

Get the Data

Ideas for collecting data within the unique context of GBL



Julie Oltman, Lehigh University

@joltman1 - julieoltman.com

Thomas Hammond, Lehigh University

Classroom-based research vs. “the medical model”/RCT

- Uncontrolled: Teachers often want everyone to play
- Non-equivalent groups: Groups are often not truly random
 - Classes are set
 - Teachers assign kids to teams
- Unit of analysis: Given social/team play – analyzing individuals or dyads or groups or classrooms or....?



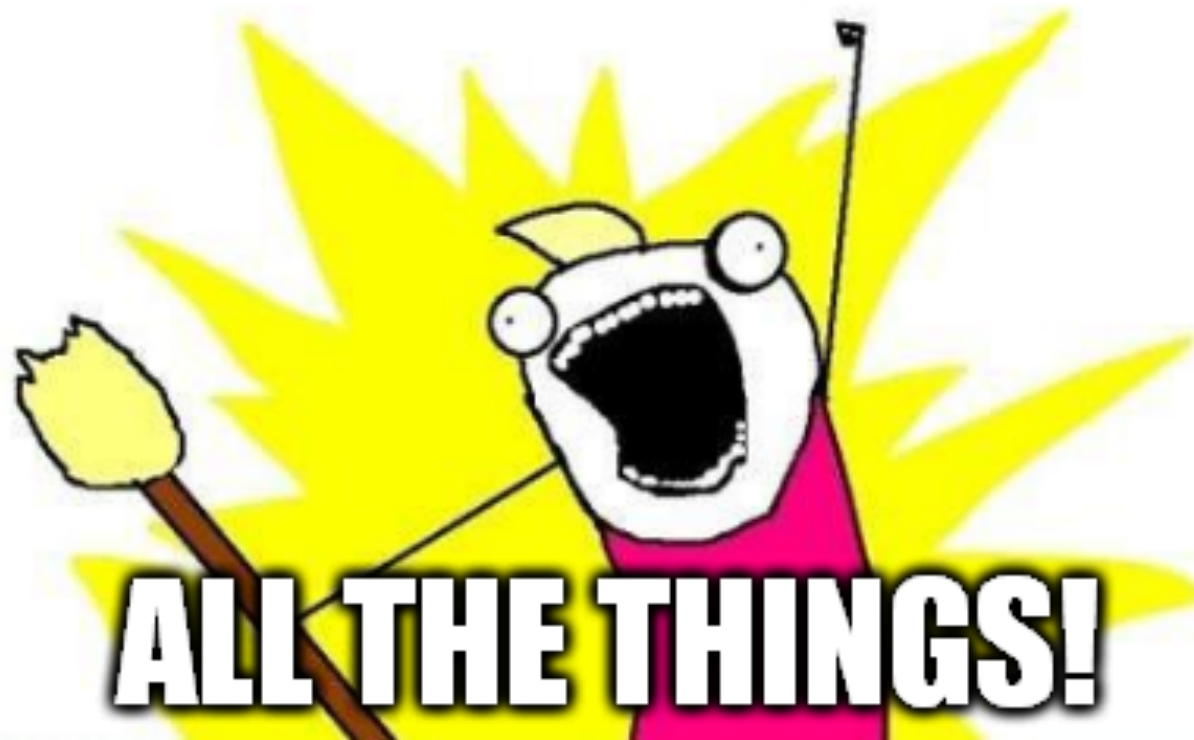
Specific challenges of GBL research

- Non-equivalent treatment: Games allow for different player experiences
 - These can be choreographed by the researcher
- Holistic / gestalt: There is power in the player experience – we don't want to interrupt that experience (Don't break magic circle!)
- Nesting of effects: Impact of GBL can (should?) extend beyond just the gaming experience
 - GBL should be embedded within the context of the whole curriculum
 - Teachers adoption of a GBL elements into a paradigm for instruction & learning



Despite the challenges and opportunities...we must still....

MEASURE



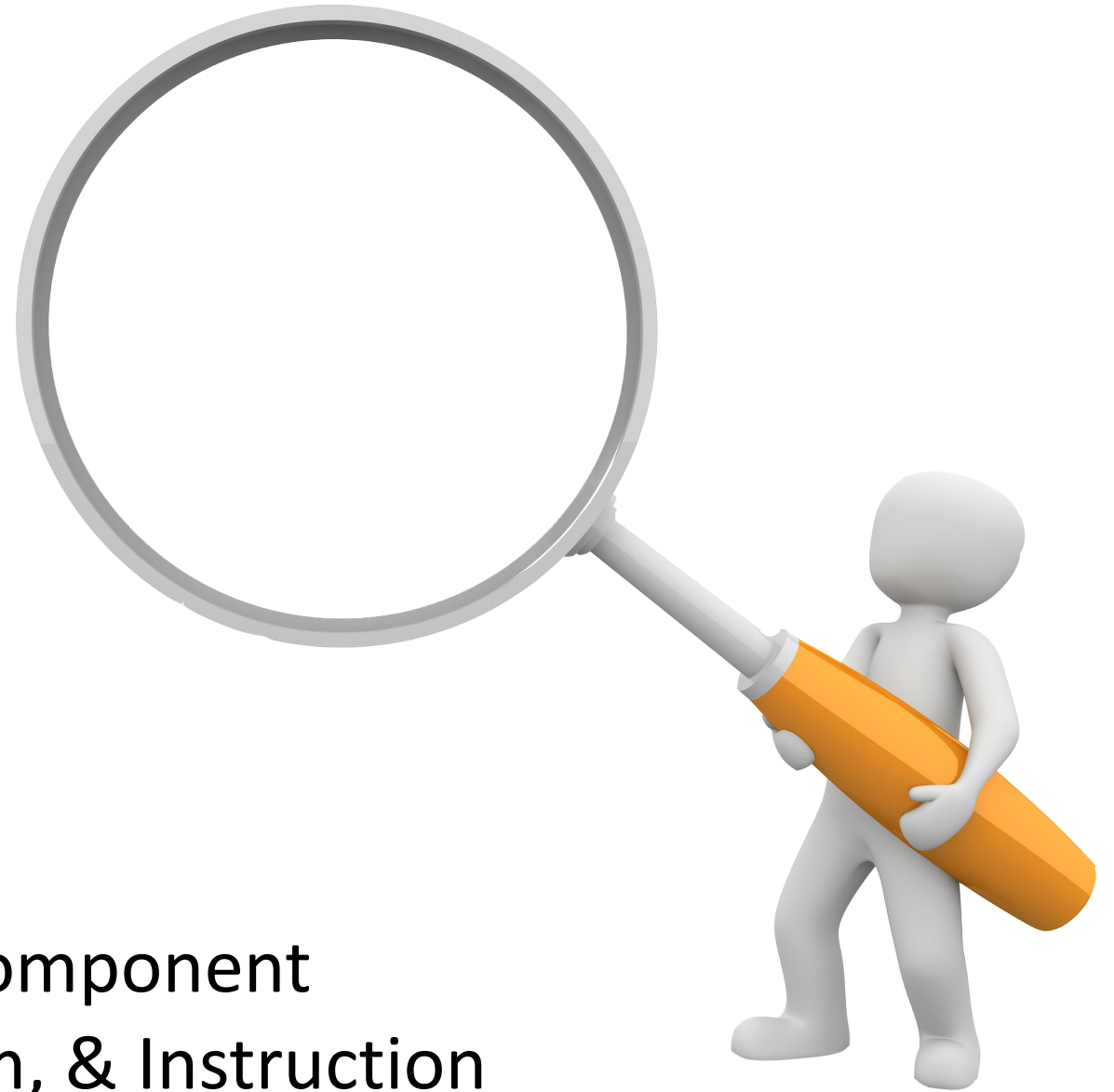
The “things...”

Initially...

- Learning
 - Pre/Post for immediate game impact
 - Pre/Post for whole unit
- Flow
 - Engagement → Magic Circle

Evolved into...

- Impact of game as a curricular component
 - Context – teachers, curriculum, & Instruction
- (Flow as moderating var., not dependent variable)



Strategies & Ideas

- Compare in-game items to non-game items
- Stealth in-game assessment
- Provide practice opportunity for flow survey
- Consider concomitant variations
- Consider opportunities for random assignment →
Solomon 4 Group design?

“Everyone Plays!”

– enthusiastic (and awesome) teacher

- Uhhhh ok....but now I have NO CONTROL GROUP?!



In-game and non-game items comparison

- Half of unit test content went into the game
- Half of unit test content was only experienced during business as usual instruction
- Compared student performance on in-game vs non-game items

Year 1 - Unit test results.

	N	Total Test Avg	Game related items	Non-game related items	Margin between game and non-game scores
Class 1 ^a	12	67.1%	71.7%	62.1%	+7.5%
Class 2 ^b	13	88.2%	95.3%	91.7%	+2.6%
Class 3	11	93.0%	95.0%	91.1%	+3.9%
Overall	36	83.0%	87.6%	81.9%	4.6%

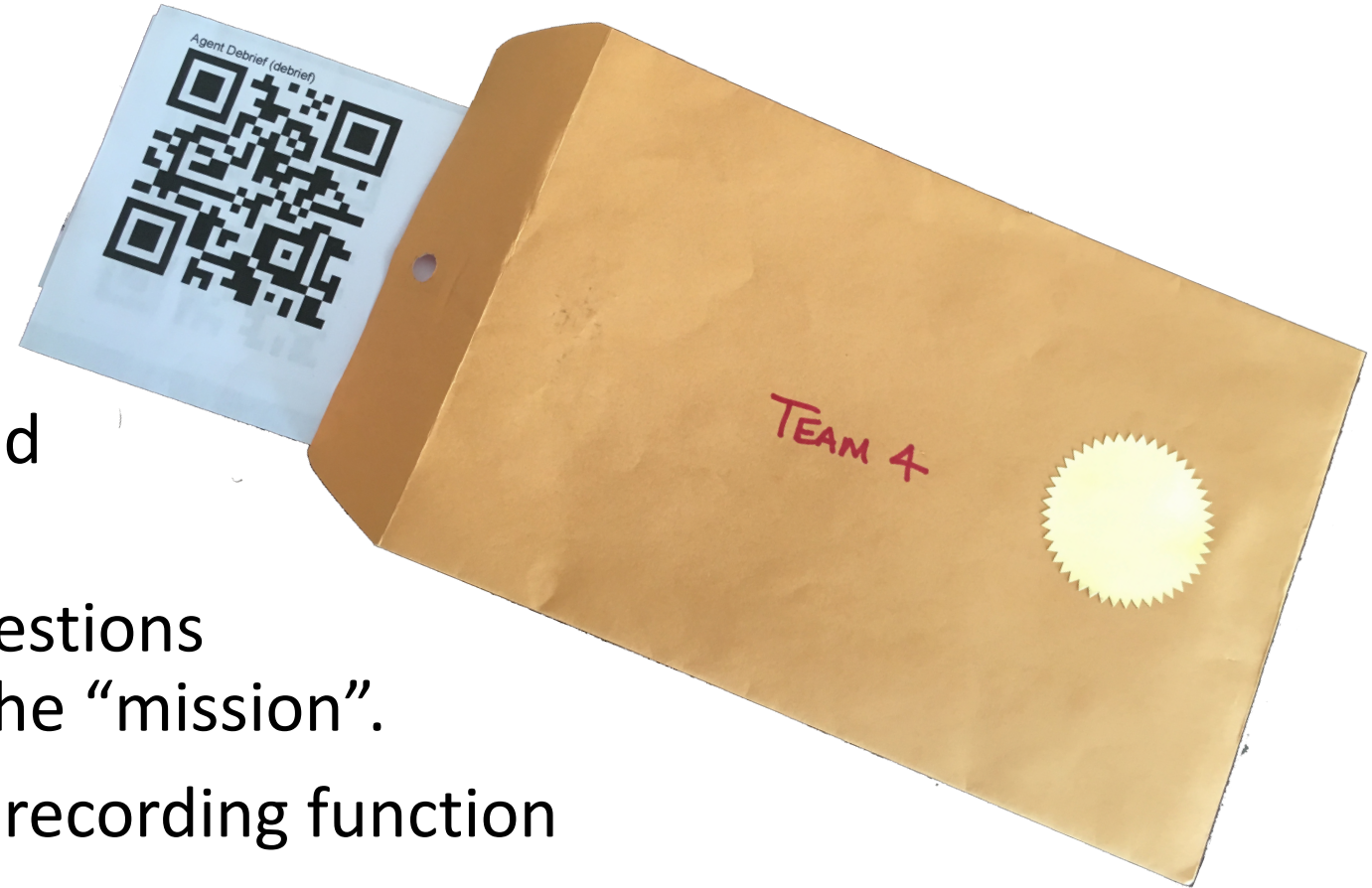
(^a StuNum 7 was absent during the 2nd day of game play and StuNum 12's test score was not made available to the researchers; ^b StuNum 17 had a very poor gaming experience due to partner issues)

Excuse me, can I interrupt for a second?

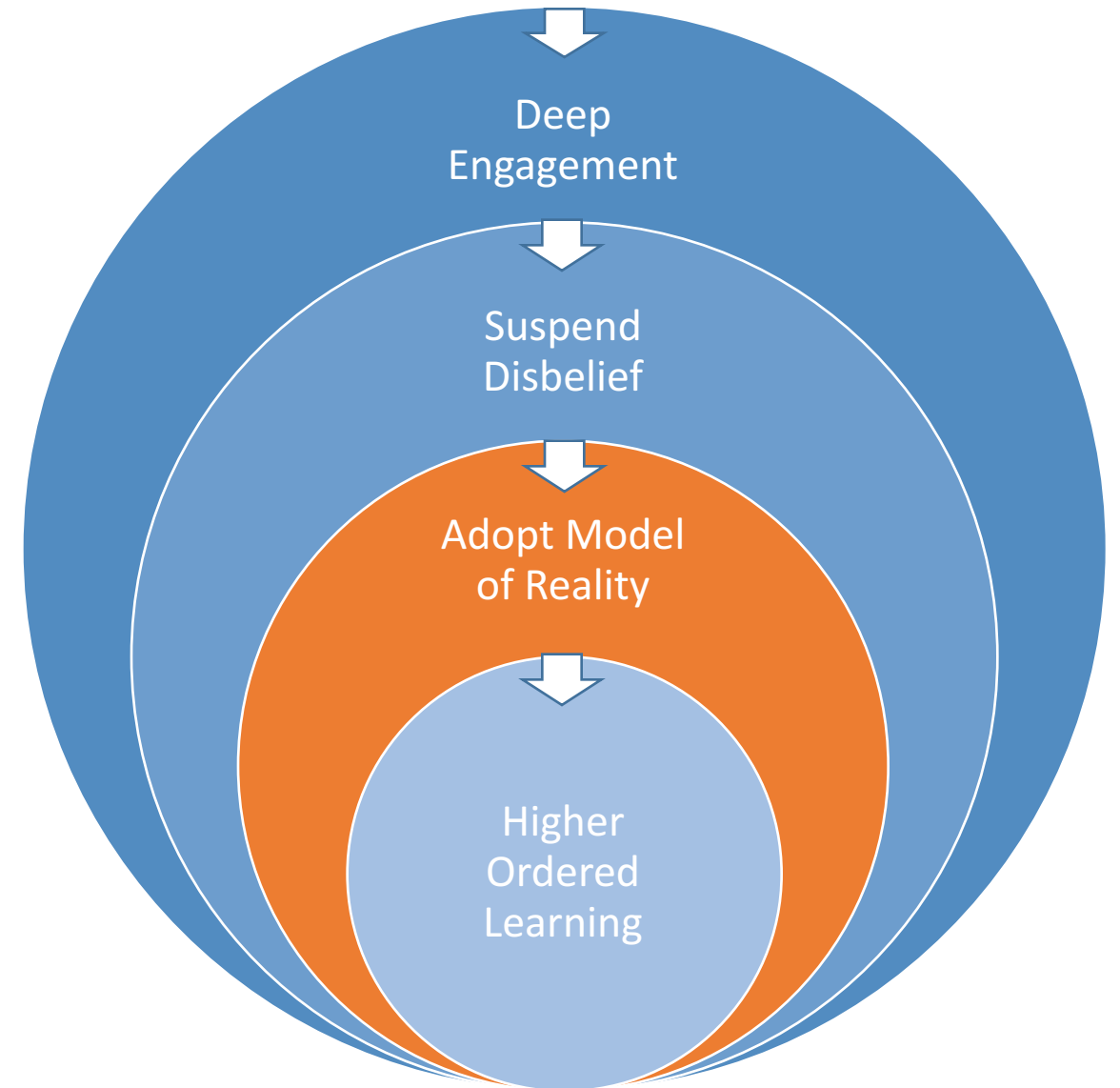


Stealth Assessment

- Frame a pre-post game assessment as an “agent interview” and “agent debrief”.
- Keeps the students “in character” ...inside the game
- Each team got a “secret package” that included QR codes
- Codes triggered interview questions that were framed as part of the “mission”.
- Utilized ARIS Notebook audio recording function
- Researcher can later compare the pre and post answers



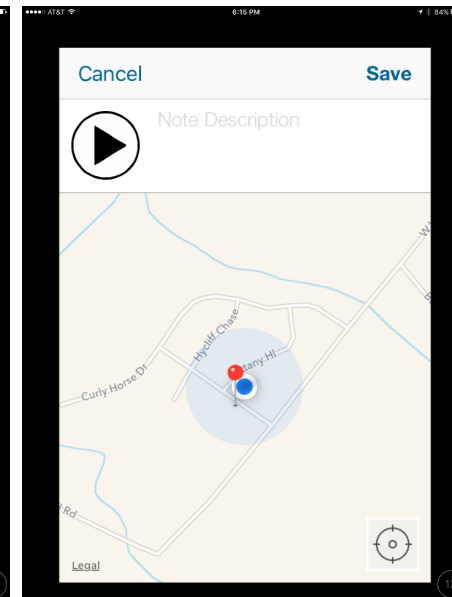
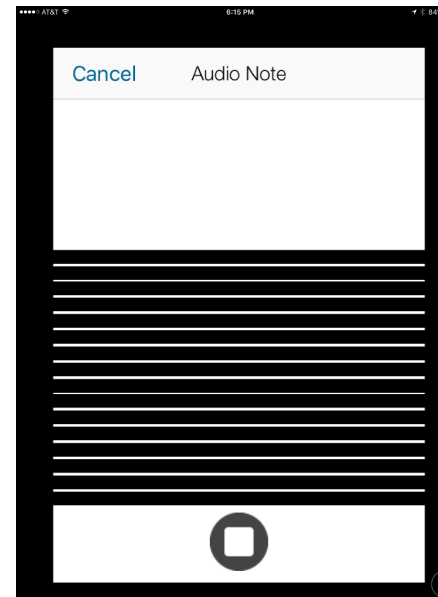
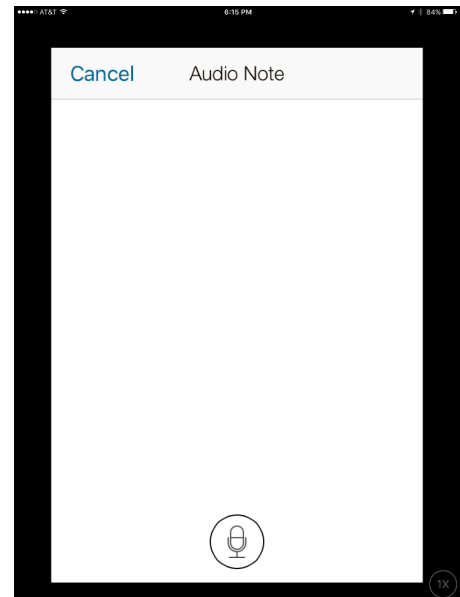
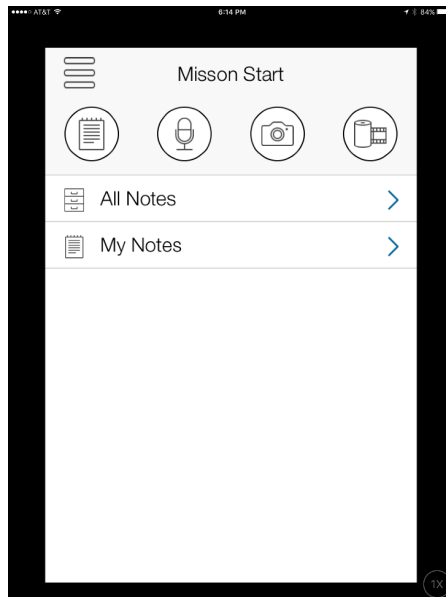
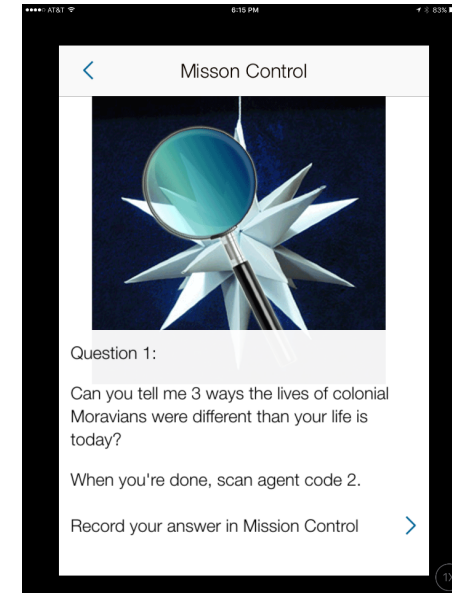
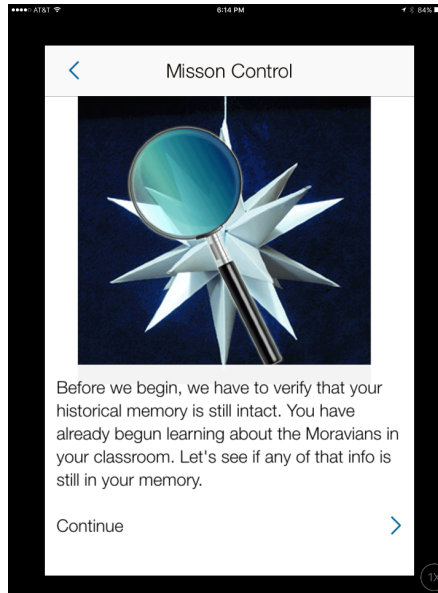
- Game is more than just a game – it’s a learning tool
- Vygotsky is the bridge....**Pivot Theory**
 - This is why math blasters is not the future of GBL
- **Pivot Theory**
 - A game can be viewed as a type of model – a simulation of an alternate reality. Just like the child using a stick as a horse to understand what the meaning of “horse”.
 - Models provide a vehicle to understanding a larger phenomenon.
 - *Only if the player passes through the orange circle will the power of GBL truly be realized.*
 - The **pivot is the bridge that allows the player/student to create new meanings (learn)**. It allows them to cross the chasm from what they know to what **they could** know.



Don't break the magic circle!

Stealth Assessment

Pre and post gameplay

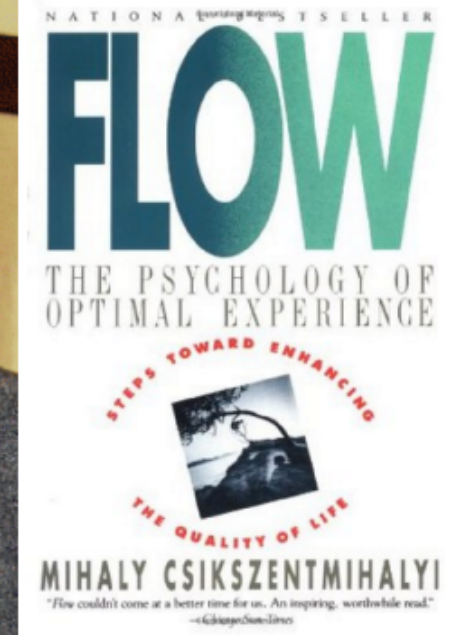


In the zone?
In flow??
Huh?

**TOW - AWAY
ZONE**



Flow is a new concept for young kids, as is self-reporting a state of mind. They need practice.



Survey Instructions

“There are no right or wrong answers to this survey. It will ask you questions about how you felt while you were playing the game today. It is trying to see if you were “in the zone” while you were playing. Some examples of “being in the zone” are:

- I was so focused on coloring a picture that I didn't even hear someone talking to me.
- I was playing soccer and I felt like I couldn't do anything wrong. I was awesome!
- I was playing a game and I was so into it, I totally forgot what time it was.

Provide Opportunity for Practice

- Played game over two days
- Students took survey at immediate conclusion of game play each day
- Survey was adapted to suit young students
- Data from 2nd day was used in analysis
 - This allowed for practice in self-reporting & game play
 - More likely to be in flow without game-play barriers
 - More likely to recognize flow with practice



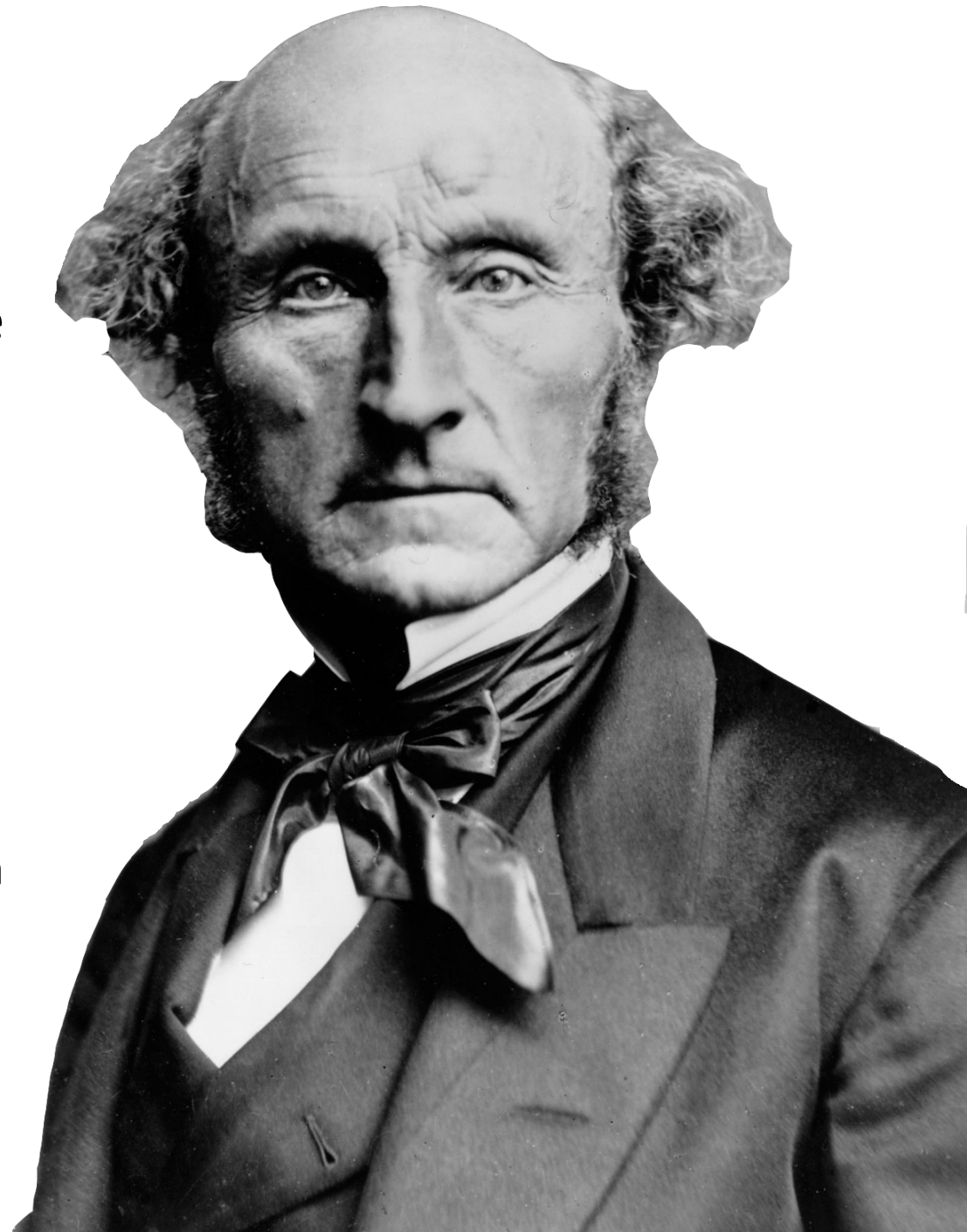
Directions:
1. Think about the game you just played
2. Circle how much each statement represents how you felt playing the game today.

	 YES!	 Yes	 I don't know	 No	 NO!
I was in the zone.					
I thought the game was hard but not too hard.					
I knew what to do in the game.					
I knew what I wanted to do in the game.					
I felt like I could get to the next level.					
The game kept my attention.					
I could do what I wanted to do in the game.					
I felt like nothing else mattered while I was playing the game.					
Time went by quickly while I was playing the game.					
I really enjoyed what I was doing.					
I would like to play this game again.					

NAME: _____ TEAM: _____

Concomitant Variation

- One of Mill's Methods to determine causality
- A variation in one factor results in a change in another factor – thus suggesting causality.
 - I hosted a party and made guacamole. The guests who ate just a little bit of guac, didn't feel great at the end of the party. Those who ate a bit more, felt worse. Those who ate a lot, were violently ill.
- Examples in my study: Dennis & Mike
 - Dennis only had half the dosage, and he is the only kid that doesn't fit my trend of kids that didn't do well on the test actually did better on the in-game items.
 - Mike had a very bad partner experience (low flow), scored better on non-game items.



What if I...



...used the game's opening 'stage-setting' sequences to stealthily *randomly assign* students into conditions?

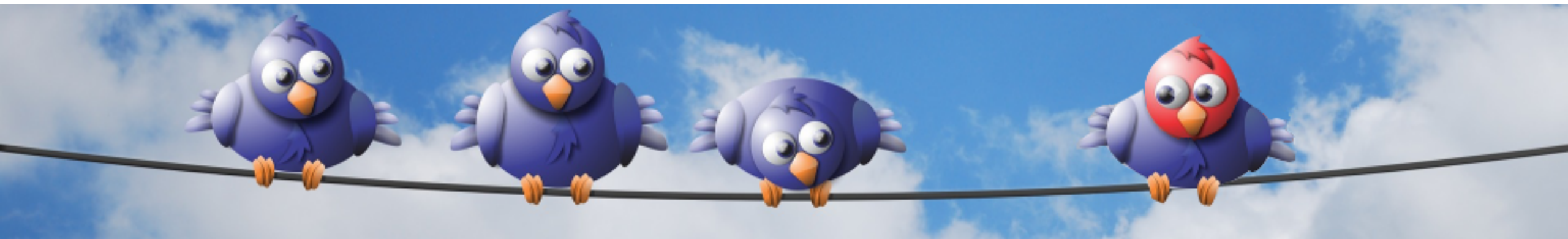
...and maybe do a Solomon 4 Group Design?

- Next generation for GBL research?
- Gold standard to determine if the **game itself** moved the needle?
- Two-group experimental designs present worry about testing carryover – was improvement because of pretest?
- Get around it with groups 3 & 4 – need #'s 120, 240 kids....
- If we view the treatment **not** as the whole GAME but as game ELEMENTS, then we can enhance random assignment and have everyone play.
- Stealth assessments in between treatments
- Compare in-game treatments

Group 1	Pretest	Treatment	Posttest
Group 2	Pretest		Posttest
Group 3		Treatment	Posttest
Group 4			Posttest

Maybe our bird can evolve?

- Maybe we can achieve RCT cred while still being authentic to GBL (holistic, nested effects, 'uncontrolled', etc.)



Questions?

Julie Oltman
julie.oltman@lehigh.edu
@joltman1

Dr. Thomas Hammond
hammond@lehigh.edu

arisgames.org

