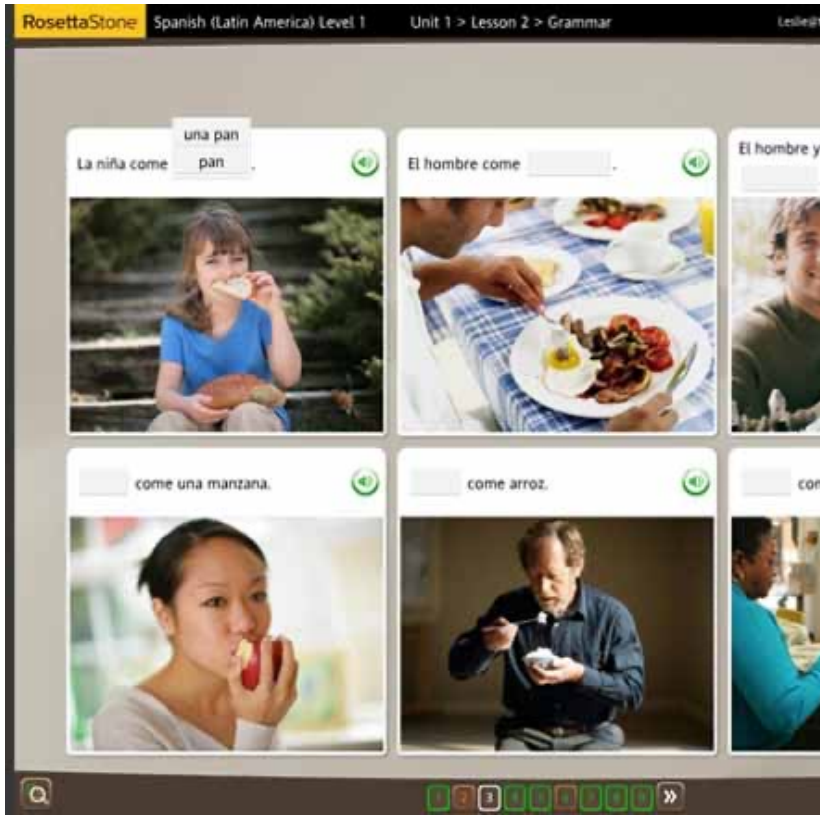
Computer-Assisted Foreign Language Vocabulary Instruction

By Carson Smith



Foreign Language Learning

- Benefits of learning a foreign language:
  - Employability
  - Cognitive functioning and cultural awareness (Fox et al., 2019)
- Computer-assisted instruction can facilitate vocabulary learning (e.g., Mirzaei et al., 2015)

The Present Study

- **<u>Goal:</u>** To compare the effects of two presentation formats when teaching foreign-language vocabulary through computer-assisted instruction
  - *High-density response construction* (HDRC) condition: Typed response in each trial
  - *Pair-test* condition: Passive viewing of material with intermittent testing that requires typed responses

The Present Study

- **Prediction:** Based on previous research on the effects of constructed responses in computer-based instruction (e.g., Kritch et al., 1995; Kritch & Bostow, 1998), we predicted
  - Faster learning of new foreign-language vocabulary faster in the HDRC condition
  - Better performance on translation post-tests for HDRC words than pair-test words
  - Better retention of HDRC than pair-test words

Method

- Ten students recruited through TCU Sona Systems
- No previous knowledge of Arabic
- SuperLab 6 software ran through Zoom “remote control” feature

Fruit (Set 1)

Shamam (Melon) Eanab (Grape)

Kitchen Items (Set 3)

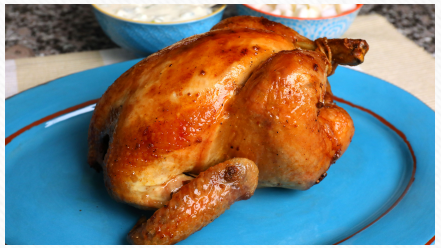
Sakin (Knife) Miqla (Pan)

Drinks (Set 5)

Halib (Milk) Qahua (Coffee)

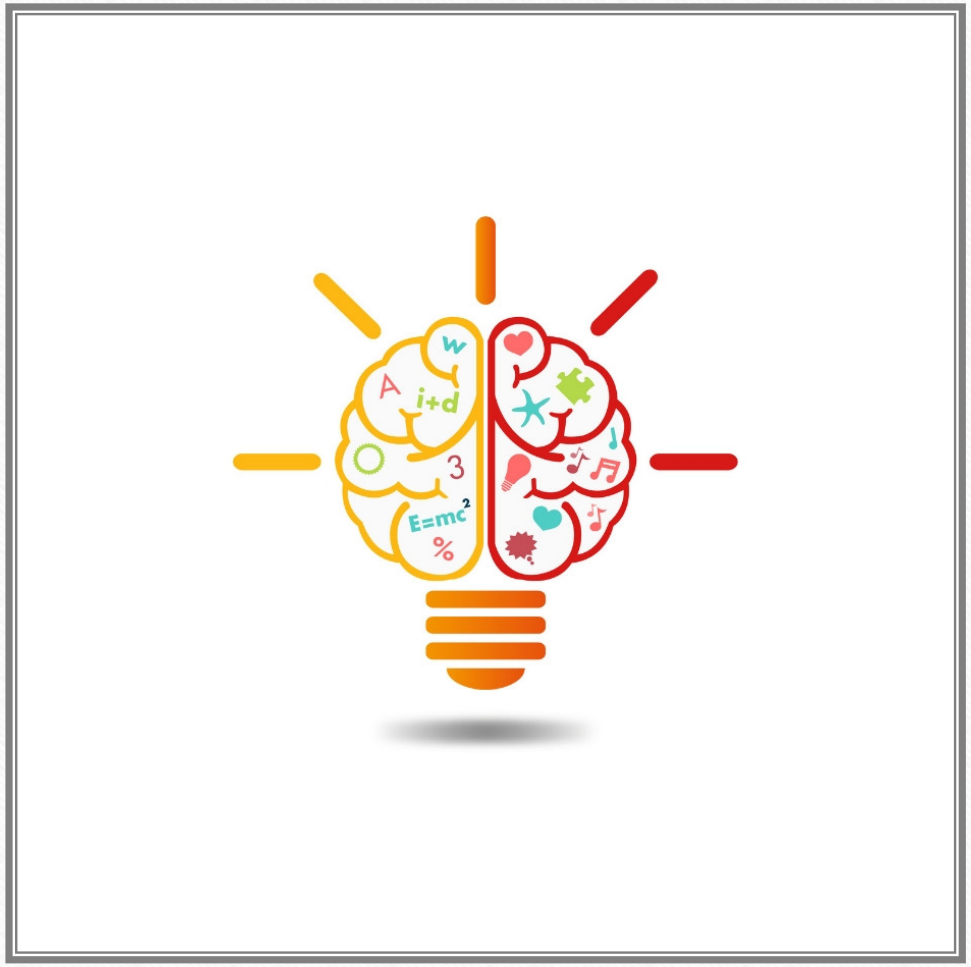
Animals (Set 2)

Tayir (Bird) Alkalb (Dog)



Food (Set 4)

Dijaj (Chicken) Jambiri (Shrimp)

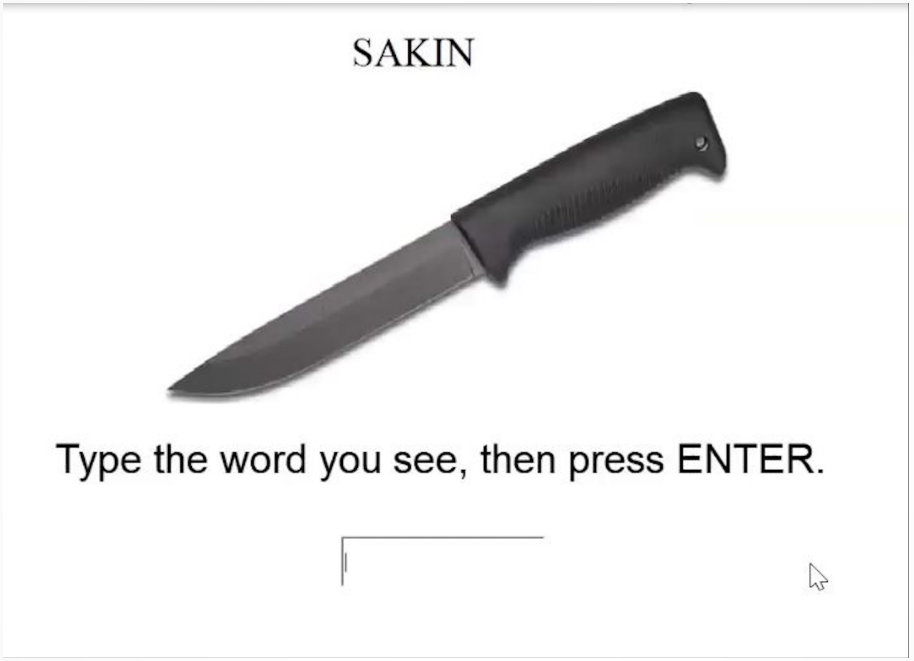


Learning Phase

- Four training subphases and four label tests
- Training subphase: 40 trials (20 HDRC and 20 pairing trials)
- Label test: 10 constructed-response trials (20 with HDRC words and 20 with pair-test words)

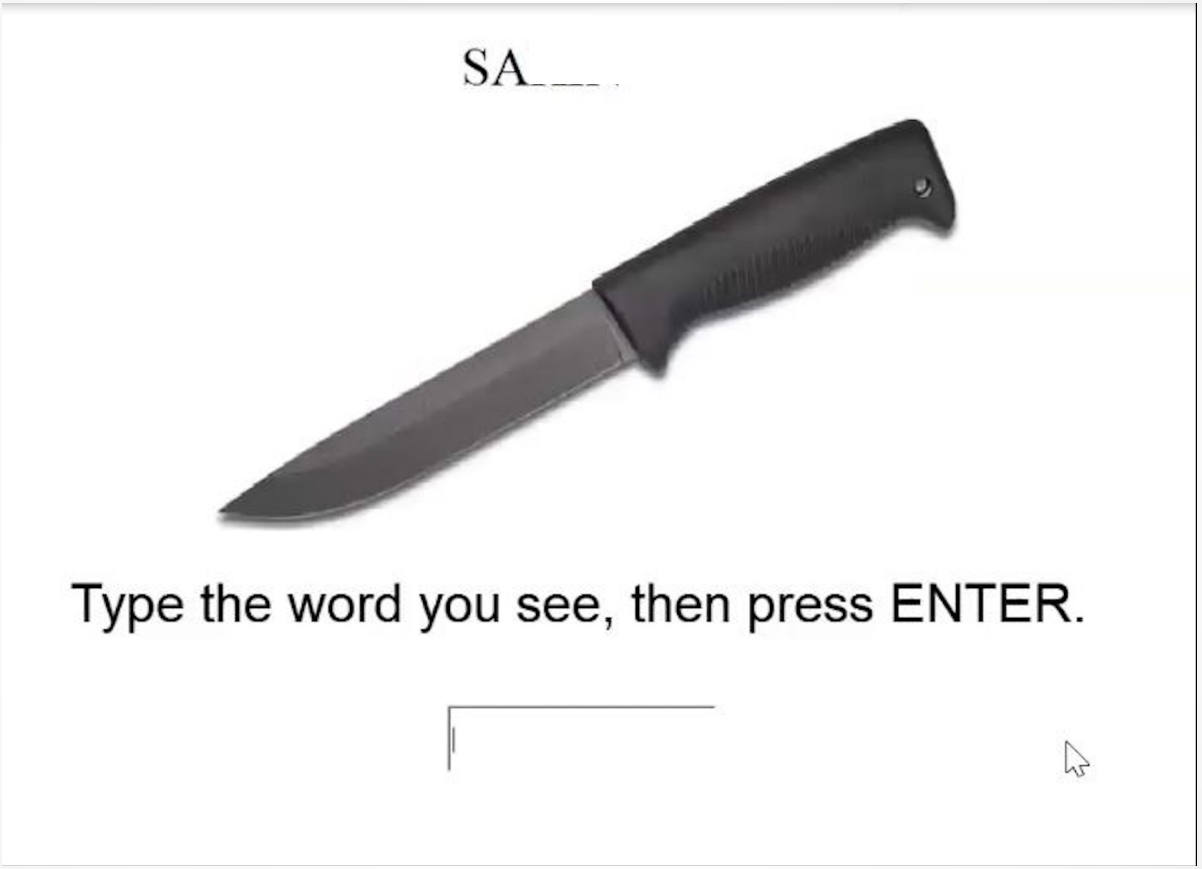
Training Subphase : HDRC Trials

- First Trial Block:



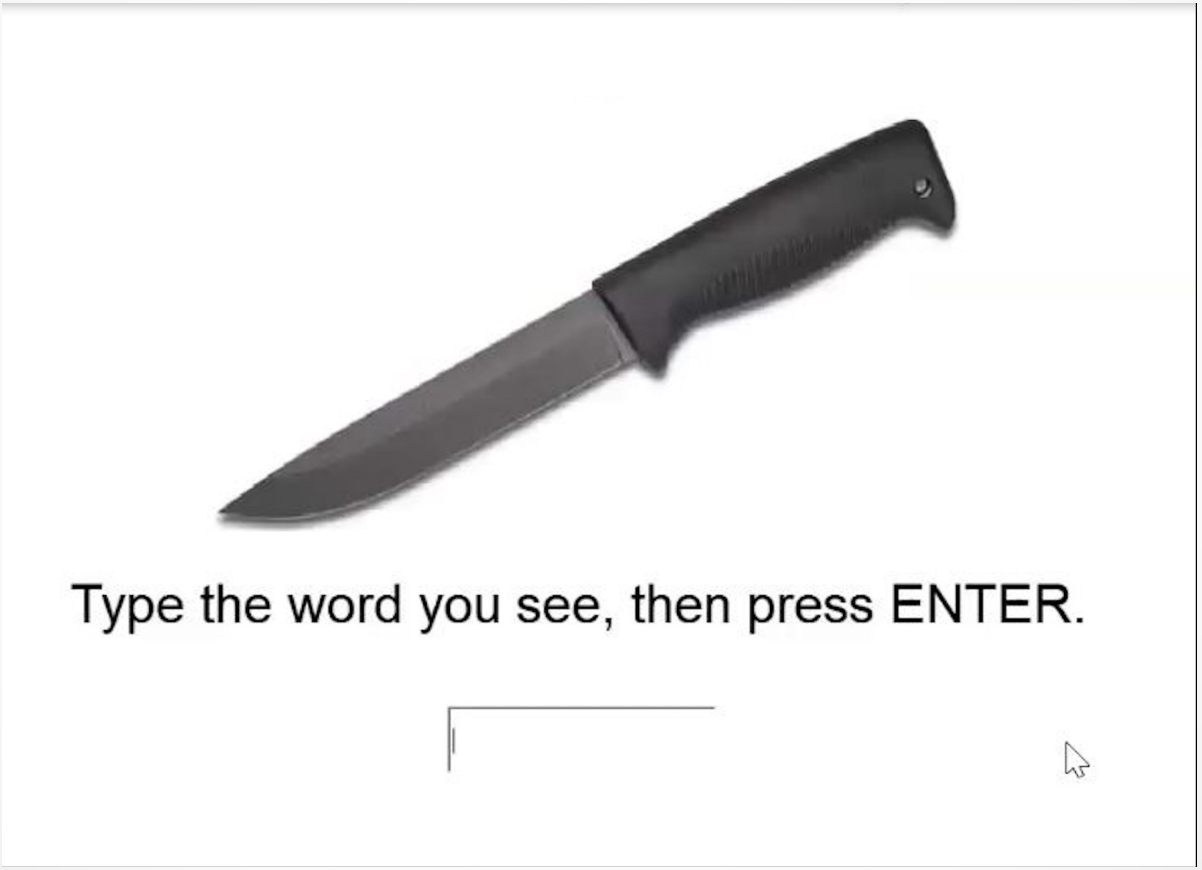
Training Subphase : HDRC Trials

- Second and Third Trial Block:



Training Subphase : HDRC Trials

- Fourth Trial Block:



Training Subphase: PT

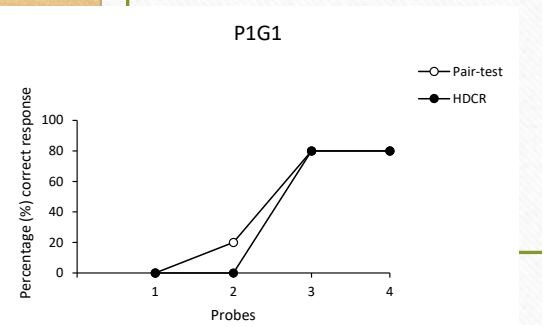
DIJAJ

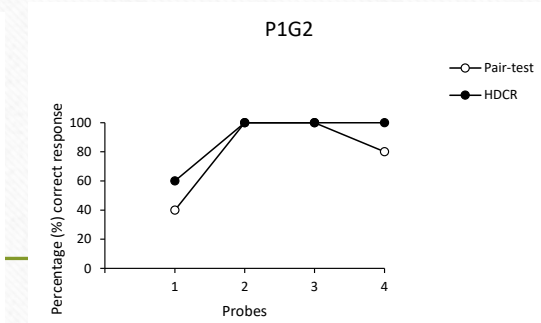
Continue

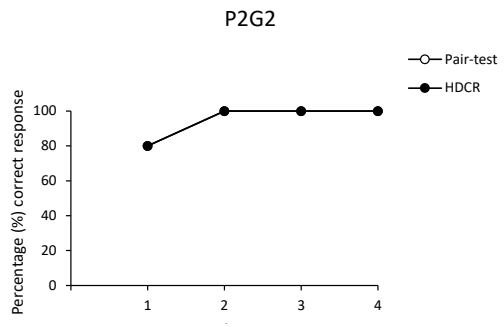
Label Test

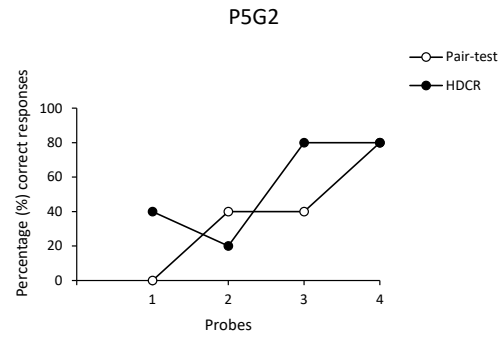
Type the word you see, then press ENTER.

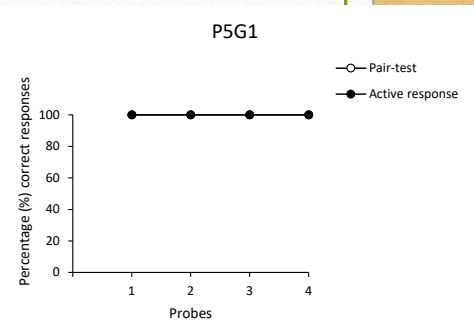
Training Phase Results

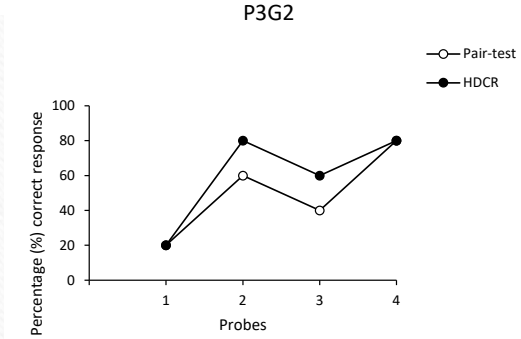


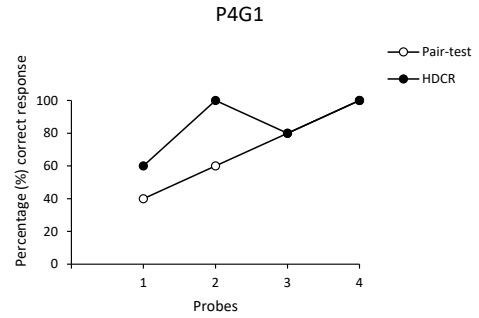


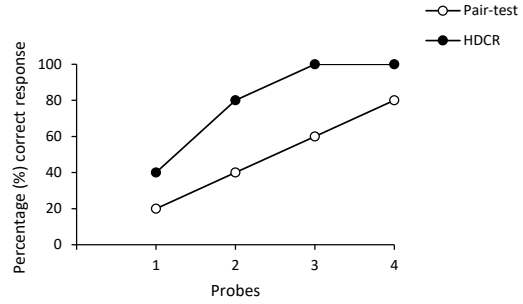


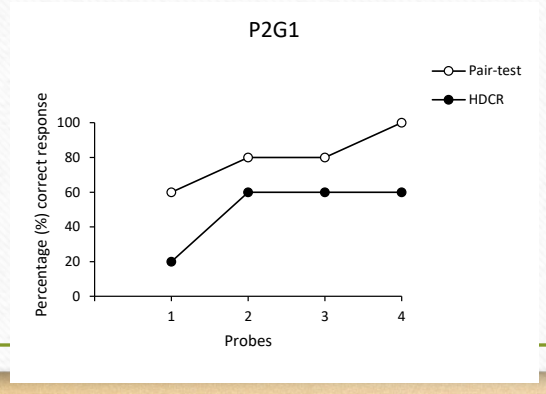


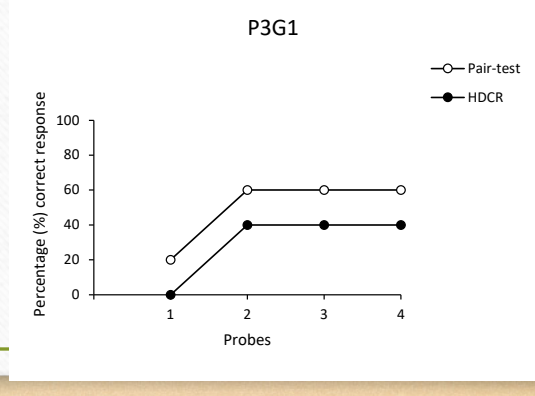




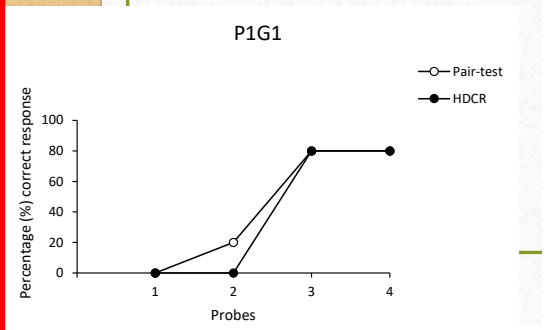


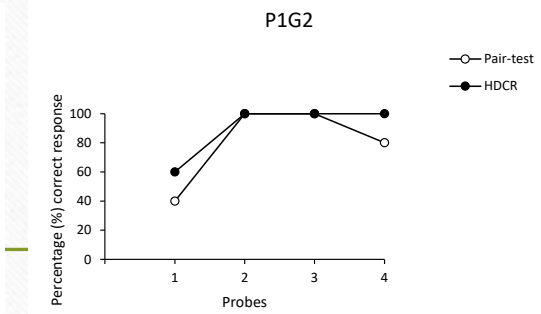


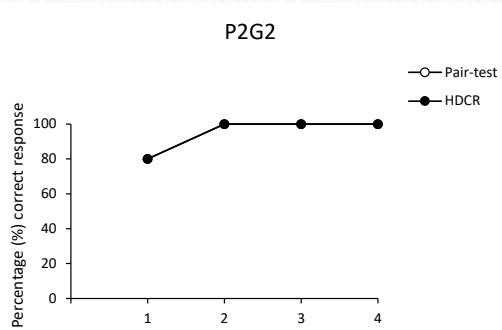


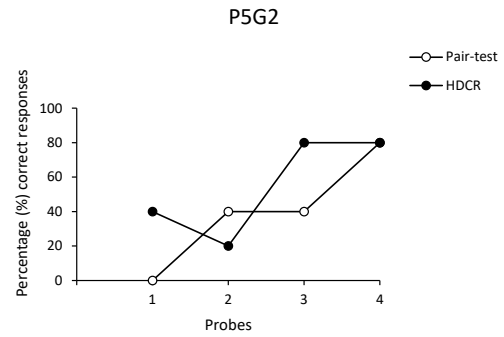


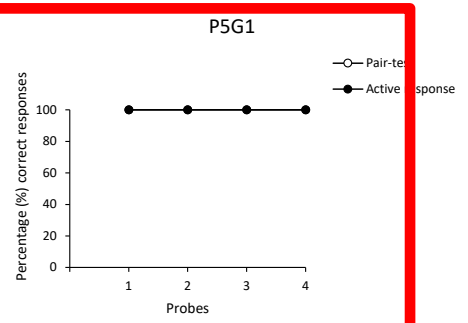
Results

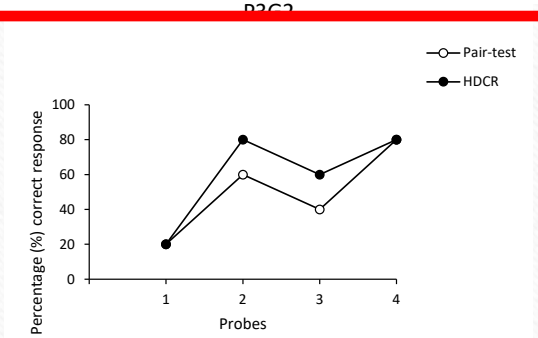

P1G1
Pair-test
HDCR
Percentage (%) correct response
Probes

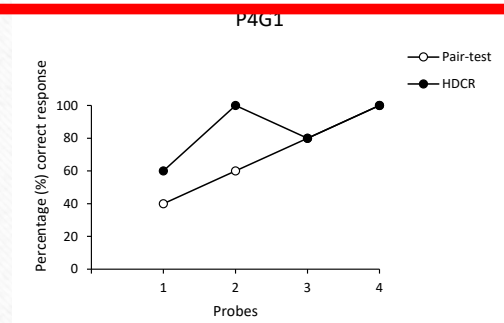

P1G2
Pair-test
HDCR
Percentage (%) correct response
Probes

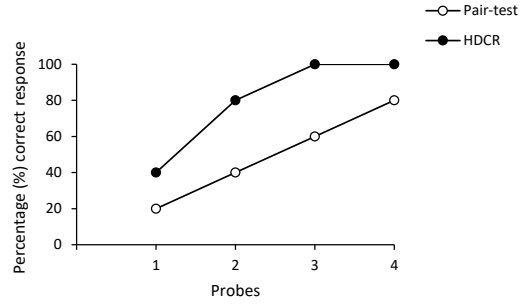

P2G2
Pair-test
HDCR
Percentage (%) correct response

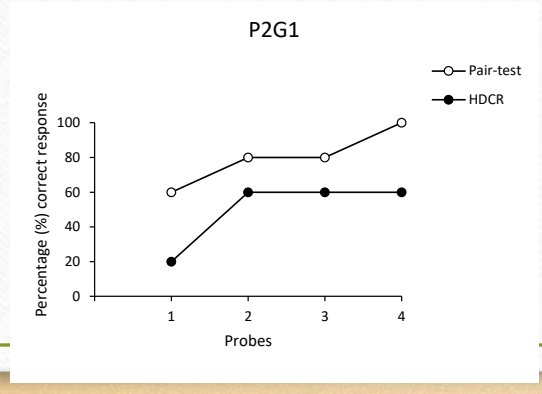

P5G2
Pair-test
HDCR
Percentage (%) correct responses
Probes

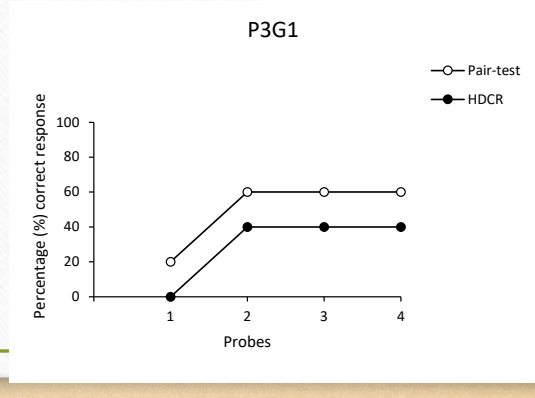

P5G1
Percentage (%) correct responses
Probes


Pair-test
HDCR
Percentage (%) correct response
Probes

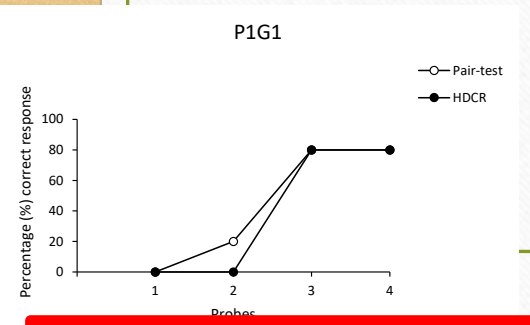

P4G1
Pair-test
HDCR
Percentage (%) correct response
Probes

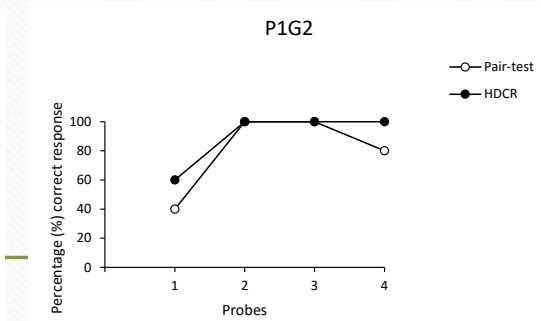

Pair-test
HDCR
Percentage (%) correct response
Probes


P2G1
Pair-test
HDCR
Percentage (%) correct response
Probes


P3G1
Pair-test
HDCR
Percentage (%) correct response
Probes

Results


P1G1
Pair-test
HDCR
Percentage (%) correct response
100
80
60
40
20
0
1
2
3
4
Probes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40
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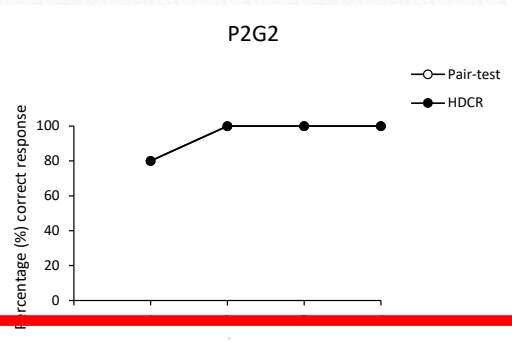
4
Probes


P2G2
Pair-test
HDCR
Percentage (%) correct response
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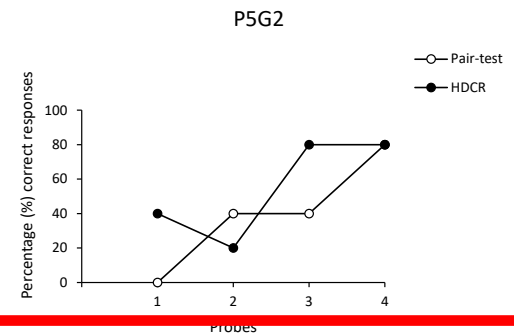
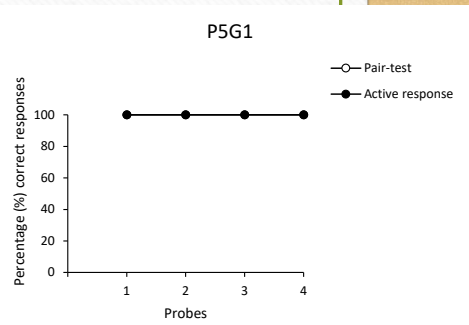
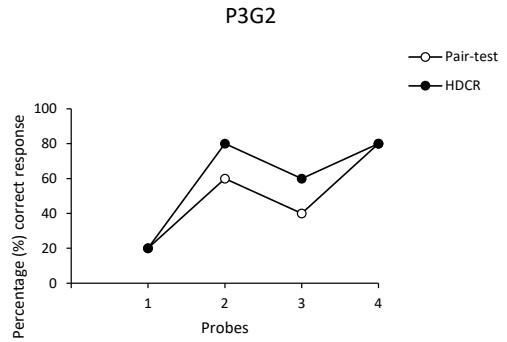
60
40
20
0


P5G2
Pair-test
HDCR
Percentage (%) correct responses
100
80
60
40
20
0
1
2
3
4
Probes


P5G1
Pair-test
Active response
Percentage (%) correct responses
100
80
60
40
20
0
1
2
3
4
Probes


P3G2
Pair-test
HDCR
Percentage (%) correct response
100
80
60
40
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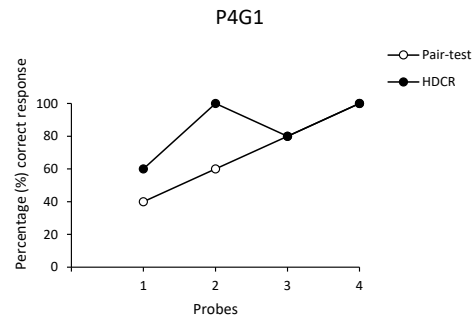
Probes


P4G1
Pair-test
HDCR
Percentage (%) correct response
100
80
60
40
20
0
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2
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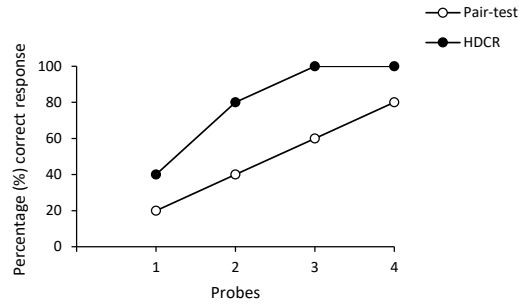
4
Probes


Pair-test
HDCR
Percentage (%) correct response
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40
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0
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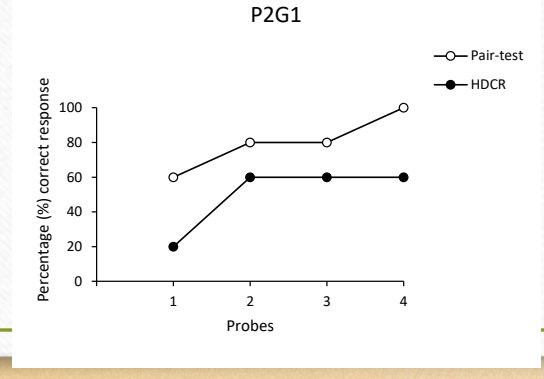
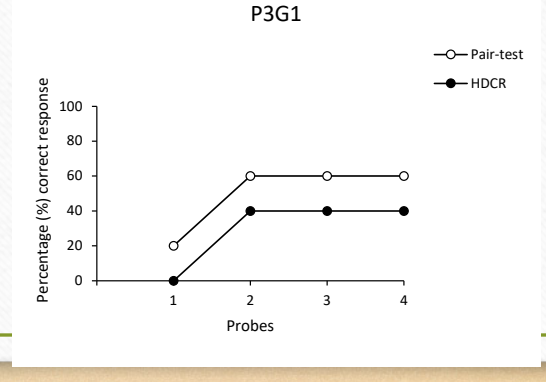
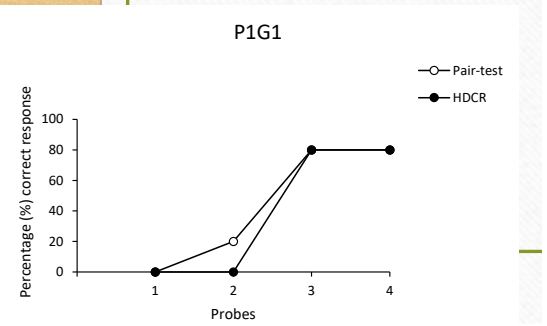
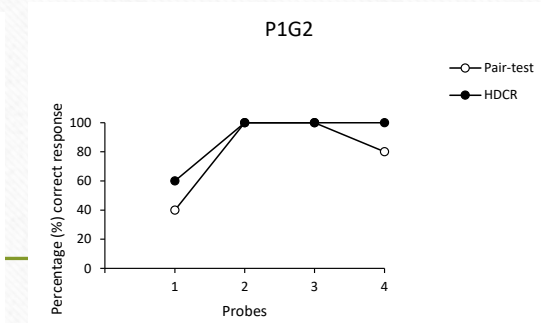
4
Probes

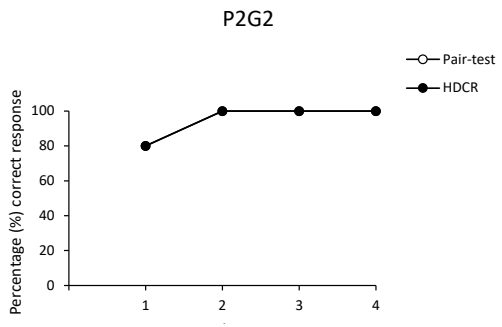

P2G1
Pair-test
HDCR
Percentage (%) correct response
100
80
60
40
20
0
1
2
3
4
Probes

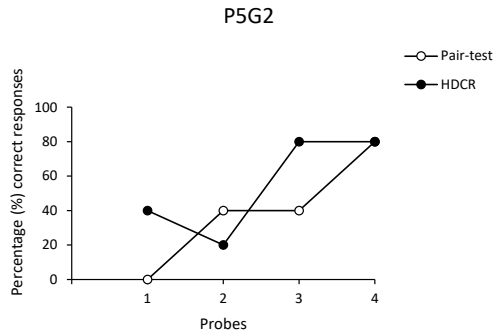

P3G1
Pair-test
HDCR
Percentage (%) correct response
100
80
60
40
20
0
1
2
3
4
Probes

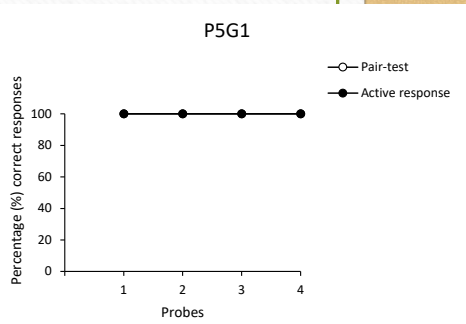
Results

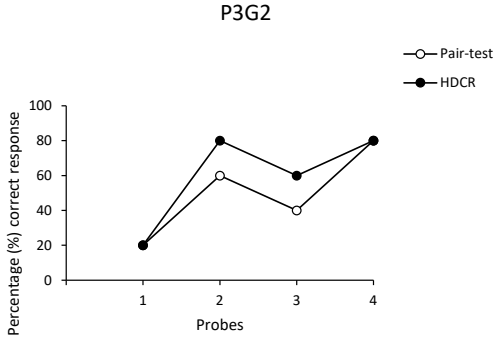

P1G1
Pair-test
HDCR
Percentage (%) correct response
Probes

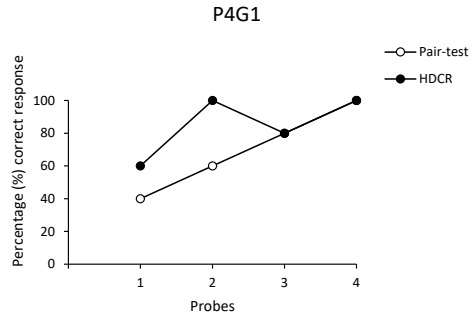

P1G2
Pair-test
HDCR
Percentage (%) correct response
Probes

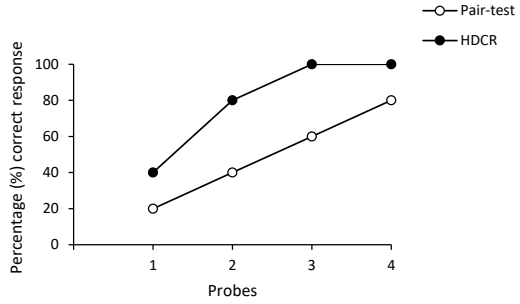

P2G2
Pair-test
HDCR
Percentage (%) correct response

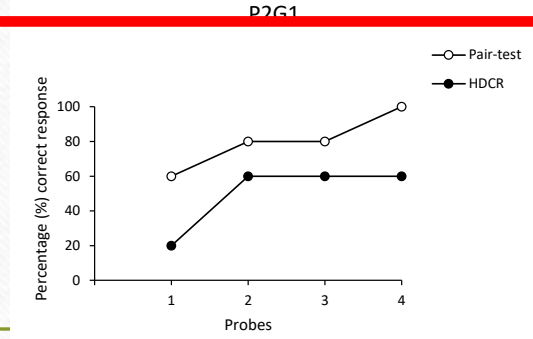

P5G2
Pair-test
HDCR
Percentage (%) correct responses
Probes

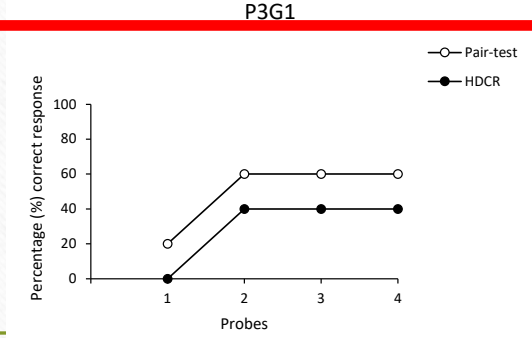

P5G1
Pair-test
Active response
Percentage (%) correct responses
Probes


P3G2
Pair-test
HDCR
Percentage (%) correct response
Probes


P4G1
Pair-test
HDCR
Percentage (%) correct response
Probes


Pair-test
HDCR
Percentage (%) correct response
Probes


P2G1
Pair-test
HDCR
Percentage (%) correct response
Probes


P3G1
Pair-test
HDCR
Percentage (%) correct response
Probes

Translation Post-Test

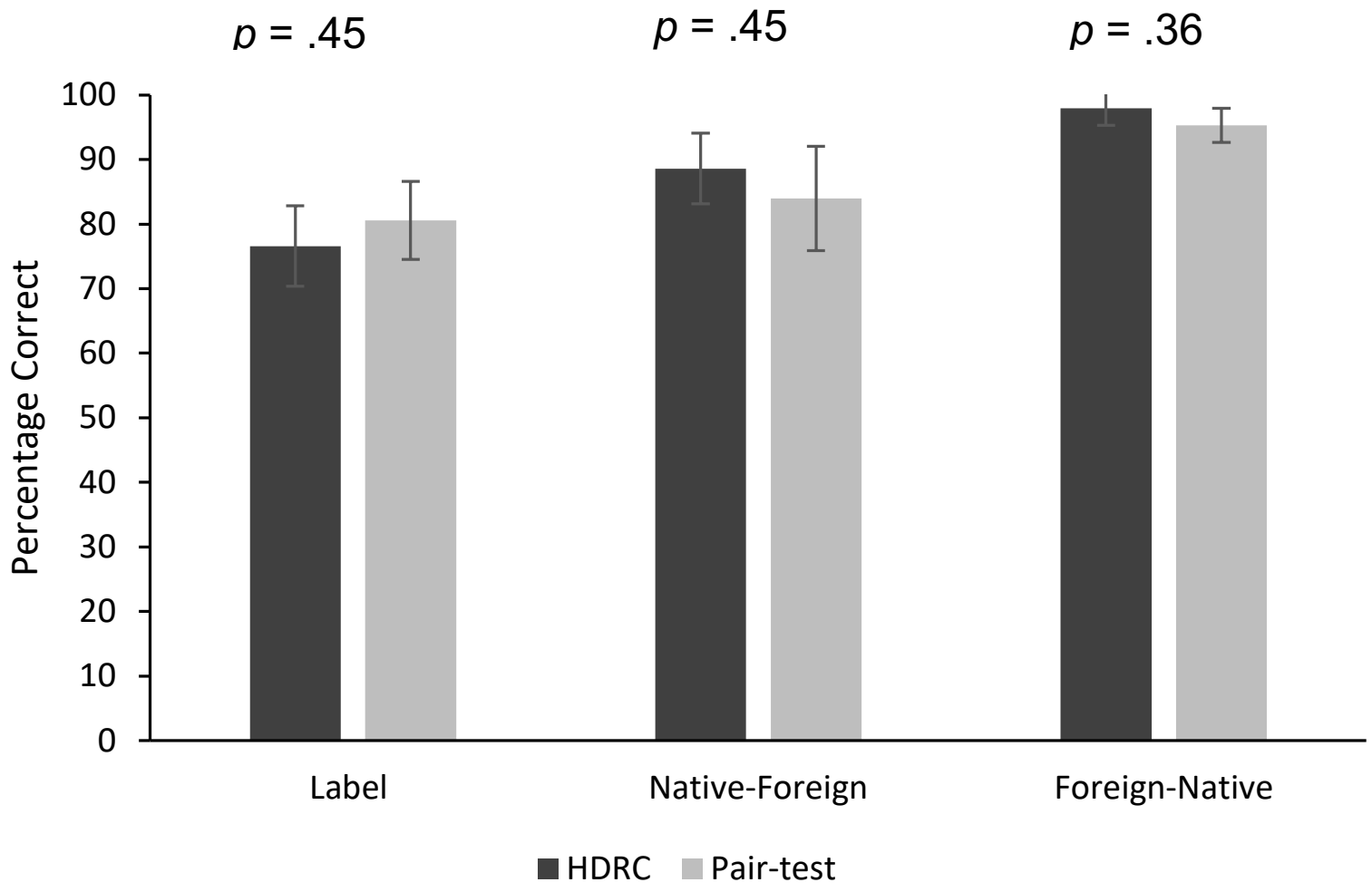
30 constructed-response trials without feedback, three for each word:

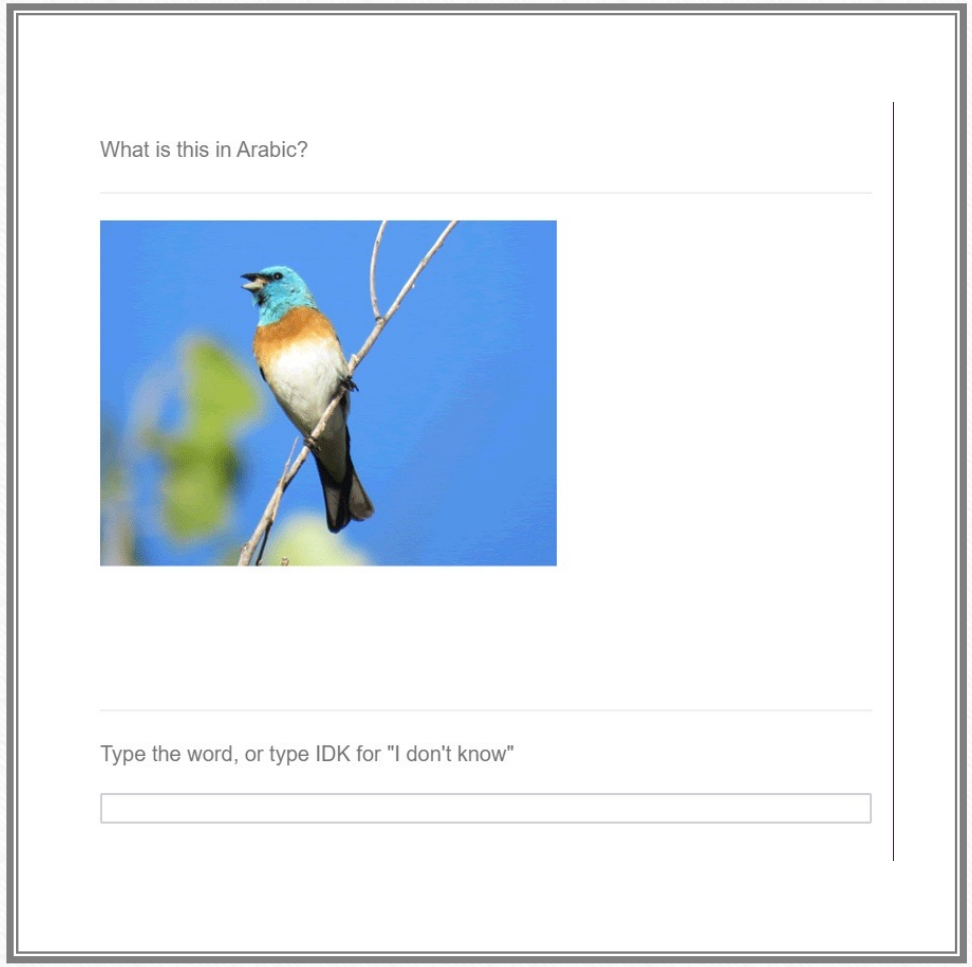
(a) A Labeling Trial: Identical to label test trials except no feedback

(b) A Foreign-Native Translation Trial (FN intraverbal): “What is [foreign word] in English?”

(c) A Native-Foreign Translation Trial (NF intraverbal): “What is [English word] in Arabic?”

Post-Test Performance

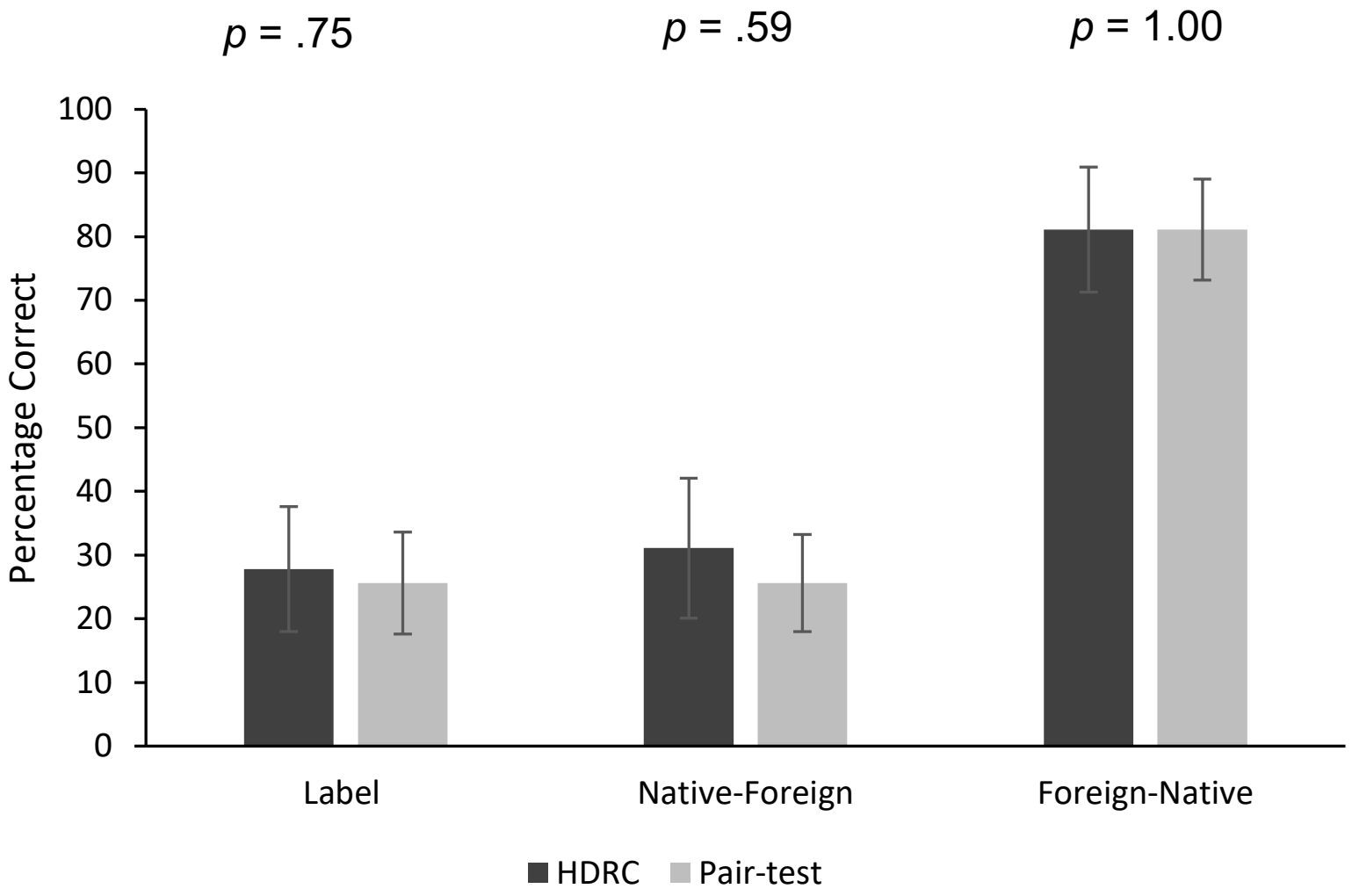




Retention Test

- Presented 1 week after the initial experiment
- 60 trials; same questions as the translation post-test

Retention Test Performance (*n*=9)



Discussion

- No advantage of HDRC instruction relative to pair-test instruction
- Previous research showed that the greater the density of constructed responses in computerized instruction, the more students learned relative to passive viewing of material
  - Complex academic content *vs*. simple word-object associations
- Pair-test learning takes less time than HDRC learning and may be a feasible way to conduct vocabulary instruction if time is of essence

Thank you!