Versant™ Aviation English Test:
a job-specific test of language that complies with ICAO requirements

leading tests of spoken language

Discussion Topics

- Overview of Ordinate

- Drivers for an ICAO-compliant test of aviation English

- Versant Aviation English Test (VAET)

  – Test structure

  – Commercial options

  – Demo of test

- Test Development for VAET

- Validation and reliability research for VAET

About Ordinate

- The leading provider of technology and services for testing spoken language.

- Founded in 1996 by two Stanford professors
- Created the patented Ordinate® Testing System
- Wholly-owned subsidiary of Pearson
  - Purchased by Harcourt in 2004 (part of Reed Elsevier)
  - Ordinate and Harcourt Assessment spun out of Harcourt and purchased by Pearson

Ordinate Experience, Expertise

VERSANT
with Ordinate® Technology

Corporate

| Needs:	Sample customers:
• Recruiting selection • Leadership programs • Training placement	• Dell • P&G • Accenture • IBM • BellSouth • UK Network Rail • Malaysia Airlines • UAE civil aviation

Schools

Needs:	Sample customers:
• Teacher/TA certification • ELL placement • Oral reading fluency	• Dallas Independent School District • Univ. of Connecticut • Tsinghua University • Kobe University • Waseda University

Government

Needs:	Sample customers:
• Employment screening • Language certification • Placement into training	• US Dept of Education • Dutch Immigration Ministry • US Dept of Homeland Security – Border Patrol • US DOD – Defense Language Institute

Language and Test Specialists

Needs:	Sample customers:
• Speech recognition • Language processing • Speaking tests	• ACT WorkKeys • ALC Japan • Pearson • Yoons • Berlitz • ETS • CTB/McGraw-Hill • Thomson Heinle

ORDINATE

Versant™ spoken language tests

- A recognized leader for testing spoken language
- Taken over the phone or on a computer
- Automatically scored
- Proven to be valid and reliable
- Tests of spoken:
  - English
  - Spanish
  - Dutch
  - Arabic (*in dev*)
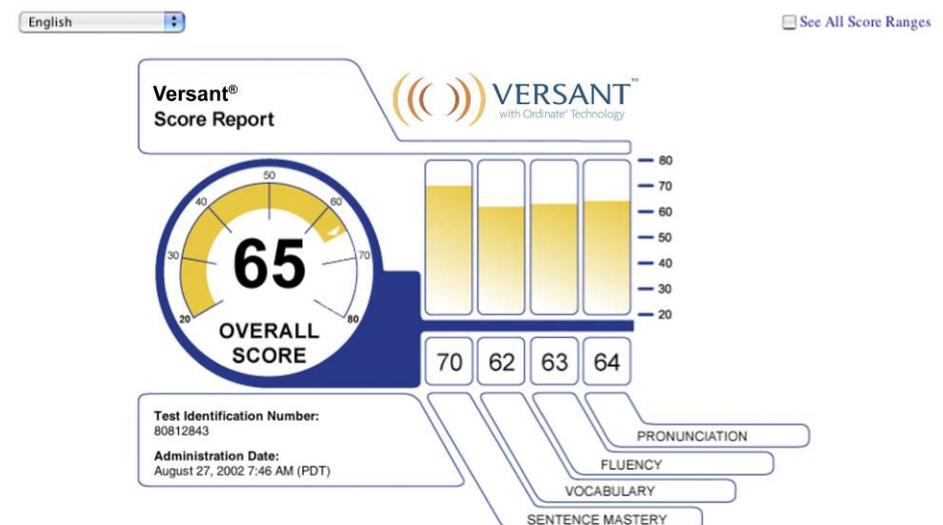
Versant™ Aviation English Test (VAET)

Drivers for an ICAO-compliant test of aviation English

What is ICAO?

International Civil Aviation Organization

- A United Nations agency
- Purpose is to codify international air navigation standards, requirements, and recommended practices
- Individual country civil aviation authorities (member states) agree to ICAO standards and requirements:
  - so their licensed professionals, planes, safety routines, etc. will be accepted by other CAAs when they fly internationally
  - to better harmonize and smooth international aviation
  - to support safer international aviation
- In addition, ICAO defines the protocols for air accident investigation followed by transport safety authorities in member states

Why test aviation English?

- ICAO analyzed accidents in the 1980s and 90s
- Noted that poor communication due to language differences between a pilot and air traffic controller contributed to some incidents
  - i.e. a **SAFETY ISSUE**
- Introduced Annex 1 with a new requirement for English proficiency
  - Defined language levels (ICAO levels 1 to 6)
  - All pilots and ATCs involved in international travel must speak sufficient English (level 4 or above)
  - Outlined requirement to test, with guidelines for acceptable testing
  - Defined timetables for initial compliance and subsequent retesting

ICAO requirements for testing

- The test must evaluate English speaking and listening skills
- The test must address aviation work-related topics used in radiotelephonic communications
- The test must cover ICAO phraseology and plain or general English
- The test must be able to assess across all 6 six ICAO-specified language skills
- The test's development team must be qualified
- The test development process must be validated
  - All tasks and items reviewed by independent experts
  - Test instructions reviewed by stakeholders
- The test must be secure
- The test must be reliable, valid and practical
- All sessions must be recorded and stored securely
- Sample and practice tests need to be available

Versant™ Aviation English Test (VAET)

Overview of the Test

VAET Overview

- Developed under a Cooperative Research and Development Program with The FAA
- Validation Report published documenting Validity and Reliability sufficient to satisfy ICAO requirements
- Can be taken by phone or computer 24x7
- Scores available within minutes
- Designed to support both training and certification programs

VAET Meets ICAO Requirements

## ICAO Checklist for Aviation English Testing

- ☑ Test evaluates speaking and listening
- ☑ Development team is qualified
- ☑ Development process is validated
  - ▪ All tasks and items reviewed by independent experts
  - ▪ Test instructions reviewed by stakeholders
- ☑ Test addresses aviation work-related topics
- ☑ Test covers ICAO phraseology and plain or general English
- ☑ Test assesses all 6 six ICAO-specified language skills
- ☑ Test is secure
- ☑ Test is reliable, valid and practical
- ☑ All sessions are recorded and stored securely
- ☑ Sample and practice tests are available

Test Structure and Content

aviation English

general English

Section	Item Type
Part A	Reading (Aviation Phraseology)
Part B	Reading (Common English)
Part C	Repeat
Part D	Short Answer Questions
Part E	Readbacks
Part F	Corrections and Confirmations
Part G	Story Retellings
Part H	Open Questions
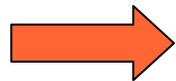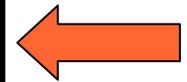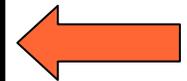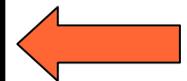
Test Security

- Secure – resistant to cheating and coaching

| Form 1 | Form 2 | Form 3 | Form 4 | Form 5 | Form … |

randomly generated forms

ITEM POOL
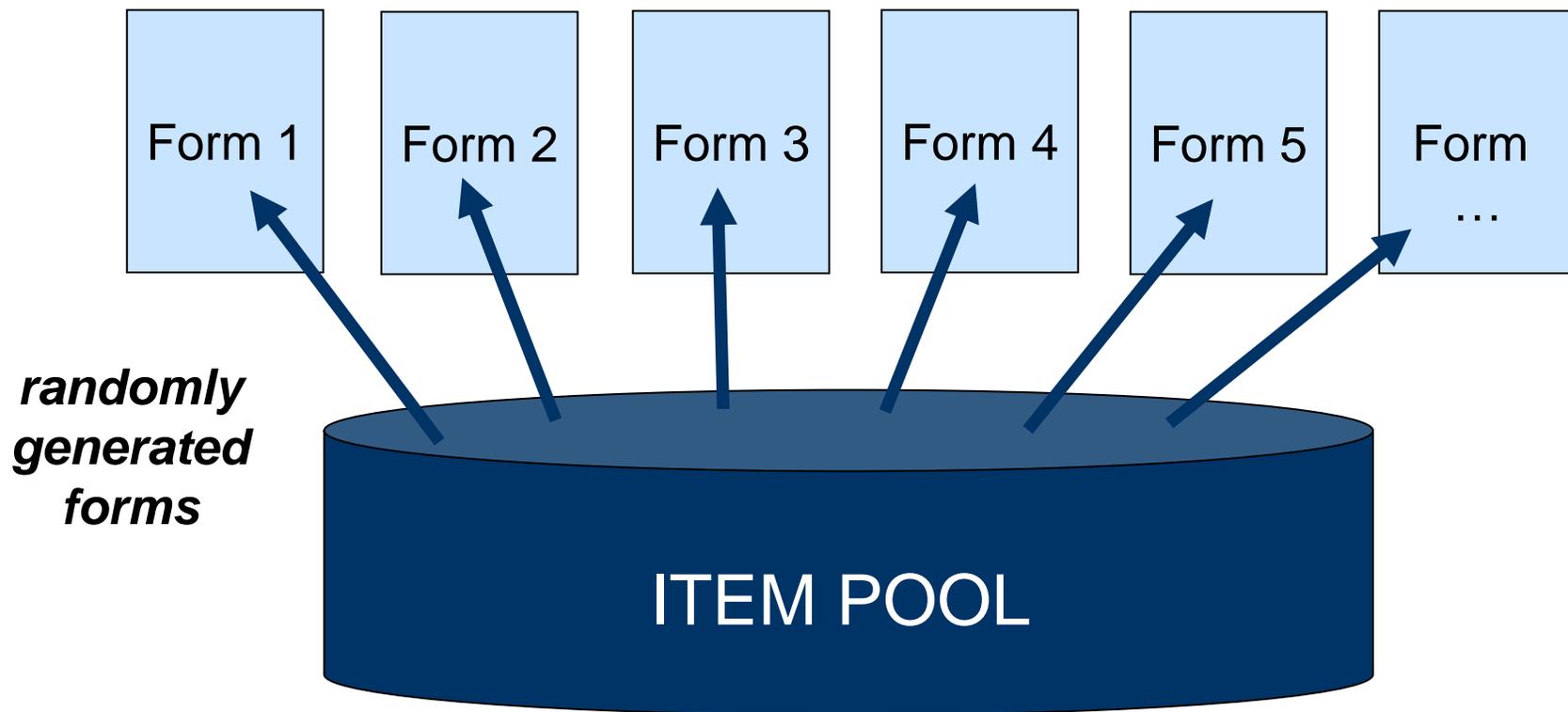
Anytime, Anywhere Delivery

- Tests delivered in a secured, proctored location by telephone or computer

- Test administration is easy
  - Instructions and test papers are created for administrator when tests are ordered
  - Administrator running the proctored location provides both to the test-taker when ready to begin
  - No complicated scheduling is required – the test administrator can have the test-taker complete the test at any time, from any authorized location

Versant Aviation English Demo Test
Call: 1-800-335-6393 or +1.415.738.3800

Test Identification Number
2872 0619

Introduction:
Thank you for calling the Ordinate testing system.
Please enter your Test Identification Number on the telephone keypad.
Now, please say the city and country you are calling from.
This is the Versant for Aviation English Demo Test. This test has 8 parts.
You will be asked several questions in each part. Now, the test will begin.
Please follow the instructions for Parts A through K.

Part A: Aviation Reading.
Please read the following radiotelephony messages when you are asked.
1. World Air 891, request descent.
2. World Air 891, maintain flight level 280 expect descent shortly.
3. Maintaining flight level 280, World Air 891.
4. World Air 891, descend flight level 120.

Part B: Common English Reading.
Please read the following English sentences when you are asked.
1. Our flight didn't start very well.
2. First there were some minor mechanical issues that needed to be resolved.
3. Then all outgoing flights were delayed because of the weather conditions.
4. When we finally took off hours later, it was a smooth flight all the way.

Part C: Repeat.
Listen to each sentence, then repeat it.
Example: when you hear: "My next flight is on Saturday."
you say: "My next flight is on Saturday."

Part D: Short Answer Questions.
Please give a simple answer to the question.
Example: when you hear: "Where in the airplane do the pilots control the aircraft?"
you say: "cockpit" or "in the cockpit".

Efficient, Simple Test-Taker Process

1. Test-taker receives test paper from proctor and reviews before starting

2. Candidate accesses the secure Ordinate® Testing System (telephone or computer)

3. Candidate enters unique Test Identification Number (TIN)

4. Candidate responds to the test questions or prompts to complete the test

Efficient, Automated Scoring

- Once the test-taker submits all responses to complete the test, it is sent to the patented Ordinate® Scoring System

- The test is automatically scored and usually available within minutes after the completed test is received

Two Versions of VAET Available Now

	Certification	Practice Placer
Purpose	The high stakes test used to assess the ICAO English language proficiency language level for official CERTIFICATION purposes. The test must be proctored, with appropriate test-taker identification and test security.	A low stakes version of the test that can be used: 1. to assess ICAO level and place individuals into the right level for training. 2. to allow test-takers to practice for the Certification test. 3. to use as an instructional activity within training.
Length	~25 to 30 minutes 78 questions	~15-20 minutes 54 questions
Content	Aviation Reading, Common English Reading, Repeats, Short Answer Questions, Readback, Corrections and Confirmations, Story Retelling, Open Questions	Aviation Reading, Common English Reading, Repeats, Short Answer Questions, Readback, Corrections and Confirmations, Story Retelling
Scoring	Most precise score, with reliability statistics based on field studies. Will produce the final ICAO language level, with a precise point score on a 10-to-70 point scale.	Estimate of what final score may be within a confidence range. Will produce an estimate of the current ICAO language level only. No point score is provided.
Security	Anonymous test IDs, secure test response capture, encrypted storage, secure reporting., Randomized test question generation	Anonymous test IDs, secure test response capture, encrypted storage, secure reporting. Uses a fixed form without random questions.

VAET – part of Jeppesen Solutions

1. **Full ICAO Language Certification Solutions**
   – for Airline, Corporate and General Aviation
   – tailored for pilots and air traffic controllers

| registering test-takers | test-taker authentication and ID verification | certification test delivery to test-taker | test certificate and score acceptance by local authorities | certification record-keeping, audit support |

test proctoring

Jeppesen

Ordinate
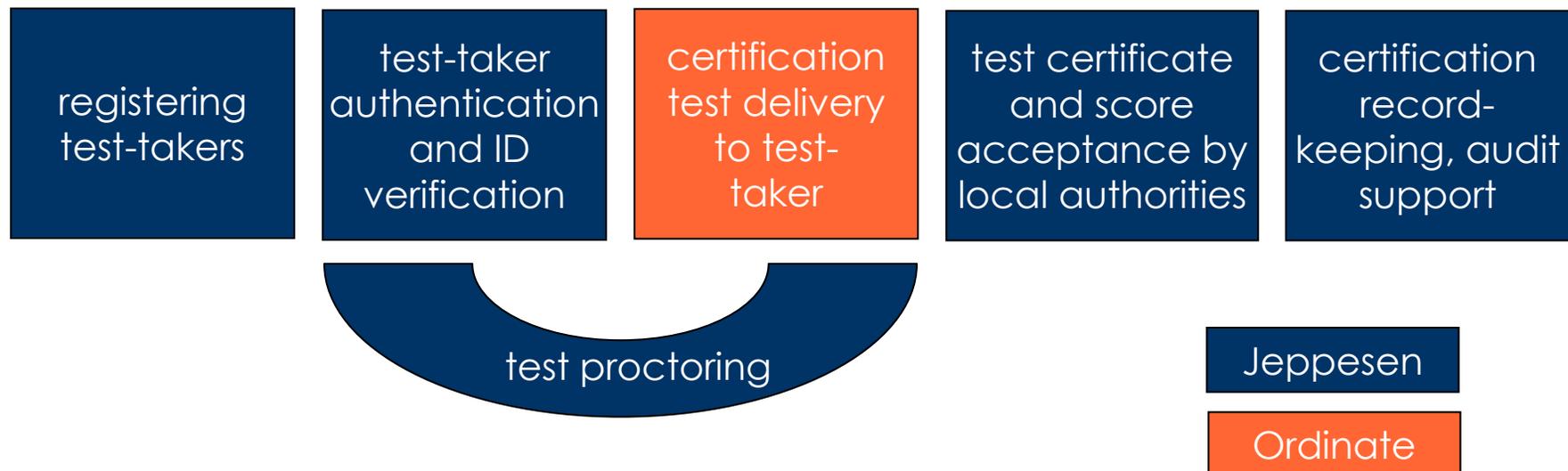
VAET – part of training programs

2. Preparation for ICAO Language Certification

Option A:

| placement test to see where people are | training if required | certification testing |

Option B:

| dry-run practice test before cert | certification testing | training if required | certification Re-testing |

Option C:

| training | practice test | training | practice test | certification testing |

| Training provider | Ordinate |
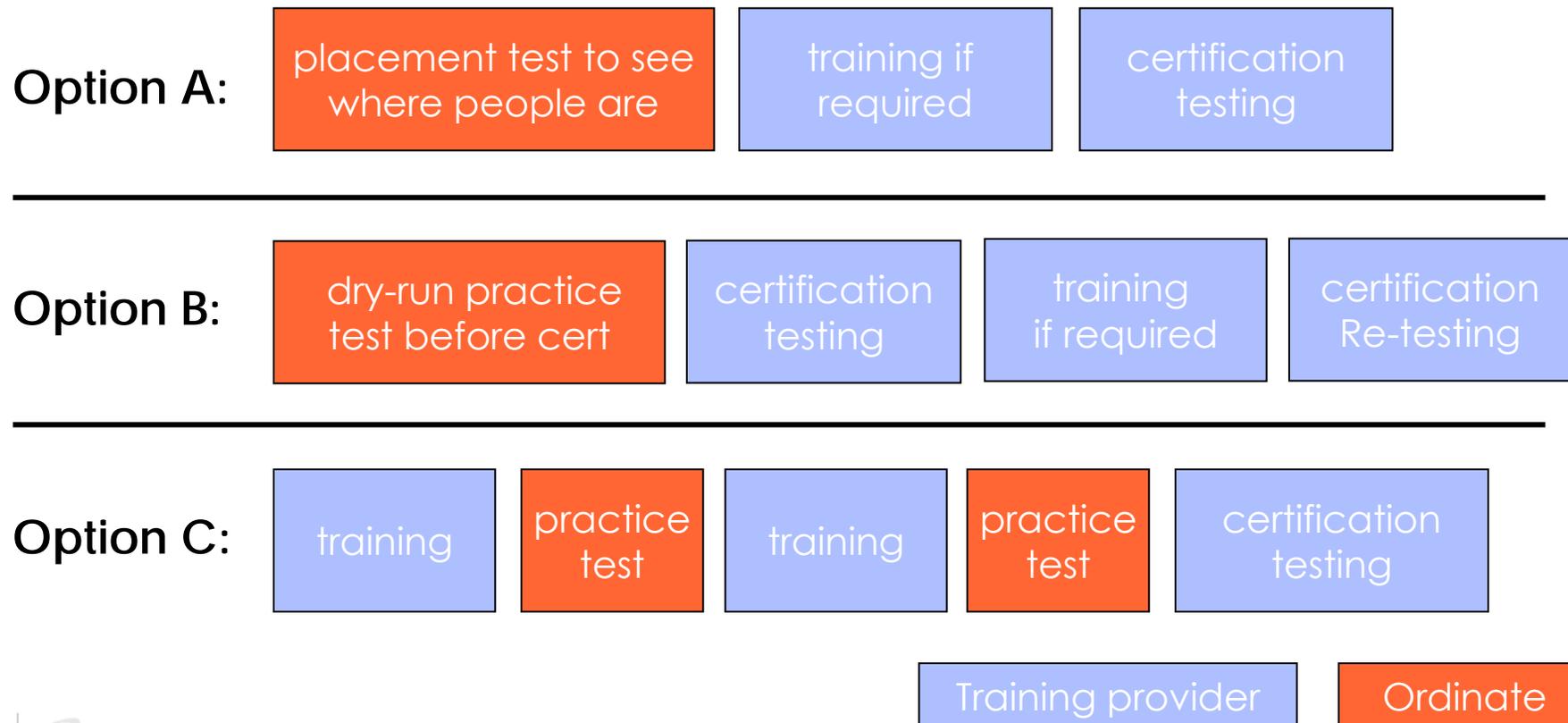
Versant™ Aviation English Test (VAET)

Demonstration

VAET Demo

PART A: AVIATION READING

You will be asked to read three aviation specific messages in a random order from among those printed in Part A. Read the messages out loud smoothly and naturally.

Sample:

1. World Air 891, request descent.
2. World Air 891, maintain flight level 280 expect descent shortly.
3. Maintaining flight level 280, World Air 891

LISTEN

VAET Demo

PART B: COMMON ENGLISH READING

You will be asked to read three sentences in a random order from among those printed in Part B. Read the messages out loud smoothly and naturally.

Sample:

1. The Lee sisters are flying to Seoul this summer for a family reunion.
2. Our flight didn't start very well.
3. Then all outgoing flights were delayed because of the weather conditions.

LISTEN

VAET Demo

PART C: REPEAT

You will hear 16 sentences in this section, one at a time. Repeat each sentence you hear – exactly as you hear it. If you can't repeat the whole sentence, repeat as much of the sentence as you can.

For example:

When you hear: *"My next flight is on Saturday."*
You say: *"My next flight is on Saturday."*

Sample: ((( ))) LISTEN

VAET Demo

PART D: SHORT ANSWER QUESTIONS

In this section, you will hear 24 short questions. Answer each question with a single word or a short phrase of two or three words.

For example:
When you hear: *"Where in the airplane do the pilots control the aircraft?"*
You say: *"cockpit" or "in the cockpit"*

Sample: ((( ))) LISTEN

VAET Demo

PART E: READBACK

You will hear several spoken radiotelephony messages. Say an appropriate readback after each one. For each question, a call sign is printed on the test sheet for your information. Use this call sign to say an appropriate readback.

For example:

The test sheet shows a call sign: Cessna 29
When you hear: *"Cessna two niner, exit taxiway Hotel.",*
one possible answer is: *"Exit taxiway Hotel, Cessna two niner."*
or another possible answer is: *"Exiting taxiway Hotel, Cessna two niner."*

Sample:

Global Air 295   ((( ))) **LISTEN**

VAET Demo

PART F: CORRECTIONS AND CONFIRMATIONS

In this task, you will hear a radiotelephony exchange between two speakers, Speaker 1 and Speaker 2. The speakers are a pilot and an air traffic controller, but not necessarily in that order. Speaker 1 speaks first, then Speaker 2 responds next. If Speaker 2's response includes wrong information, correct that information. If Speaker 2's response includes a question or request, respond appropriately. For each question, a call sign is printed on the test sheet for your information.

For example:

The test sheet shows a call sign:	**East Global Air 295**
When you hear:	*East Global Air 295, contact radar 125.*
One possible answer is:	*East Global Air 295, negative, contact Radar 122.15.*
OR another possible answer is:	*East Global Air 295, I say again, 122.15.*

Sample:

Gulf ABCJ   ((•)) LISTEN

VAET Demo

PART G: STORY RETELLING

You will hear four stories. After each story, retell it as best you can in your own words in English. Each story will be read only once. After you hear a beep, you will have 30 seconds to retell the story.

Sample: ((( ))) LISTEN

VAET Demo

PART H: OPEN QUESTIONS

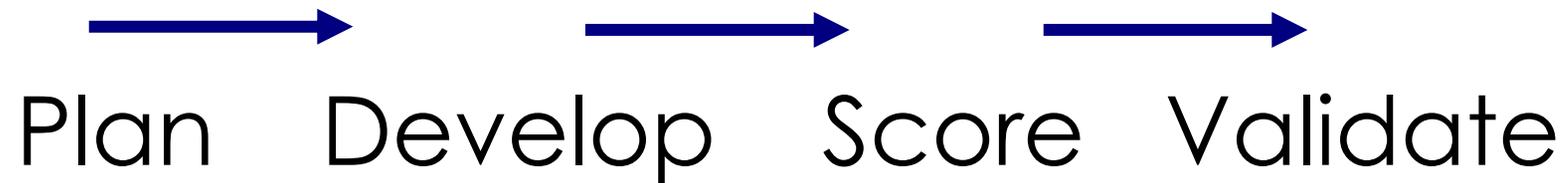You will hear two questions. After you hear a beep, speak your opinion as fully and clearly as you can. You will have 30 seconds to answer. Express your opinion and supporting reasons in clear, coherent English. Try to speak for the whole 30 second period.
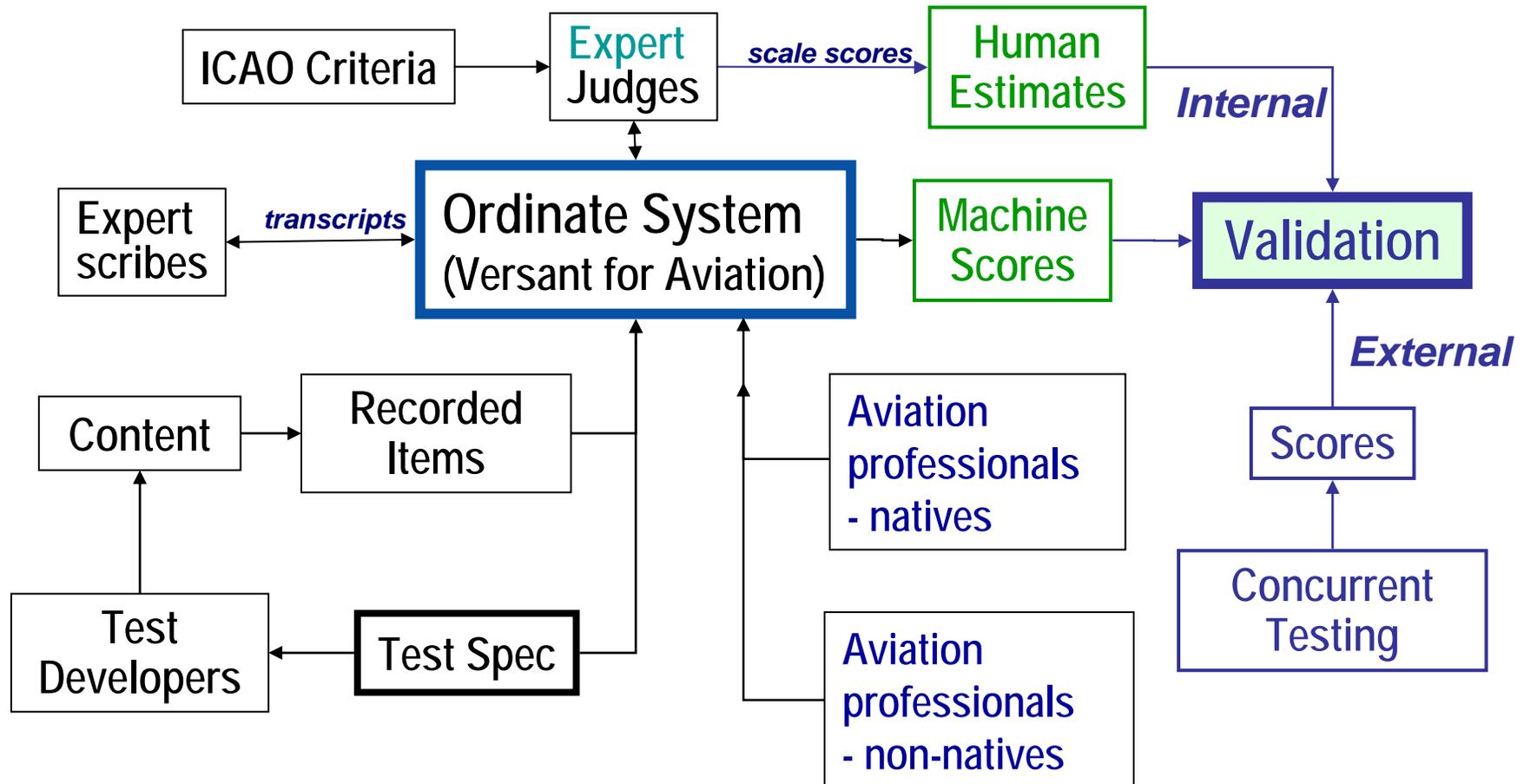
Sample: ((( ))) **LISTEN**

Versant™ Aviation English Test (VAET)

Test Development Process

Development Process

Plan → Develop → Score → Validate

Development Process

```
ICAO Criteria  →  Expert        scale scores    Human
                  Judges                        Estimates         Internal

Expert          transcripts    Ordinate System              Machine          Validation
scribes                        (Versant for Aviation)        Scores

                                                                              External

Content    →  Recorded                    Aviation                          Scores
              Items                        professionals
                                           - natives
Test                                                                         Concurrent
Developers  ←  Test Spec                   Aviation                          Testing
                                           professionals
                                           - non-natives
```

ORDINATE

Development Expertise

| Education	Experience
Ph.D., Linguistics	University professor specializing in applied linguistics and language testing, especially in the aviation domain
Ph.D., Psycholinguistics	10+ years of experience developing and conducting research on second/foreign language tests
M.A., TESOL	4+ years of experience developing and conducting research on second/foreign language tests
Ph.D., Psychology	3 years of experience developing and conducting research on second/foreign language tests
Occupation	Experience
Program manager for aviation language training, ICAO committee member	25 years of experience in human resource development and language training
Consultant for ICAO English language competency project	30+ years of experience as Air Traffic Control Officer in the UK and Australia
Pilot	10+ years of experience as pilot in the UK
International air traffic training program manager	10+ years of experience in international air traffic training
Policy and program officer for government English language center	25+ years experience developing curriculum for aviation English language training

Item Development
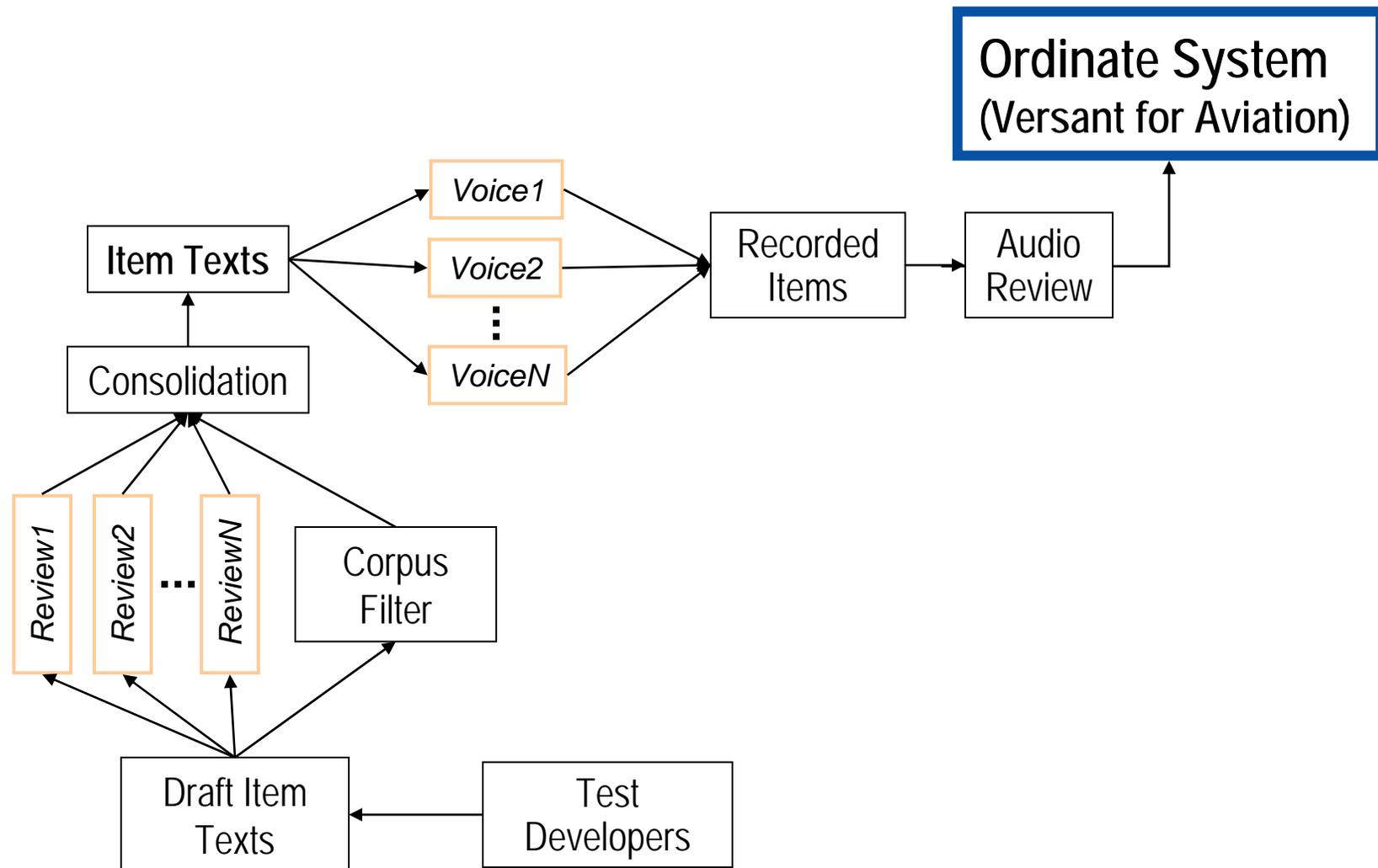
Coverage and Representativeness

OSU corpus

- Radiotelephony transcripts (235,000 words)
- Aviation standard publications (338,000 words)
- General aviation publications (258,000 words)

Item Development
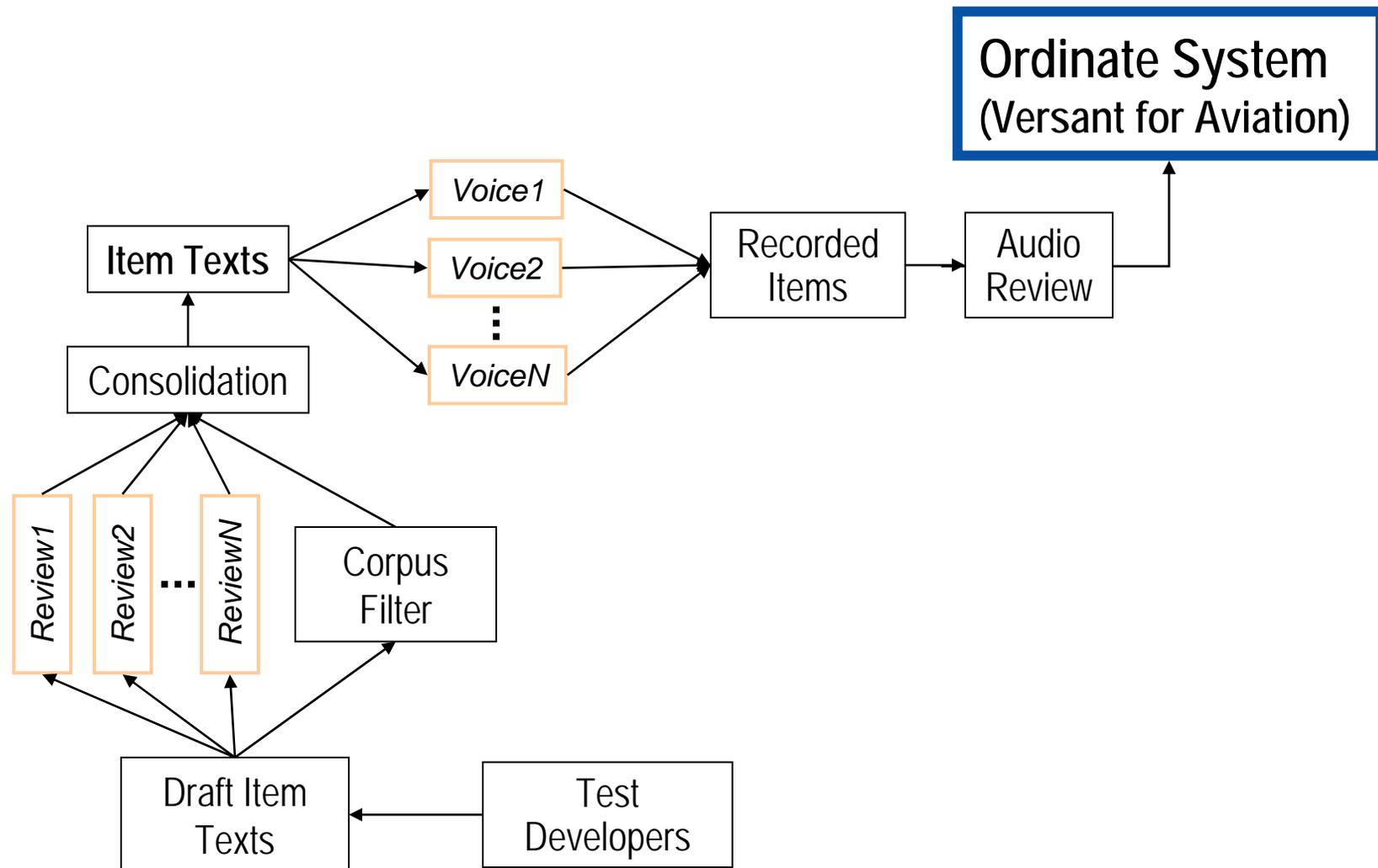
Field Testing

- Period: September 2006 – February 2007
- Participants: 1,250 professionals
  - Pilots and air traffic controllers
  - Both native and non-native English speakers
    - Native English speakers (about 38%)
    - Non-native English speakers (about 62%)
  - 90 different native countries (by birth place)
  - 50 different native languages (by L1)

Versant™ Aviation
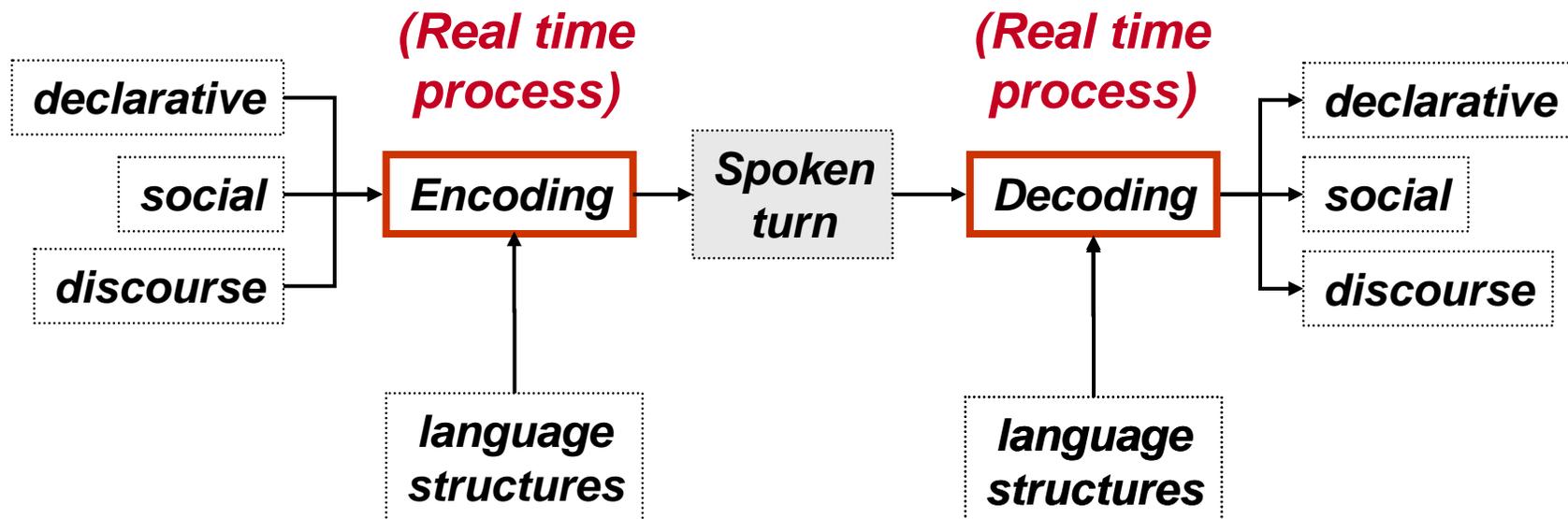# English Test (VAET)

The Construct

Construct Validity

- ICAO rating scales
- Aviation corpus
- Target Language Use domain:
  - Aviation phraseology
  - Common English in the aviation domain
  - Routine & non-routine situations
- Real-world tasks
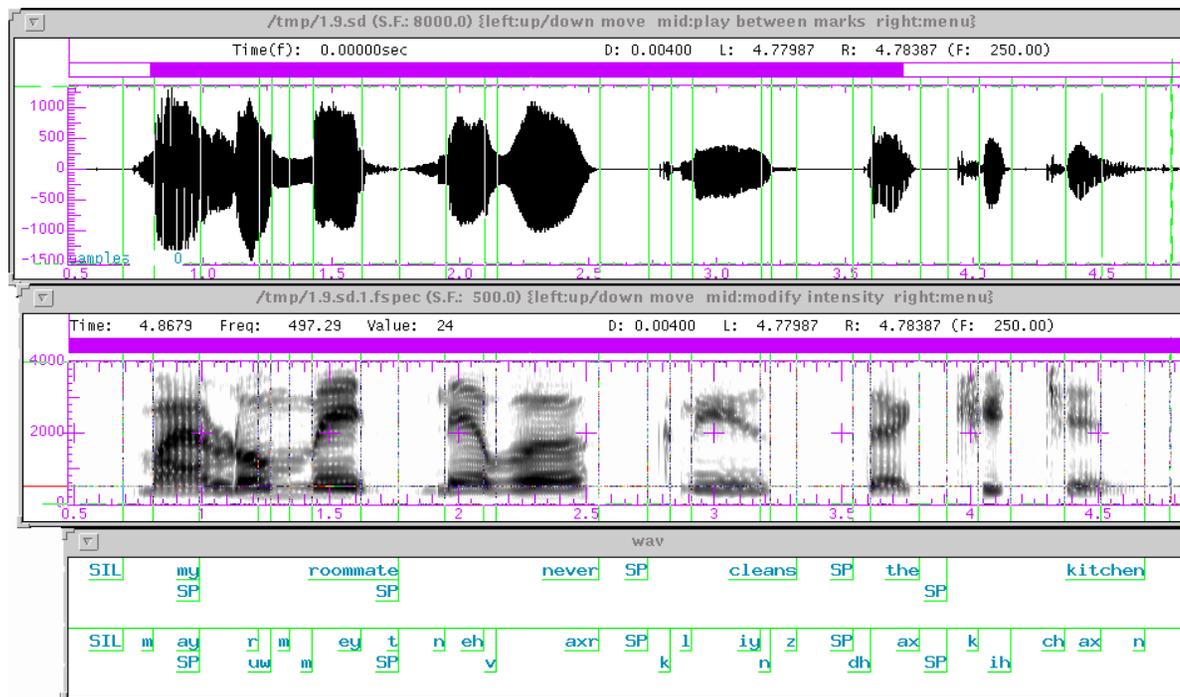
Psycholinguistic Construct

– Real-time receptive and productive processing

- Access and retrieve lexical items
- Build phrases and clause structures
- Articulate responses

..... without attention to the linguistic code (automaticity)

Construct: ability to track what is said, extract meaning in real time, and formulate and produce relevant, intelligible responses, at a conversational pace

(Real time process)   **(Real time process)**

declarative					declarative
social	→	**Encoding** → **Spoken turn** → **Decoding**	→		social
discourse					discourse

language structures   *language structures*

Phoneme & Word Alignment

Construct Definition

"The Versant Aviation English Test is designed to measure facility in spoken aviation English and common English in the aviation domain; that is, the ability to understand spoken English both with regard to aviation radiotelephony phraseology and topics related to aviation (such as movement, position, time, duration, weather, etc.), and the ability to respond appropriately in intelligible English at a fully-functional pace."

(Test Description and Validation Summary, page 10)

Versant™ Aviation English Test (VAET)

Test Validation and Reliability Research

Validation

- ## Participants: 140 professionals
  - Pilots and air traffic controllers
  - Non-native English speakers
  - Representative of a variety of native languages

Criterion Validity

- Do the scores correlate with other measures of the same construct?

YES: VAET scores correlate highly with human ratings

Machine scores versus human scores (n=140, r=0.94)

N = 140
r = 0.94
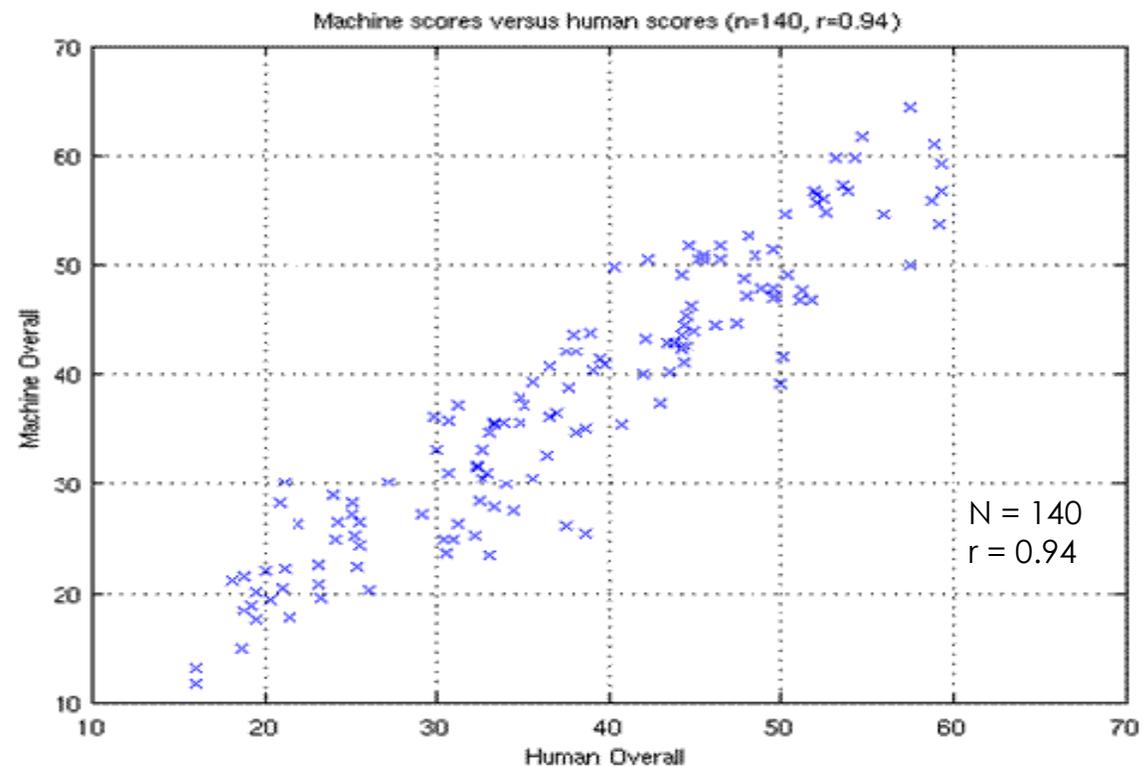
VAET Reliability

- Reliability = consistency of measurement

Split-Half Reliability by Score Type	VAET	Aviation human rated
Vocabulary	0.89	0.89
Structure‡	0.82	0.84
Fluency	0.95	0.97
Pronunciation	0.97	0.98
Comprehension	0.88	0.87
Interactions	0.88	0.89
Overall FINAL	0.93	0.92

‡ The "Structure" sub-skill in VAET is similar to the "Sentence Mastery" sub-skill in Versant for English

Discrimination

- Can the test distinguish groups with and without the ability being measured?

YES: VAET distinguishes between native and non-native English speakers
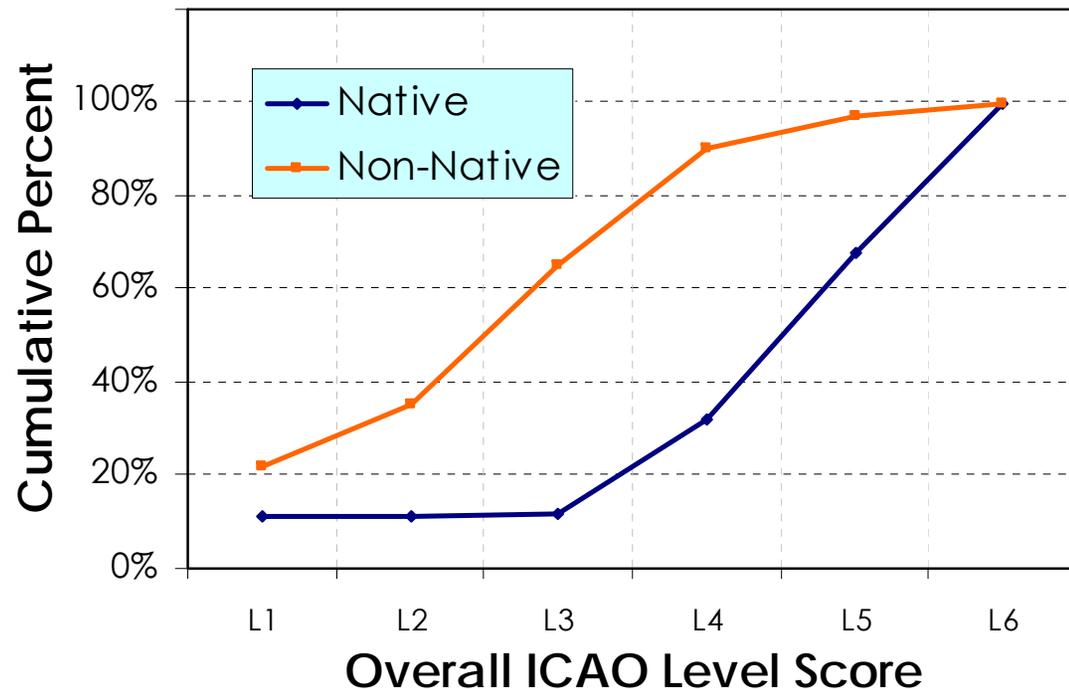
Questions?

For more information

- Learn more about Ordinate and our tests at www.ordinate.com

- If you would like more detail by reading the "VAET Test Description and Validation Summary" document, please bring us a business card at the end of this session.

- Contact us for more information:
  Alistair Van Moere – avanmoere@ordinate.com
  Mark Engelter – mark_engelter@ordinate.com

THANK YOU!

Scoring

Reading	Pronunciation
Repeat	Structure
Short Answer Questions	Vocabulary
Readbacks	Fluency
Corrections and Confirmations	Comprehension
Story Retellings	Interactions