

## Investigating 'Private' Second Language Writing Processes with Complementary Data Collection Methods

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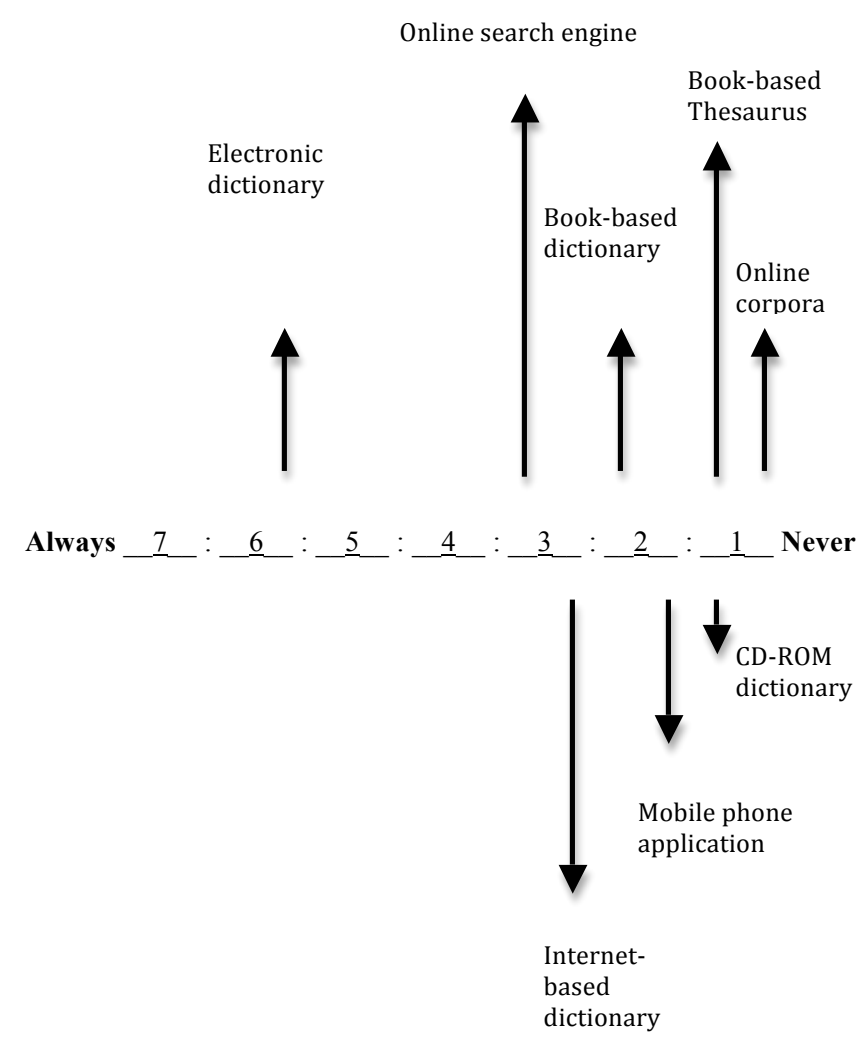
### Abstract

*"Writing is not necessarily something to be ashamed of, but do it in private and wash your hands afterwards" (Robert Heinelein, 1907-1988)*

Our increasing understanding of second language (L2) writing processes has begun to illuminate the enormous difficulties facing foreign language students when they compose texts in English. This research aims to investigate the complex cognitive activity underpinning the planning, formulation, transcription, reading and revising processes involved in the production of L2 academic texts by Japanese university students. In order to help learners with the problems they face, we need to have a clear idea of exactly what is happening, moment by moment, inside the writer's head, but tapping into these cognitive processes is far from easy. By combining complementary data collection methods (eye tracking, keystroke logging, stimulated retrospective think aloud (SRTA) protocols, and discourse analysis), we aim to provide a rich description of the real time L2 text construction and revision processes used by Japanese students at different levels of proficiency. This should enable us to develop training materials, based on sound empirical evidence, with which to raise learners' awareness of effective strategies for writing in a second language.

### What lexical resources do Japanese learners typically refer to during L2 writing tasks and why? (See student questionnaire; N = 131)

- When writing reports or essays in English, how often do you use some kind of lexical resource (dictionary, Thesaurus, etc.) to help?  
Always : 7 : 6 : 5 : 4 : 3 : 2 : 1 : Never
- When you need help with your English writing, which of the following resources do you use?



- From the resource(s) you **most often use** above, can you explain why you like it/them?
  - Electronic dictionaries:** Convenient; portable; quick for searching; multiple dictionaries available; detailed information on vocabulary; sentence searches possible; reliable (edited by experts); show only required information (cf. the Net); pronunciation model provided; 'history function' (records words already searched for); doesn't require Internet access.
  - Search engine:** Quick; gives authentic NS examples.
  - Internet-based dictionary:** Convenient when writing reports; free access; fast; multiple resources available; up-to-date; numerous example sentences; possible to translate whole sentences.
  - Book-based dictionary:** Familiar/habitual; all information is provided on one page (no scrolling necessary); possible to make notes on the pages.
  - Mobile phone:** Convenient; portable; can use in any location; doesn't require Internet access.
- During English writing tasks, what information do you usually search for in dictionaries?
  - English translation of Japanese word (Mean = 0.82)
  - Example sentences (Mean = 0.81)
  - Japanese translation of English word (Mean = 0.78)
  - Spelling (Mean = 0.77)
  - Information on how to use a word (Mean = 0.67)
  - Phrasal verbs or idioms (Mean = 0.51)

### What can L2 writing errors tell us about students' writing strategies?

彼女ができました。付き合いい始めて一ヶ月です。  
girlfriend got going out start one month is

- Search for 'tsukiau' in Casio EX-word electronic dictionary, using Shogakukan Progressive Japanese-English Dictionary.  
つきあう「付き合う」  
1. associate with; keep company with; go about [around] with  
⇒ Common translation error: I now have a girlfriend. I've been **associating** with her for a month.
- Search for 'associate with' in Oxford Advanced Learner's Dictionary:  
Associate *verb, adj., noun*  
1 [VN] ~sb/sth (with sb/sth) to make a connection between people or things in your mind: *I always associate the smell of baking with my childhood. He is closely associated in the public mind with horror movies.* 2 [V] ~ with sb to spend time with sb, especially a person or people that sb else does not approve of: *I don't like you associating with those people*
  - These kinds of errors are suggestive of poor writing strategies amongst Japanese university students.
  - Analysis of the final products of the writing process are insufficient to reach any firm conclusions.

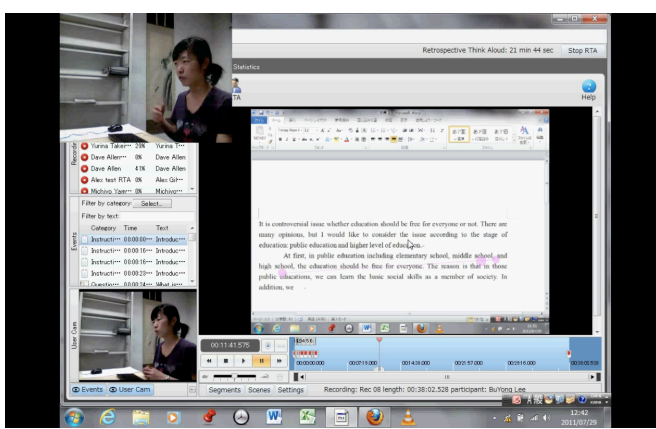
### Eye tracking study - Experimental methodology

- Participants' L2 proficiency assessed with C-Test.
- Participants familiarize themselves with hardware/software.
- 10 minutes planning time for IELTS essay: 'Education should be free for everyone'. To what extent do you agree or disagree with this statement?
- Calibration of eye tracker (Tobi T60).
- Participants write timed essay (35 minutes).
- SRTA protocol initiated after a short break (recorded using Tobii Studio 2.2).
- SRTA video file converted from .avi to .mp4.
- SRTA protocol transcribed using Inqscribe.
- Resulting data is analysed in detail.

### To what extent can complementary data collection methods (eye tracking, keystroke logging, SRTA protocols & discourse analysis) provide insights into students' L2 writing strategies?

#### Example from Pilot Study

BY: Post-graduate student & Teaching Assistant in the Writing Centre at Tokyo University, studying Japanese literature (Proficiency level = Advanced).



- Frequent use of multiple online lexical resources during text construction: Goo & ALC (J-E, E-J dictionaries); Merriam Webster dictionary & Thesaurus; Google. Evidence of different search strategies for different purposes:
  - Spelling checks:  
[00:12:52.04] A: Oh what's happening? So you're checking ALC [BY: Er ALC] yeah.  
[00:13:19.26] BY: I just put the word er er misspelling word.  
[00:13:25.24] A: Yeah OK why why did you do that? To che- check the spelling in ALC? [BY: Spell to check] yeah so e- even if it's misspelled [BY: Yes] it will give you a hint [BY: Yes] is is that your idea? [BY: Yes] Yeah I see. What happened? Ah.  
[00:13:42.28] BY: It was the right spelling.
  - Selecting between synonyms in Thesaurus:  
[00:23:36.22] BY: And check again *fundamental* or any other appropriate word or not.  
[00:23:44.12] A: Right so you're just translating *fundamental* into Japanese are you here?  
[00:23:51.10] BY: N- no [A: No?] but erm mm.

[00:23:56.04] A: Ah OK you're looking in the Thesaurus [BY: Thesaurus] ah OK.  
[00:24:06.18] BY: Mm er check and maybe *fundamental* is OK.

(c) Selective use of different J-E, E-J online dictionaries:

[00:26:14.20] A: *Korri* right OK so you checked in Goo this time [BY: Eh he] yeah? You you used ALC before and then Goo [BY: Ah] this time  
[00:26:25.12] BY: Er for checking authentic just one to one words [A: Mm] I usually check the Goo.  
[00:26:34.10] A: You check Goo?  
[00:26:35.14] BY: Mm and so- some words wide range of words [A: Yeah] check ALC that time ALC and Ejiro mm suggest many word.  
[00:26:52.14] A: Right lots of choices [BY: Lots of choices] yeah ah.  
[00:26:56.20] BY: Or just quick reference (laughs) is convenient using Goo.

(c) Checking naturalness of language in Google:

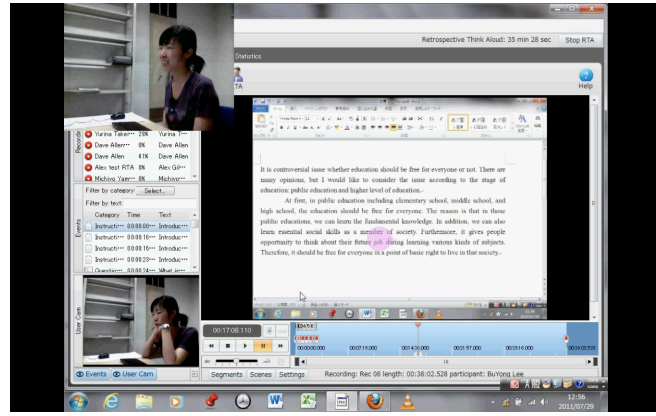
[00:49:18.00] BY: This is the the sentences is unnatural or I need to check in Google.

[00:49:27.02] A: Ah ha right so you're just copying and pasting [BY: Yes] into Google [BY: Yes] to check [BY: To check] if if it's natural or not? [BY: Mm] yeah yeah it's not natural [BY: Not natural] actually yeah (both laugh).

- Effective use of Word's automatic grammar/spell check functions:

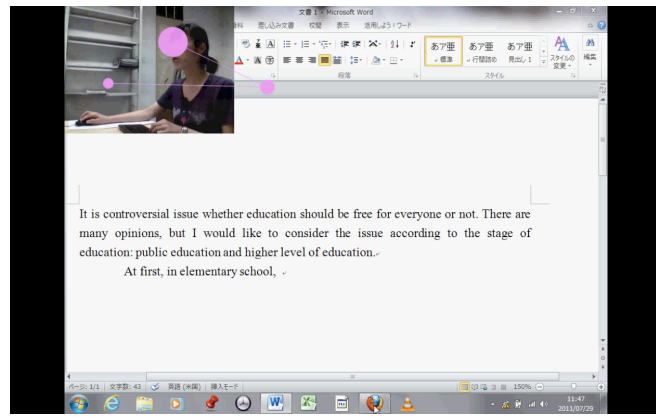
[00:12:26.02] BY: I I need to check the spelling (laughs) [A: Aah] to erm [A: So you] the dictionary.  
[00:12:31.18] A: You noticed it was underlined [BY: Yes] yeah so you realized there was a spelling [BY: Yes] mistake [BY: Yes] yeah OK.  
[00:12:45.27] BY: (Both laugh) So or two times it was mis mis so.  
[00:12:52.04] A: So you you changed the spelling yeah you changed the A to an O to guess if that was the problem [BY: Yes] yeah I see yeah it's still a mistake [BY: Mm] so guessing again? Oh what's happening? So you're checking ALC [BY: Er ALC] yeah.

- Eye gaze positions useful in identifying problem areas during text construction:



[00:35:22.01] A: You're reading future jobs.  
[00:35:23.12] BY: Oh future jobs the plural or single (laughs).

- Rapid tracking across the top of the screen indicative of ongoing thought processes:



[00:14:15.28] A: What are you looking for there do you know?  
[00:14:18.08] BY: Er I just thinking about the next sentence or the next a sentence (laughs).

- Microgenesis episodes (MGEs) evident in SRTA protocol, facilitated by learners working in their zone of proximal development (ZPD) whilst negotiating meaning with the interviewer:

[00:44:40.10] A: You weren't sure which verb to use with this? [BY: Yes] Financial burden [BY: Financial burden] So you decided not to use it? [BY: Not to use it] 'cos you weren't sure about the verb? [BY: Ye- Yes] I see OK yeah yeah with financial burden we probably say erm like imposes a financial burden [BY: **Oooh**] or something like that [BY: **Oh thank you**] mm.

### Conclusions

- The complementary data collection methods were successful in providing a 'thick description' (Geertz 1973) of the L2 text construction process.
- Replay of eye tracking and keystroke logging immediately after the writing event was highly effective in eliciting information on writing strategies and thought processes.
- Evidence of a wide range of L2 writing strategies employed, with variations associated with individual preferences and proficiency level.
- SRTA videos provide valuable data to use in the production of EAP training materials for second language writers, where effective and ineffective strategies can be highlighted.