How Aptitude-treatment-interaction Studies can Benefit
Learning-oriented Assessment

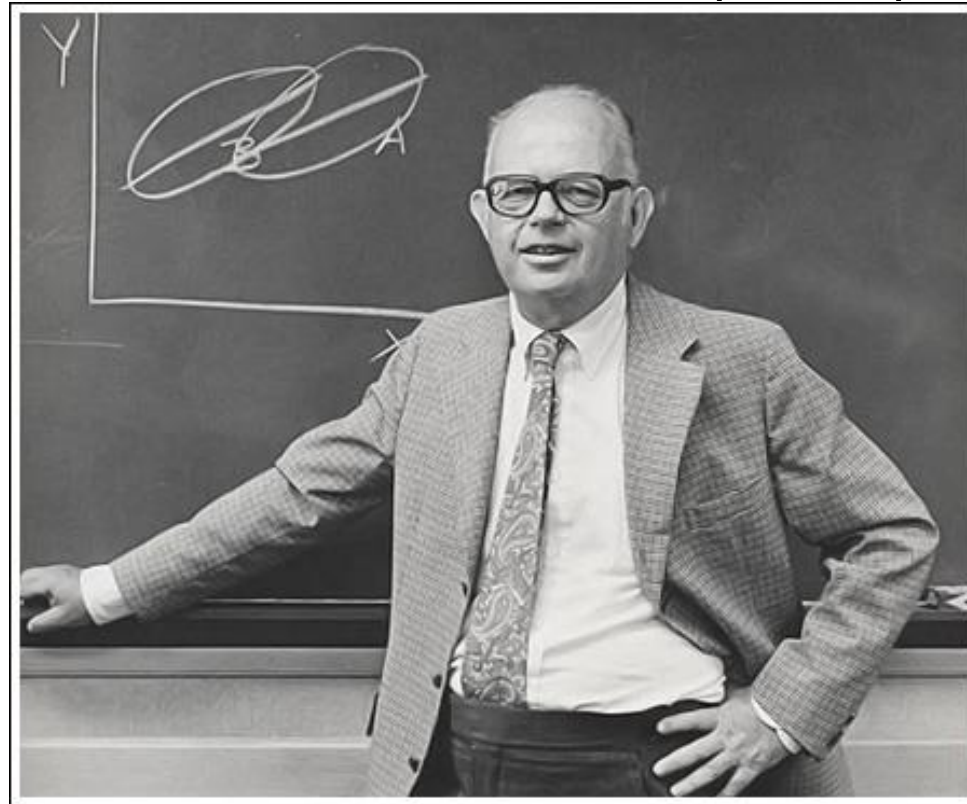Payman Vafaee

Yuichi Suzuki

Eric Pelzl

UNIVERSITY OF MARYLAND

"Optimal learning is the result of the instruction being perfectly matched to the learner's aptitudes."
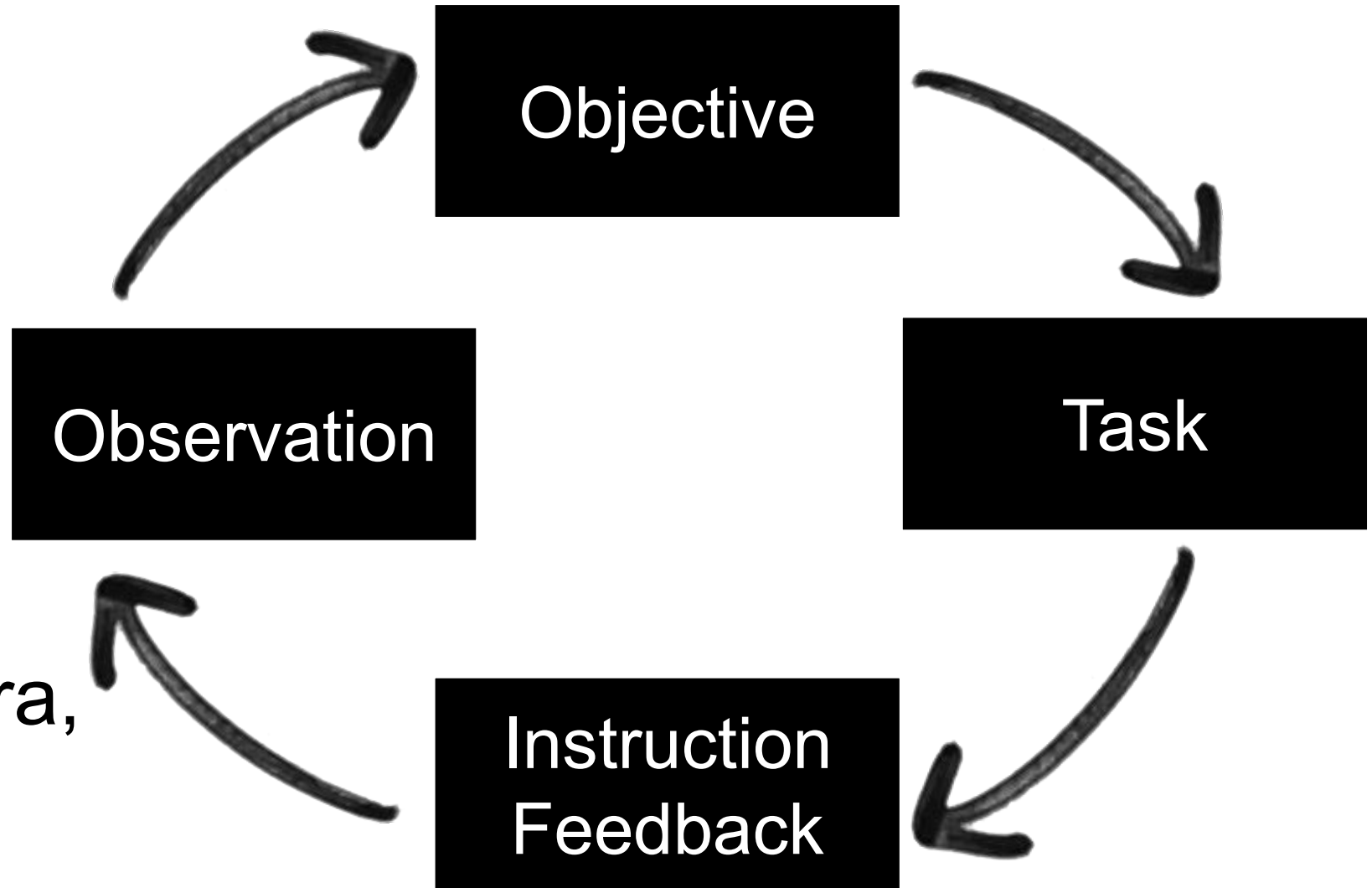
Cronbach & Snow (1977)

Learning-oriented Assessment

Focuses not only on assessment but also on how **instruction** and **feedback** can be **tailored** to L2 learning (Purpura & Turner, 2013).

Learning-oriented Assessment

LOA is fundamentally iterative and recursive until a criterion level of mastery is achieved (Purpura, 2004)

# Learning-oriented Assessment

How can I use assessment results to provide feedback for guiding learning?

How can I design interesting and cognitively engaging tasks so my students will enjoy learning?

Needs to be informed not only by a theory of L2 testing, but also by a theory of L2 learning (e.g., VanPatten's model in Purpura, 2004).

Individual Differences

Individual differences in cognitive ability play a major role in second language learning

Motivation

Talent: Cognitive Ability

Personality Facets

Experience
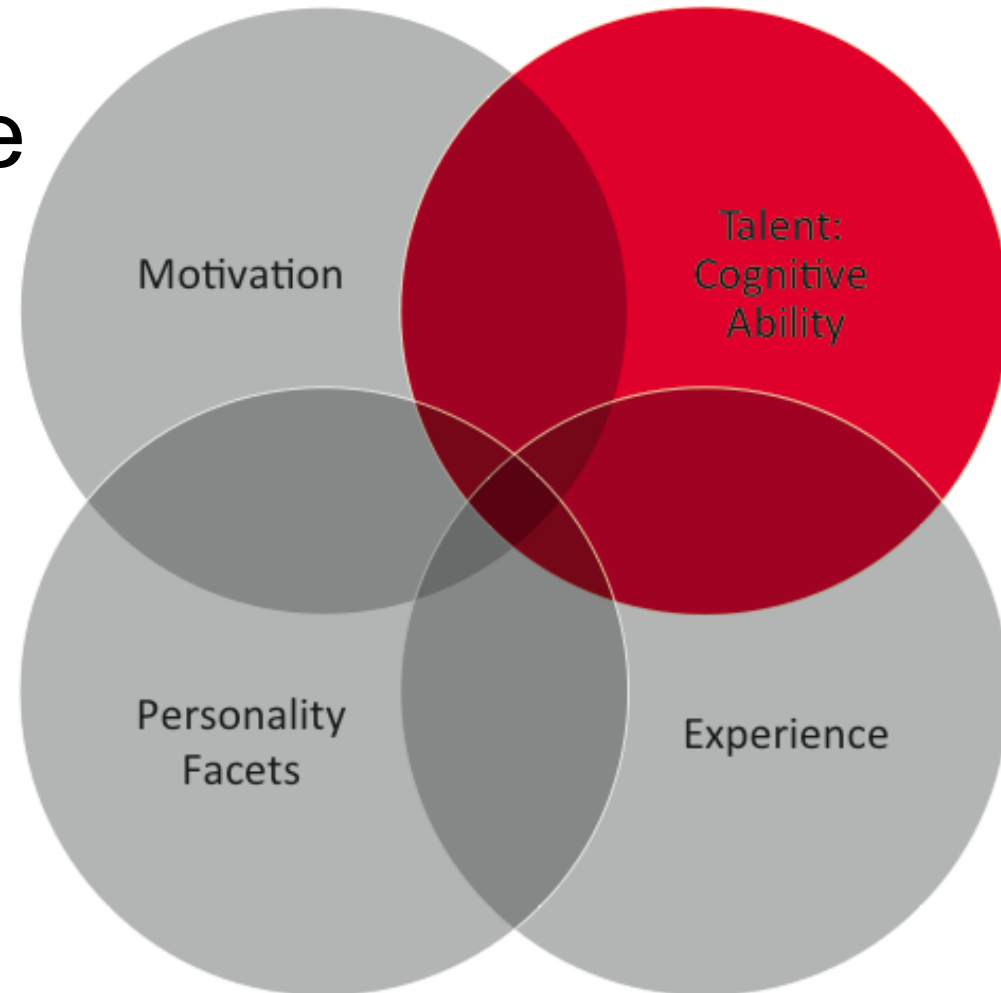
Individualization of L2 Learning

"…different sets of cognitive abilities can enhance learning under various learning conditions" (Kormos,2013; Snow, 1992)

Some instructional strategies (treatments) are more or less effective for particular individuals depending upon their specific abilities (Snow,1989).

Aptitude-treatment Interaction (ATI)

ATI is "using learner **aptitude profiles** to inform **pedagogical interventions** exploiting learner strengths and circumventing or avoiding learner weaknesses."
(Doughty, 2013:165)
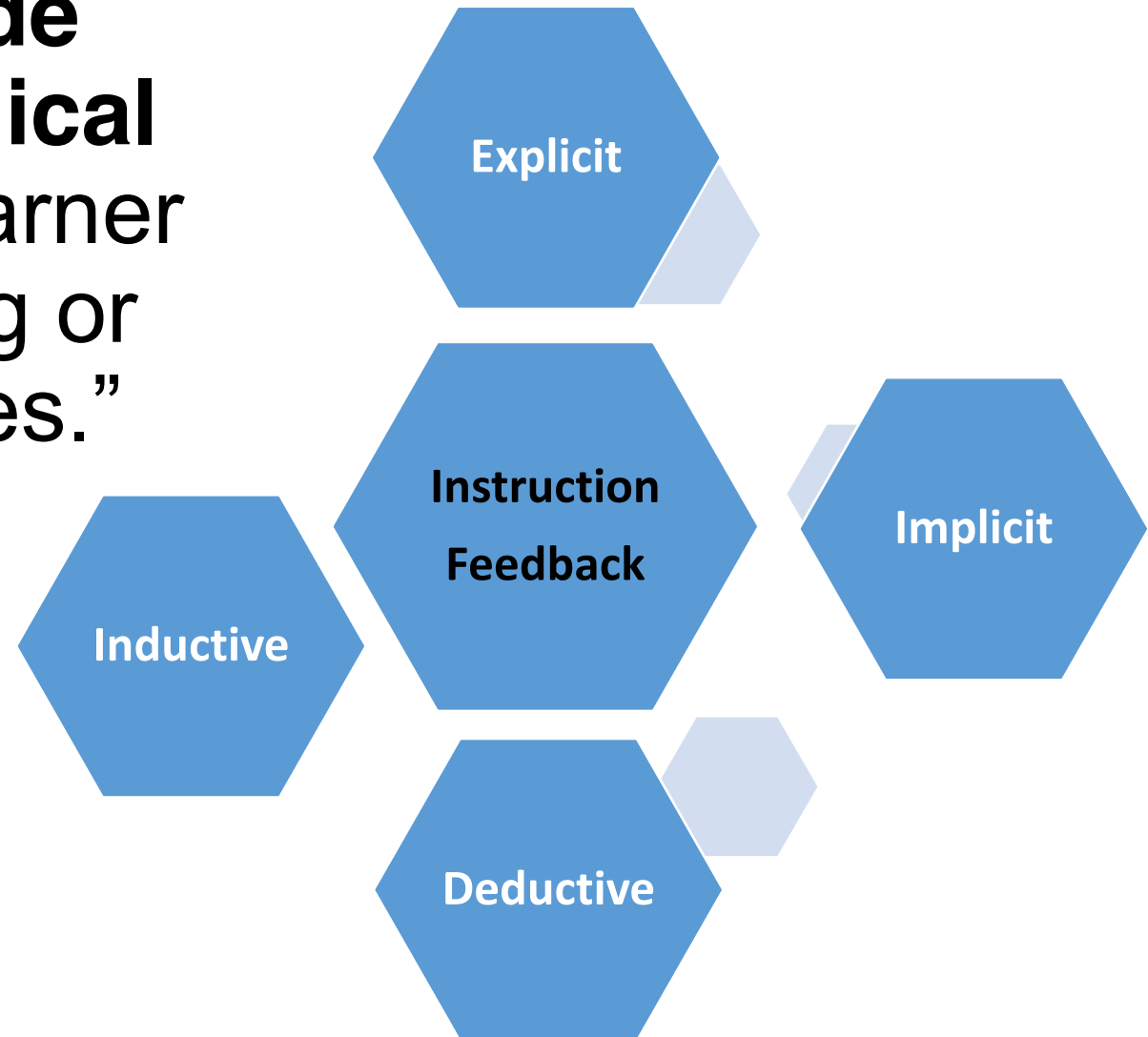
L2 Aptitudes

Are considered to be relatively stable "traits"

Readiness to learn a L2 in instructed foreign language settings

It is a multi-componential construct

L2 Aptitude Components

DeKeyser & Koeth (2011):

● Various aspects of memory
    • Phonological short-term memory
    • Working memory
● Language analytic ability (explicit induction)
● Aptitude for learning elements of pragmatics
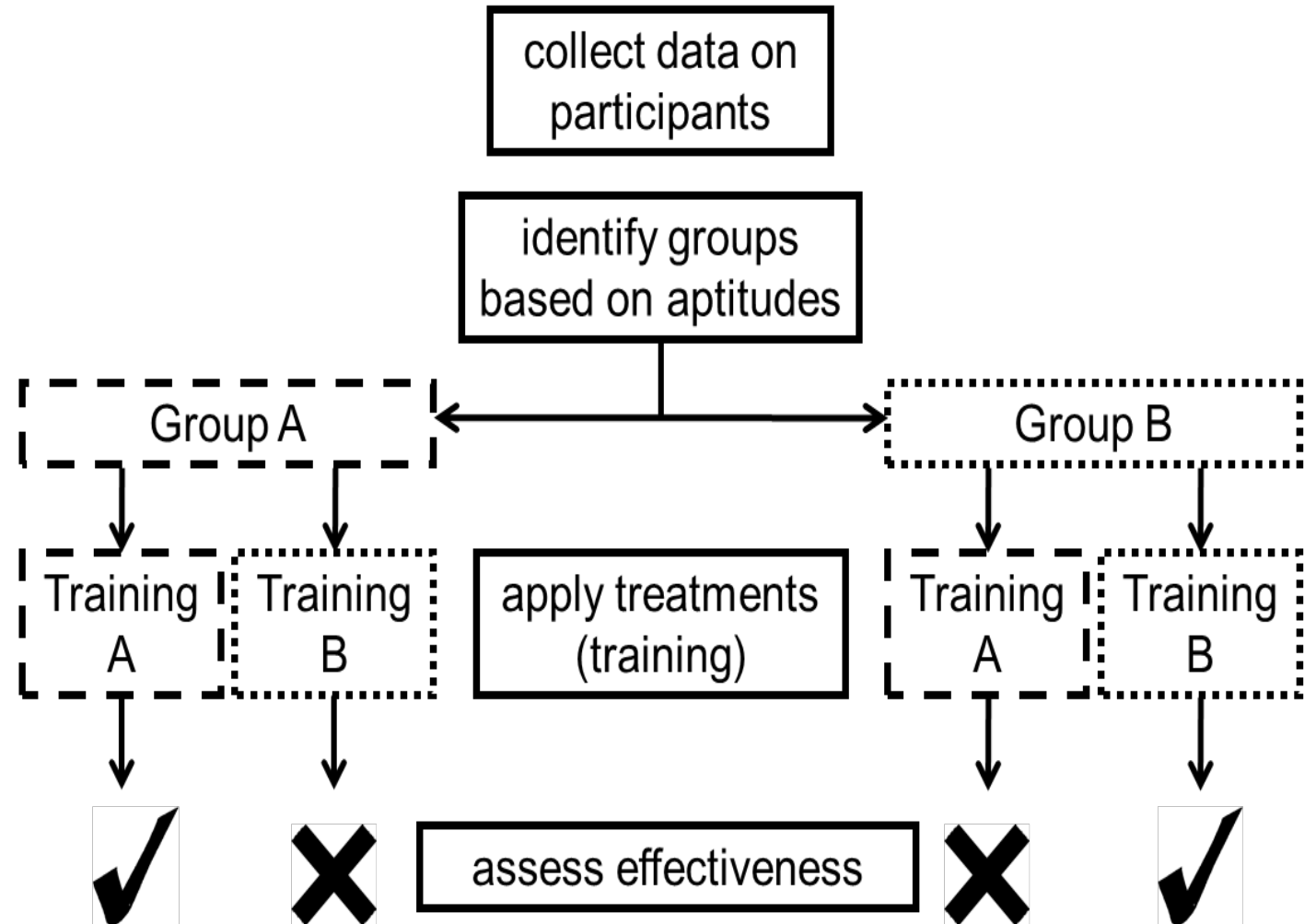● Implicit learning ability
● Phonetic sensitivity

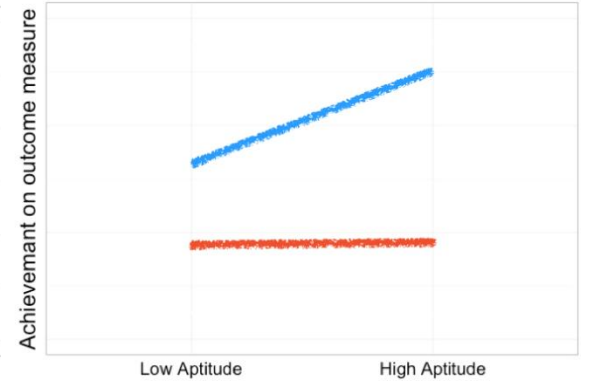# Aptitude-Treatment Interaction (ATI)
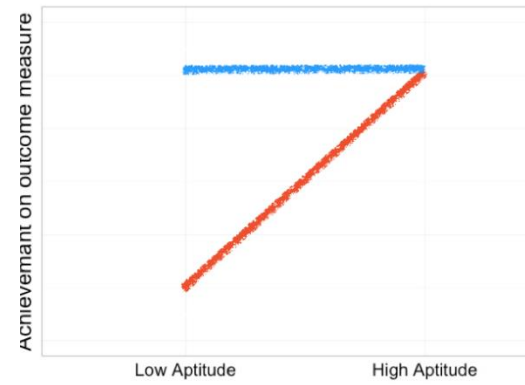
Ideal Results
(Pashler et al., 2009)
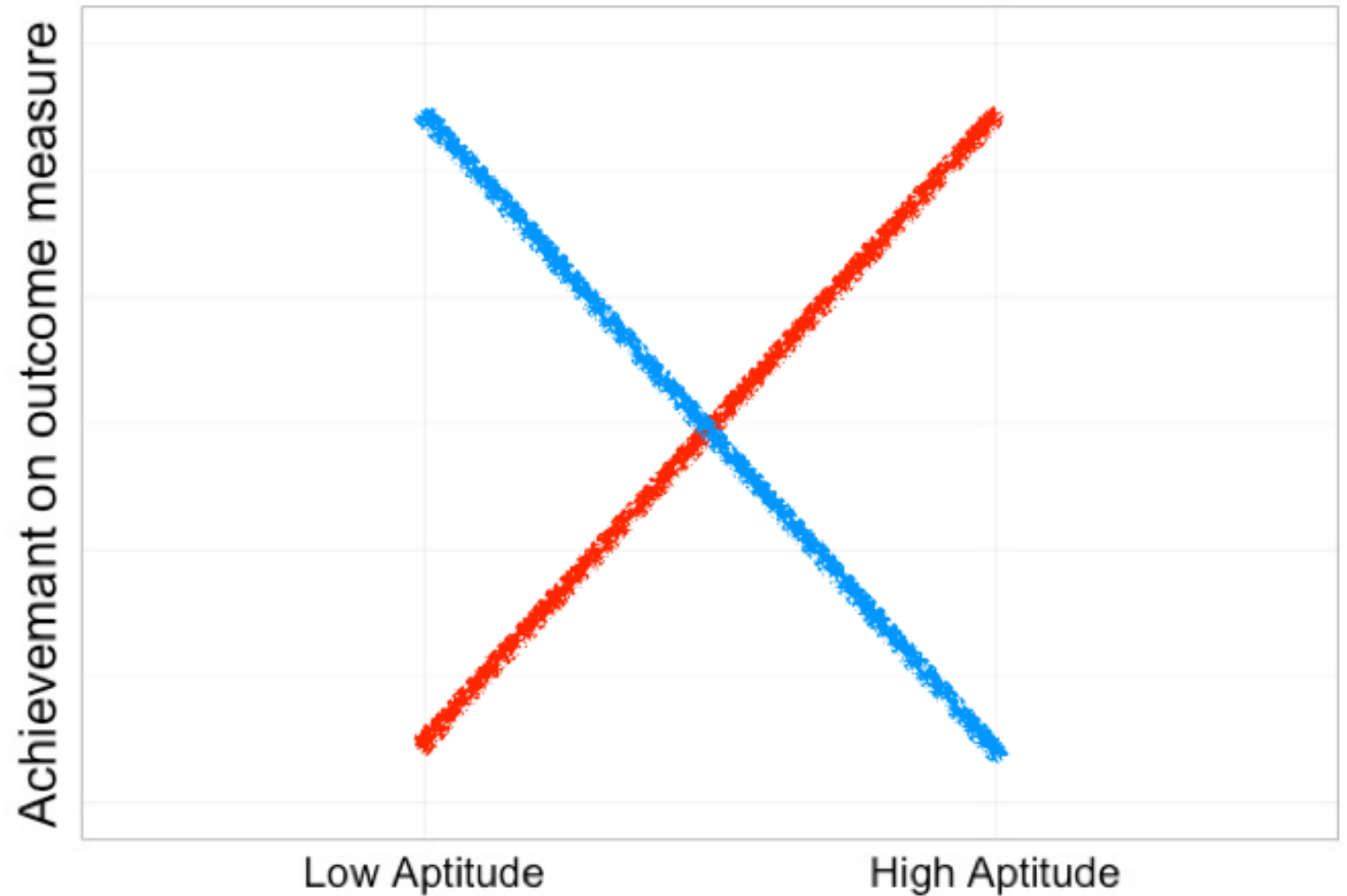
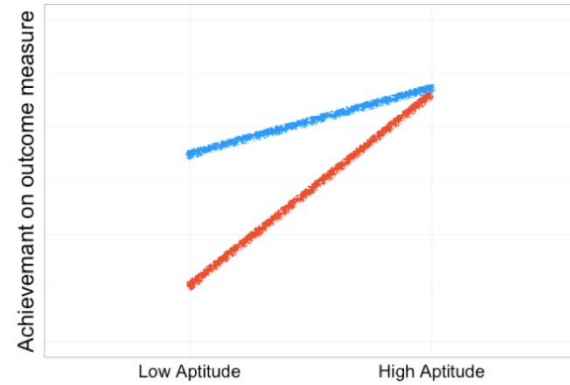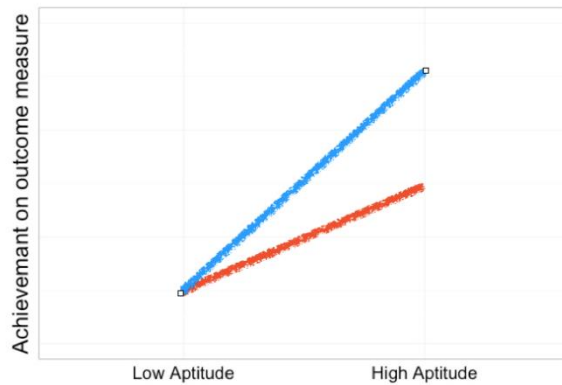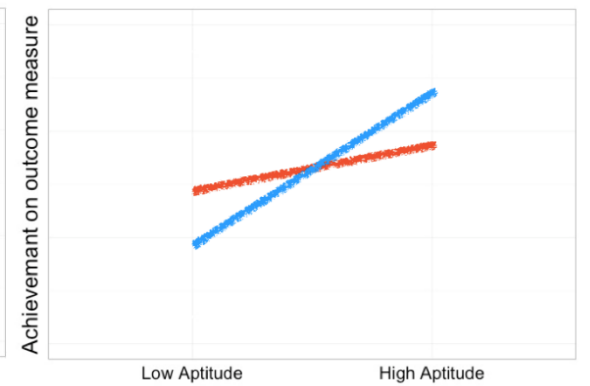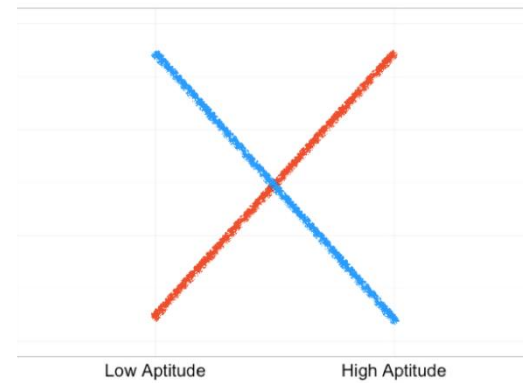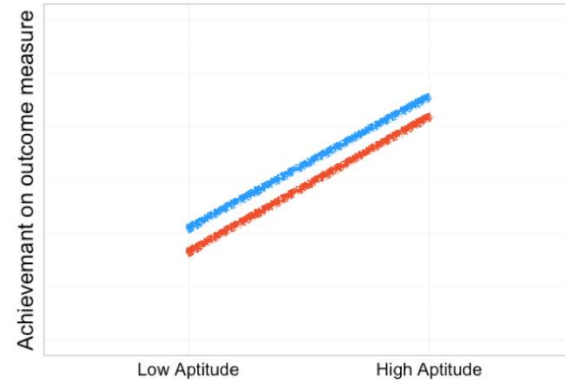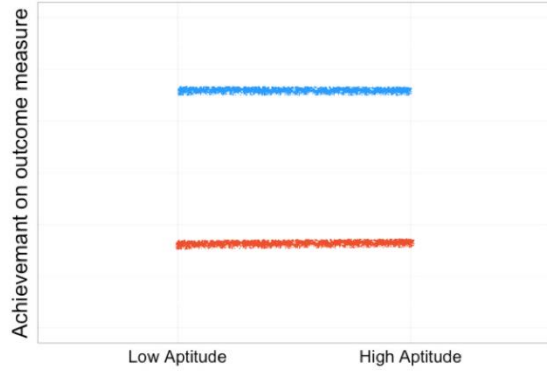# Aptitude-Treatment Interaction (ATI)

Ideal Design
(Vatz et al. 2013)

Possible scenarios with implications for LOA:

Possible scenarios with implications for LOA:
Cross-over interaction

Meaning: One treatment was <u>beneficial</u> for high-aptitude learners but <u>not beneficial</u> for low-aptitude learners.
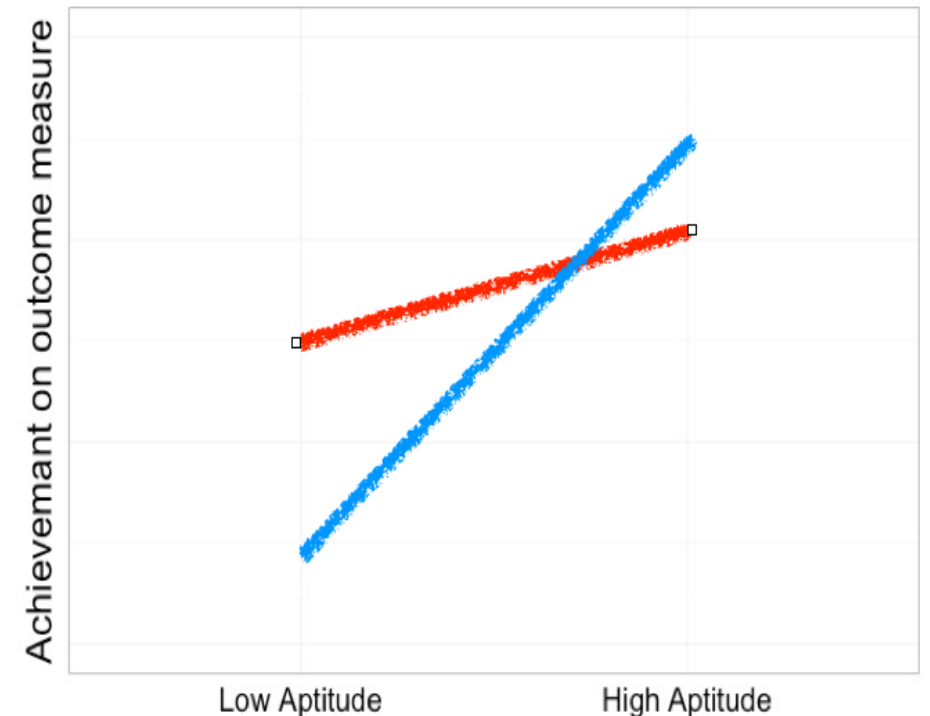
Examples:

Brooks, Kempe and Sionov (2006)

Perrachione, Lee, Ha and Wong (2011)

Implications :

- Choice of treatment has an impact on *both* high and low aptitude learners.
- Individualization of treatment is essential
- If not, in terms of fairness, we should somehow account for the disadvantage

Possible scenarios with implications for LOA:
One superior treatment with no aptitude effect

Meaning: One treatment type led to superior results for both high- and low-aptitude learners *and* strongly attenuated the effects of aptitude
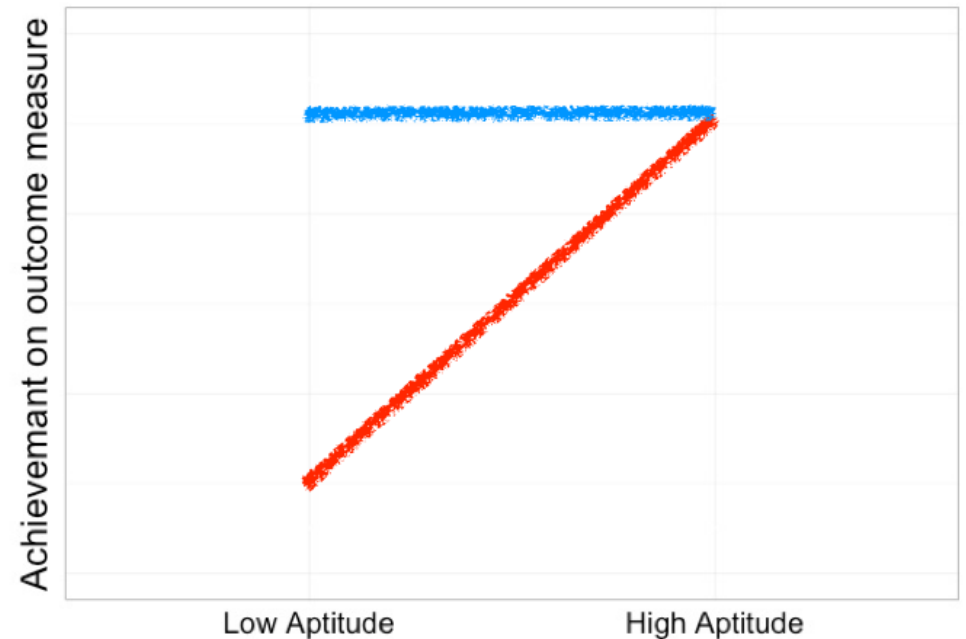
Examples:
Payne and Whiney (2002)
Erlam (2005)

Implications :
- The choice of treatment is clear
- The treatment enhances the fairness of LOA

Possible scenarios with implications for LOA:
One superior treatment with a clear aptitude effect

Meaning: One treatment type led to superior results for both high- and low-aptitude learners. However, the high aptitude learners clearly benefited much more than low-aptitude learners.
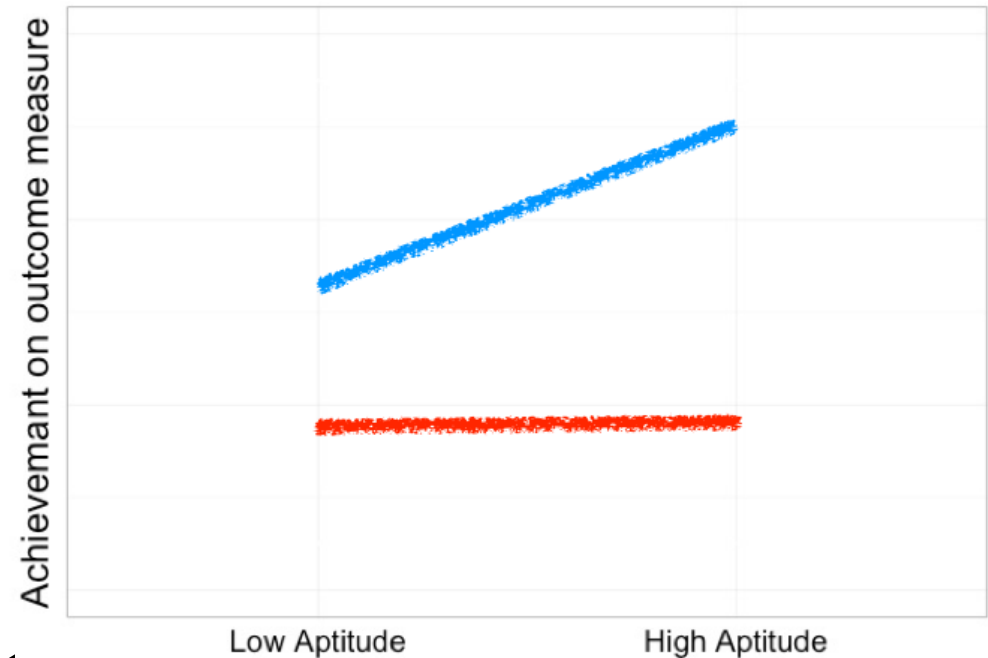
Examples:
Sheen (2007)
O'Brien, Segalowitz, Freed & Collentine (2007)

Implications :
- The choice of treatment is clear
- The teacher can consider other ways to accommodate individual differences

Conclusions

- ATI studies enhance our understanding about the effectiveness of different types of instruction and feedback

- ATI studies have important fairness implications for LOA

- SLA and LOA researchers need to collaborate and conduct ATI studies more specifically aimed at LOA
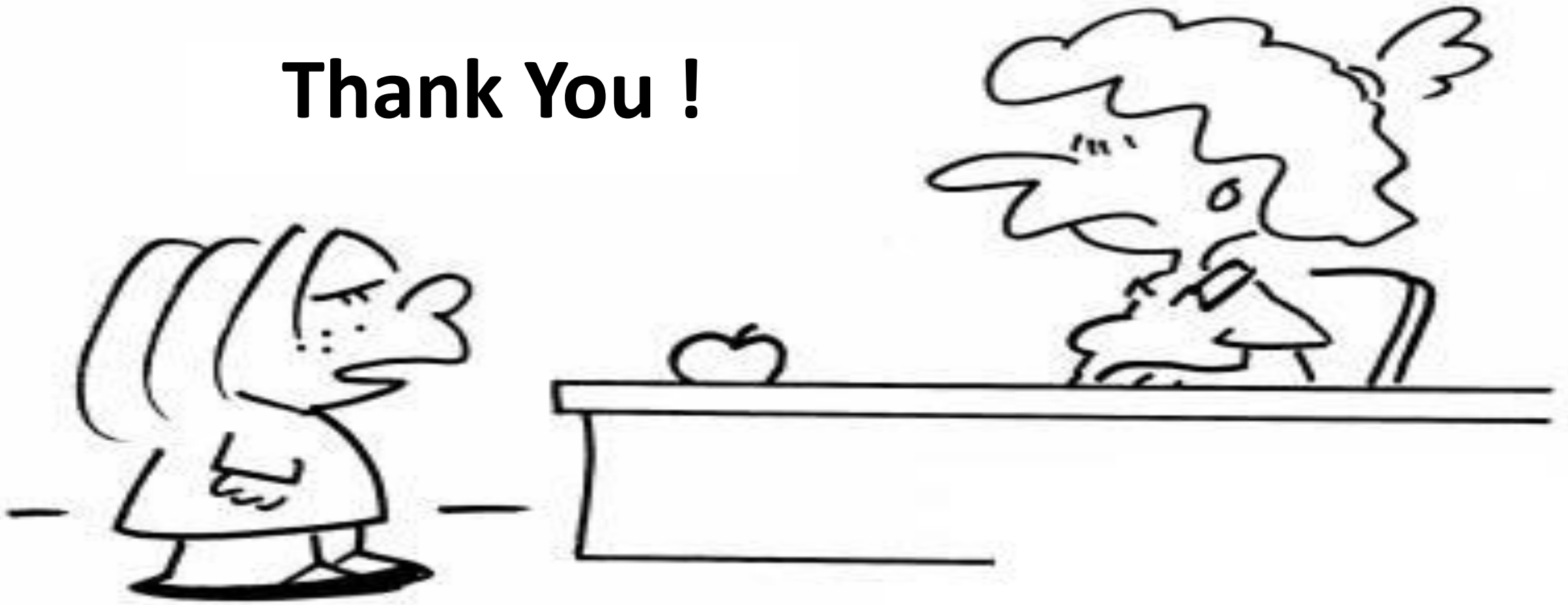
"How do you know I have a learning disability?
— Maybe you have a *teaching* disability!"