Is CALL feedback better because it is immediate? (And what is immediate?)
Immediate > delayed feedback?

- Explicit, unsubstantiated claims (e.g., Alderson, 2005; Brown, 1997; Chun & Brandl, 1992; García & Arias, 2010; Kane-Iturrioz, 2008; Lan, Sung, & Chang, 2007)
- Implicit claims (e.g., Amaral & Meurers, 2011; Heift, 2010; Nagata & Swisher, 1995; Nagata, 1999)
- CALL applications (e.g., Rosetta Stone, Open English, Tell Me More, Criterion)
Rosetta Stone

• “Our proprietary speech-recognition technology gives learners **instant feedback** for rapid progress.”
Open English

• “The cutting-edge speech recognition system available to Open English’s students provides immediate feedback on your pronunciation.”
Tell Me More

• “This patented system enables the learner to speak freely with the computer, without even touching the keyboard or the mouse, and to obtain an immediate evaluation of his/her pronunciation.”
Criterion

• “They find out immediately how their work compares to a standard and what they should do to improve it.”
What is immediate feedback?

- At end of test/task
- At submission of response
- 2 seconds after submission of response
- At end of speaking turn (e.g., recast)
- At submission of an essay (e.g., Criterion)
- During essay writing (e.g., Aubrey & Shintani, 2014)
- At end of word (e.g., underlining in Word)
Immediate Delayed

IBI  EOT
Item by item  End of test

Dempsey & Wager (1988)
Henshaw (2011)
Purpose

• Provide evidence of how varied feedback timing affects learning of rules for articles by ESL learners
SLA theoretical background

Cognitive processing window
(Doughty, 2001, p. 253)

- Limited by working memory
- ≤ 40 seconds

$$\implies IBI > EOT$$
SLA literature

• No sig. difference between IBI & EOT/longer delays
• Sheen (2012), Quinn (2013)
  – Adult ESL students’ use of past tense, passive in narration task
  – Feedback provided as soon as student made error (IBI)
  – Feedback provided after student finished task (EOT)
  – No sig. difference between IBI & EOT conditions
CALL literature

• Goda (2004)
  – EFL students’ scores on TOEFL structure questions
  – No sig. difference between IBI & EOT feedback
• Lavolette, Polio, and Kahng (2013)
  – Used Criterion to give feedback on ESL students’ TOEFL-style essays
  – Feedback upon completing essay (EOT)
  – 1-week delayed feedback
  – No sig. difference in students’ responses to feedback
CALL literature

• Henshaw (2011)
  – L1 English speakers’ learning of Spanish subjunctive
  – IBI, EOT, 24-hour delayed, no feedback
  – No sig. differences on old or new items found among feedback groups

• Aubrey & Shintani (2014)
  – L1 Japanese speakers writing in English
  – Wrote in Google Doc shared with researcher
  – Targeted hypothetical conditionals
  – Researchers provided corrections during writing or few minutes after
  – Feedback during writing more effective
<table>
<thead>
<tr>
<th>Study</th>
<th>More effective feedback timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>English and Kinzer (1966); Kulhavy and Anderson (1972); Metcalfe et al. (2009), Experiment 1; Surber and Anderson (1975); Webb, Stock, and McCarthy (1994), Experiment 1</td>
<td>Delay longer than EOT more effective than EOT.</td>
</tr>
<tr>
<td>Butler et al. (2007); King, Young, and Behnke (2000)</td>
<td>Delay longer than EOT more effective than IBI.</td>
</tr>
<tr>
<td>Sturges (1978)</td>
<td>Delay longer than EOT more effective than delay shorter than EOT; EOT more effective than delay shorter than EOT</td>
</tr>
<tr>
<td>Guzmán-Muñoz and Johnson (2008); Rankin &amp; Trepper (1978); Schooler and Anderson (1990), Experiments 2 and 3</td>
<td>EOT more effective than IBI.</td>
</tr>
<tr>
<td>Rankin &amp; Trepper (1978); Schroth (1992); Schroth (1995); Smith and Kimball (2010)</td>
<td>Delay shorter than EOT more effective than IBI.</td>
</tr>
<tr>
<td>Brosvic and Epstein (2007); Dihoff, Brosvic, Epstein, and Cook (2004); Lin, Lai, and Chuang (2013)</td>
<td>IBI more effective than EOT.</td>
</tr>
<tr>
<td>Brosvic and Epstein (2007); Dihoff, Brosvic, Epstein, and Cook (2004); King, Young, and Behnke (2000)</td>
<td>IBI more effective than delay longer than EOT.</td>
</tr>
<tr>
<td>Schroth (1992); Schroth (1995)</td>
<td>IBI more effective than delay shorter than EOT.</td>
</tr>
<tr>
<td>Clariana et al. (2000); El Saadawi et al., (2008); Gaynor (1981); Lewis and Anderson (1985), Experiments 2 and 3; Schooler and Anderson (1990), Experiment 1; Smith and Kimball (2010); Surber and Anderson (1975); Van der Kleij, Eggen, Timmers, and Veldkamp (2012)</td>
<td>No difference between IBI and EOT/various delays.</td>
</tr>
<tr>
<td>Metcalfe et al. (2009), Experiment 2; Webb et al. (1994), Experiment 2</td>
<td>No difference between EOT and longer delay.</td>
</tr>
</tbody>
</table>
Research question

• Does the timing (IBI or EOT) of feedback affect ESL students’ gain scores on 5-minute-delayed and 1-week-delayed posttests
  a. on the same (repeated) questions?
  b. on new questions?

Predictions:

<table>
<thead>
<tr>
<th>Cognitive processing window</th>
<th>Item learning (repeated items)</th>
<th>System learning (new items)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EOT &lt; IBI</td>
<td>EOT &lt; IBI</td>
<td></td>
</tr>
</tbody>
</table>
Participants

- 112 ESL students
- Mean age: 21
- 59 male, 52 female (1 missing)
- L1s
  - Chinese (61)
  - Arabic (24)
  - Japanese (13)
  - Korean (5)
  - Thai (4)
  - Other (5)
- Randomly assigned to IBI (53) & EOT (59) groups
Procedure

- **Pretest**
  - 27 items
  - No feedback
- **Treatment 1**
  - 17 items
  - Feedback
- **Treatment 2**
- **5-minute-delayed posttest**
  - 27 items
  - No feedback
- **1-week delayed posttest**
Questions

Drag to insert:

- A bed
- The bed
- Bed

in my hotel room was too hard, so I couldn't sleep.
Feedback

The answer is:
The bed in my hotel room was too hard, so I couldn't sleep.

Sorry, you answered incorrectly.

Remember, use "the" when something after a noun makes it definite, especially descriptions starting with "that."

Next question
• Sig. interaction of time & feedback timing, $F(1, 108) = 4.20$, $p = .043$, $\eta^2_{part} = .037$

• Sig. main effect of time
  $F(1, 108) = 27.83$, $p < .001$, $\eta^2_{part} = .21$
New items

- Nearly sig. main effect of feedback timing, $F(1, 108) = 3.61, p = .06, \eta^2_{part} = .032$

- Sig. main effect of time $F(1, 108) = 41.22, p < .001, \eta^2_{part} = .28$
Summary

• For both repeated & new items
  – EOT < IBI
  – Not due to time spent reading questions & feedback:
    Question reading time: EOT ≈ IBI
    Feedback reading time EOT > IBI

• IBI feedback appears to be more effective & efficient for both item & system learning for MC questions
Pedagogical implications

• Take advantage of CALL capability to provide IBI feedback on MC questions
• Also consider IBI feedback for other question types
• CALL applications may be justified in claiming that “immediate” feedback is more effective – but what do they consider “immediate”? 
Thank you!

- Betsy Lavolette
- betsylavolette@gmail.com