



Introduction to the **Center for the Study of Adult Literacy**

Daphne Greenberg
COABE CONFERENCE
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Investigators

□ **Principal Investigator**

- Daphne Greenberg, Ph.D., Associate Professor, Educational Psychology, Georgia State University (GSU)

□ **Co-Principal Investigators**

- Lee Branum-Martin, Ph.D., Associate Professor, Psychology, GSU
- Maureen Lovett, Ph.D., C.Psych., Senior Scientist, The Hospital for Sick Children and Professor, Pediatrics and Medical Sciences, University of Toronto
- Art Graesser, Ph.D., Professor, Psychology and Institute for Intelligent Systems (IIS), University of Memphis (UM)
- Jan Frijters, Ph.D., Associate Professor, Child and Youth Studies, Brock University

□ **Co-Investigators**

- Chis Oshima, Ph.D., Professor, Research and Measurement, GSU
- Robin Morris, Ph.D., Associate Provost, Regents Professor of Psychology, GSU
- Xiangen Hu, Ph.D., Professor, Psychology/IIS, UM
- Mark Conley, Ph.D., Professor, Leadership and Curriculum/IIS, UM
- Andrew Onley Ph.D., Assistant Professor and Associate Director of IIS, UM

Advisors and Other Partners

Advisors

- ❑ Dr. Marcia Barnes, University of Texas—Houston Health Sciences
- ❑ Dr. Donald Compton, Vanderbilt University
- ❑ Ms. Bernikeya Clifton, Literacy Action, Inc.
- ❑ Dr. Stephen Reder, Portland State University
- ❑ Dr. David Rosen, President, Newsome Associates, Jamaica Plain, Massachusetts
- ❑ Mr. Glen McLeod and Ms. Léa Lacerenza, Toronto Catholic District School Board
- ❑ Adult Literacy Teacher, TBD

Partners

- ❑ Texas Institute for Measurement and Evaluation Statistics (TIMES)
- ❑ American Institutes for Research (AIR)

Mission

CSAL is committed to understanding the reading-related characteristics that are critical to helping adult learners reach their reading goals and to developing instructional approaches that are tailored to adult learners' needs and interests.

CSAL Projects

- ❑ Explore the reading skills as well as the underlying motivational and cognitive attributes of adult learners.
- ❑ Refinement and development of a multiple-component reading intervention that includes a web-based, animated, e-tutor.
- ❑ Pilot testing of the reading intervention.
- ❑ Supplemental studies.
- ❑ Dissemination activities.

Research Questions

- ❑ What are the relative underlying cognitive strengths and weaknesses of adults who struggle with reading?
- ❑ To what extent are there identifiable individual differences in the adults' patterns of strengths and weaknesses?
- ❑ To what extent do the items on tests appropriately measure the intended skills in the ways intended by the developers?
- ❑ Do the items coherently measure a unitary trait in the manner intended?
- ❑ To what extent do some items exhibit unfavorable characteristics, such as extreme difficulty or a lack of sensitivity?
- ❑ To what extent do the items function in a way that is practical for test administration?
- ❑ What is the structure of motivation for this population?
- ❑ How do individual differences in motivation relate to the cognitive and reading skills of adult struggling readers?

Research Questions

- ❑ To what extent is the research-based intervention developed in this project more effective than typical methods used for adult learners?
 - ❑ What are the growth rates and nature of change in reading skills through intervention?
 - ❑ Which of the cognitive and motivational skill predictors explain person-to-person variability in those growth rates?
 - ❑ Are significant gains made across pretest, midpoint , and posttest points independent of reading instruction?
 - ❑ Are there growth rate differences between the intervention group and the control group on the posttest measures?
- ❑ Which measures effectively identify students who are appropriate for the intervention, and which measures effectively assess student learning outcomes?

Learning that is multidimensional and a focus that changes over time

LANGUAGE
COMPREHENSION

BACKGROUND KNOWLEDGE
(facts, concepts, etc.)

VOCABULARY
(breadth, precision, links,
etc.)

LANGUAGE STRUCTURES
(syntax, semantics, etc.)

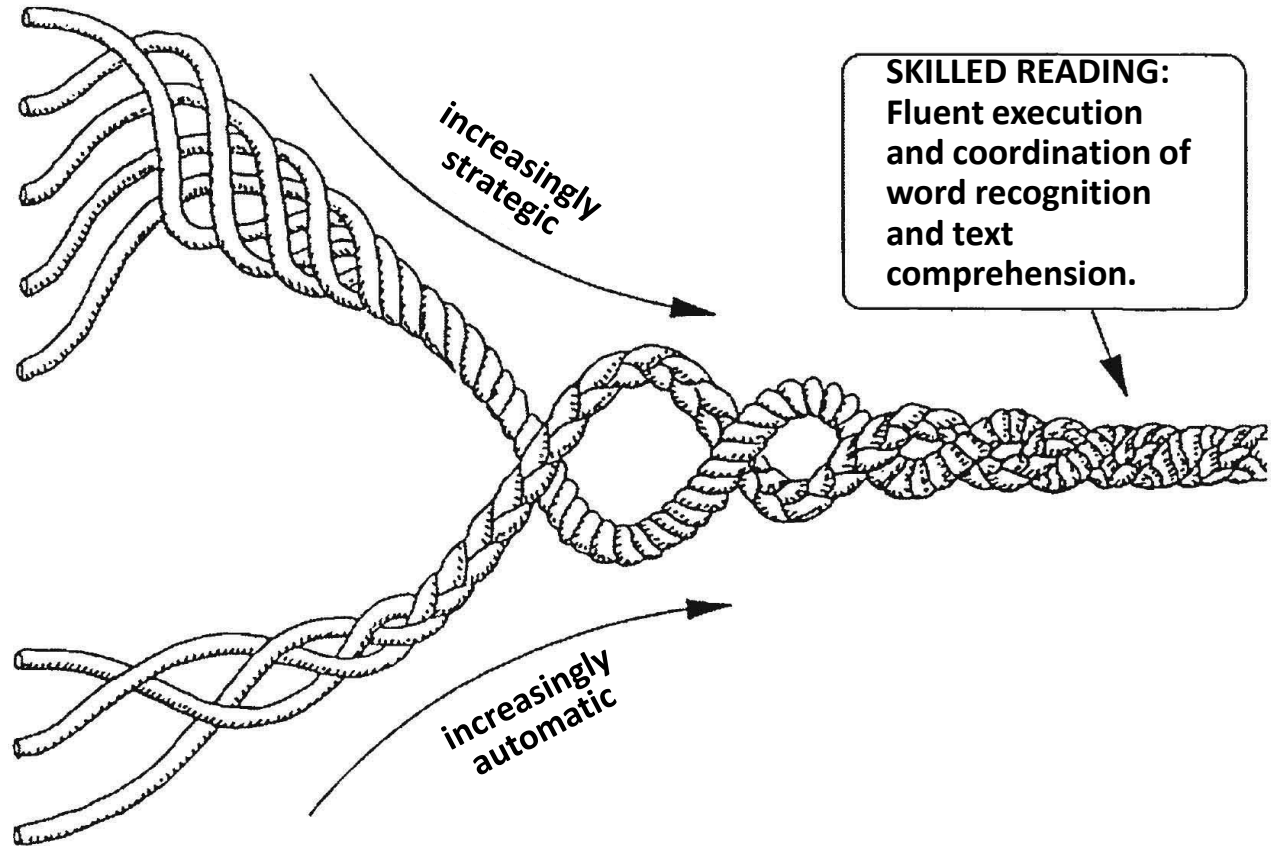
VERBAL REASONING
(inference, metaphor, etc.)

LITERACY KNOWLEDGE
(print concepts, genres, etc.)

WORD RECOGNITION
PHONOLOGICAL AWARENESS
(syllables, phonemes, etc.)

DECODING (alphabetic
principle, spelling-sound
correspondences)

SIGHT RECOGNITION
(of familiar words)



Hollis Scarborough (2003)

Motivation

- ❑ Motivation plays a critical role in literacy learning.
- ❑ Not heavily studied.
- ❑ We focus on three motivational constructs:
 1. Self-reported motivation for reading
 - ❑ Interest, avoidance, task value, perceived difficulty and goal orientation
 2. Attributions for success and failure with reading
 - ❑ What reasons do adult readers give for successes and failures in reading?
 3. Affective episodes
 - ❑ What role do the memories and emotions of past reading experiences play in the present?

Testing

- ❑ To clarify the appropriateness of the use of a wide array of standardized reading, motivational, and cognitive assessments with adult literacy learners.
- ❑ To provide clarity on the cognitive and motivational profiles of adult literacy learners.



Testing

500 Adult Literacy Students

- ❑ 250 in Toronto, 250 in Atlanta
- ❑ Reading between 3rd and 8th grade levels
- ❑ Non-native speakers and native speakers



Testing of Lower-Level Components of Reading

- ❑ Phonological Awareness
- ❑ Morphological Awareness
- ❑ Decoding
- ❑ Irregular Word Reading
- ❑ General Word Reading Accuracy
- ❑ Vocabulary
- ❑ Word Reading Fluency
- ❑ Connected Text Fluency

Testing of Higher-Level Components of Reading

- ❑ **Written Comprehension**
- ❑ **Oral Comprehension**
- ❑ **General Knowledge/Background Information**
- ❑ **Reasoning**
 - ❑ Nonliteral Language
 - ❑ Meaning from Context
 - ❑ Inference
 - ❑ Ambiguous Sentences
- ❑ **Memory**
 - ❑ Long-Term Memory Retrieval
 - ❑ Short-Term Memory Retrieval
 - ❑ Working Memory/Division of Memory/Attentional Control

Cognitive and Motivational Functioning

Motivation and Other Influences

- ❑ Expectancy Value Questionnaire (EVQ: Eccles & Wigfield, 1995; 2002)
- ❑ Intrinsic Motivation Inventory (IMI: Ryan, 2002)
- ❑ Reading Motivation Scale (RMS: Guthrie & Wigfield, 2009)
- ❑ Affective Episode Interview (Gorges & Kandler, 2012)
- ❑ TBD attribution measure based on ecologically-valid behavioral vignettes
- ❑ Demographic Questionnaire
- ❑ Reading Practices Questionnaire
- ❑ Computer Familiarity

Our Philosophy

- ❑ Guided by Competence Motivation (Elliot & Dweck, 2005) and Self-Determination Theory (Deci & Ryan, 2002)
 - ❑ Goals/interests
 - ❑ Engagement in, and persistence with reading tasks
 - ❑ Cognitive attributions for success and failure
- ❑ All learners should feel that:
 - ❑ The instructional experience meets their own needs, interests, and goals
 - ❑ Is a worthwhile investment of personal time and energy, which are often limited by competing demands in their lives
- ❑ Therefore, we plan on:
 - ❑ Providing the learner control over approaches to difficult reading tasks and what he/she reads and works on
 - ❑ Supporting autonomy by ensuring that the learner sees progress in their own skills
- ❑ Each learner will meet with the instructor at regular intervals to:
 - ❑ Review testing results
 - ❑ State their interests and needs
 - ❑ Formulate personal goals

Developing instruction to meet the needs of adult struggling readers

The starting point

- ❑ Effective instruction starts with an evidence-based model of what is involved in becoming a skilled reader. What must be learned?
- ❑ Effective instruction builds upon research on what helps adults better learn new skills and knowledge.
- ❑ Effective instruction meets the needs and goals of the learners, and is tailored when possible to their different goals and profiles.

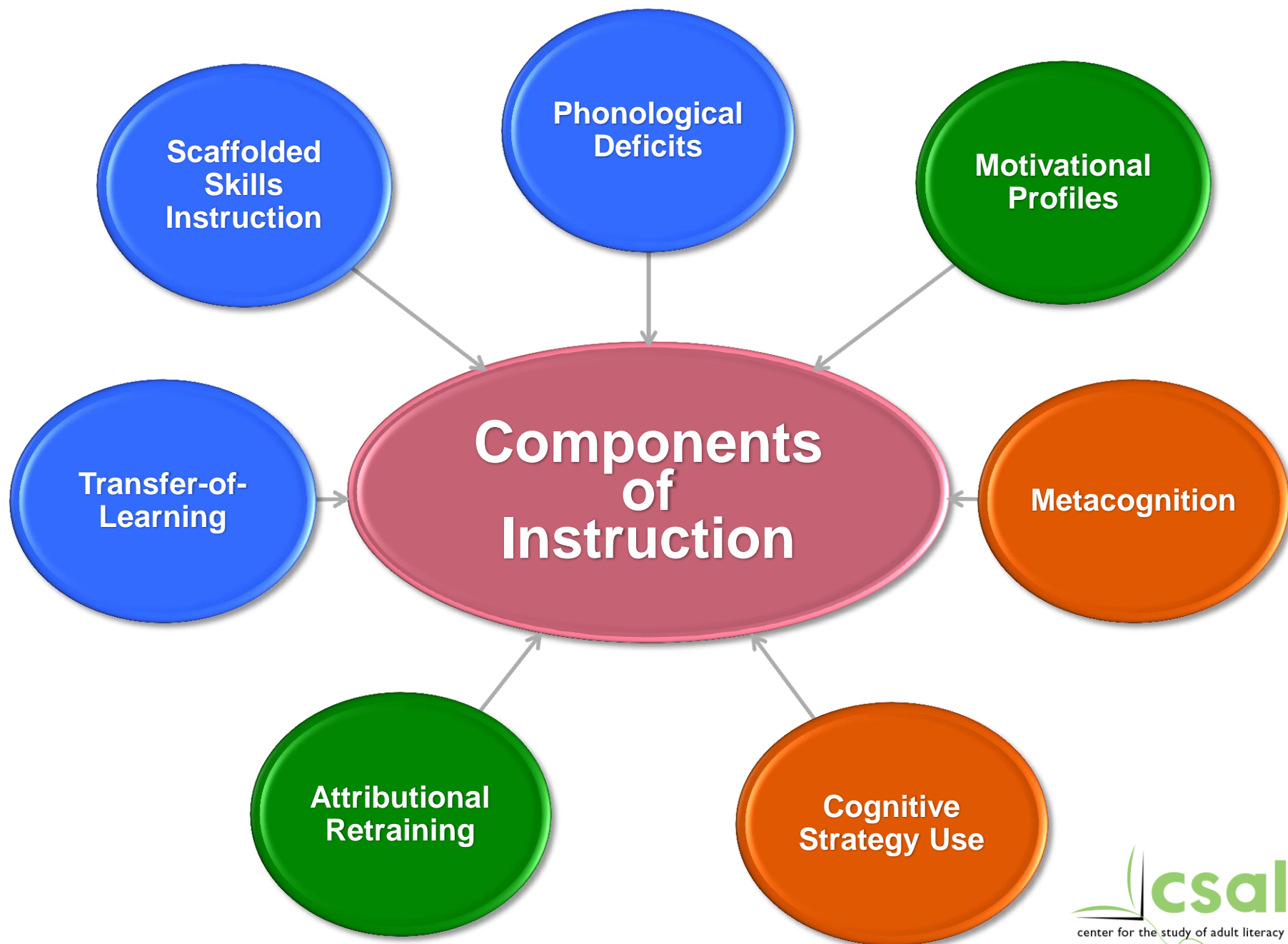
Developing instruction to meet the needs of adult struggling readers

The many challenges

- ❑ Making instruction relevant to their goals
- ❑ Designing and using materials of interest
- ❑ Addressing gaps in foundational skills, strategies, and knowledge
- ❑ Structuring learning tasks that will generate motivation to engage and maintain effort
- ❑ Celebrating tangible success and providing a cognitive framework for failures
- ❑ Maximizing outcomes from whatever time the adult learner can devote to instruction and practice

Components of the Instructional Framework

- ❑ Word attack skills and decoding strategies
- ❑ Vocabulary knowledge
- ❑ Knowledge of text structures and conventions
- ❑ Reading comprehension strategies
- ❑ Individualization of instruction through the use of intelligent tutoring technology
- ❑ Motivation and engagement in literacy learning activities
- ❑ Choice in text and topic selection





Reading Intervention in High School

A reading program for teens
who are struggling readers



Designed to specifically address
literacy learning problems in adolescents

To date, more than 3000 students have
received instruction in high schools
across Ontario

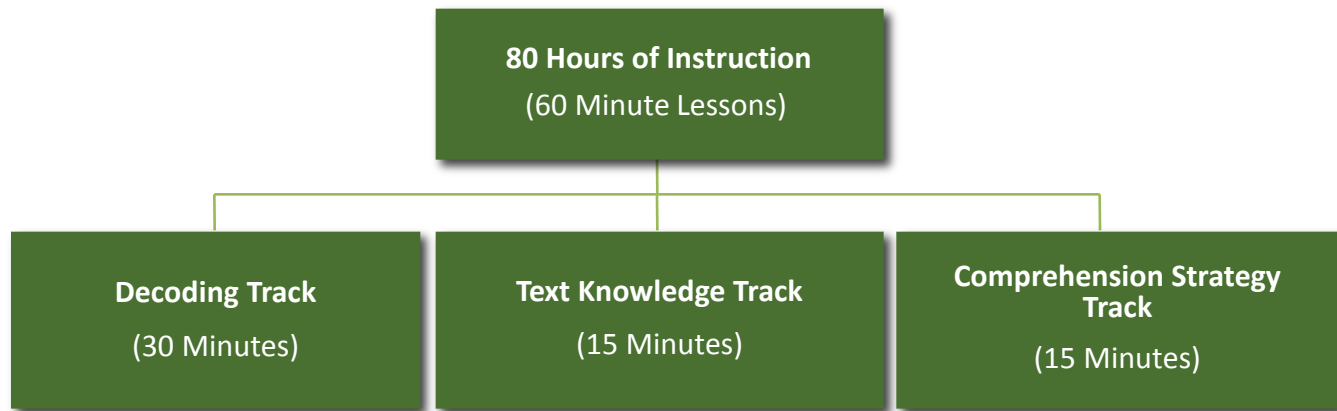
PHAST PACES is the research version of Empower™ Reading High School

Empower™ © The Hospital for Sick Children 2006



Empower™ Reading: High School

An intervention for struggling readers in high school



(Lovett, Lacerenza, De Palma, & Frijters, *JLD*, 2012)

Findings from Our High School Study

- ❑ Significant gains on standardized word attack, word reading, and passage comprehension tests following PHAST PACES
- ❑ Significant gains in letter-sound knowledge and multisyllabic word identification
- ❑ Average effect size of .68 across outcomes
- ❑ At one year follow-up, passage comprehension showed continued growth
- ❑ Variability of outcomes among high school participants

(Lovett, Lacerenza, De Palma, & Frijters, *JLD*, 2012)

New Directions in Intervention Design

- ❑ PHAST PACES as a starting point
- ❑ Some instruction from human instructor in small groups
- ❑ Comprehension instruction using an intelligent tutoring system (AutoTutor)
- ❑ Text repository for our adult learners

Text Selection

- ❑ Critical to good instruction
- ❑ Related to both cognition and motivation
 - ❑ Interesting
 - ❑ Relevant to adult lives
 - ❑ Multiple purposes
 - ❑ Not too easy or too difficult
- ❑ Different genres, media, and technologies



Questions about Text Selection

- ❑ What texts are in use for various purposes in adult literacy centers?
- ❑ What web-based texts are available through various commercial, government and adapted resources?
- ❑ How should texts be rated for relevance and level?
- ❑ How do we establish a repository and make it accessible to motivated students?

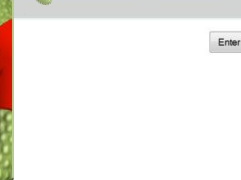
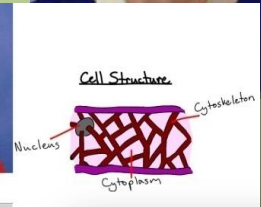
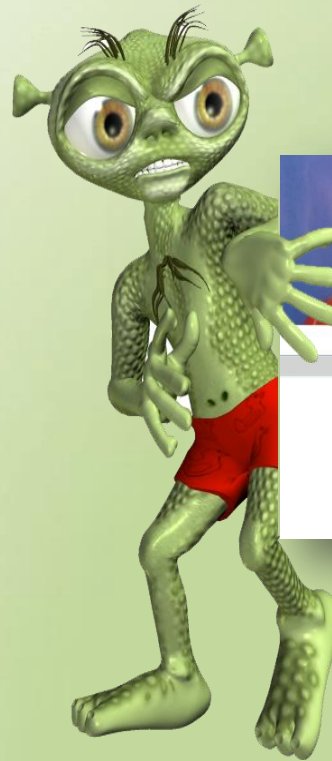
Steps to Build Repository

- ❑ Administer adult literacy text survey.
 - ❑ Embedded categories related to topic and genre
 - ❑ Skills and center practices
- ❑ Solicit ideas and examples from publishers, government agencies, other centers, and local adult literacy centers.
- ❑ Create an annotated list of resources.
- ❑ Develop analysis categories.
 - ❑ Topics (such as health, employment, parenting, hobbies)
 - ❑ Tasks (including filling out forms)
 - ❑ Text difficulty and characteristics with Coh-Metrix-TEA

Intervention with AutoTutor

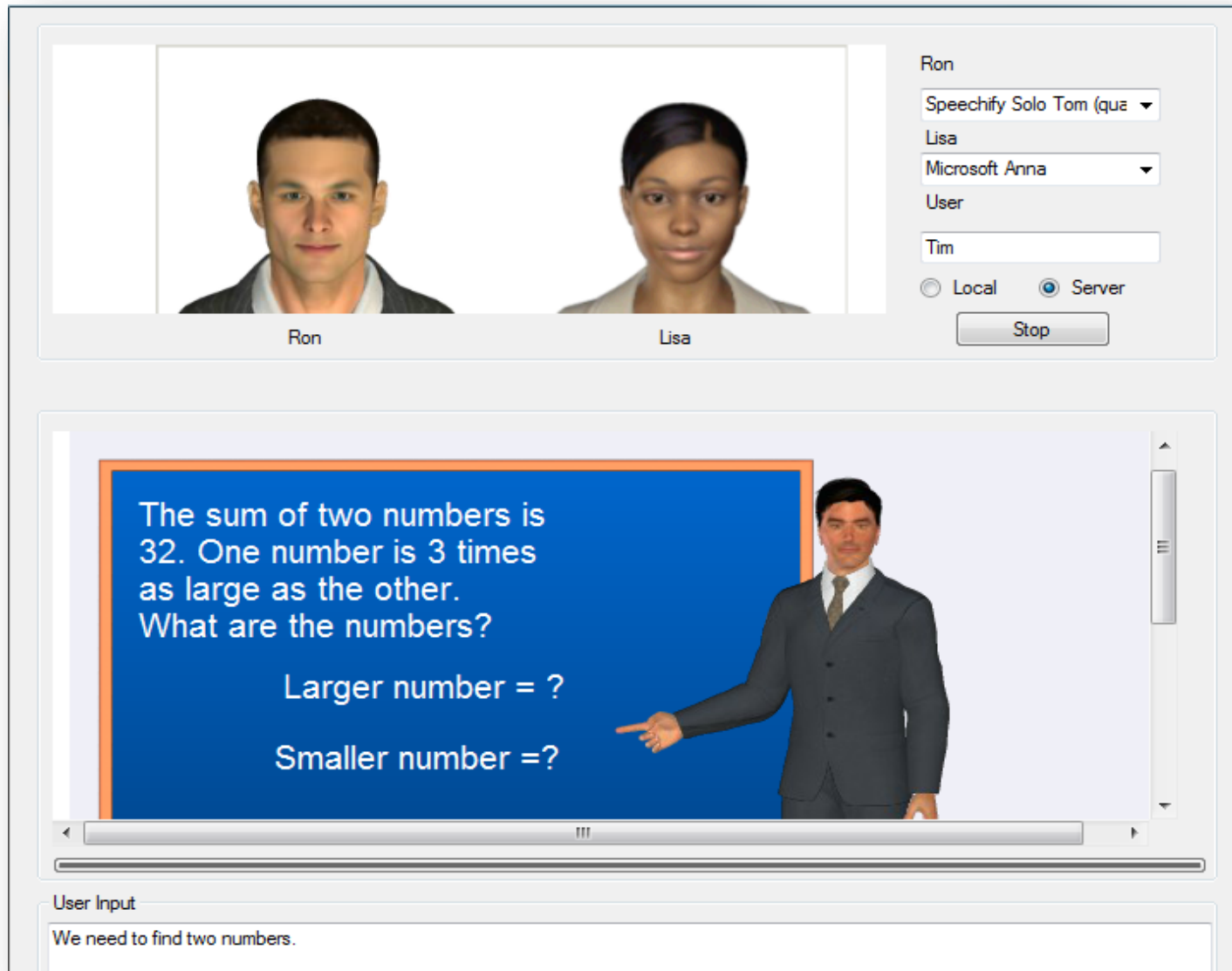
(Graesser, D'Mello, Hu, Cai, Olney, & Morgan, 2012)

- ❑ Conversational agents
- ❑ Intelligent Tutoring System
- ❑ Online through browser
- ❑ Media include texts, diagrams, videos, quizzes, games, and social media
- ❑ Adults communicate by typing, speaking, or pointing/clicking



Trialogs

Two or more agents
are often better than one agent



The interface displays two avatars, Ron and Lisa, in a video call window. To the right of the avatars is a control panel with the following settings:

- Ron: Speechify Solo Tom (qua)
- Lisa: Microsoft Anna
- User: Tim
- Local: ☐ Server: ☒
- Stop button

The main display area shows a presentation slide with a blue background and white text. The text on the slide reads:

The sum of two numbers is 32. One number is 3 times as large as the other.
What are the numbers?

Larger number = ?
Smaller number = ?

A third avatar, Tim, is standing next to the slide, pointing at the text.

At the bottom of the interface, there is a "User Input" section with the text:

We need to find two numbers.

How AutoTutor Works

- ❑ Evaluating and Responding to Student Contributions
 - ❑ Advances in computational linguistics
 - ❑ Content knowledge, skills, strategy use, emotions, motivation
 - ❑ Individualized instruction by responding to the student's answers adaptively
- ❑ Conversation Patterns
 - ❑ Interacts with students by questioning, hinting, eliciting information, filling in gaps, correcting the student
 - ❑ Indirect feedback
 - ❑ Intelligent conversational scaffolding
- ❑ Multiple Agents (Trials)
 - ❑ Human, student agent, and teacher agent
 - ❑ Vicarious learning
 - ❑ Teacher interacts with human and student agent
 - ❑ Human teaches student agent, with teacher agent intervening
- ❑ Multiple Media

AutoTutor Script Authoring Tool (ASAT)

- ❑ Define agents
- ❑ Define types of student inputs
- ❑ Create rigid conversation scripts between agents
- ❑ Create adaptive conversation scripts that include human interaction
- ❑ Create conversation rules
- ❑ Link to Media

ASAT - The University of Memphis

File Tool Help

Script 1.xml

Agents SAC RigidPack TutoringPack Rule Xml Media

Agent: Lisa

Lisa

First name: Lisa Last name: Brown

Gender: Female Title: Ms.

Display name: Lisa

Canned expressions

	Name	Text	Speech
▶ 1	PositiveFeedback	I agree!	I agree!
2	PositiveFeedback	I agree!	I agree!
3	PositiveFeedback	Yeah!	Yeah!
4	MetaComRsp	Once again.	Once again.
5	MetaComRsp	Once more.	Once more.
6	MetaComRsp	Let me say that again.	Let me say that again.
7	MetaComRsp	Let me repeat.	Let me repeat.
8	MetaComRsp	Okay.	Okay.
9	PromptStart	I bet you know this.	I bet you know this.
10	PromptStart	I don't get this.	I don't get this.
11	PromptStart	I bet you can get this.	I bet you can get this.
12	PromptStart	See if you know the answer to this.	See if you know the answer to this.
13	PromptStart	I bet you know the answer to this.	I bet you know the answer to this.
14	PromptStart	I think you can get this.	I think you can get this.

Our Website

csal.gsu.edu

