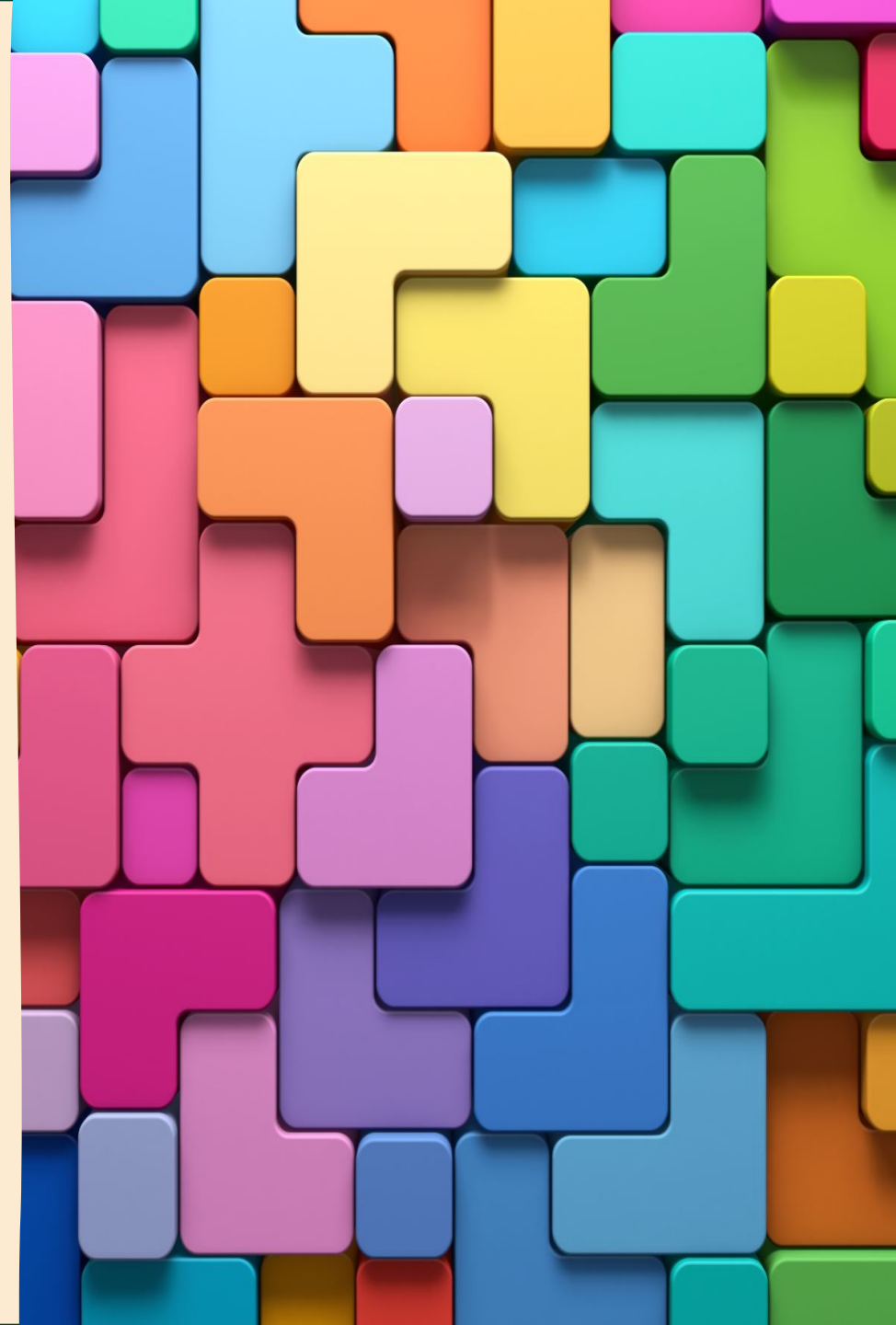


The 4th J-SLARF Meeting, July 1st

# Understanding L2 learners: **Exploring the factors that affect L2 speech learning**

Yui Suzukida

Juntendo University/UCL





# Contents of today's talk

- **Background:**  
Individual differences and L2 speech learning
- **My ongoing project**
- **Q &A**

# Individual Differences in second language acquisition(SLA)

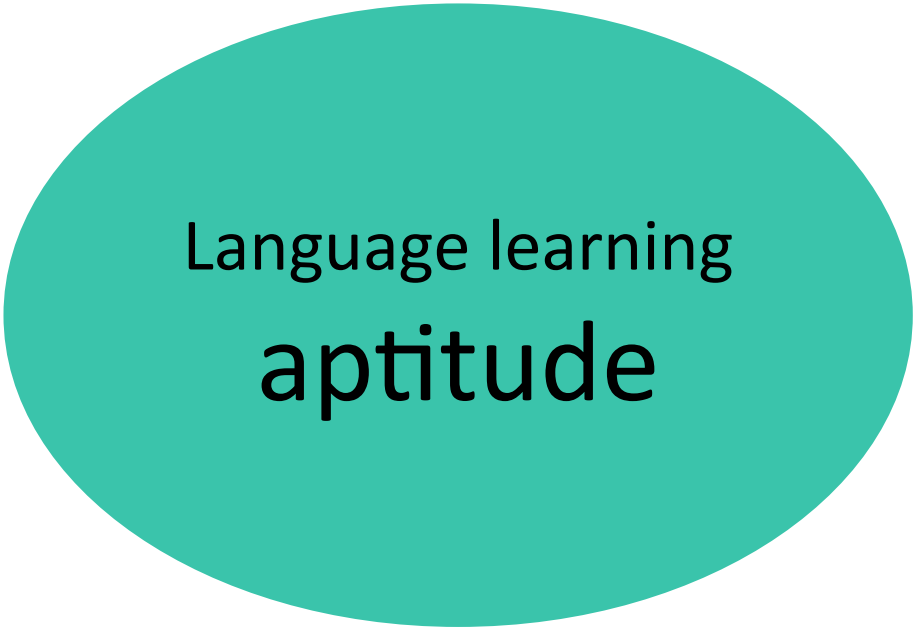
In contrast to first language acquisition, huge individual variability in how fast and how far people can go in learning a second language (L2).




# Individual Differences in second language acquisition(SLA)

Factors that may affect the speed and attainment of L2 are considered as Individual Differences (IDs) in SLA.

Traditionally, researchers paid attention to those elements:



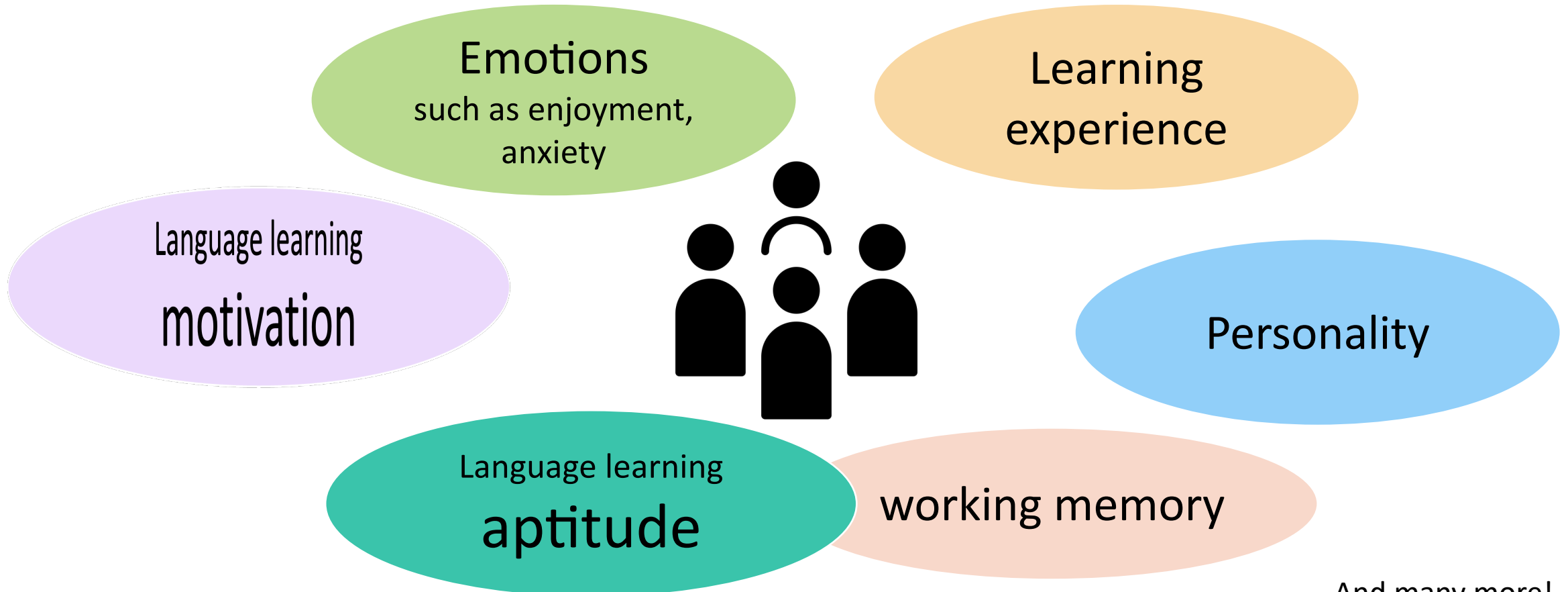
Language learning  
**aptitude**



Language learning  
**motivation**

# Individual Differences in (SLA)

However, recent ID studies also look at other aspects of learners (e.g., social and emotional IDs)



And many more!

# IDs that contribute to successful L2 speech learning

## Cognitive factors

- L2 Sound discrimination ability (Baker Smemoe & Haslam, 2013; Hu et al., 2013)
- **Spectral and temporal acuity** (e.g., Kachlicka et al. 2019; Kempe et al, 2015; Lengeris & Hazan, 2011; Wong & Perrachione, 2007)

= **Precisely perceiving individual dimensions of acoustic information:**

- **formants** (acoustic energy concentrations resulting from resonance)
- **duration** (length of sounds)
- **amplitude rise time** (the time/duration from the onset of a sound to its maximum amplitude)

# IDs that contribute to successful L2 speech learning

## Cognitive factors

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- Spectral and temporal acuity (e.g., Kachlicka et al. 2019; Kempe et al, 2015; Lengeris & Hazan, 2011; Wong & Perrachione, 2007)

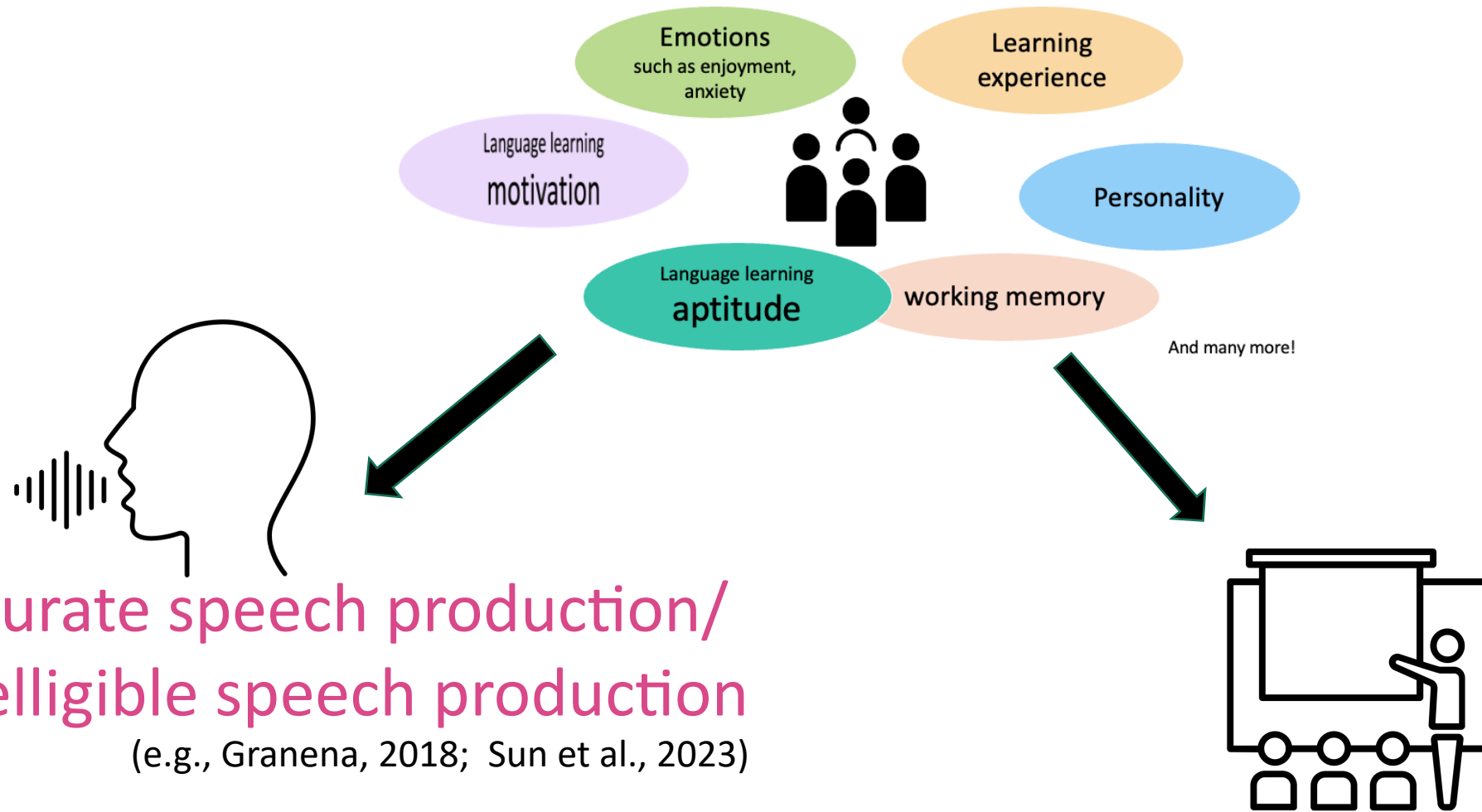
## Sociopsychological factors

- **Motivation** for nativelike L2 pronunciation (Gonet, 2006; Moyer, 2004)
- Pronunciation learning **anxiety** (Baran-Łucarz, 2016; Liu & Huang, 2011)

## Experiential factors

- **L2 use** with non-native and native speakers outside the classroom (Muñoz, 2011, 2014)

# IDs research on L2 speech/pronunciation learning



Accurate speech production/  
Intelligible speech production

(e.g., Granena, 2018; Sun et al., 2023)

Effectiveness of pronunciation instruction

(e.g., Kissling, 2014)



# One of my ongoing projects

## Comprehensibility

**Appropriate use of words**  
**Use of a wider range of words**  
**Accurate use of grammar**  
**Use of complex grammar**

## Accentedness

Accurate production of

- **sounds**
- **suprasegmentals**

# One of my ongoing projects

Do IDs have influences on L2 learners' accurate **self-evaluation** of speech?

**Appropriate use of words**

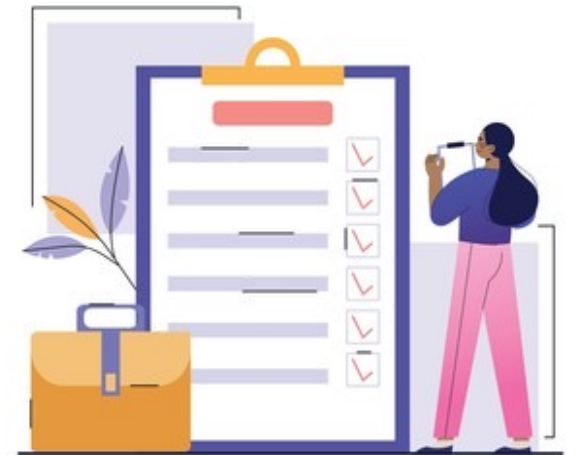
**Use of a wider range of words**

**Accurate use of grammar**

**Use of complex grammar**

**Accurate production of**

- **sounds**
- **suprasegmentals**

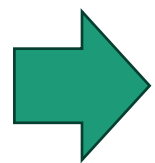


(e.g., Isaacs & Trofimovich, 2012; Saito et al., 2015a,b; Trofimovich & Issacs, 2012)

# Why self-assessment?

- (apart from feedback) It helps L2 speakers **notice and subsequently minimize the gap** between the target linguistic system and the speakers' own conception of it.

- x[ ][ ]W !"#%&'()\*+,-./0123456789:;[ ]ÿ[ ][ ]<=[ ]>[ ][ ]?@AB  
**and weaknesses**



It promotes their commitment to making adjustments to language learning (Little & Perclova, 2001).

# Why self-assessment can't be ignored?

- Incorrect assessment affects **confidence** and **willingness to communicate** in classrooms (de Saint Léger, 2009; de Saint Léger & Storch, 2009).

➔ Under-confident learners may **avoid participating** in L2 communication

➔ Over-confident learners **may not take advantage of opportunities** to improve their L2 skills when necessary

# Background

## Self-evaluation

{ estimate ones' overall proficiency level  
specific skills with rubrics

- **speaking, pronunciation** (e.g., Dlasca & Krekeler, 2008; Saito et al., 2020)
- **listening** (e.g., Brantmeier et a., 2012)
- **writing** (e.g., Yaghoubi-Notash, 2012)
- **vocabulary** (e.g., Gaffney, 2018)
- **Can-do statements** (e.g., Suzuki, 2015)

(See Li and Zhang, 2020 for a meta-analysis)

# Mismatch?



\* **Dunning- Kruger effect** (e.g., Dunning, Johnson, Ehrlinger, & Kruger, 2003; Kruger & Dunning, 1999)

- poor performers tend to overestimate their ability  
(being unaware of their incompetence due to the lack of meta-knowledge)
- skilled performers tend to underestimate their ability

The effect can be observed in L2 speech/pronunciation evaluation. However, a limitation acknowledged in those studies is that L2 learners did not listen to their own speech when evaluating.

(e.g., Trofimovich et al., 2016 )

# Cause of mismatch? (L2 speech/pronunciation)

- lack of past self-evaluation experience (e.g., Ortega et al., 2021, Kissling & O'Donnell, 2015 )

**Overestimate**

- Heavy influence of L1 phonology on L2 perception (Mitterer et al., 2020)

**Overestimate**

- An eagerness to improve/ a sceptical attitude towards one's own performance (Dlaska & Krekeler, 2008).

**Underestimate**

- Dissatisfaction caused by past experience of L2 use (Dlaska & Krekeler, 2008).

**Underestimate**

# Factors that facilitate the calibration of self-assessment

- Experience in using L2 for conversation/ extracurricular speaking practice in EFL settings (e.g., Saito et al., 2020)
- Feedback from native speakers, peers and teachers (e.g. Butler & Lee, 2010; de Saint Léger, 2009)



## Motivation 1

The inaccuracy of self-evaluation reported in the existing studies is based on participants' self-report.

Therefore, it is not clear if the inaccuracies can be still observed even when they have access to their own speech.

## Motivation 2

While past research indicated that L2 use and awareness-raising via feedback help L2 learners' calibration, factors that affect the **processing of L2 input** have not been studied yet.



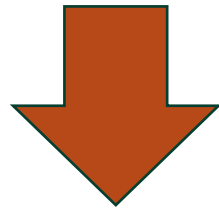
# Research question

Do **spectral and temporal acuity** (formant, duration, amplitude risetime), affect L2 learners' self-assessment of speech?

# Hypothesis:

Identifying L2 phonological features and discriminating L1 and L2 sounds (i.e., accurate L2 perception) are crucial for L2 speech/pronunciation learning

(e.g., Kachlicka et al., 2019; Perrachione et al., 2011 ; Saito, Macmillan, et al., 2022 )



Precise **auditory perception** may lead to accurate self-assessment (= minimum discrepancies between self- and objective evaluation).

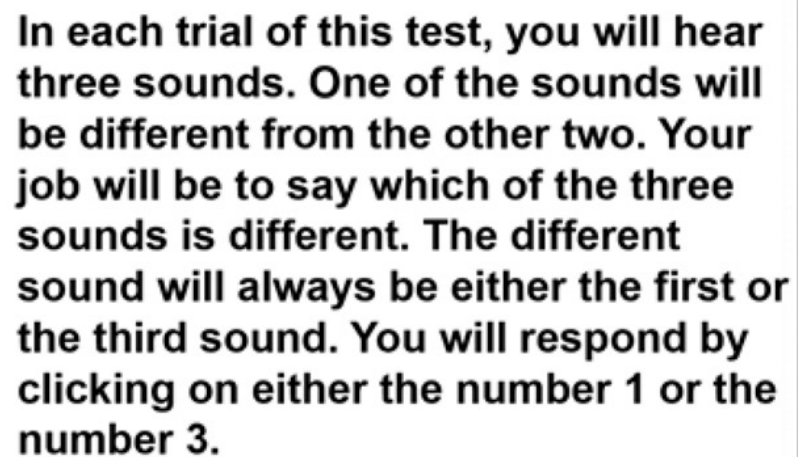
# Participants profile:

## Japanese learners of English (n = 98)



- **Extremely limited opportunities for extracurricular speaking practice** (80% = 0 hours, 20% = less than 0.5 hours)
- **L2 pronunciation accuracy** – measured via native speakers' accentedness rating
- **Spectral and temporal acuity** – a composite score of formant, duration, and rise time discrimination tasks (e.g., Kachlicka et al., 2019)

\*According to Kolmogorov-Smirnov tests, pronunciation & acuity scores were normally distributed ( $p > .05$ )



In each trial of this test, you will hear three sounds. One of the sounds will be different from the other two. Your job will be to say which of the three sounds is different. The different sound will always be either the first or the third sound. You will respond by clicking on either the number 1 or the number 3.



### Discriminate sounds

Which sound is different: number 1 or number 3?

1

3

# Self-evaluation task

1. Explanation of the task procedure + assessment rubric
2. Practice session (speech recording → self-assessment)
3. Main session (speech recording → self-assessment)

- An argumentative task (1 min of planning + 1 min response time)
- Replayed the response they just made and rated

Accentedness (pronunciation accuracy) on a 1000-point slider scale  
(1 = poor, 1000= excellent) (see Saito et al., 2016 for a similar decision)

# Native rating (objective evaluation)



- 5 native raters of English with TESOL/Applied Linguistic background
- After a training session, they proceeded to rate the Accentedness on a 1000-point slider scale (*1 = poor, 1000= excellent*)
- Chronback's alpha = .89
- The scores were standardized and averaged to establish the baseline scores.



# Calculation of 'Rating inaccuracy' score

**Rating discrepancy score** = Self-evaluation score – native baseline score

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transformed to a squared Euclidean distance metric



**Rating inaccuracy score** = absolute value of **Rating discrepancy score**

(i.e, 0 is perfect accuracy; higher is less accurate irrespective of under or overestimation)

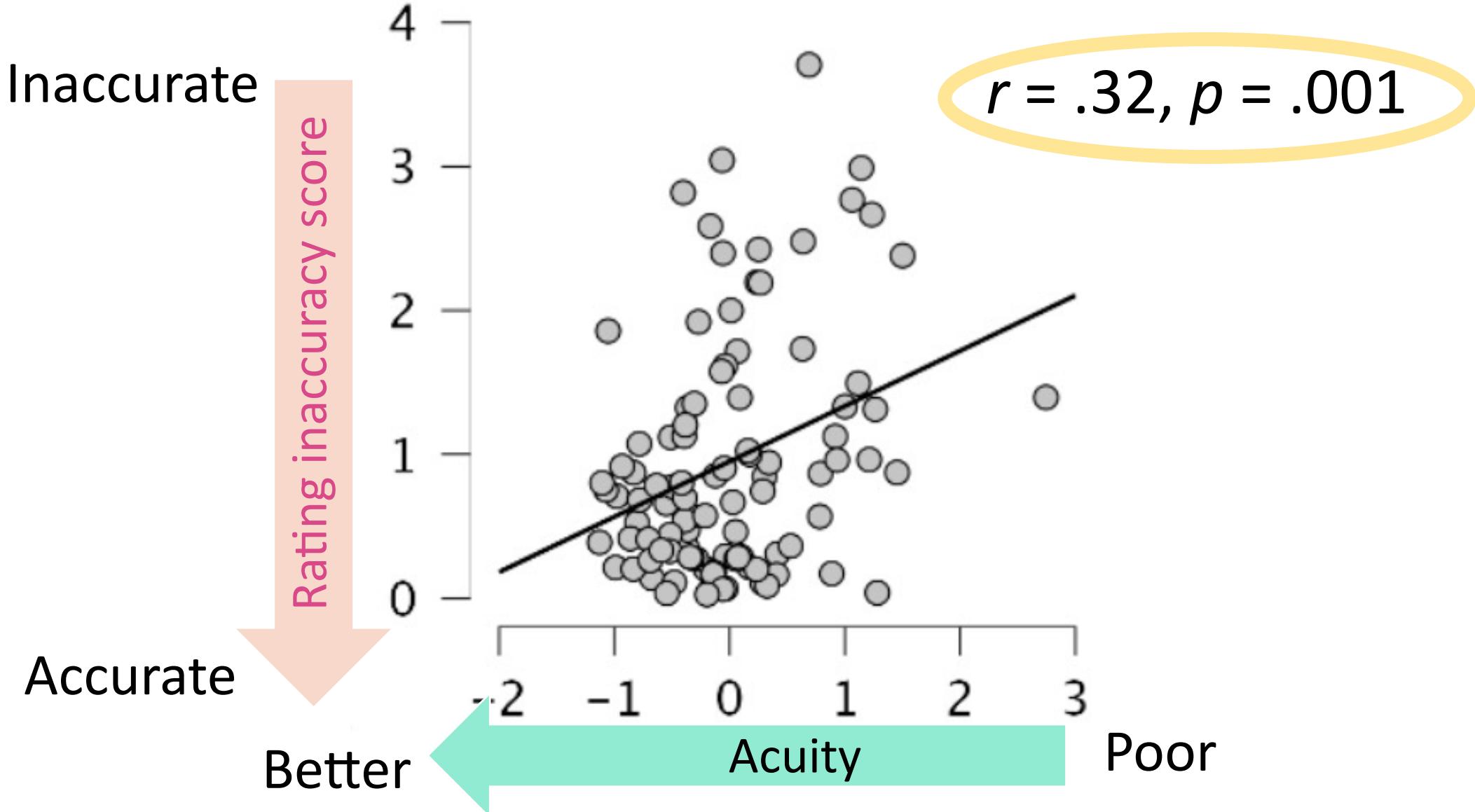
( $M = .95$ ,  $SD = .83$ ,  $Range: .03-3.7$ )

(cf., Trofimovich et al., 2016)

# Results

# Person's correlation between auditory acuity and rating accuracy

(low score = better acuity)



# Dunning-Kruger effect

Rating discrepancy score

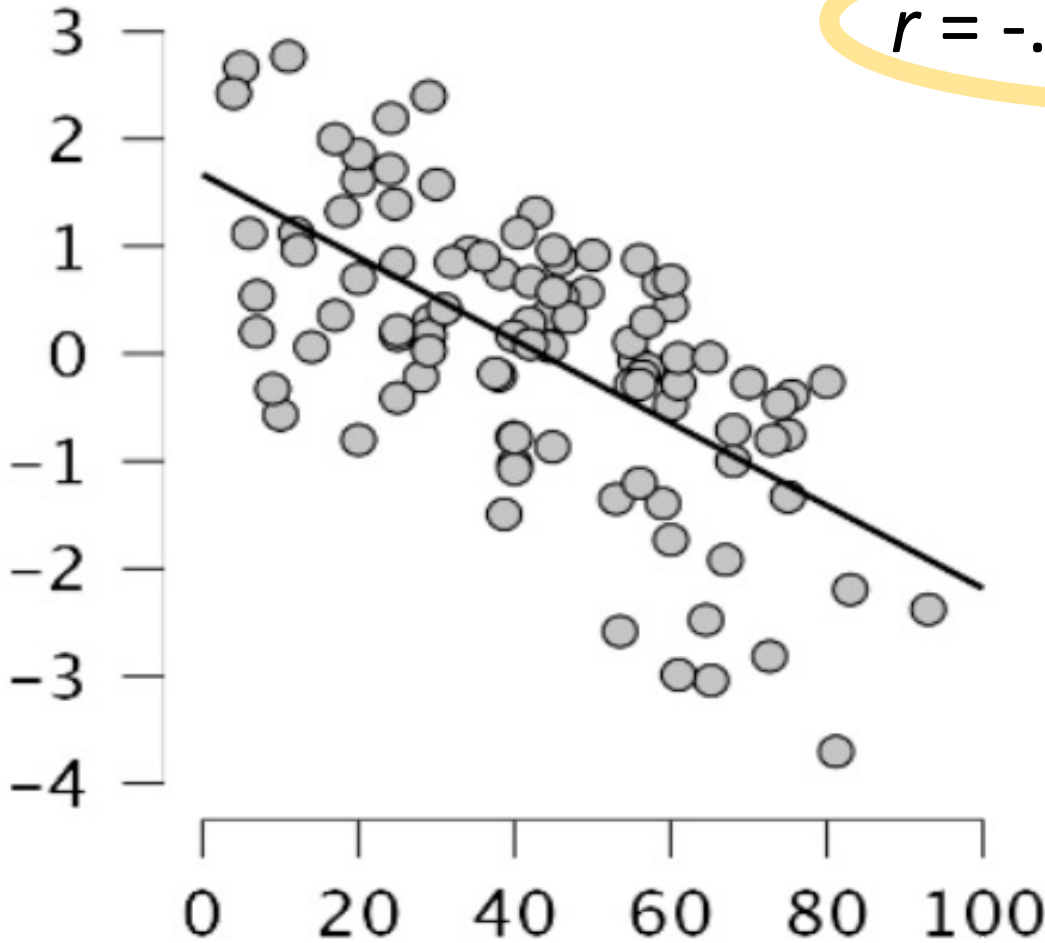
Overestimating

Accurate

Underestimating

Poor

Excellent



Pronunciation accuracy

# Discussion 1

Hypothesis: Precise **auditory perception** may lead to accurate self-assessment (= minimum discrepancies between self- and objective evaluation).

✓ Supported.

# Discussion 1

Building on past studies (e.g., Kachlicka et al., 2019; Perrachione et al., 2011; Saito, Macmillan, et al., 2022) that show auditory discrimination is crucial for L2 speech/pronunciation learning, the current study indicated that **it also affects the accurate assessment of their own speech.**

Therefore, the link between auditory acuity and better L2 production skill may be partially explained by its role in helping L2 learners correctly identify errors in their own speech.

# Discussion 1

**Building on past studies** (e.g., Kachlicka et al., 2019; Perrachione et al., 2011; Saito, Macmillan, et al., 2022) that show auditory discrimination is crucial for L2 speech/pronunciation learning, the current study suggests that **it also affects the accurate assessment of their own speech.**

Therefore, the link between auditory acuity and better L2 production skill may be partially explained by its role in helping L2 learners correctly identify errors in their own speech.

**Further investigation is required to explore this potential link.**

# Discussion 2

Extending the previous studies of the Dunning-Kruger effect (e.g., Mitterer et al., 2020), which was based on the general impression of their own speech, the current study showed that the effect is still present even after they carefully listen to their own speech.

The effect is indeed persistent, so it is crucial to introduce calibration training to minimise the gap (e.g., Saito et al., 2020).



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