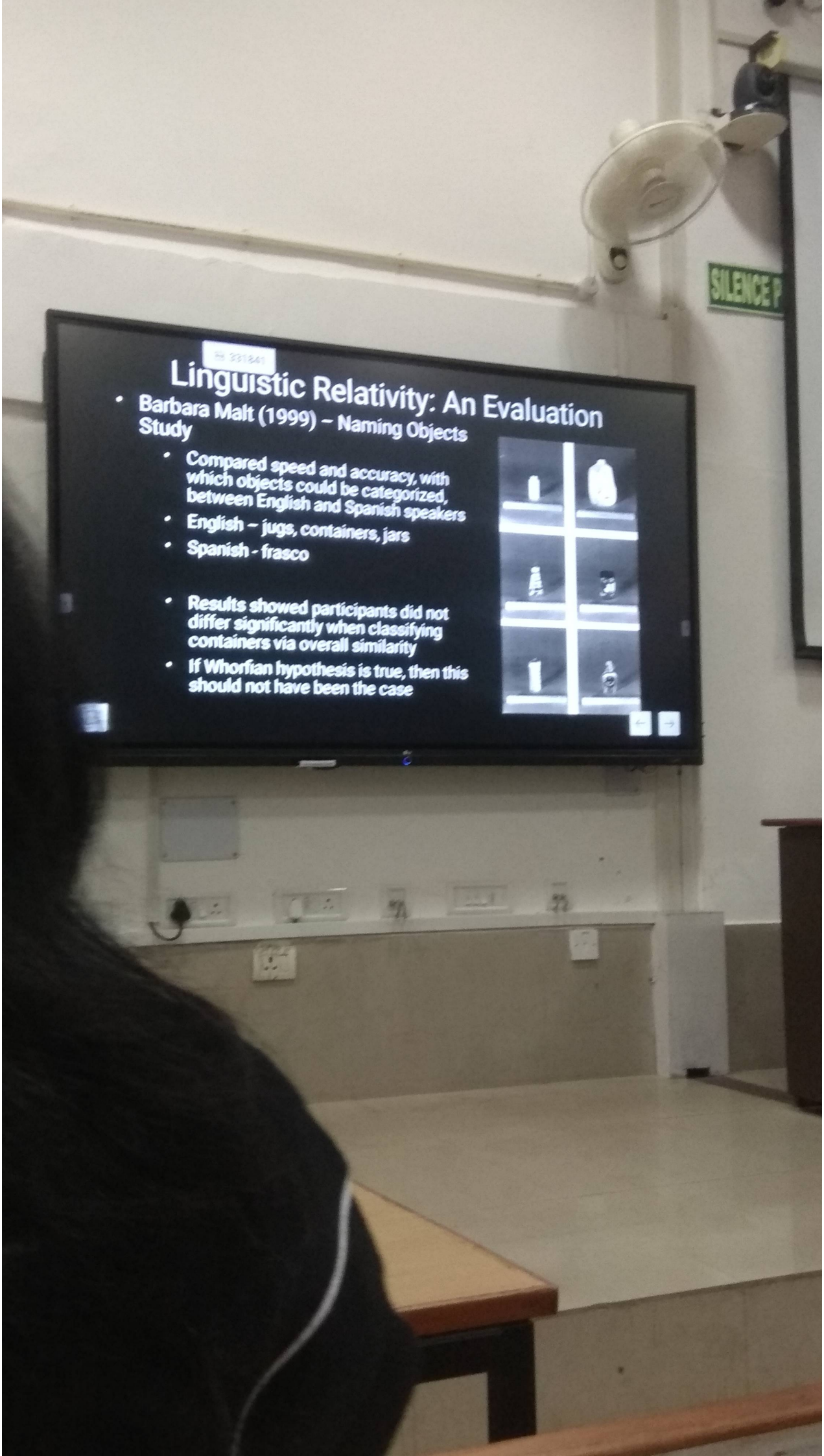

Linguistic Relativity: An Evaluation
E. Rosch Heider, 1972 ("Universals in color naming and memory")
Compared colour perception between Americans and the Danis
Experiment involved participants learning new colour names using standard colour chips (munsell chips)
"According to Whorfian hypothesis, language should influence memory for colours"

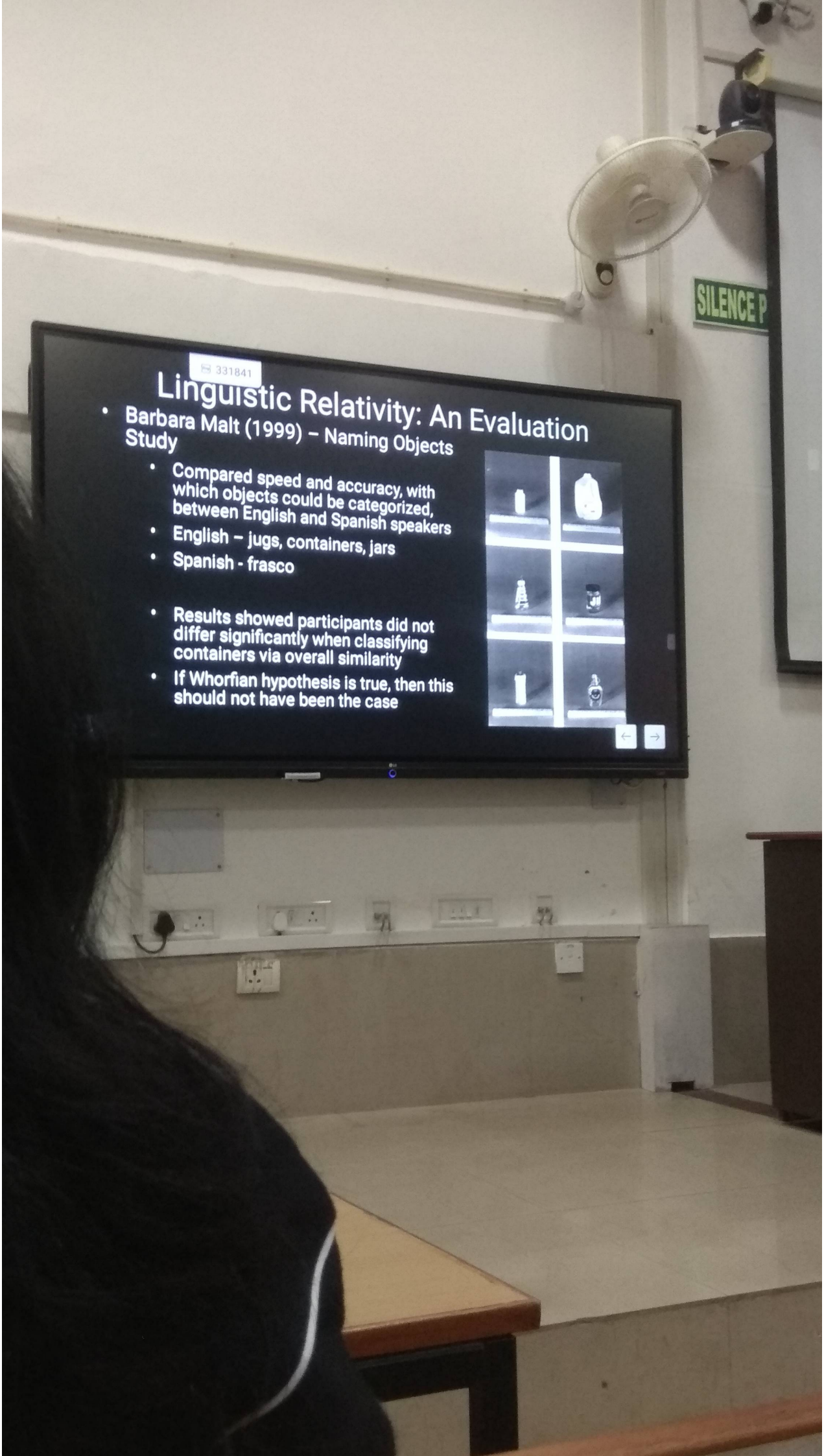

495681
Procedure
Test chips were mounted on white cards
Participant saw a single chip for 5s
Then waited 30s
Then participant was shown 160-chip array and ask to select the chip seen earlier


135233


Results
Memory accuracy results
highly consistent i.e. fo
were remembered mo
than non-focal colours
groups
Difference betwe
and boundary co
significant for ei
al
TABLE 2
ACCURACY AND LATENCY OF COLOR MEMORY
Dependent variable
Stimulus colors
Focal
Inter-nominal
Boundary
American Ss
No. correct
Correct response latency*
Incorrect response latency*
5.25
6.0
12.4
3.22
9.8
13.5
2.51
12.5
11.8
Dani Ss
No. correct
Correct response latency*
Incorrect response latency*
2.05
2.5
3.6
47
2.9
3.5
.71
3.6
3.6
* Latency means shown in seconds. All analyses were performed using log10 of time in seconds.


Results
Memory accuracy results were highly consistent i.e. focal colours were remembered more accurately than non-focal colours in both groups
Difference between inter-nominal and boundary colours was not


SILENCE P
Linguistic Relativity: An Evaluation
Barbara Malt (1999) – Naming Objects Study
Compared speed and accuracy, with which objects could be categorized, between English and Spanish speakers
English – jugs, containers, jars
Spanish - frasco
Results showed participants did not differ significantly when classifying containers via overall similarity
If Whorfian hypothesis is true, then this should not have been the case


331841
Linguistic Relativity: An Evaluation
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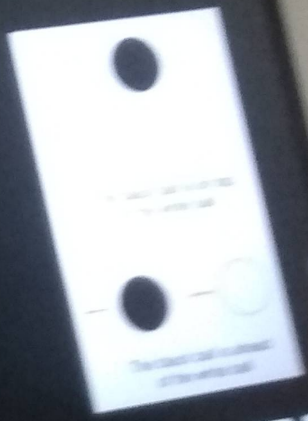
Results showed participants did not differ significantly when classifying containers via overall similarity
If Whorfian hypothesis is true, then this should not have been the case
SILENCE P

Linguistic Relativity: An Evaluation

- Boroditsky (2001) – Time Perception
  - English speakers see time as horizontal – pushes deadline back or meeting moves forward
  - Mandarin speakers see time on a vertical axis – up and down to refer to order of events

- Subjects were shown a prime
- Then asked to confirm or disconfirm temporal propositions (e.g. November comes before December)



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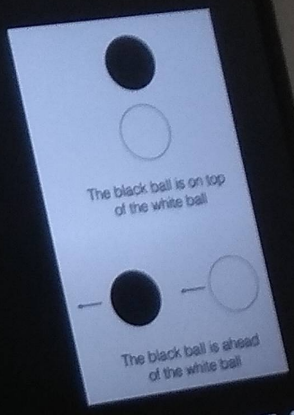

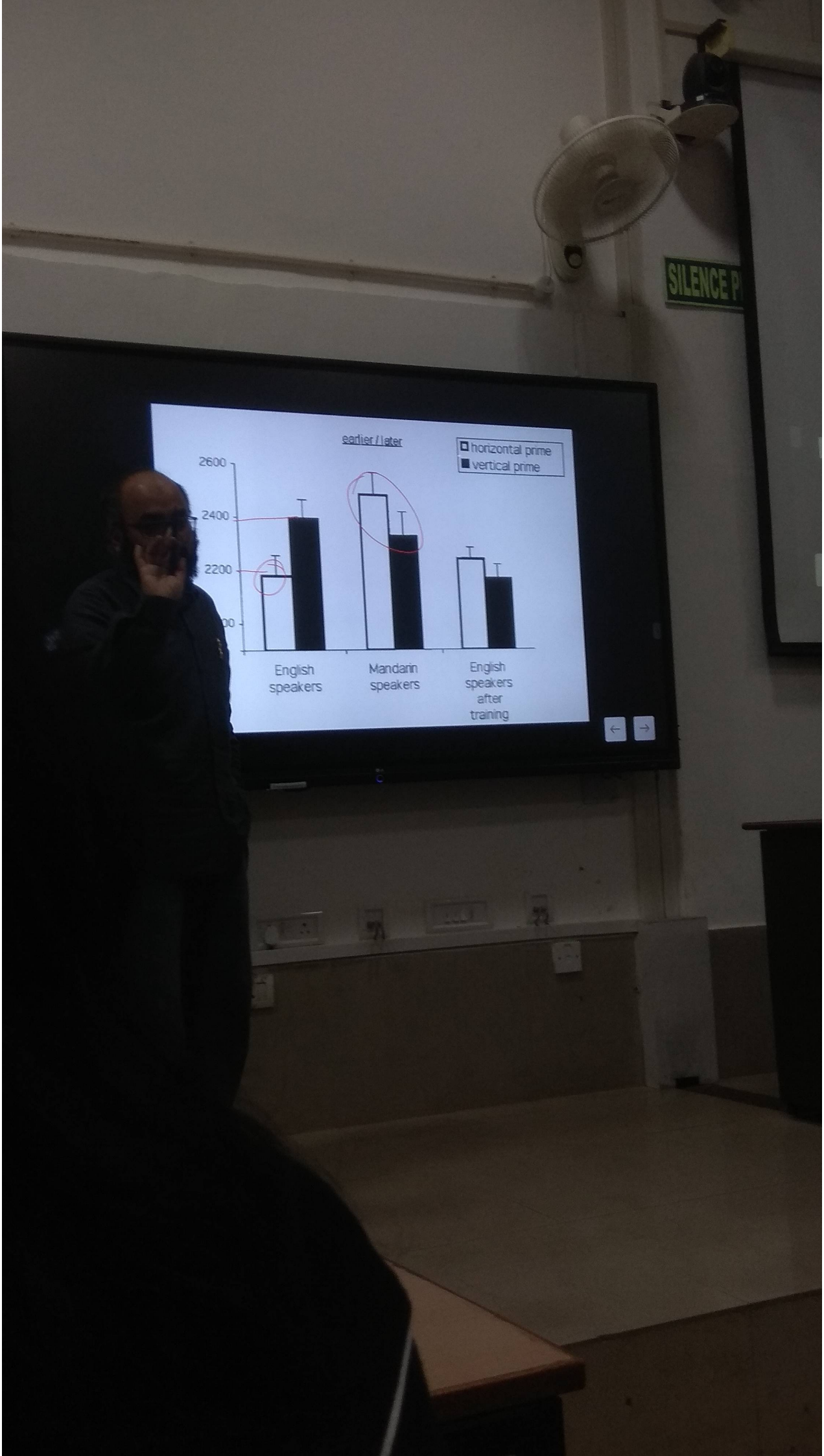
SILENCE P
earlier / later
horizontal prime
vertical prime
2600
2400
2200
English speakers
Mandarin speakers
English speakers after training


earlier / later
horizontal prime
vertical prime
RT (msecs)
2600
2400
2200
2000
English speakers
Mandarin speakers
English speakers after training