

Building the (research) world we want to live in

16th Pronunciation in Second Language Learning and Teaching Conference

Concordia University, Montréal, Québec, Canada

October 15–17, 2025





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in alphabetical order by last name

PSLT 2025 Conference

Concordia University

Montréal, Québec, Canada

15-17 October 2025

All of you!

Opening remarks

- Researcher
 - Quantitative
 - Cognitive linguistics
 - Research methods
- Learner/Teacher
 - Spanish (French, Catalan)
 - Spanish Language Program Director
 - Emphasis on actionable information and practical activities
- Content: How and what we research > what we have found

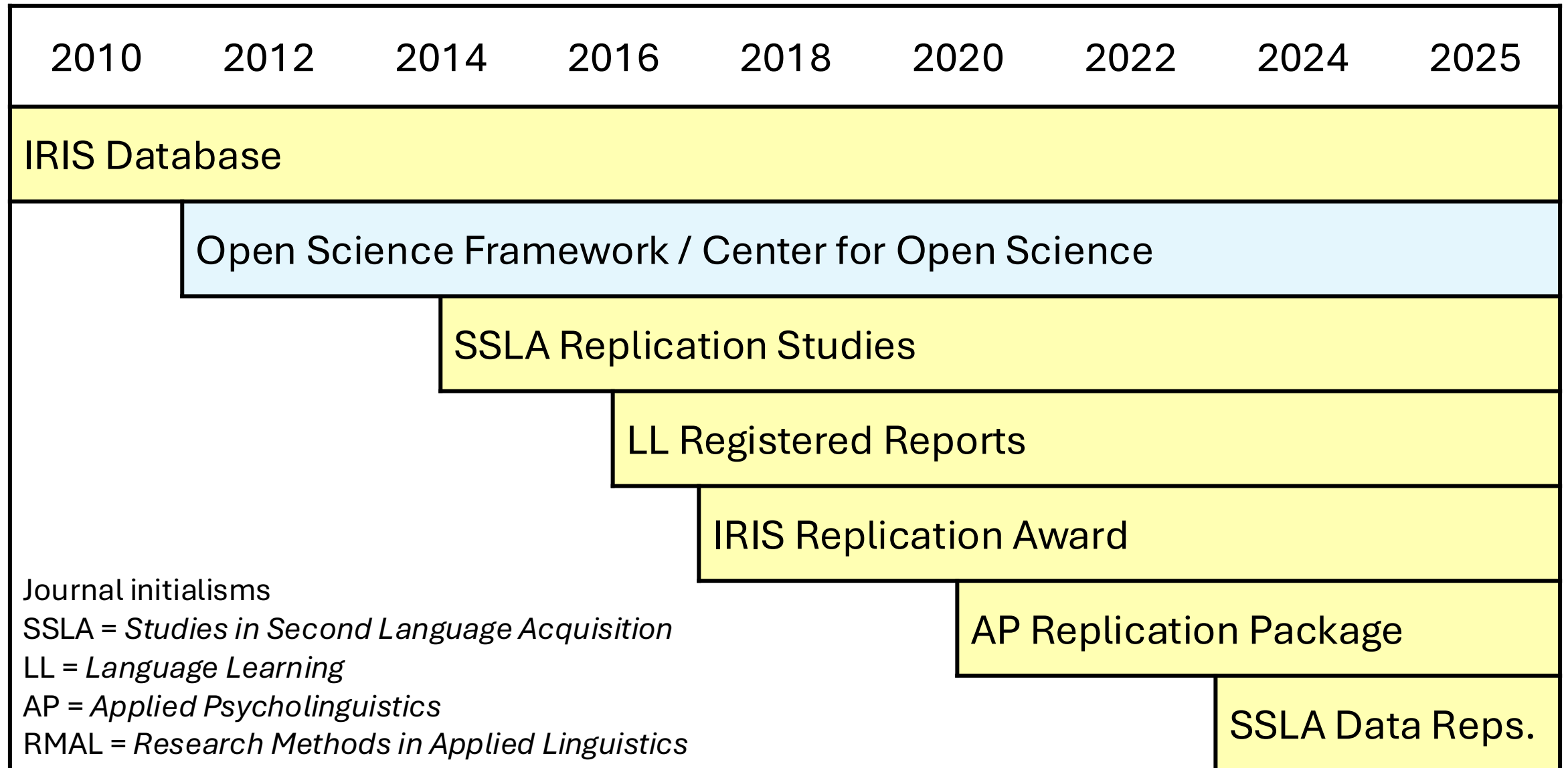
Outline for today's talk (today's pitch)

- Part 1: Catalysts for the Pronunciation Research Accelerator
 - 1.1 Setting the stage: The Open Science movement
 - 1.2 Working together: The Pronunciation Research Accelerator
- Part 2: HVPT as an ideal first project
 - 2.1 State of the art in High Variability Phonetic Training (HVPT)
 - 2.2 HVPT as an ideal candidate for our first project
 - 2.3 Our team's work on HVPT and the design of the HVPT PRA project

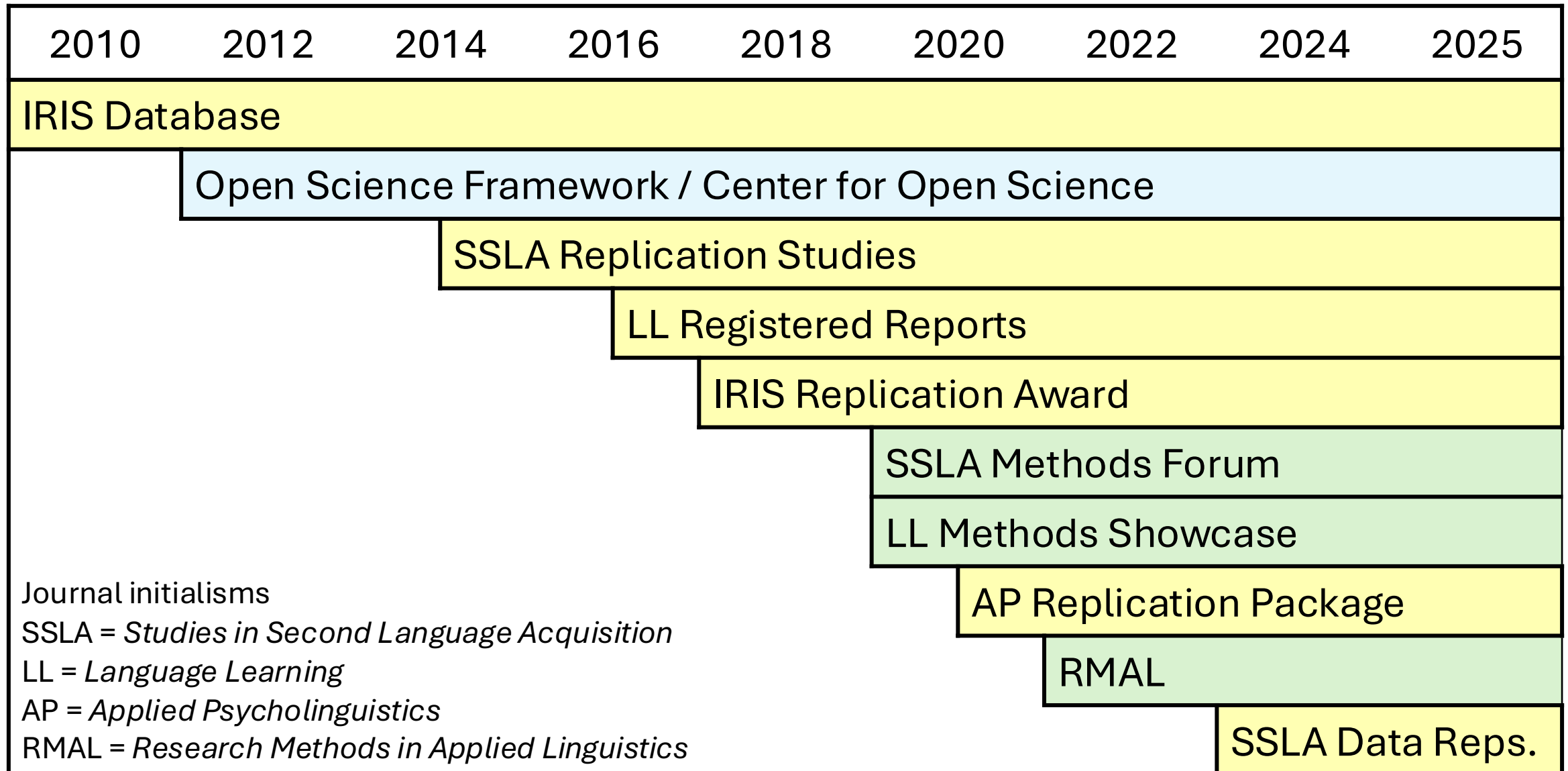
Part 1.1

Open Science

Open science turn



Open science / methodological turn



Open science in L2 pronunciation

Replication

- Huensch. (2024). Clarifying the role of inhibitory control in L2 phonological processing: A preregistered, close replication of Darcy et al. (2016).

Multisite

- Nagle et al. (2025). Comparing lower and higher variability multi-talker perceptual training.

Multisite replication (*counting online recruitment as multisite)

- Barlow et al. (2024). The effects of exposure and explicit stereotypes on veracity judgments of Polish-accented English speech: A preregistered close replication and extension of Boduch-Grabka & Lev-Ari (2021).
- Brown et al. (2023). Searching for the “native” speaker: A preregistered conceptual replication and extension of Reid, Trofimovich, and O’Brien (2019).
- Brekelmans et al. (2022). Does high variability training improve the learning of non-native phoneme contrasts over low variability training? A replication.
- Huensch & Nagle. (2021). The effect of speaker proficiency on intelligibility, comprehensibility, and accentedness in L2 Spanish: A conceptual replication and extension of Munro and Derwing (1995a).

Are our methods transparent and reproducible?

The tasks, protocols, and coding schemes we use

The lifecycle of any research study is beset by a series of decisions, many of which are essentially arbitrary, whose consequences are usually unknown ... We have argued that one simple remedy with the potential to minimize unhelpful sources of non-replicability is to ensure that public reports are accompanied by the archiving, and public release where possible, of study materials, protocols, data and analysis scripts.

Bolibaugh et al., 2022, p. 804

How we process and analyze the data

Following Breznau et al. (2021), we are bound to conclude that ‘idiosyncratic uncertainty is a fundamental feature of the scientific process that is not easily explained by typically observed researcher characteristics or analytic decisions.’ Idiosyncratic variation across researchers might be a fact of life that we have to acknowledge and integrate into how we evaluate and present evidence.

Coretta et al., 2023, p. 20

Are our methods transparent and reproducible?

How we process and analyze the data

Idiosyncratic variation across researchers might be a fact of life that we have to acknowledge and integrate into how we evaluate and present evidence.

Coretta et al., 2023, p. 20

Concept, Method, & Procedure			Coding & Analysis			Combos
Target	Tasks	Record	Window	Outcome	Analysis	
Project leads			Analysts (46 teams, 211 ind.)			

Do our findings generalize?

Speakers

- To a new, highly similar sample?
- To a new, somewhat different sample?
- To a new, quite different sample?

Instructed L2
learners of **A**

Instructed L2
learners of A

Instructed L2
learners of B

Instructed L2
learners of C

Immersion L2
learners of B/C

Instructed L2A
context 1

Instructed L2A
context 2

Instructed L2B
context 2

Instructed L2A
context 3

Context

- To a new, highly similar context?
- To a new, somewhat different context?
- To a new, quite different context?

Do our findings generalize?

Items (Perception)

- Same items, produced by new talkers
- New items, produced by same talkers
- New items, produced by new talkers

Items / Voices

Same items,
new talkers

New items,
same talkers

New items,
new talkers

Phonetic
context

Same context

New context

Context

- To sounds in the same phonetic context (same items, different items)
- To sounds in a new phonetic context (different items)
- To sounds in noise, in other listening conditions, sentential contexts, etc.

Harnessing this potential

Direct replication affords the field a crucial opportunity to verify previously published findings, and doing so through a multisite approach may be particularly valuable because it allows one to isolate the signal ... from the noise

Morgan-Short et al., 2018, p. 396

Coordinated methods and procedures

- Common core to address our central questions
- Options for individualization and additional components

Multisite studies

- Automatically get different samples
- May be interesting geographic, sociodemographic, and contextual variation

Big-team speech science

- Moving beyond teams of 2-5 researchers to teams of 15-30
- More precise estimates of target effects and variation across samples

Why do this?

Scientific (our (sub)field)

- Provide new, precise, generalizable insights
- Ask new and nuanced questions using large data sets

Scientific (other fields)

- The more generalizable our work, the more we can connect with cognitive science, educational psychology, etc.

Social and Practical

- We have discussed this type of initiative at PSLLT over the years
- PSLLT is a supportive community and the ideal launching pad
- Doing good science is hard and takes a village



Pronunciation Research Accelerator

Mission

- Create an international network of speech scholars at all stages of their careers. These scholars should represent diverse geographies, institutions, and areas of expertise within applied speech science.
- Foster big-team, collaborative speech science into key topics that represent our shared applied interests and have the potential to bridge the research-practice (or research-policy) divide.

Roles and Responsibilities

Advisory Board

- Oversees development of governance and procedural documents
- Oversees funding initiatives
- Provides organizational and logistical support
- Evaluates proposals for viability and potential for impact

Project lead(s) (primary contact for project teams)

- Oversees development / pre-registration of project materials
- Works with board to ensure materials are documented and archived
- Works with teams to ensure timely completion of project milestones

Project teams

- Collaborates in development / pre-registration of project materials
- Responsible for local data collection, preprocessing, and submission

Advisory Board



Charlie Nagle
University of Texas at Austin



Amanda Huensch
University of Pittsburgh

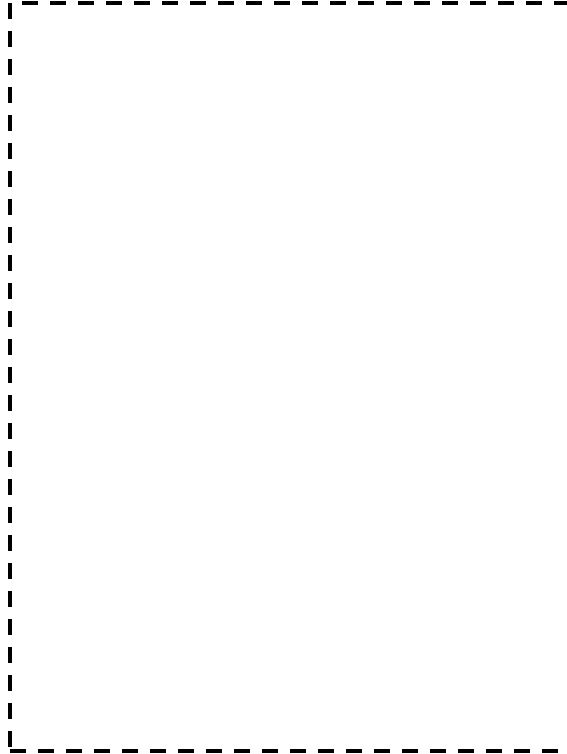


Pavel Trofimovich
Concordia University

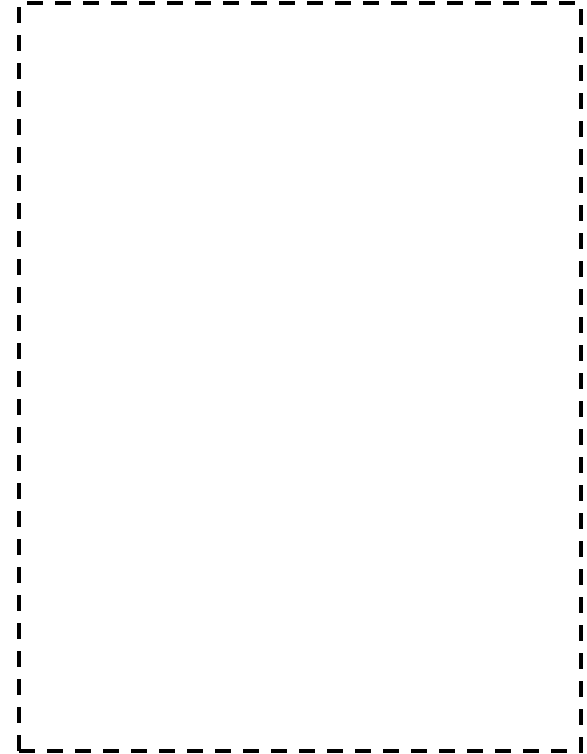
Area Experts



Shelby Bruun
University of Texas at Austin
Expertise: Gorilla, logistics



Your photo here!

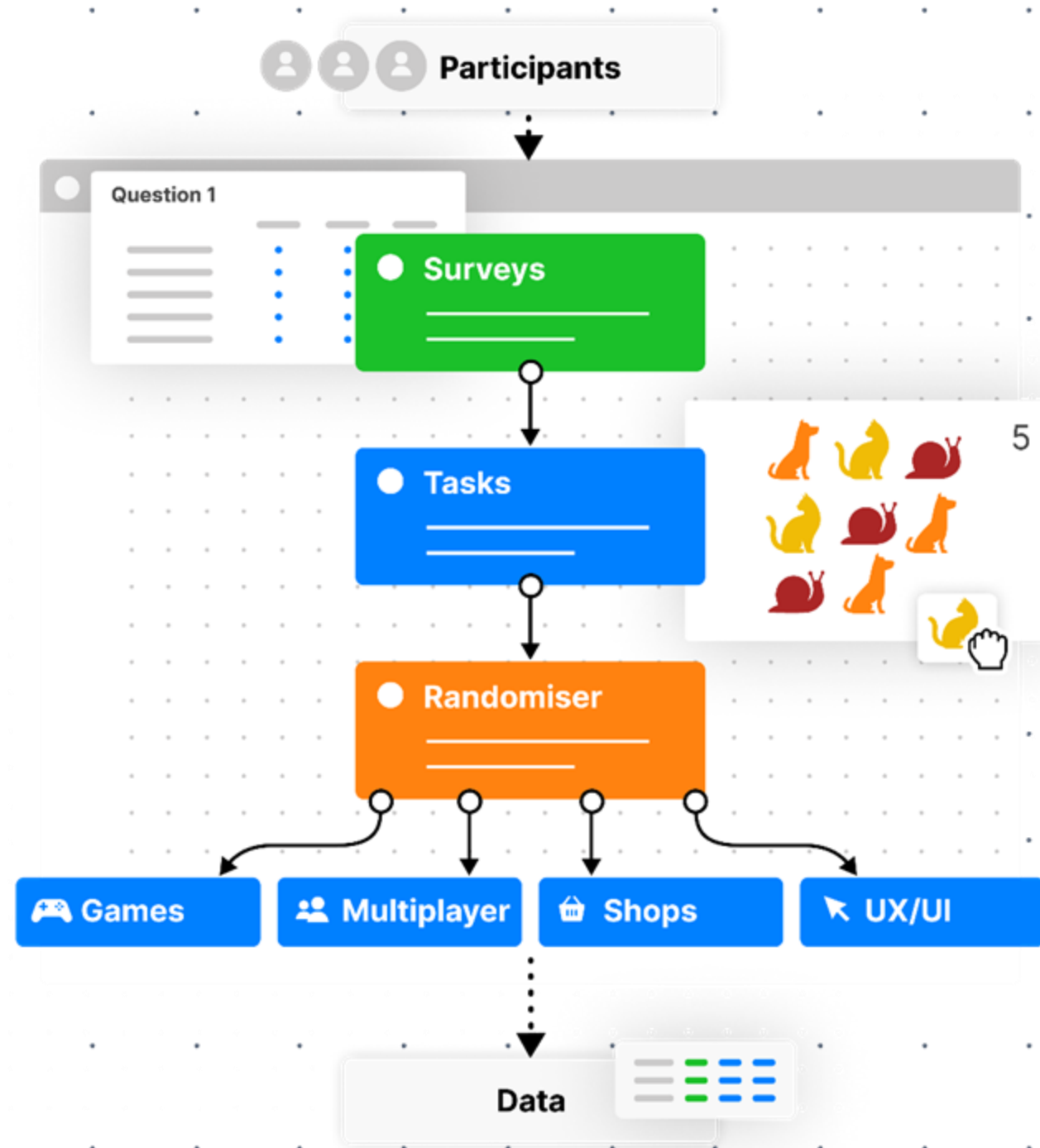


Your photo here!

GORILLATM

Powerful, easy-to-use tools for
experimental psychology
and related disciplines

www.gorilla.sc



What is Gorilla?

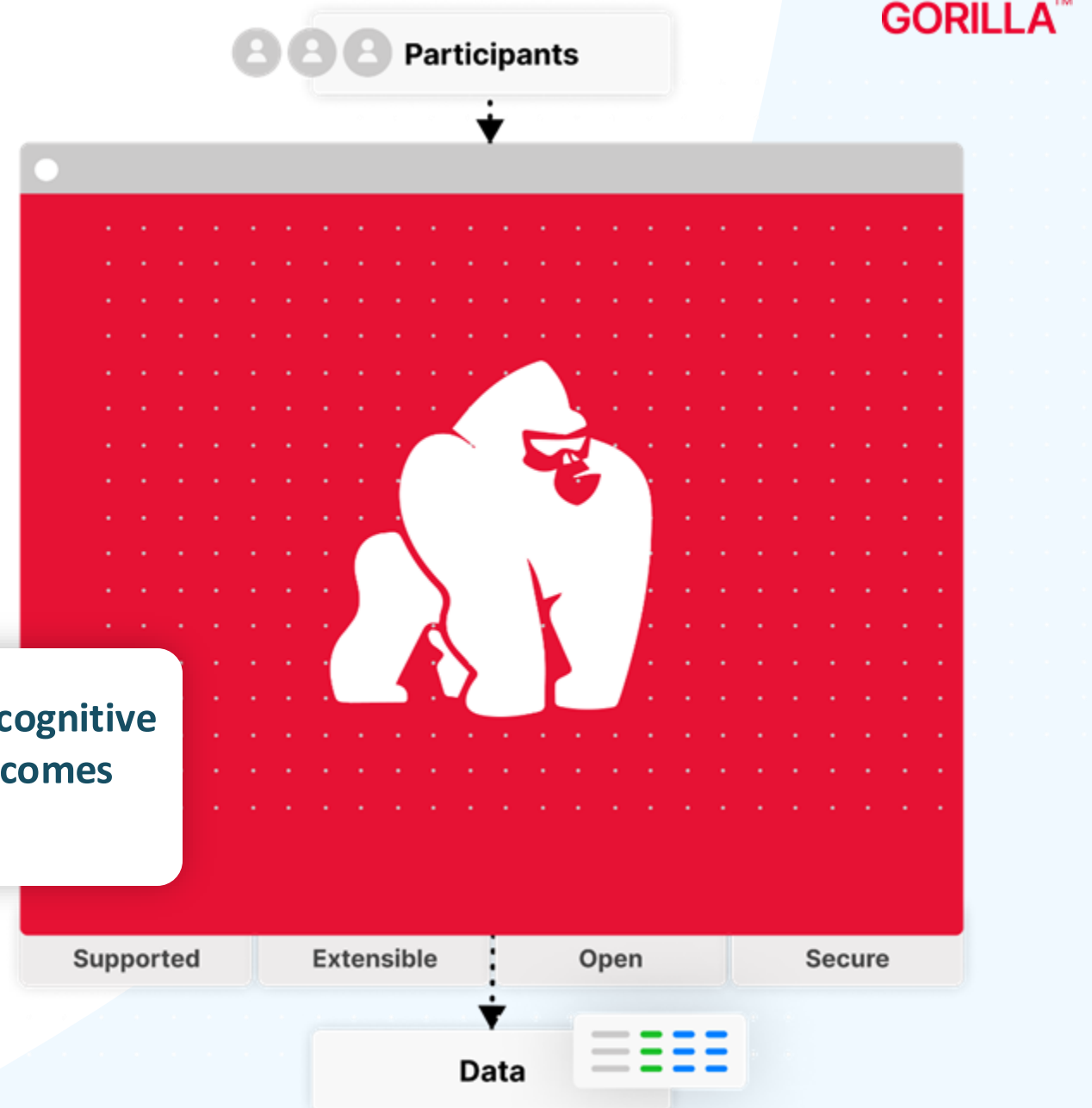
Our Vision

Create a better world based on evidence, not opinion.

Our Mission

Create an all-in-one research platform for human data collection, so that we have the data on what works.

“People go in, gorgeous cognitive and behavioural data comes out.”



Gorilla support

What?

- Department basic subscription: 200 users / 5,000 respondents
- Four-year staggered model with ramp-up to full payment

Why?

- Makes tasks easy to develop, export, and deploy globally
- Gorilla is hyper-responsive to researcher feedback



Tools for Second Language Speech Research and Teaching

Membership and Incentives

Membership

- Free and open to anyone doing L2 speech research
- Must commit to participating in one project every three years
- Other ways to get involved forthcoming (stay tuned!)

Incentives

- Join a lively and supportive research community
- Research support from the advisory board and project leads
- Gorilla subscription with seats to run PRA studies at your site
- Research grants for PRA studies (stay tuned!)

Two-Year Project Cycles

	Academic Year (AY) 1									AY 2									AY 3		
	Fall			Spring			Summer			Fall			Spring			Summer			Fall		
Ramp-up CfP > Vote > Launch	■	■																			
			■																		
				■																	
					■																
						■															
Run Design > Collect > Submit						■	■	■	■	■											
										■	■	■	■	■	■						
															■						
Complete Aggregate > Analyze > Write															■	■	■				
															■	■	■				
						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Tentative Five-Year Plan

Year	PRA Activities
1 (25-26)	Launch with basic website Membership list Governing documents
2 (26-27)	Website development Funding mechanisms Procedural documents
3 (27-28)	Funding mechanisms Procedural documents review Discussion of professional organization
4 (28-29)	Funding mechanisms Formation of professional organization
5 (29-30)	Launch professional organization New advisory board

Tentative Five-Year Plan (Research)

Year 1 AY 25-26			Year 2 AY 26-27		Year 3 AY 27-28		Year 4 AY 28-29		Year 5 AY 29-30	
P1	Launch	Launch	Run							
P2	Vote	Launch	Run							
P3			Vote	Launch	Run					
P4					Vote	Launch	Run			
P5							Vote	Launch	Run	
P6								Vote	Launch	

Addressing some potential concerns

What we're asking you to do

- Get involved
- Add this to your research program

What we're **not** asking you to do

- Give up your current research program
- Make this the sole focus of your research program

What about evaluation and promotion?

- Participating in projects like this demonstrates your strength as a scholar
- You can log your contribution precisely using CRediT



High Variability

[Phonetic]

[Apple]

[Tennis]

[Etc.]

Training

Part 2.1

State of the art in HVPT

Trajectory of HVPT Research

Phase 1: Initial research (1990s)

- Logan and Lively studies
- Talker variability is beneficial for learning

Phase 2: Growing / sustained interest (2000s-2010s)

- Emphasis on talkers and stimulus characteristics
- Stimulus features can be made variable

Phase 3: Scrutiny / expansion (2020s)

- Research synthesis (meta-analysis) and replication
- How to optimize training features
- Emphasis on type of variability, how it is structured, when it is delivered

Phase 4: Big-team science (starting now!)

- Pronunciation Research Accelerator project 1

Study	Year	Focus	Estimates included
Chau & Huensch	2025	Listener-based / global ratings	141
Yao et al.	2025	Perception, production, combined training	223
Zhang et al.	2025	Optimal talker variability	68
Uchihara et al.	2025	HVPT > perception	32-96
Uchihara et al.	2024	HVPT > production	17-42
Mahdi & Mohsen	2024	HVPT > pronunciation achievement	22
Zhang et al.	2021	Single vs multitalker perception training	5-13
McAndrews	2019	Suprasegmental perception training	12
Mahdi & Al Khateeb	2019	Computer-assisted pronunciation training	20
Saito & Plonsky	2019	Pronunciation instruction	68-119
Sakai & Moorman	2018	Perception training > production	10-21
Thomson	2018	HVPT research themes and trends	<i>Narrative</i>
Barriuso & Hayes-Harb	2018	HVPT research to practice	<i>Narrative</i>
Lee et al.	2015	Pronunciation instruction	60-110
Thomson & Derwing	2015	Pronunciation instruction	<i>Narrative</i>

Study	Year	Focus	
Chau & Huensch	2025	Listener-based / global ratings	
Yao et al.	2025	Perception, production, combined training	
Zhang et al.	2025	Optimal talker variability	Meta-analyses of what makes HVPT work
Zhang et al.	2021	Single vs multitalker perception training	
Uchihara et al.	2025	HVPT > perception	Meta-analyses of the average effect of HVPT
Uchihara et al.	2024	HVPT > production	
Mahdi & Mohsen	2024	HVPT > pronunciation achievement	
McAndrews	2019	Suprasegmental perception training	
Mahdi & Al Khateeb	2019	Computer-assisted pronunciation training	
Saito & Plonsky	2019	Pronunciation instruction	
Sakai & Moorman	2018	Perception training > production	
Thomson	2018	HVPT research themes and trends	Description of HVPT features and impact
Barriuso & Hayes-Harb	2018	HVPT research to practice	
Lee et al.	2015	Pronunciation instruction	
Thomson & Derwing	2015	Pronunciation instruction	

HVPT Syntheses

Is it effective for improving perception?

Yes, with medium to large gains.

Is it effective for improving production?

Yes, with small gains.

To what extent are gains retained?

Well in perception, not well in production.

To what extent does learning generalize?

Well in perception, not well in production.

What variables affect learning, retention, and generalization?

Many, multiple talkers seem to be better than single talkers.

See the following research syntheses:

Zhang et al. (2025)

Uchihara et al. (2025)

Uchihara et al. (2024)

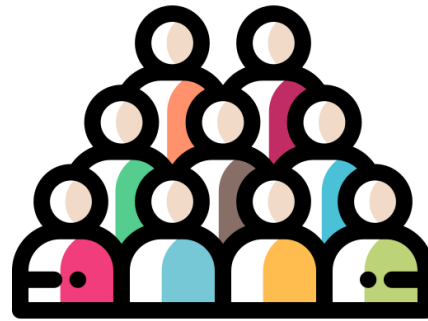
Mahdi & Mohsen (2024)

Zhang et al. (2021)

Thomson (2018)

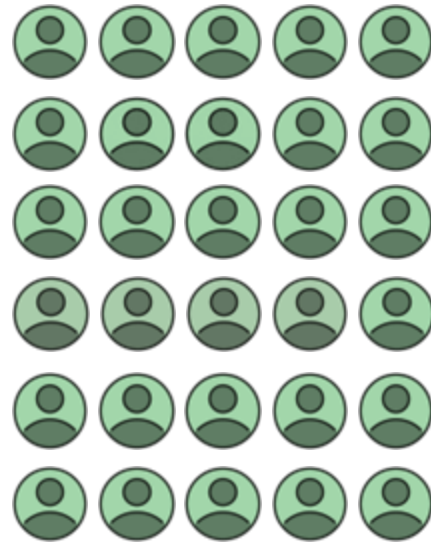
Barriuso & Hayes-Harb (2018)

The centrality of



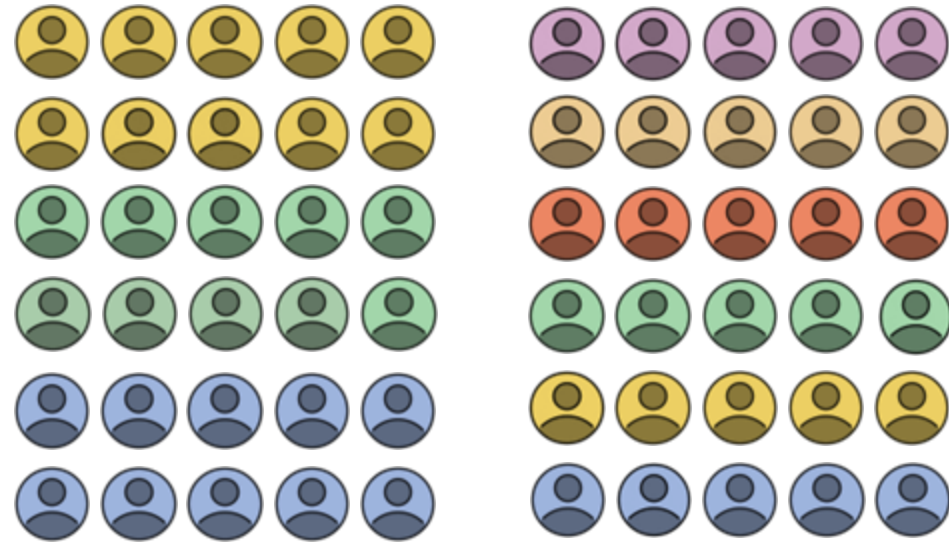
Single-Talker

Blocked



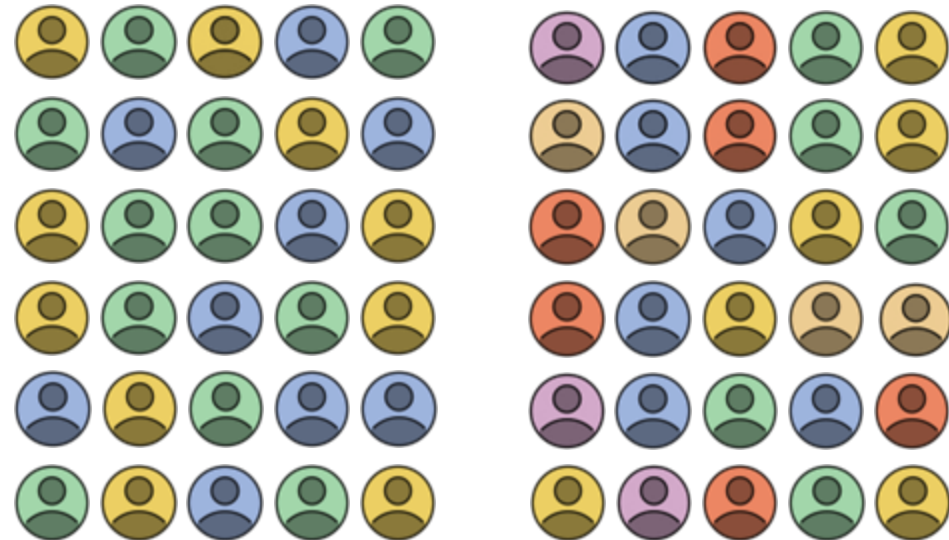
Multi-Talker

Etc.



Interleaved

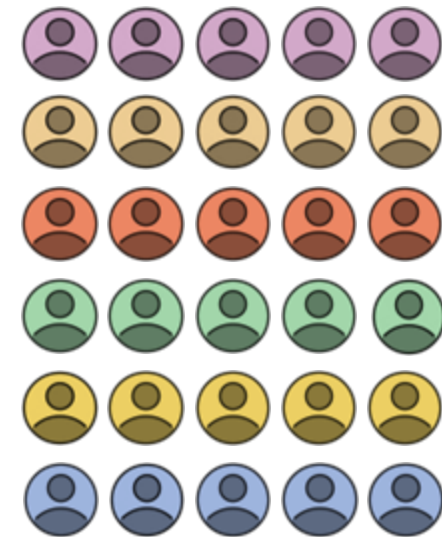
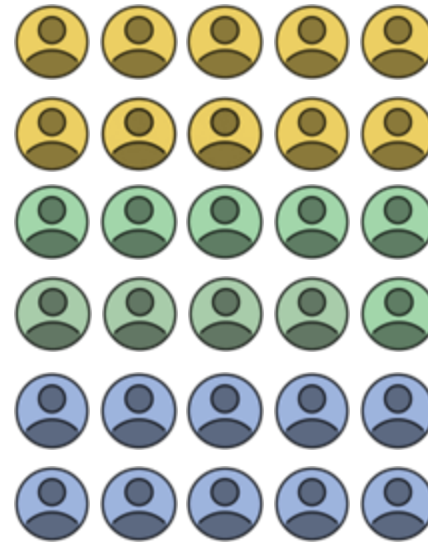
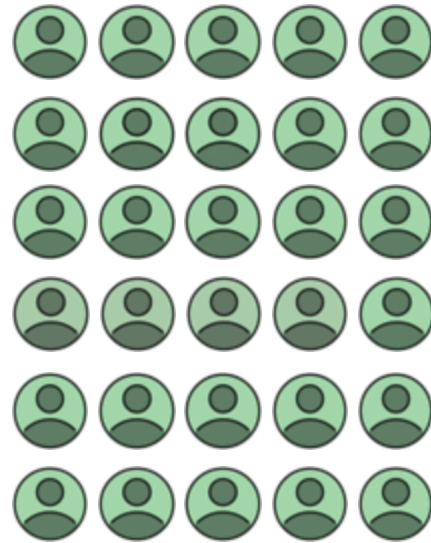
Etc.



Low Overall

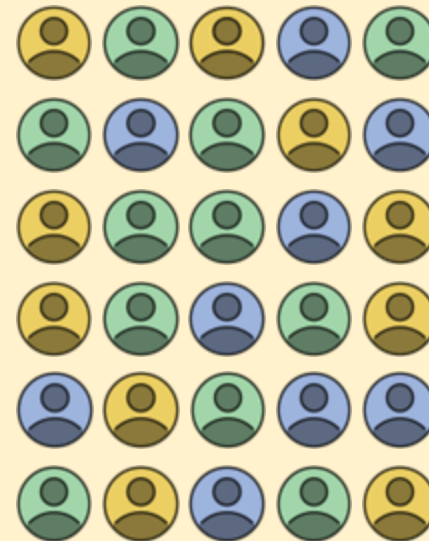
High Overall

Low
Trial-by-Trial

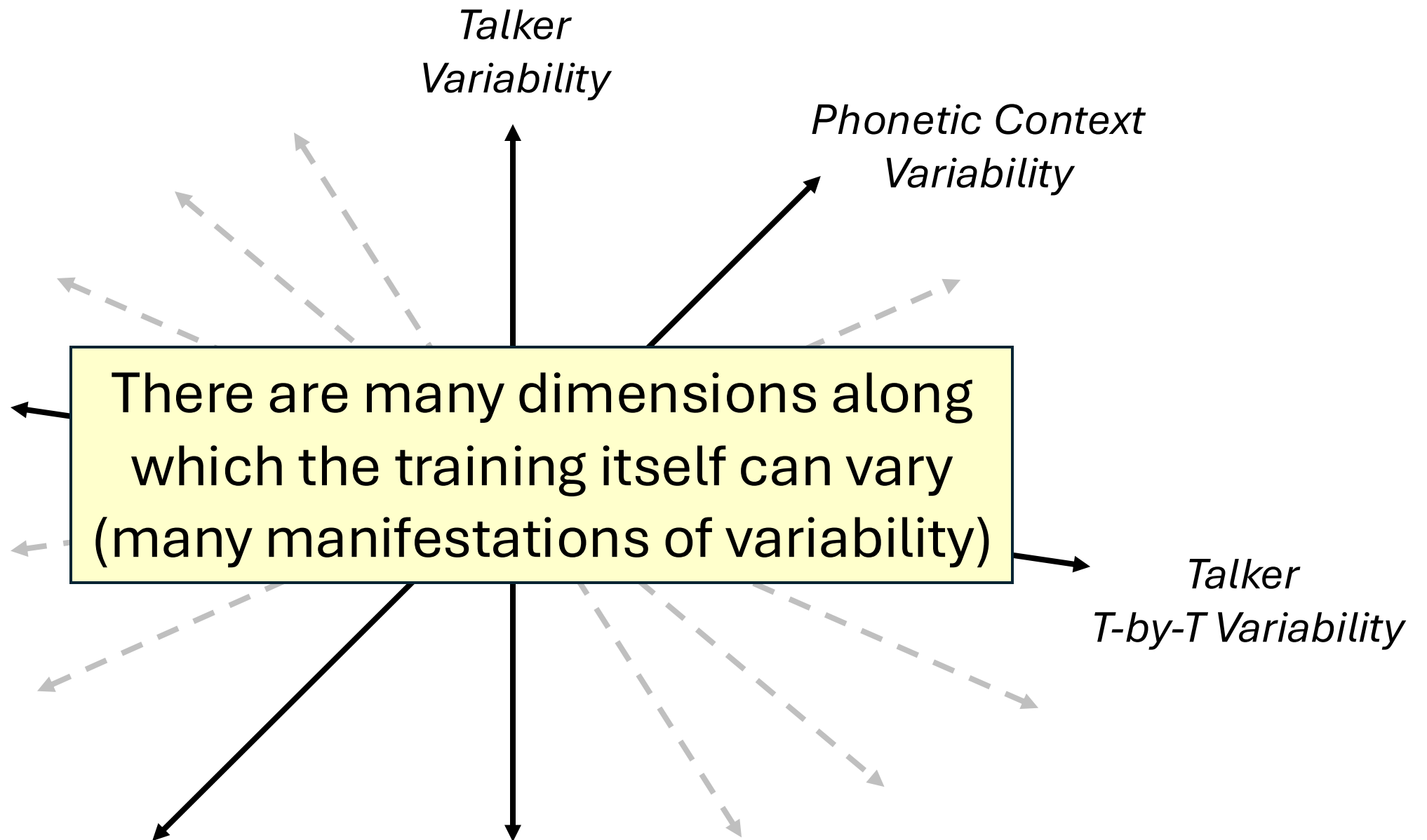


Etc.

High
Trial-by-Trial



Etc.



HVPT Training Features (some recent examples)

- **Number of talkers** (Nagle et al., 2025; Kartushina & Martina, 2019, 2025)
- **Presentation format** (blocking / interleaving; Perrachione et al., 2011)
- **Input type** (audio / audiovisual; Zhang et al., 2021)
- **Stimulus features** (acoustically enhanced / normal; Cheng et al., 2019)
- **Response options** (symbols / keywords; Fouz-González & Mompean, 2021)
- **Task type** (identification / discrimination; Carlet & Cebrian, 2022; Cebrian et al., 2024)
- **Stimulus type** (words / nonwords; Mora et al., 2022)
- **Conditions** (with / without noise; Mora et al., 2022)
- **Practice schedule** (massed / spaced; Alfotais et al., 2025)
- **Intervention timing** (Cebrian et al., 2024; Nagle et al., 2025)

Raviv et al. (2022)

differences
in number of
examples
(set size)

differences
between
(stimulus)
examples

differences
related to
training
conditions

differences
related to
training
schedules

	Numerosity	Heterogeneity	Contextual Diversity	Scheduling
Feature 1				
Feature 2				
...				

Raviv et al. (2022)	differences in number of examples (set size)	differences between (stimulus) examples	differences related to training conditions	differences related to training schedules
	Numerosity	Heterogeneity	Contextual Diversity	Scheduling
Number of talkers		***		
Pres. format (blocking / interleaving)				
Input type (audio / audiovisual)				
Stimulus features (normal / enhanced)				
Response options (symbols / keywords)				
Task type (identification / discrimination)				
Stimulus type (words / nonwords)				
Conditions (with / without noise)				
Practice schedule (spaced / massed)				
Intervention timing (learner proficiency)				

HVPT Other Moderators (some examples)

Additional training features

- Total trials
- Trials / session
- Trials / target
- Number of targets

Participant characteristics

- Context of learning (foreign / second language)
- Proficiency

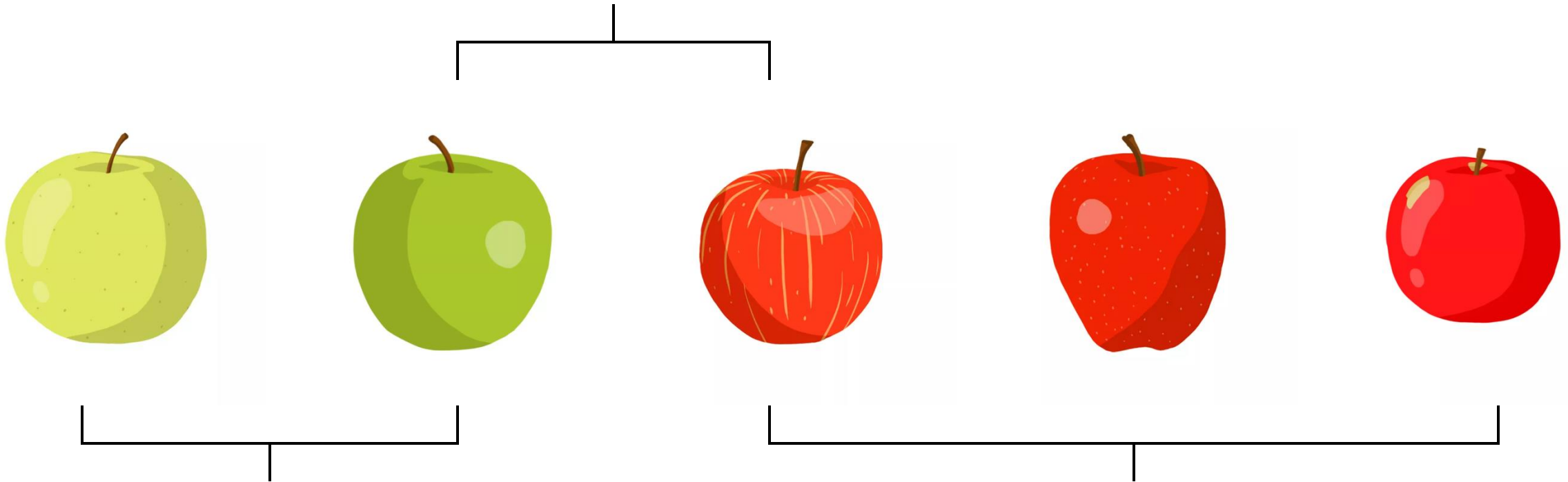
Target characteristics

- Learning challenge (new category / new cue)

Part 2.2

HVPT as an inter/intradisciplinary bridge

Different lab / site



Same lab / site

Same lab / site

L2 (Speech) Journals	Example Publications
<i>Journal of Second Language Pronunciation</i>	Perception and production training effects on production of English lexical schwa by young Spanish learners.
<i>Studies in Second Language Acquisition</i>	Does timing matter?: Exploring different windows of maximal opportunity to enhance the effectiveness of high variability phonetic training.

Speech Journals	Example Publications
<i>Journal of Phonetics</i>	Is talker variability a critical component of effective phonetic training for nonnative speech?
<i>Journal of the Acoustical Society of America</i>	Talker-variability in visual feedback articulatory training: Transfer to words, long-term maintenance, and generalization.

Cognition Journals	Example Publications
<i>Cognition</i>	Auditory category learning is robust across training regimes.
<i>Journal of Memory and Language</i>	Does high variability training improve the learning of non-native phoneme contrasts over low variability training? A replication.

Variability Beyond Speech Training (some examples)

- High variability orthographic training (one / three typefaces; Pelzl, 2025)
- Inter-session intervals (3.3-day interval / 7-day interval; Suzuki, 2017)
- Presentation format (blocking / interleaving; Suzuki, 2021)
- Presentation format and practice type (input / output; Suzuki & Sunada, 2019)
- Many others in the domain of word learning
- And beyond (c.f. Raviv et al., 2022)



86. INTERESTED MAN
87. INTERESTED MAN
88. INTERESTED MAN
89. INTERESTED MAN
90. INTERESTED MAN
91. INTERESTED MAN
92. INTERESTED MAN
93. INTERESTED MAN
94. INTERESTED MAN
95. INTERESTED MAN
96. INTERESTED MAN
97. INTERESTED MAN
98. INTERESTED MAN
99. INTERESTED MAN
100. INTERESTED MAN

ODD APPLES

High Variability

[Phonetic]

[Apple]

[Tennis]

[Etc.]

Training

Part 2.3

HVPT as an ideal candidate

Why start with HVPT?

Applied

- Help learners improve
- Create efficient and engaging training paradigms
- Create robust and generalizable paradigms

Theoretical

- Examine the link between variability and learning, and its moderators
- Connects us to other areas of language science
- Connects us to cognition research, educational psychology research, etc.

Practical

- Our team has been working on a scalable approach
- Large-scale perception studies easier to implement
- HVPT offers room for individualization

2.4.1

Our work to scale HVPT

Our team



Charlie
Nagle



Germán
Zárate-Sánchez



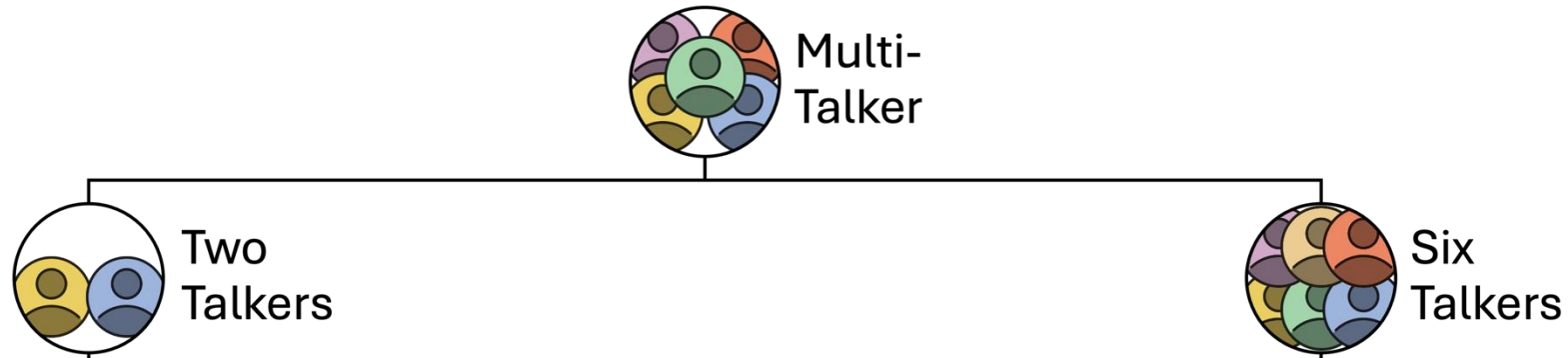
Shelby
Bruun



Declan
Revenew

Many undergraduate research assistants, funded through the
UT Austin Undergraduate Research Assistantship Program

Our project's conceptual architecture



Our project's timeline

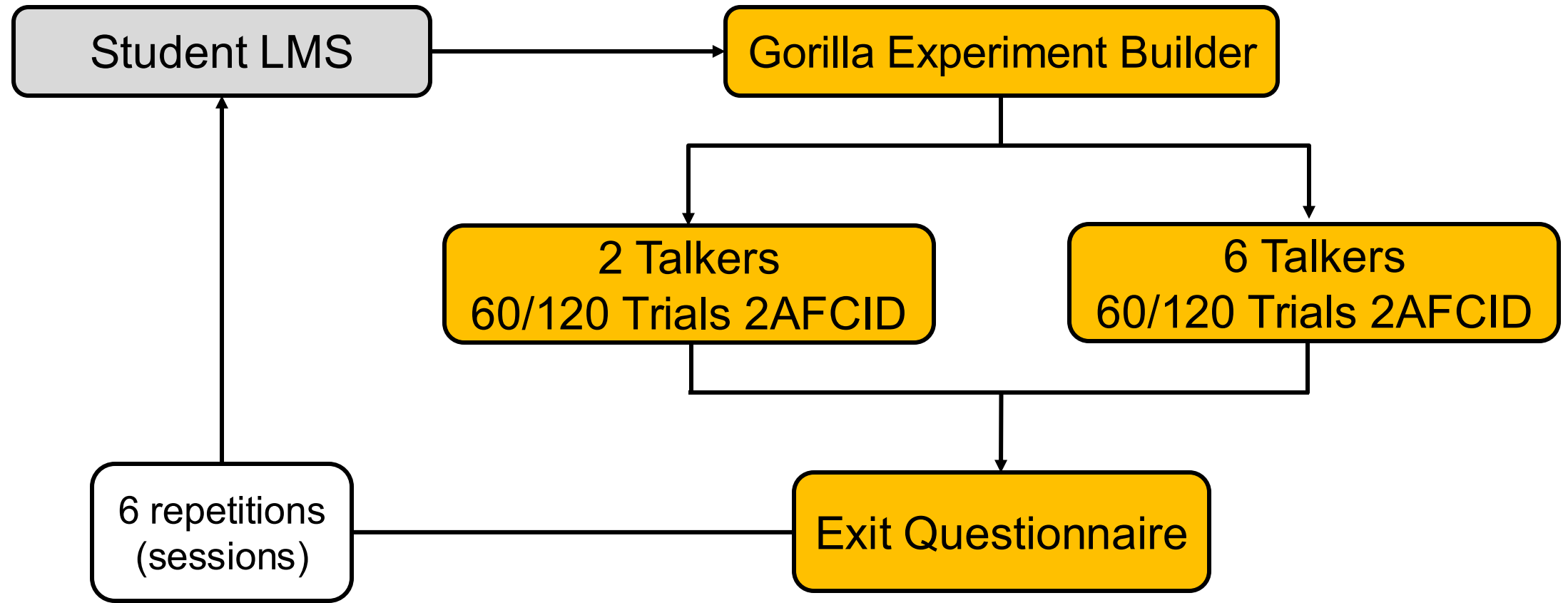
- First-semester university-level Spanish course
- Groups and no. and timing of sessions held constant
- Trials/session and talker presentation format modified

Semester	Groups	Sessions	Trials	Format	Target
Fall 23	Pilot				
Spring 24	Control, 2T, 6T	6	120	Block	Stops
Fall 24	Control, 2T, 6T	6	60	Block	Stops
Spring 25	Control, 2T, 6T	6	60	Inter.	Stops

Our project's training and testing procedures

Week(s)	2-Talker/6-Talker	Control
1	In-Class Pretest & Background Questionnaire	
2–4	Monday/Friday Training	
5	In-Class Immediate Posttest	
7	In-Class Delayed Posttest	
8–10		Monday/Friday Training

Our project's training interface (Gorilla)



2.4.2

Optimizing Perception Learning
(OPL / “opal”)

Goals of the OPL project

- Make sites **comparable** by fixing perception training features
- Make perception training **generalizable** by allowing sampling characteristics and target structures to vary
- Create room for **individualization** outside of the “core” by allowing researchers to add components a la carte at individual sites (production testing, ID measures, etc.)

OPL project features

Common Core

- 1, 2, 4 talker groups (at least 20 participants / group)
- 6 sessions (2 / week)
- 90 trials / session (counterbalancing across targets)

What you need to do

- Record your talkers (8) and prepare stimuli
- Run your study
- Deliver your data and other required components

What we provide

- Study architecture in Gorilla
- Seats in Gorilla to run participants
- Additional professional support depending on your needs*

Optimizing Perception Learning (OPL / “opal”)

Timeline	Tasks
Oct – Nov ‘25	Express interest, finalize teams
Nov ‘25 – Jan ‘26	Meet to organize project, select training targets
Jan – March ‘26	Record talkers (8), process and prepare files
March – Aug ‘26	Acoustically analyze stimuli, prepare to launch studies
Aug – Dec ‘26	Run studies
Jan ‘27	Submit data and other required components
Jan – April ‘27	Aggregate, clean, and analyze data, organize write-up
April – Sep ‘27	Draft and submit manuscript(s)

Together we've got this!

PRA interest form



Q&A: Ask me why we need to acoustically analyze stimuli

Extra Slides

Why acoustically analyze the stimuli?

	Numerosity	Heterogeneity	Contextual Diversity	Scheduling
Number of talkers				

- Assumed: More talkers = more heterogenous / representative
- Guaranteed: More talker = greater numerosity
- Need to understand dimensions along which stimuli vary
- Need to collect, validate, and publish reusable stimulus set