Time for a Test! Two-Stage Tests enhance learning and bring laughter in classes of any size… and at STLHE?

Dr. Catherine Rawn, Professor of Teaching, Psychology Department
University of British Columbia, Vancouver, Canada
@cdrawn http://blogs.ubc.ca/catherinerawn/

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What do you hope to learn today about Two-Stage Exams?

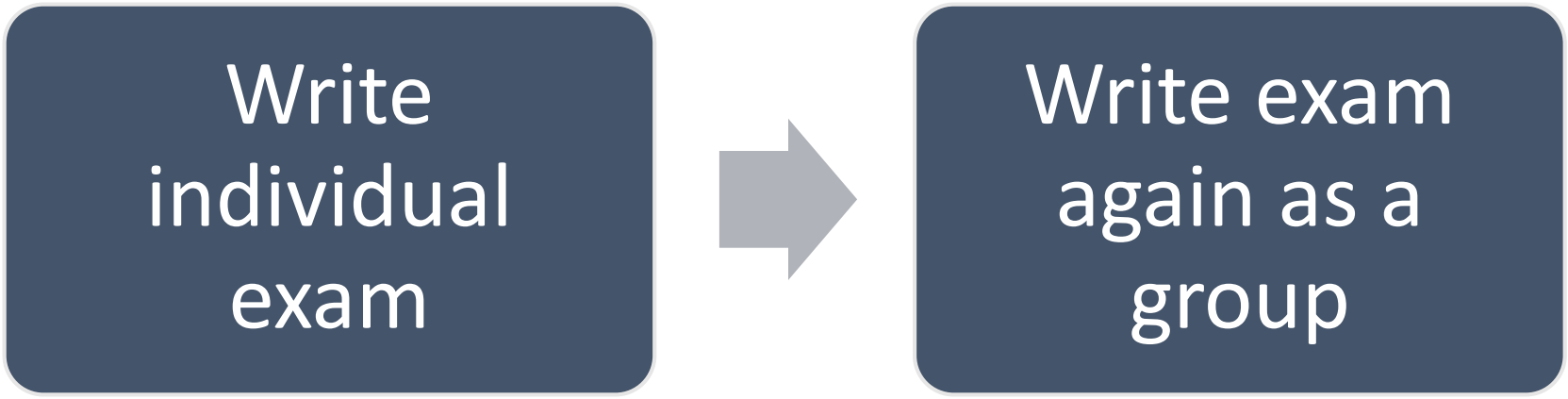
How does it work?	(How) Does it help students learn?
• Overview • Demonstration • Tips	• Empirical support • Theoretical alignment

Learning Objectives

By the end of this workshop, you should be able to…

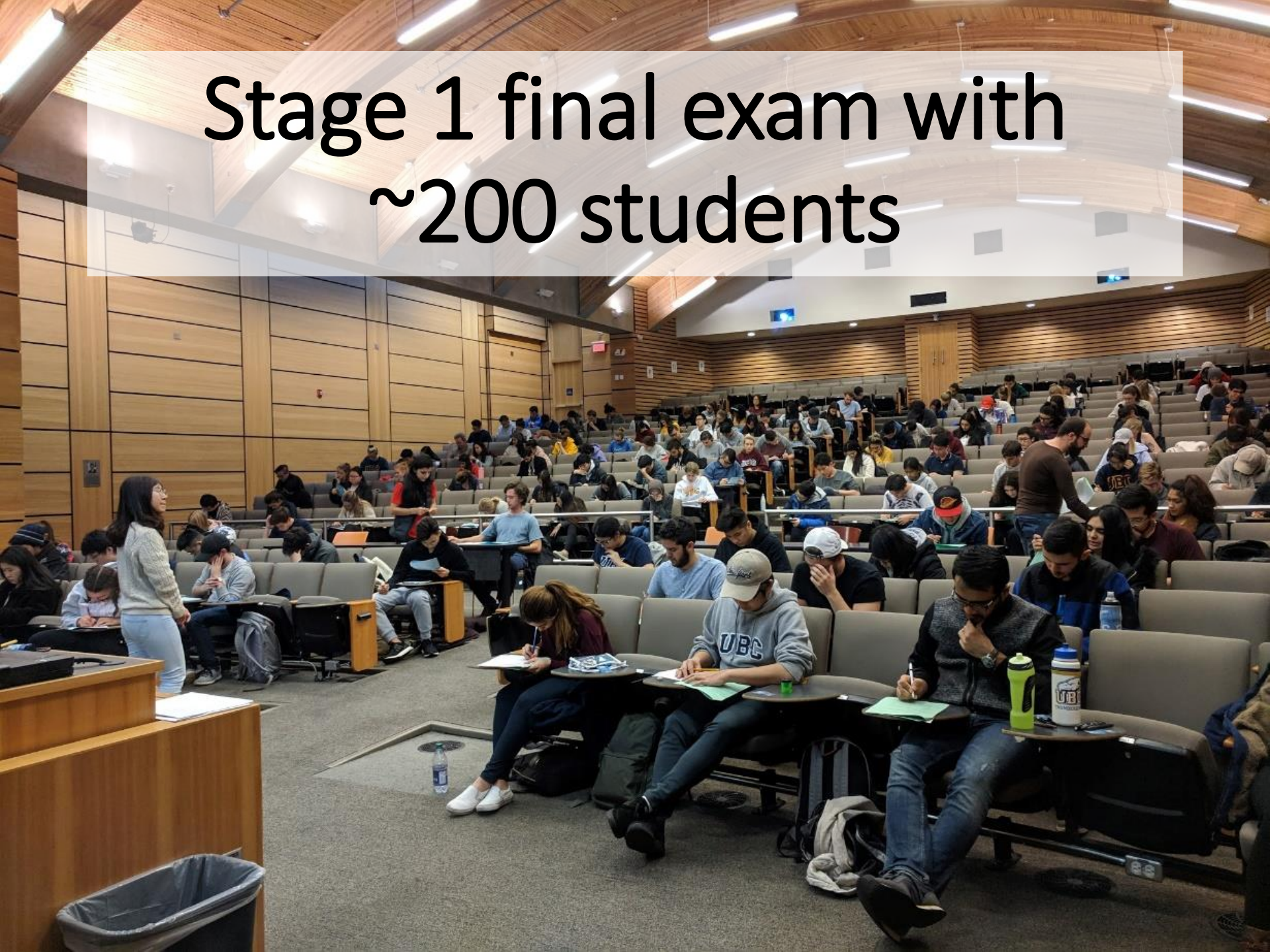
1. describe Two-Stage Tests and how they can be implemented in a classroom;
2. discuss a personal experience of participating in a two-stage test;
3. identify and summarize some of the scholarly research and psychological theory supporting the use of two-stage tests.

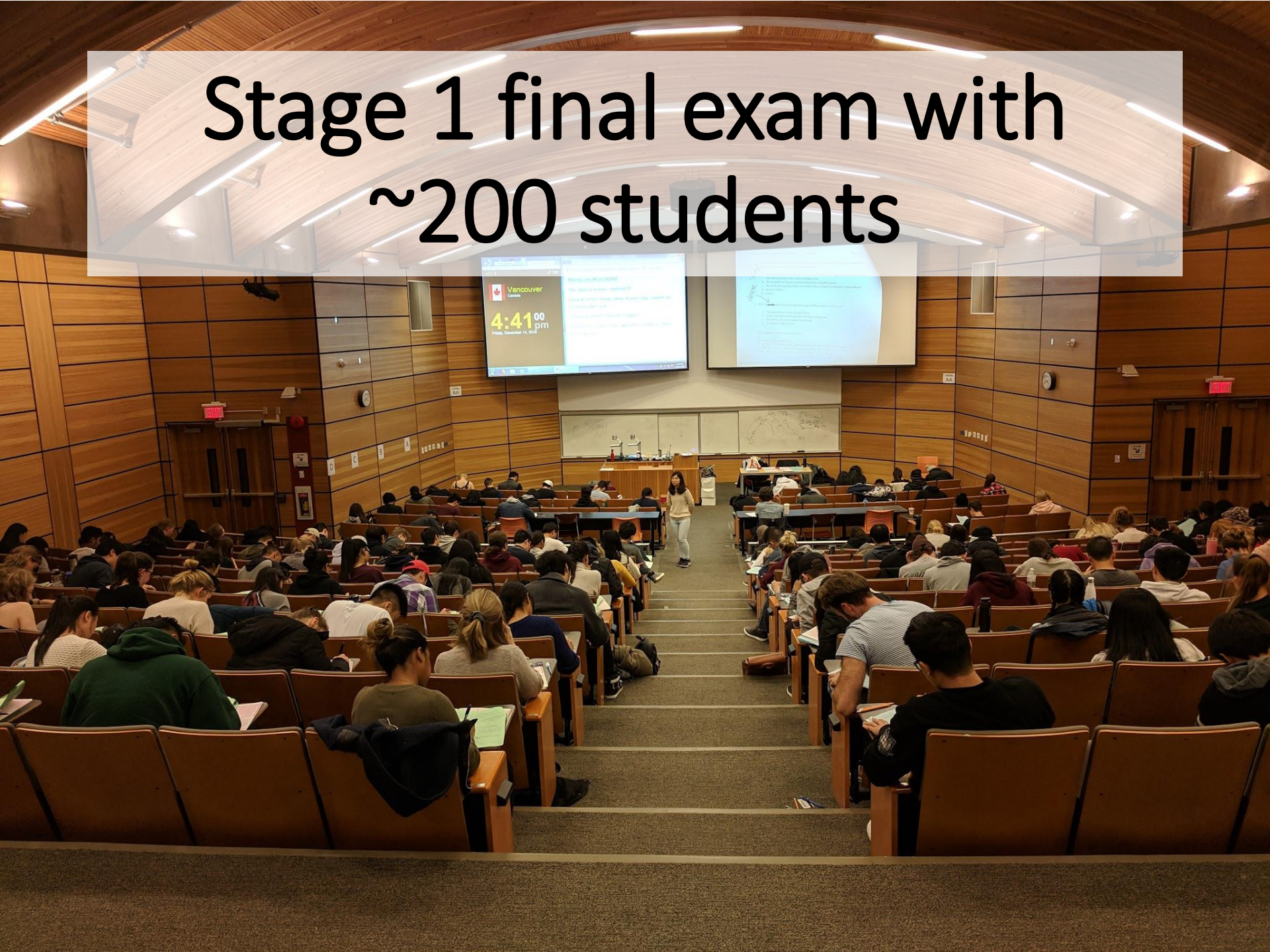
How do Two-Stage Exams work?



How do Two-Stage Exams work?

- Individual 2/3 time; Group 1/3 time
  - *Shorten the test*
  - **Multiple choice**, fill-in-the-blank, short answer
- Quick *transition*: important + gets faster
- Weight: 75-90% individual, 25-10% grp
  - Group average ~20% higher than Individual


Stage 1 final exam with ~200 students
UBC



Stage 1 final exam with ~200 students


Stage 2 final exam with
~200 students

Stage 2 final exam with ~200 students

Demo Time!

Stage 1

- Handout with 3 MC questions
- Please take 4 minutes to complete the three MC questions.
- Write answer on cue card.
- Submit your cue card when you're done

Stage 2

- In groups of 4-6 people, discuss your answers to those questions and come to consensus
- Submit a new cue card with your Group Code and answers

Answers

1. If a result is *statistically significant,* this means that
   - **Answer: A.** if there is truly no effect in the population, a result this large is unlikely.
   - ***Individual: 46% correct, Group: 81% correct***
   - *Item-total correlation = .537 (Individual), = .593 (Group)*

2. When everyone in the population of interest has an equal chance to participate in the study, the researcher is
   - **Answer: D.** using random selection.
   - ***Individual: 88% correct, Group: 97% correct***
   - *Item-total correlation = .443 (Group)*

3. Consider the following survey question: “Do you agree that reckless teenagers are more dangerous drivers than mature adults?” What question wording mistake does this question exemplify?
   - **Answer: C.** It is a loaded question.
   - ***Individual: 75% correct, Group: 97% correct***
   - *Item-total correlation = .443 (Group)*

With your group...

- How did it feel to be a “student”?
- What did you learn from doing the group test?
- What remaining questions do you have about this technique?
  - Can your groupmates answer/brainstorm solution?

A really wordy slide with tips for later…

- Invigilation: **~1 TA/instructor per 50 students**
- Complete Group exam much faster than individual
- Same questions, same class period (or else look up answers)
- Long answers = watching one (“smartest”) person write
- A few individuals get a better score than groups (~5% in mine)
  - Individual grade counts for 100%
  - Teaching moment: encouraging assertiveness, confidence
- Unpublished data: Groups of 3 or fewer (participating) members statistically perform worse than groups of 4-6
  - Circulate during group to monitor participation
- Some options to offer students with academic concessions
  - Opt out of group part, take average group score
  - Begin writing earlier, join class for group part
- Some options for make-up exams
  - If multiple students, write together
  - If not, offer average group score so not penalized

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Consistent with Broader Research on How People Learn

- Active learning promotes learning
  - *Involved* in learning process
  - Doing meaningful actions
  - Thinking about those actions
  - In collaboration with others
    - (see Prince, 2004)

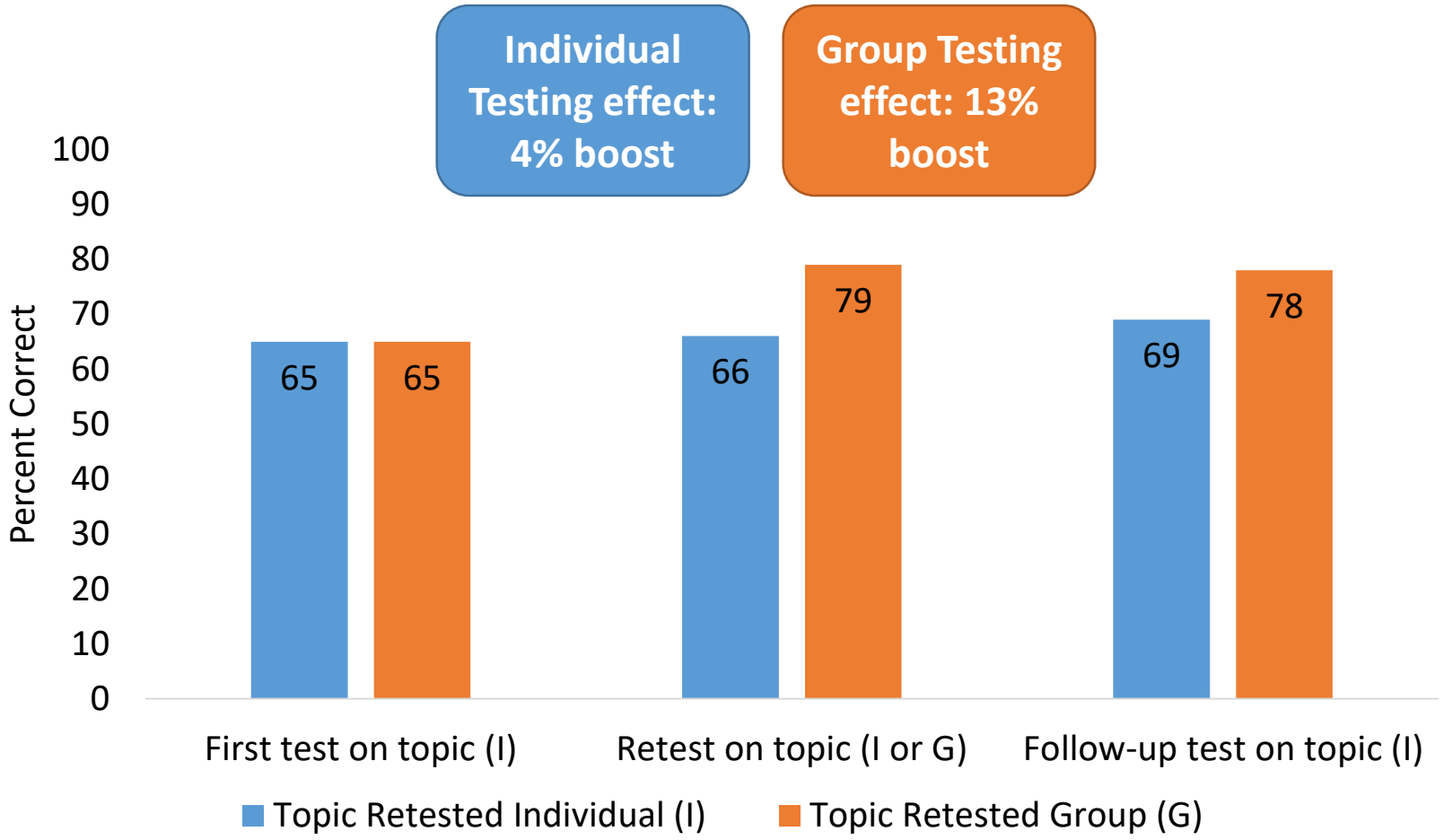
Consistent with Broader Research on How People Learn

- Testing effect
  - Repeated tests (not just rereading) → Retention
  - (see Rowland, 2014, for meta-analysis)
- May enhance both *encoding* and *retrieval* of tested material
- May enhance meta-cognitive knowledge
  - Feedback, chance to explain
- *See Rawn, Ives, & Gilley, 2019, for tips and literature review*

Two-Stage Exams Increase Student Learning

- Quasi-experimental crossover design, 98 students (Gilley & Clarkston, 2014)
  - 2 topics, repeated measures design
  - All: First test both topics (Friday)
  - Varied type of immediate retest per topic: Individual or Group
  - All: Individual test both topics (Monday)

Two-Stage Exams Increase Student Learning



Gilley & Clarkston, 2014. Graph adapted from Table 2 Midterm 1; effect size replicated Midterm 2.

Most Students Like Two-Stage Exams

- Rieger & Heiner, 2014
  - Survey 123 students (class of 179)
  - 87% support use for midterms; 74% support MT + final
  - open-ended responses: 76% positive, 10% negative
  - Report more confidence

- Students perceive anxiety reduction
  - Zimbardo, Butler, & Wolfe (2003)

Additional Benefits

- May increase sense of belonging, enjoyment
  - Talking in class → belonging → enjoy class
  - Sandstrom & Rawn (2015)

- Complements in class group activities, projects
- Improved quality of tests
- Relaxes test day experience
- Discussion energizes students + me
- Overall positive response from students

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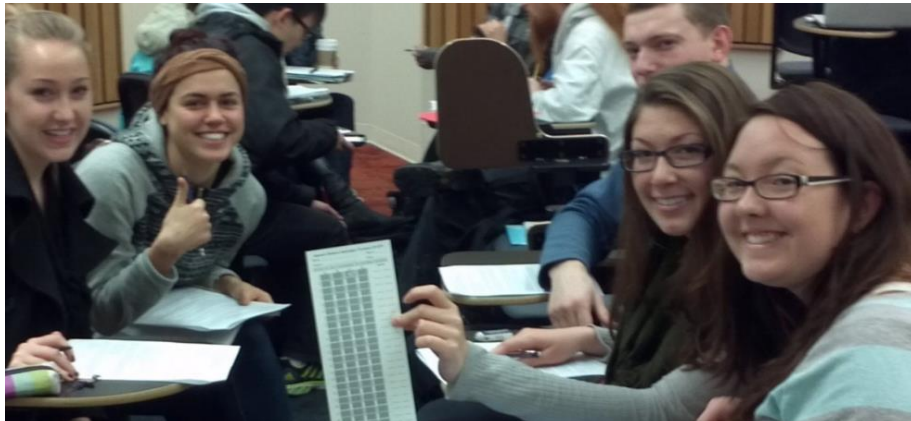
Consider Two-Stage Exams for Next Year

- Be open to taking calculated risks, getting students on board, a loud classroom, your role as designer of a learning experience
- Supported by research: student learning + enjoyment
- Manageable in classes of any size
- Plan carefully, consult resources
- Consider analyzing data to improve tests (& publication?)
- See handout for link to resources and references (http://goo.gl/ZzETYr)

- Have fun!



Resources

- Videos by the CWSEI team depicting Two-Stage Exams in action.
  - http://www.cwsei.ubc.ca/resources/files/Two-stage_Exams.pdf
  - http://blogs.ubc.ca/wpvc/two-stage-exams/
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- Brett Gilley, aka @ModernHydra
- Rawn, C. D., Ives, J., & Gilley, B. (2019). Two-Stage exams increase learning and laughter on exam day in classes of any size. In J. Golding, C. D. Rawn, & K. Kern (Eds.). *Strategies for Effectively Teaching Large Classes in Higher Education.* San Diego, CA: Cognella Academic Publishing.

Resources and References

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    - The title might be alarming here… they showed no effect of the 2-stage exam on final exam performance (compared with material that had been previously tested only with individual tests). I'm ok with this. Not every study is going to find the same effect (particularly ones with some execution oddities like this one), yet this is still a "no-change" effect with no evidence that student learning decreases. Moreover, students still enjoyed the process and found it less stressful than the individual-only tests. No harm done, potential benefits.
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