English Language Learning Magazine

CONTACT

Special Research Symposium Issue

Discourse in the Classroom

Learner Beliefs and Attitudes

Language Processing and Memory in ESL

VOLUME 41, NUMBER 2, MAY 2015
*I*SSN # 0227-2938
Teachers of English as a Second Language Association of Ontario
www.teslontario.net/publication/contact-magazine

TESL Ontario

CONNECTION • COMMUNITY • EMPOWERMENT

ACKNOWLEDGEMENTS

TESL Ontario would like to acknowledge the support it received from the following organizations and individuals to arrange for and publish the refereed proceedings of the Fifteenth Annual Research Symposium

including

TESL Ontario Conference Committee

TESL Ontario Office Staff

The Participants in the Research Symposium

The External Reviewers:

Richard Clément, PhD, University of Ottawa

Janna Fox, PhD, Carleton University

Kartchava, Eva, PhD, Carleton University

Murray Munro, PhD, Simon Fraser University

IN THIS ISSUE

VOLUME 41, NUMBER 2, MAY 2015

Editors' Notes

Theme 1: Discourse in the Classroom

Theme 2: Learner Beliefs and Attitudes

Theme 3: Language Processing and Memory in ESL

Teachers of English as a Second Language Association of Ontario

CONTACT

Contact is published four times a year (Feb, June, August, and November) by TESL Ontario. February is our conference issue and May is our research issue. It is published for the members of TESL Ontario and is available free online to anyone.

Contact welcomes articles of general interest to association members, including announcements, reports, articles, and calls for papers.

Personnel

Legal

ISSN # 0227-2938

Cover image

https://www.flickr.com/photos/pulpolux/1244808389

TESL ONTARIO

TESL Ontario is a supportive community empowering educational professionals to help English language learners to thrive.

Contact TESL Ontario

TESL Ontario #405 - 27 Carlton St.
Toronto, ON M5B 1L2
Phone: 416-593-4243 or 1-800-327-4827
Fax: 416-593-0164
http://www.teslontario.net

Enquiries regarding membership or change of address should be addressed to the TESL Ontario Membership Coordinator at membership@teslontario.org.

Enquiries regarding advertising rates and reservation of advertising space should be addressed to the Office Coordinator at administration@teslontario.org.

Board

Executive director

Renate Tilson

Affiliates

TESL Durham, TESL Hamilton-Wentworth, TESL Kingston, TESL London, TESL Niagara, TESL North York/York Region, TESL Northern Region, TESL Ottawa, TESL Peel/Halton/Etobicoke, TESL Toronto, TESL Waterloo-Wellington, TESL Windsor

Teachers of English as a Second Language Association of Ontario

EDITORS' NOTES

FOREWORD

This issue offers the refereed proceedings of the fourteenth Annual Research Symposium, part of the 42nd Annual TESL Ontario Conference held in Toronto in October 2014. The three themes that provided the focus of the Research Symposium were as follows:

Discourse in the Classroom

Learner Beliefs and Attitudes

Language Processing and Memory in ESL

As in previous years, the three themes covered topical issues that affect the classrooms and practice of ESL professionals in varied ways. Teachers who encounter problems and challenges related to these themes on a daily basis in their classrooms look for background information and practical ideas that will help them meet their learners' needs and the needs of their own professional development. In organizing the Research Symposium around topical themes and in publishing the proceedings, TESL Ontario offers ESL professionals relevant information on recent research and new initiatives; this information informs both classroom practice and the development of the profession.

Following past practice, the different themes were selected in consultation with members of TESL Ontario. Symposium presenters were invited to submit a written version of their oral presentation after the Research Symposium. Selected reviewers, subject experts on the review topic, commented on the manuscripts for final inclusion in the proceedings. Those papers included in these proceedings offer readers theoretical, research and practical insights on pedagogical challenges that classroom teachers, administrators, and other ESL professionals deal with on an on-going basis as they endeavour to provide learners with optimal learning conditions. We are confident that readers will find the selected papers interesting and relevant to their teaching and professional development. We hope teachers and researchers will feel inspired by the ideas presented, and that teachers will launch their own inquiries into an aspect of their teaching context, then report their insights at future TESL Ontario conferences.

We also wish to thank all the presenters who participated in the different topics of the Symposium for their dedication to their work and for sharing their expertise and insights. Without them, we could not have organized the Symposium and compiled these proceedings. Finally, we thank the many individuals who contributed in one way or another to the success of the Research Symposium. We particularly wish to thank the editor of *Contact* magazine, Brett Reynolds, and TESL Ontario's administrative office, and conference staff for supporting us in organizing and preparing the Research Symposium and for the opportunity to assemble this refereed Research Symposium issue of *Contact*.

Without their continued support, our work would have been considerably more difficult and markedly less pleasant.

Hedy McGarrell

David Wood

Co-editors

INTRODUCTION

The Research Symposium and the ensuing refereed proceedings of contributions to the symposium have become an integral part of the annual TESL Ontario conference. The symposium at the 2014 TESL Ontario conference brought together researchers and language professionals who addressed one of the three topics that had been selected for inclusion. While some of the contributions included present data from individual researchers' recent studies, others summarize areas of activity in areas that have become topical in ESL learning and teaching. The contributors link theoretical insights with practical issues in pedagogy and consider the implications to classroom practice. All three themes addressed at the 2014 Research Symposium are represented in these proceedings. They are grouped according to theme and, within each theme, presented in alphabetical order of the presenters.

Theme 1: Discourse in the Classroom

In his paper *Spoken Corpora and Classroom Interaction,* Michael McCarthy focuses on the use of selected interactional features as used by native English speakers (NS) and non-native English speakers (NNS). McCarthy discusses findings from a comparison of two corpora, one from NS interaction outside the classroom, the other from NNS language in the classroom to explore differences in the use of two discourse markers and response tokens. The comparison shows that the interactional features examined are typically used by teachers in the classroom, leaving little opportunity for learners to develop facility. McCarthy suggests that learning opportunities to develop facility with such interactional features.

Theme 2: Learner Beliefs and Attitudes

The first paper in this section is by Elaine Howrwitz, entitled *Beliefs about Language Learning and the Experience of Second Language Learning: Asking Useful Questions about Language Learners*. The paper is a retrospective of Horwitz' widely-known research on learner beliefs about language learning, along with a set of reflections on her evolving perpectives. Horwitz offers ways to help learners arrive at realistic expectations for language

learning and to encourage more effective language learning strategies. She suggests that the research on metacognition can be of support to teachers in helping learners develop more effective learning practices.

The second paper within this topic is James McCrostie's *Learner Beliefs of Word Frequency and the Impact on Vocabulary Notebooks*. McCrostie explored how and why Japanese undergraduate learners of English selected the vocabulary they included in a vocabulary notebook they were required to maintain as part of their course. The findings indicate that the participants relied on their teachers and textbooks when selecting, seemingly arbitrarily, vocabulary items. The participants selected primarily individual words rather than expressions, were unable to determine whether words were important or not and indicated a preference for teacher-provided vocabulary lists.

Kim Noels and Lou Mantou's contribution, *Mindsets, Goal Orientations and Language Learning: What We Know and What We Can Do,* reports on studies that examine whether language learners' beliefs about whether the ability to learn an additional language are fixed or malleable. Participants' learning goals, achievements and confidence depended on the mindset they adopted, but manipulation of learners' mindset affected their goal setting and reactions. Noels and Mantou discuss implications of these findings in terms of theory and for classroom learning.

Theme 3: Language Processing and Memory in ESL

Philippa Bell in her paper *The memory effect - Does working memory affect how people learn new second language grammar?* reports on two studies of the role of working memory on the acquisition of grammar by learners in meaning-focused tasks, with a focus on implicit and explicit processing, incidental learning, and implicit and explicit learning. Results are mixed, in that working memory appears to play no role in how grammar is processed under these conditions, but it may play a role in how much grammar will be learned. Learners with large working memory capacity and an explicit grammar focus appear to be advantaged.

In a review of recent research entitled *Learning and using language, from the inside out: Recent perspectives on the nature of real-time spoken language processing*, Craig Chambers examines how second language learners process spoken language. Learners are challenged by the ways that language is processed incrementally during listening, as the mind links speech phenomena to words stored in the mental lexicon. These limitations are partially compensated for by the use of contextual cues that are created by the presence of other words in an utterance.

Xavier Gutierrez, in his paper *Knowledge sources in L2 writing and their contributions to the resolution of language-related episodes*, reports on a study exploring how different knowledge sources are used in individual and collaborative writing tasks to resolve language-related episodes. Participants reported individually on the changes they made

to written drafts, and were also recorded discussing a collaborative writing task. They used both explicit and implicit knowledge sources effectively, although explicit knowledge appears to have had more successful results.

We have enjoyed preparing this Special Research Symposium Issue for readers of *Contact* and wish to thank the contributors for submitting written versions of their papers. To grow, members of the TESL profession need to continue to investigate research and teaching practice; this continual striving for more sophisticated research questions and teaching techniques allows them to meet the challenges encountered in their classrooms. We hope that the stimulating contributions contained in this issue of the referred proceedings of the 2014 Research Symposium will inspire teachers to experiment with a new methodology or new techniques in their classrooms.

Hedy McGarrell

David Wood

Co-editors

CONTRIBUTORS TO THE PROCEEDINGS

Bell, Philippa, PhD

Philippa Bell is an Assistant Professor at the Université du Québec à Montréal. One of her research interests is to understand the relationship between working memory and the acquisition of second language grammar using explicit (conscious) and implicit (unconscious) learning mechanisms.

Chambers, Craig, PhD

Craig Chambers is an Associate Professor of Psychology affiliated with the interdisciplinary Human Communication group at the University of Toronto Mississauga. Professor Chambers' research explores the mental processes underlying the processing and acquisition of spoken language at various points across the human lifespan

Gutierrez, Xavier, PhD

Xavier Gutierrez is an Assistant Professor of applied linguistics and Spanish at the University of Alberta. His research focuses on knowledge representations of language and their relationship to second language learning and use.

Horwitz, Elaine, PhD

Elaine Horwitz is Professor of Curriculum and Instruction at the University of Texas at Austin, USA. She has published widely on beliefs about language learning and language anxiety. She is the author of Becoming a Language Teacher: A Practical Guide to Second Language Learning and Teaching, 2nd ed., Pearson, 2013.

Lou, Mantou, PhD Candidate

Mantou Lou received his Master degree from the University of Alberta, where he is now completing a PhD in Sociocultural Psychology. His research is focused on the influence of language mindsets on language acquisition and intercultural communication.

McCarthy, Michael, PhD

Michael McCarthy is Emeritus Professor of Applied Linguistics, University of Nottingham, UK, Adjunct Professor of Applied Linguistics, University of Limerick, Ireland and Visiting Professor, Newcastle University, UK. He is (co-)author and (co-) editor of 50 books and more than 100 academic articles, including the international best-seller adult courses Touchstone and Viewpoint.

McCrostie, James, MA TESOL

James McCrostie is Associate Professor at Daito Bunka University in Japan. His teaching and research interests include vocabulary acquisition as well as academic and professional writing. He was recently a visiting researcher at Carleton University on a one-year research sabbatical.

Noels, Kimberly, PhD

Kimberly Noels is Professor in the Department of Psychology and Adjunct Professor in the Department of Educational Psychology at the University of Alberta. Her research interests focus on the social psychology of intercultural communication, particularly the interconnections between second language learning, motivation, identity, and interethnic relations.

EDITORS

McGarrell, Hedy, PhD

Hedy McGarrell is Professor of Applied Linguistics at Brock University. Her research focuses on ESL writing and technology in language learning and teaching. Her publications include *Language Teacher Research in the Americas* (TESOL) and, with K. Brillinger, Writing *for Results: Academic and Professional Writing Tasks* (Longman).

Wood, David, PhD

David Wood is Associate Professor of Applied Linguistics and TESL at Carleton University, with extensive EAP, ESL, and TESL experience in Canada and abroad. His research interests are in formulaic language, speech fluency, and language teacher education.

SPOKEN CORPORA AND CLASSROOM INTERACTION

Michael McCarthy, University of Nottingham

Abstract

In this article, two key elements of interaction which emerge from the investigation of native-user spoken corpora (discourse markers and response tokens) are considered and compared with evidence from classroom corpora when students are presenting and interacting. The chosen features are of high frequency in everyday conversational language. However, because teachers play an important management and monitoring role in classrooms, their use of these features tends to dominate the language of the classroom, with few opportunities available for learners to use them. It is argued here that the features which characterise conversational language outside of the classroom should be seen as equally important elements in the creation of interaction within the classroom, and that the achievement of what scholars have termed "classroom interactional competence" (CIC) leads to enhanced opportunities for learning. Students who manage to develop CIC have a greater chance of achieving the goal of general interactional competence outside of the classroom. Good teachers exploit the moment-by-moment unfolding of the interaction in the classroom to shape learners' contributions and to maximise learning opportunities.

Sinclair and Coulthard (1975), showed in their ground-breaking description of the structure of classroom interaction that teachers managed their classrooms through a hierarchy of actions, ranging from the macro-organisation of the whole lesson, through sequences of exchanges with their pupils around key topics of the syllabus, down to the individual speech acts whereby information and instructions were given, student responses were elicited through question-and-answer sessions, and feedback was given to reassure pupils that they were on the right track (or withheld as a signal that things were not going in the right direction). The classrooms that provided Sinclair and Coulthard with their data were teacher-fronted and the display of knowledge, transmitted by the teacher, was the key pedagogical goal. The transcripts in their book may seem at times quaint now, in the era of collaborative learning, pair-work and group-work, task-based learning, and technology-led classrooms. The question is, how can one best understand what interaction happens in classrooms, how it relates to what happens in other environments, and what relationship it may have with second language learning?

The role of spoken corpora in explicating interaction

One of the major advances in late-twentieth-century technology was the easy availability of high-quality, miniaturized audio recording equipment. In tandem with the development of recording technology came swift advances in computer hardware and software for the analysis of written texts and spoken transcripts. These enabled both smaller and large-scale spoken corpora to be collected (see McCarthy 1998 for a brief survey of spoken corpora development). Analysis of spoken data, especially everyday conversation, showed just how different it could be from written texts, not least in its grammar, where the emphasis is on interaction and on the exigencies of real-time, face-to-face communication (Carter & McCarthy, 1995, 2006, 2015). Discourse analysts, conversation analysts, and corpus linguists alike revealed the structure and patterning of talk, two key elements of which are revisited below. Spoken corpora in particular were able to show the considerable regularity of patterning of spoken interaction: while individual conversational transcripts may look chaotic and at times almost as if they lack any kind of structure, thousands of conversations analyzed with sophisticated software revealed consistent organization and patterning. Complex systems such as turn-taking mechanisms (Sacks, Schlegoff, & Jefferson, 1974; Stivers et al., 2009; Tao, 2003), discourse-marking (Schiffrin, 1987), the construction of interlocutors' engagement and use of response tokens (Bublitz, 1988; McCarthy, 2002), and the co-construction of utterances (Clancy & McCarthy, 2015) were shown to be the means of creating successful interaction using a relatively small set of items and features of the potentially vast linguistic repertoire.

Back into the classroom: classroom interactional competence

The notion of classroom interactional competence (CIC) rests on the idea that the more successful interaction in the classroom mirrors successful interaction outside of the classroom, the more learning is enhanced. That is not to say that classroom conversations are the same as conversations in the coffee shop or round the dinner table. Classrooms are special places, where, by and large, it is the teacher's job to manage the interaction and to spot and foster learning opportunities. Equally, learners can and do assist one another in classrooms and contribute to the learning enterprise. The negotiation of meaning that is often observed in student-student tasks has been seen to assist language acquisition (Johnson, 1995). Ohta (2001) suggests that "learners both utilize and provide developmentally appropriate assistance to their peers" (p. 124), albeit lower level learners often remain dependent on the teacher before they can successfully complete collaborative tasks (p. 269). Walsh (2011), therefore, defines CIC as: "Teachers' and learners' ability to use interaction as a tool for mediating and assisting learning." CIC places interaction at the centre of learning. A further key point made by Walsh is that CIC does not simply encompass fluency and accuracy as defining language proficiency but, crucially, the notion of *joint* activity, hence **inter**action rather than just the action of speaking in class.

Explicating CIC therefore requires two complementary approaches, both of which can be underpinned by referring to spoken corpora: (a) understanding core linguistic features of

non-classroom spoken interaction which speakers use to communicate effectively and (b) understanding the nature of classroom interaction, for present purposes, in second language classrooms. Learners obviously learn a lot through written work but for most learners in the world, what is said in the classroom remains central to the learning experience, even though learning is also now often complemented by online interactions of various kinds. From these two perspectives, it may be seen more clearly how teachers manage the discourse of their classrooms to maximize learning opportunities. The evidence of classroom conversations does not necessarily demonstrate or prove language acquisition, but it can be brought to bear to pinpoint moments of learning opportunities and how they are exploited (or not) and use such insights in teacher education to help train teachers as managers of interaction and as promoters of CIC.

Markee (2008) argues that the techniques of conversation analysis (e.g. the study of turn-taking and adjacency pairs) are the keys to understanding how CIC emerges in second language classrooms. Such techniques can be applied to individual classroom transcripts but also, to some extent, en masse, to corpus data. Walsh, for example, used a corpus of some 100,000 words of transcribed EFL classroom interactions to build his model of CIC and his description of the four characteristic "modes" of interaction that language teachers engage in. Equally, large-scale corpus projects such as the English Profile corpus are gathering increasing amounts of classroom and oral examination data which will shed further light on CIC and on the emergence of general interactional competence among learners.

Core features of spoken interaction

A full account of spoken interaction is beyond the scope of the present paper, but here I wish to focus on just two core features that have emerged from discourse analysis, conversation analysis and corpus analysis as frequent in, and central to, everyday speaking:

- Use of discourse markers
- Use of response tokens

As mentioned above, there is much more to a successful conversation than these two features, for example, the special character of spoken grammar (Carter & McCarthy, 1995, 2006, 2015) or the vocabulary of speaking in a more general sense (Buttery & McCarthy, 2012). For present purposes, however, the two features listed above will be used to illustrate the highly interactive nature of common talk and problems associated with the classroom environment in relation to such talk.

Discourse markers

Spoken corpus evidence, based on frequency counts, shows that two discourse markers in particular, *right* and *well*, are among the 40 most frequent words. This is the case in major varieties of native-user English (i.e., British & North American varieties; see Leech et al., 2001; McCarthy, 2002, 2010). This is remarkable in one sense, given the dominance

of grammatical words in the upper ranks of frequency lists (determiners, prepositions, pronouns, conjunctions, modal, and auxiliary verbs, etc.). When one appreciates their roles in marking features of interaction, it is less remarkable. *Right* functions to mark boundaries in discourse (as well as functioning as a response token – see below), and *well* (which can also be used as a response token) frequently functions to shift assumed or projected directions of the discourse, for example, to mark the start of a new phase, to mark hesitation, or inability to respond in the assumed way, such as being unable to answer a yes-no question with either yes or no. These extremely common interactive functions account for the high frequency of the two items.

Spoken corpus evidence shows the overwhelming preference of *right* and *well* to be used at or near the beginning of the speaker's turn, or to occupy the whole turn, thus giving these expressions a key linking role in the flow and continuity of conversation from one speaker to another (see McCarthy 2010 for a discussion of the notion of flow in conversation). In casual, everyday conversations among social equals, both items are available to all interlocutors.

Right and well in classroom contexts

When classroom corpora are analyzed, the distribution of the two discourse markers is illuminating, both in positive and less satisfying ways. In this paper evidence is offered from two learner contexts: (1) learner classrooms of typical non-native speaker students from a number of countries around the world, in the form of data collected for the spoken component of the English Profile project (see above), here referred to as the EP corpus, and (2) classrooms in a higher education institution where non-native and native-speaker students pursue academic subjects and professional training together (in this case, education and training for hotel management careers at a college in Shannon, Ireland), here referred to as the CLAS (Cambridge, Limerick, & Shannon) corpus (Healy & Onderdonk Horan, 2012). Figure 1 shows the distribution of speaker turn-initial *right* in the EP corpus, comparing its use by teachers and by students.

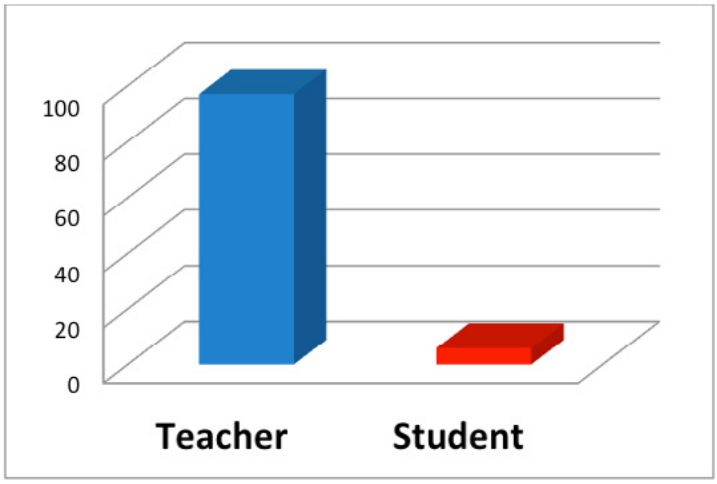

Figure 1. Turn-initial *right*: EP corpus.

The picture is somewhat predictable, confirming what Sinclair and Coulthard (1975) showed four decades ago, that teachers use *right* to organize, monitor and manage the discourse. It is a powerful marker in the classroom. With a 16:1 ratio in its use by teachers as opposed to students, it typically shows the teacher segmenting the lesson into its phases and responding to student contributions, both evident in extract 1:

Extract 1

<T> = teacher <S1,2,etc.> = any student

<T > *Okay **right**, and what about you Olga?*

<S1> *I'm going to Russia, to Moscow.*

<T> *Oh nice.*

<S1> *Yeah. I'm going to do a summer course in Russian language and I'll be with a host family too.*

<T> *Okay how long for?*

<S1> *For a month.*

<T> ***Right**.*

<S1> *July.*

<T> *Very good. Excellent.*

The segmenting function is rarely available to a student apart from in contexts such as student presentations and pair or group work when addressed to peers. In adult learning contexts, the segmenting function would be similarly restricted, though the responding function might be less so, with opportunities to use it to respond to information or directions from the teacher without being heard as insolent or too forward.

Well at the beginning of a speaker's turn has a different distribution, and in the CLAS corpus a finer variation in the distribution of its use can be observed when teachers, native-speaking students (NS), and non-native speaking ones (NNS) are compared. This is shown in figure 2.

This distribution can be explained by the fact that students are often in a situation of hesitation as respondents and/or need to respond with a shift of direction (when answering questions, for example). Although the NNS in these data use *well* less, there is a reasonable amount of evidence for its use, but the native-speakers are more at home with it, probably using it with a degree of automaticity not always available to the non-native user. Automaticity is an important element of fluency and the ability to maintain conversational flow (McCarthy, 2010); the greater the degree of automaticity, the greater classroom conversations mirror the interactions found in non-classroom settings.

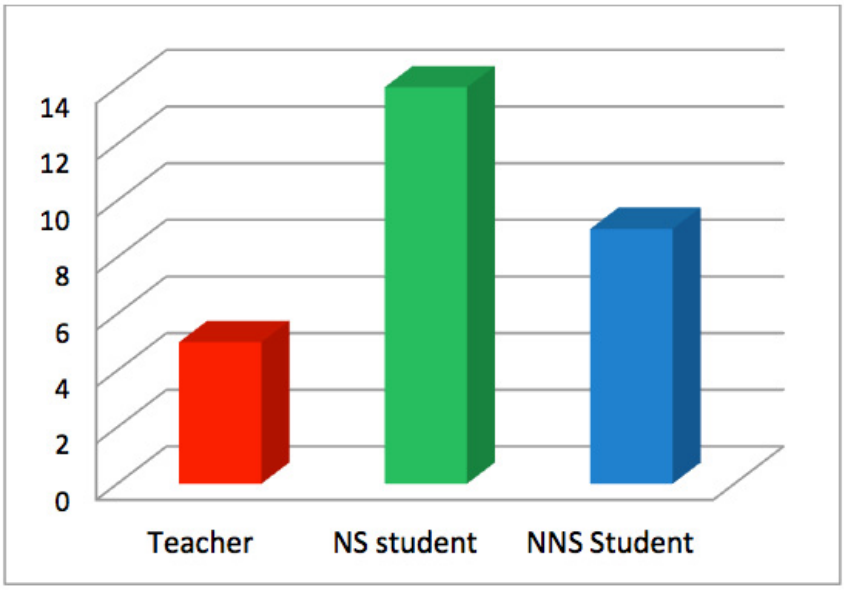

Figure 2. Turn-initial *well*: CLAS corpus

Right, well, and other discourse markers are evidence of interactional functions in classroom discourse. In a CIC framework, they may be tracked and observed in terms of how they correlate with such things as teacher scaffolding and feedback, waiting time, and student thinking time, all of which affect how students' contributions are shaped and how such "shaped" contributions can create learning opportunities. This is the approach taken by classroom language analysts such as Seedhouse (2004) and Walsh (2011).

Response tokens

McCarthy (2002) and O'Keeffe and Adolphs (2008) examined a series of items frequent in corpora (for a similar study of Spanish, see Amador Moreno, McCarthy, & O'Keeffe, 2013) whose function it is to show engagement when responding, in other words, to indicate "good listenership." These include high-frequency adjectives and adverbs such as *absolutely* (*not*), *great, really! / really?, too bad, perfect, fine, good, well … / well!,* and so on. Responding with these highly interactive items does more than merely saying yes or no. With these items there is a similar situation to that which pertains to the discourse markers noted above: teacher-dominated classrooms rarely provide learners with opportunities and contexts to use them. A typical spoken corpus, non-classroom example is (in the context of giving street directions):

Extract 2

<S1> *You go up the road about a mile to East Shore Road.*

<S2> *Uh-huh.*

<S1> *You'll take a left.*

<S2> *Yeah.*

<S1> *You'll come to a stop sign take a right and just follow it all the way out.*

<S2> ***Oh. Perfect.***

<S3> ***Great.***

The classroom corpora used show a similar distribution of *great* as a response token to that of *right*: in other words it is the teacher who uses it, with virtually no examples of learners doing so. Lack of opportunity for learners to use such tokens means lack of opportunity to develop general interactional competence and the parallel skill in developing classroom interactional competence, and lessening the chances of meeting and exploiting the learning opportunities that CIC both creates and reinforces. Opportunity for use is an important element of classroom activity and, clearly, restricted opportunities mean not only limited practice but reduced opportunities for feedback and evaluation of learners' competence (Buttery & Caines, 2010). The maximally effective classroom is one where teacher-student interaction and student-student interaction mirrors the way humans interact outside of the school walls. In conversations outside of class, the context may be purely social; in classrooms, the context is learning-focused but learning is achieved more readily if everyone puts one another at ease and communicates naturally, in other words, if learning itself becomes a social activity.

Modes of classroom interaction

Walsh (2006), basing his study on a corpus of EFL classes, classifies the strategic behaviours of teachers under four "modes" of interaction, whose aim is to align language use with pedagogical goals and to create the best conditions for teaching and learning (see also Seedhouse, 2004). Sometimes, the teacher is concerned with managing and organising the classroom, other times attention is directed to the materials and their activities, then other times the teacher is focusing on the system of the target language, its grammar, vocabulary, and pronunciation, and at other times the teacher encourages the students to engage in genuine interaction. In this last mode, the goal is students expressing themselves, recounting their experiences, and practising fluent production. It goes without saying that all this is in the context of the classroom rather than that of the outside world, where opportunities for interaction in the target language may be scant. The practised teacher also continuously monitors the total classroom situation and ensures an enjoyable and motivating environment for all concerned (Dörnyei, 2007).

Shifts from one classroom mode to another occur moment-by-moment and are characteristically controlled by the teacher; there is not necessarily a pre-ordained script or lesson plan and fluidity and flexibility are essential. Such interaction can be observed through the lens of discourse analysis (observing higher-order patterns and structure in the interaction) and/or conversational analysis (which typically addresses the turn-by-turn unfolding of the interaction), using classroom transcripts or audio-visual records of classroom activity. In such analyses, classroom language, like non-classroom conversations,

unfolds turn-by-turn between speakers and listeners; the discourse manifests as jointly constructed, is (pedagogically) goal-oriented, and is organised on the content and interpersonal plains at the same time.

Effective teachers make moment-by-moment observations of what is happening in their classes, consider what should be happening, and switch, with acute sensitivity, from one mode of talk to another, back and forth in a carefully monitored series of actions designed to maximally exploit the available learning time and to spot and generate learning opportunities. For the learners, developing CIC through opportunities for interaction is crucial both to their involvement in the learning process and to the development of their general interactional skills.

References

Amador Moreno, C., McCarthy, M. J., & O'Keeffe, A. (2013). Can English provide a framework for Spanish response tokens? *Yearbook of Corpus Linguistics and Pragmatics 2013*, 175–201.

Bublitz, W. (1988). Supportive Fellow Speakers and Cooperative Conversations. Amsterdam: John Benjamins.

Buttery, P. & Caines, A. (2010). Normalising frequency counts to account for 'opportunity of use' in learner corpora. In: Y. Tono, Y. Kawaguchi & M. Minegishi (Eds.), *Developmental and Crosslinguistic Perspectives in Learner Corpus Research*. Amsterdam: John Benjamins, 187–204.

Buttery, P. & McCarthy, M. J. (2012). Lexis in spoken discourse. In J. Gee & M. Handford (Eds.), *The Routledge Handbook of Discourse Analysis*. Abingdon, Oxon and New York: Routledge, 285–300.

Carter, R. A. & McCarthy, M. J. (1995). Grammar and the spoken language. *Applied Linguistics, 16*(2), 141–58.

Carter, R. A. & McCarthy, M. J. (2006). *Cambridge Grammar of English*. Cambridge: Cambridge University Press.

Carter, R. A. & McCarthy, M. J. (2015). Spoken grammar: Where are we and where are we going? *Applied Linguistics* 36, 1–21.

Clancy, B. & McCarthy, M. J. (2015). The pragmatics of co-constructed turn taking. In Ruehlemann, C. & Aijmer, K. (Eds.), *Corpus Pragmatics. Exploring Speaker Meaning in Computerized Corpora* (pp. 430–453). Cambridge: Cambridge University Press.

Dörnyei, Z. (2007). Creating a motivating classroom environment. In Cummins, J. & Davison, C. (Eds.), *The International Handbook of English Language Teaching* (pp. 639–651). New York: Springer.

Healy, M. & Onderdonk Horan, K. (2012). Looking at language in hotel management education. In F. Farr & M. Moriarty (eds.), *Language, learning and teaching: Irish research perspectives* (pp. 141–165). Berlin: Peter Lang.

Johnson, K. (1995). *Understanding Communication in Second Language Classrooms*. New York: Cambridge University Press.

Markee, N. (2008). Toward a learning behavior tracking methodology for CA-for-SLA. *Applied Linguistics* 29: 404–427.

McCarthy, M. J. (1998). *Spoken Language and Applied Linguistics*. Cambridge: Cambridge University Press.

McCarthy, M. J. (2002). Good listenership made plain: British and American non-minimal response tokens in everyday conversation. In R. Reppen, S. Fitzmaurice & D. Biber (Eds.), *Using Corpora to Explore Linguistic Variation* (pp. 49–71). Amsterdam: John Benjamins.

McCarthy, M. J. (2010). Spoken fluency revisited. *English Profile Journal*. Inaugural issue. Retrieved from http://journals.cambridge.org/action/displayJournal?jid=EPJ

Ohta, A. S. (2001). *Second Language Acquisition Processes in the Classroom: Learning Japanese*. Mahwah, New Jersey: Lawrence Erlbaum Associates.

O'Keeffe, A. & Adolphs, S. (2008). Using a corpus to look at variational pragmatics: response tokens in British and Irish discourse. In K.P. Schneider & A. Barron (Eds.), *Variational Pragmatics* (pp. 69–98). Amsterdam: John Benjamins.

Sacks, H., Schlegoff, E., & Jefferson, G. (1974). A simplest systematics for the organisation of turn taking for conversation. *Language*, *50*(4), 696–735.

Schiffrin, D. **(**1987). *Discourse Markers*. Cambridge: Cambridge University Press.

Seedhouse, P. (2004). *The Interactional Architecture of the Language Classroom: A Conversation Analysis Perspective*. Oxford: Blackwell.

Sinclair, J., McHardy, J., & Coulthard, R. M. (1975). *Towards an Analysis of Discourse*. Oxford: Oxford University Press.

Stivers, T., Enfield, N. J., Brown, P., Englert, C., Hayashi, M., Heinemann, T., Hoymann, G., Rossano, F., de Ruiter, J. P., Yoon, K.-E., & Levinson, S. C. (2009). Universals and cultural variation in turn taking in conversation. *PNAS* (*Proceedings of the National Academy of Sciences*), *106*(26), 10587–10592.

Tao, H. (2003). Turn initiators in spoken English, a corpus based approach to interaction and grammar. In C. Meyer & P. Leistyna (Eds.), *Corpus analysis, language structure and language use* (pp. 187–207). Amsterdam: Rodopi.

Walsh, S. (2006). *Investigating Classroom Discourse*. Abingdon: Routledge.

Walsh, S. (2011). *Exploring Classroom Discourse*. Abingdon: Routledge.

BELIEFS ABOUT LANGUAGE LEARNING AND THE EXPERIENCE OF SECOND LANGUAGE LEARNING

Asking Useful Questions about Language Learners

Elaine Horwitz, University of Texas at Austin

Abstract

This paper examines the experience of language learning from the perspective of research on beliefs about language learning. In doing so, it also describes the evolution of one researcher's approach to studying the role of learner differences in second language learning.

The paper discusses common student beliefs about language learning and how they impact language learning. For example, what do adult learners think about trying to learn a new language when they believe that early childhood is the ideal time for language learning? How do we counter common beliefs that a language can be fully learned in one or two years or that language learning is merely a matter of learning grammatical rules or a bunch of new words? How can we convince adults with low first language (L1) literacy that they can still learn a second language (L2)? The paper offers suggestions to help learners develop more realistic expectations for language learning and more effective language learning strategies. It concludes that research on metacognition helps teachers help learners develop more effective learning practices.

The academic discipline of Second Language Acquisition (SLA) entails the study of how humans learn additional languages and the factors that influence their learning. As such, research in SLA commonly addresses a range of important questions such as:

1. Does the human brain "learn" second languages in the same way(s) it learns other things?
2. How does a person's first language influence second language learning?
3. Do children have advantages in second language learning?
4. How does the learning context influence second language learning?

5. Which teaching practices best facilitate second language learning?
6. Why are some language learners more successful than others?

I have been interested in the last question on this list, the question of differential success in language learning, since I began studying French in junior high. I maintained this interest during my language teaching career. During my doctoral studies, I read about a number of variables associated with higher levels of second language achievement including foreign language aptitude (Carroll & Sapon, 1959), empathy (Guiora, Beit-Hallahmi, Brannon, Dull, & Scovel, 1972), and learner motivation and attitudes toward the target language and culture (Gardner & Lambert, 1972). Early in my studies, I came across an intriguing cognitive style variable described by the psychologist D. E. Hunt called Conceptual Level (Hunt, 1970, 1977). Conceptual Level is a cognitive style variable that describes students' levels of abstractness and interpersonal maturity. At the time, it was being examined as a source of differential success in several types of school learning, (Hunt, 1971). Conceptual Level also offered guidance to teachers as to how to organize instruction for different types of learners. Specifically, with respect to second language classrooms, students with higher conceptual levels, that is with higher levels of abstractness, could be expected to tolerate and probably even enjoy classroom activities with low amounts of structure such as role play activities. Students with lower conceptual levels, however, would have difficulty dealing with activities that offered little teacher guidance as to which target structures to use or the ideas that should be communicated. A Conceptual Level approach to teaching would have teachers vary the amount of "choices" students would need to make based on their need for structure.

As I studied the construct of communicative competence and how communicative goals would and could change language classrooms with my mentor Sandra Savignon, it seemed to me that conceptual level embodied the types of abilities needed for a student to be successful in a communicatively designed second language class. Since communicative language classrooms required learners to learn within a low- or at least a less-structured language classroom, I designed my dissertation research to test the correlations between conceptual level and traditional measures of foreign language aptitude (the Modern Language Aptitude Test) with student achievement in French measured in two ways: traditional grammatical based achievement tests (linguistic competence) and three speech tasks requiring spontaneous production (communicative competence). And although I later discussed how teachers might accommodate students with different conceptual levels within their classrooms (Horwitz, 1986), the original study (Horwitz, 1982) simply examined whether students with higher conceptual levels would achieve higher levels of (French) language competence than students with lower conceptual levels. The following abstract summarizes the findings of the study:

> This study explored the relationship between conceptual level a social cognitive variable and second language communicative competence. Conceptual level indexes both cognitive complexity and interpersonal

> maturity which have been related to first language communicative abilities. The research hypotheses stated that conceptual level was related to the development of communicative competence while foreign language aptitude was related to linguistic competence (mastery of the structural components of a second language).
>
> Conceptual level was found to be related to both communicative and linguistic competence ($r = .54$, $p < .001$; $r = .48$, $p < .001$) as was foreign language aptitude ($r = .40$, $p < .01$; $r = .41$, $p < .01$). However, foreign language aptitude was not found to be related to linguistic competence when conceptual level was statistically controlled ($r = .20$, $p < .135$). Conceptual level, on the other hand, was found to be related to communicative competence when foreign language aptitude was statistically controlled ($r = .42$, $p < .01$). Thus, conceptual level appears to be an important individual variable in second language learning. (p. 65)

Thus, the study confirmed my intuitions by finding that there was a substantial correlation between Conceptual Level and student performance on both the communicative tests and the linguistic competence tests in French. The traditional predictor of success in language classes, the Modern Language Aptitude test, was not related to performance on either the communicative or linguistic tasks. Students with higher Conceptual Levels tended to do better on both types of French tests, and my ideas that it was helpful for students to be able to deal with a low structure environment in communicative language classes was supported by the study.

Armed with these results, I wanted to help teachers see how important it was to recognize students' conceptual levels and accommodate different student types in communicative instruction. Low Conceptual Level students would need high levels of classroom structure, while higher Conceptual Level students could function well in low structure environments and would be uncomfortable with higher levels of structure (McLachlan & Hunt, 1973, Zampogna, Gentile, Papalia & Silber, 1976). I began to do workshops for in-service teachers on modifying instruction for students at varying conceptual levels. A particular difficulty in doing these workshops was in defining/describing Conceptual Level in a succinct and comprehensible way. Conceptual Level has two components: cognitive complexity and interpersonal maturity, and both components, in turn, are composed of two components: dimensional complexity and integrative complexity. These workshops included at least 5 over-head projector (pre-powerpoint) slides defining Conceptual Level:

> **Slide 1:** Conceptual Level = Cognitive Complexity + Interpersonal Maturity.
>
> **Slide 2:** Cognitive Complexity = Dimensional Complexity + Integrative Complexity
>
> **Slide 3:** ***Dimensional Complexity*** is the number of dimensions/ perspectives that the individual can generate on a given set of

information. For example, perspectives on teachers could include: "smart/not smart", "fun/not fun", "L1 speaker/L2 speaker".

Slide 4: ***Integrative Complexity*** is the number and inter-connectedness of the rules an individual uses to organize the perspectives. Higher-level dimensions such as "a professional teacher" might include having high subject level competence, up-to-date information about language teaching, love of students, and high ethics.

Slide 5 ***Interpersonal Maturity*** is Cognitive Complexity in dealing with people, seeing people in multiple ways and not dealing with people from a stereotypical perspective.

During a presentation for community college language instructors, I had one of those "life flashing" experiences. Three thoughts crossed my mind simultaneously: 1) How could it take five slides of definitions to start to improve language instruction? 2) The Conceptual Level paradigm maintained that students with varying Conceptual Levels needed different types of instruction with different amounts of structure so I had to ask myself, "Can teachers really vary instruction for students with different Conceptual Levels?" And, most importantly 3) What about those "theories about language learning" I had heard all through my career as a language teacher, didn't they have something to do with language teaching? Many students had told me that they **knew** that mistakes at beginning stages of language learning would become permanent or that when you had learned 5,000 words, you knew the new language, and colleagues mentioned their own pet theories of SLA. A philosophy professor I once worked with had told me that second language learning was simply a matter of reconnecting with a language spoken in a previous life!

The third thought about how students thought about language learning did not come entirely out of the blue. I had already been thinking about beliefs about language learning in terms of taking new teachers' ideas into account when presenting new approaches to language teaching (Horwitz, 1985). I had also been working on foreign language anxiety and thinking that certain perfectionistic beliefs might be a source of anxiety (Horwitz, Horwitz & Cope, 1986; Gregersen & Horwitz, 2002). For example, some anxious students believed that it was important never to make a mistake when speaking the new language. And there were also all those undergraduate students who found their way across campus to my office. For a number of years, students had been coming to see me to talk about their language classes. Each of them had a specific personal story about why language learning was particularly difficult for them. The SLA questions I posed at the beginning of this paper seemed to be more concerned with a theoretical understanding of language learning or at a more practical level how teachers should present language instruction. I wanted to know what happens to students when they are in language classes. At that point, I realized that I needed to reframe the question I was using to guide my study of second language learners. My original question "why are some students more successful than others?" seemed at least to some extent to blame students for their own lack of success and did not address the

actual experience of classroom second language learning.[1] I realized that my real interest in SLA concerned questions like, "what is it like to be an anxious language learner?" or "what happens when classroom practices conflict with students' ideas about how to learn a language," or even "how do personal language learning histories support or hinder current language learning?"

Beliefs about Language Learning

Beliefs about language learning refer to the ideas that people have about how humans learn second languages and consequently how languages should be taught. Of course, I was particularly interested in the beliefs that language students (Horwitz, 1988) or language teachers (Horwitz, 1985) have. Although some ideas about language learning may seem outlandish—my former colleague's association of language achievement and previous lives, for example—many people hold seemingly unquestionable common-sense ideas about language learning such as the belief that children are superior to adults as language learners. As a language teacher educator, I had spent a lot of time thinking about teachers' ideas about language learning, but until that moment presenting the Conceptual Level slides, I had not considered that language teachers needed to know about students' beliefs about language learning. It seemed to me that it is essential to know students' ideas when planning and presenting language instruction, especially when teachers are using non-traditional language teaching approaches. The question of whether children actually have advantages over older language learners was less important to me than the impact such a belief could have on an older language learner. In the US, language study often starts in middle school, and university language learners may still be struggling to complete basic second language requirements. I wondered what the impact of believing that older learners have missed a language-learning window might be, when the learners themselves are older.

In an effort to identify beliefs commonly held by language learners, I developed the Beliefs about Language Learning Inventory (BALLI; Horwitz, 1988) based on student interviews and focus-groups as well as teacher lists of beliefs they had encountered. This instrument originally included 34 individual belief items within five categories: 1) the difficulty of language learning, 2) language aptitude, 3) the nature of language learning, 4) beneficial learning and communication strategies, and 5) motivations and expectations for language learning. Sample items include:

- The most important part of learning English is learning to translate from my native language.
- If beginning students are permitted to make errors in English, it will be difficult for them to speak correctly later on.[2]

1 Other influences on my thinking including the new literature on learner autonomy, especially Henri Holec's (1987) groundbreaking article and the emerging qualitative research.

2 I am using English as the target language in these examples, but the questionnaire can easily be modified to other languages.

I have recently updated the BALLI. The new version (BALLI 2.0) includes the original 34 items and 10 new items (Horwitz, 2013).[3] New items elicit students' ideas about several topics including whether native-speaking teachers are preferable (e.g., It is better to have teachers who are native-speakers of English), learner autonomy (e.g., It is possible to learn English on my own without a teacher or a class), and student perceptions about required language tests (e.g., Tests like the TOEFL, the IELTS, or the TOIEC are good tests of my English ability).

I believe that the results of BALLI studies have implications for language teaching in a variety of settings.[4] For example, in a number of studies (e.g., Horwitz, 1999), substantial percentages of students indicated that they believe that a second language can be learned in two years or less with an hour a day of study. Students who believe that one *ought* to be able to learn a new language in a short period of time can begin to see themselves as having below average language learning ability if they are not successful within their (unrealistic) timeframe. The majority of students across cultural groups also believe in the existence of specialized language learning abilities that only some people possess. This belief is likely an additional source of a poor language learning self-concept. Students' native languages can also be a source of pessimism about language learning. English is usually perceived as a difficult language to learn, and students can often cite numerous unsuccessful English learners from their first language group.

Of particular importance to teachers of adult learners are students' beliefs about beneficial language learning practices. Adult learners have had previous educational experiences and from those experiences, they may have come to believe in specific ways to approach learning. BALLI responses indicate that substantial numbers of students believe that language learning is a matter of translating, or learning vocabulary words, or learning grammar rules. Such beliefs often manifest themselves in very limited language learning practices and substantial anxiety when these practices do not lead to success (e.g., Horwitz, 1987, 1988; 1999; Kern, 1995; Kunt, 1997; Park, 1995; Truitt, 1995; Yang, 1999).

Within specific populations of languages learners, I am especially concerned about the beliefs of adult language learners about their capacity to learn a second language. My doctoral student Nancy Meredith has been interviewing adult learners and has found that some wonder about their ability to learn English since they had not even achieved a secondary education in their country of origin. They see themselves as lacking the ability to learn any academic material. Not surprisingly, they were pessimistic about their ability to learn English, and it remains to be seen how they will adjust to formal classrooms.

One important limitation of the BALLI findings summarized here (Horwitz, 1987, 1988; 1999; Kunt, 1997; Truitt, 1995; Yang, 1999) is that most studies have used the responses of academically-tracked high school and university students. Adult ESL educators often work with students who have had interrupted and non-traditional schooling. The majority of

3 The 10 additional items of the BALLI 2.0 do not fall within the original five BALLI categories.
4 The findings I am reporting here all come from studies using the original BALLI.

BALLI studies have also been conducted in countries with universal educational systems. Teachers should know the beliefs of their own students especially when these students come from new or non-traditional learning groups so that they can help their students understand the reasons for the activities they assign. While the BALLI is a useful starting point, it cannot substitute for direct conversations about student beliefs since students will likely have a number of beliefs that are not included in the BALLI.

Asking SLA Questions about the Experience of Language Learning

Although other researchers have sought to identify the factor structure of the BALLI (Hsiao & Oxford, 2002; Yang, 1999), I have generally limited my study of beliefs to the descriptive level: identifying the beliefs that students hold and exploring relationships between beliefs and other learner factors such as anxiety (Kunt, 1997; Truitt, 1995) or strategies (Yang, 1999).[5] My goal has been to help teachers (and students) better understand why students approach language learning in the way(s) they do rather than to develop a theoretical model of SLA that places beliefs within an array of other variables. I link beliefs and the experience of language learning because they can impact both feelings about language learning and language learning behaviours. In addition, beliefs are concrete and relatively understandable for both language learners and teachers. To my mind the nature and etiology of beliefs fall more comfortably within the purview of other social sciences such as social psychology or sociolinguistics rather than within SLA. My intuition is that beliefs about language learning develop and function similarly to other categories of beliefs, but that is an empirical question. At the same time, I think that qualitative studies of belief maintenance and change as learners interact with language learning offer useful insights about what is going on in people's heads when they approach a language learning task and how interacting with the new language impacts their beliefs (and/or anxiety).[6]

Although teachers should know about the specific beliefs held by their students, they should also be aware of common beliefs that they are likely to encounter. According to a number of BALLI studies, teachers can expect students who believe that only some people are able to learn a language, that languages can be learned quickly, and that specific languages are difficult to learn. The belief that language learning is more difficult for older learners is particularly prevalent (Horwitz, 1999). This suggests that there will be a number of belief mismatches between language learners and their teachers as well as differences in expectations between learners and the language programs they are enrolled in. (In my experience, belief differences between teachers and the programs they teach in are also common.) In the case of younger learners, there are likely to be mismatches between family beliefs about language learning and school procedures, and younger learners may receive conflicting advice about how to go about language learning.

5 Since individuals hold multiple beliefs, establishing relationships between individual beliefs and other learner characteristics can be tricky statistically. The BALLI 2.0 elicits opinions about 44 beliefs items and does not yield a composite score. Factor Analysis can be used to reduce the number of items to a more interpretable number of common factors.

6 At the same time I was developing the BALLI, Anita Wenden (1986, 1987) was interviewing students about their language learning experiences to demonstrate how they came to have the beliefs they articulated.

Some Suggestions for Using Belief Research in Language Teaching

Most language learning occurs outside the classroom, and language learners are "on their own" most of the time. What do they choose to do? How do they feel about their language learning activities and their overall language learning experience? How do their learning experiences influence their beliefs about language learning? Do language learners become more or less comfortable over time? These are questions language teachers should ask in all language learning situations, but they are probably especially important in the case of adult learners with interrupted schooling because this group of learners may have had limited success or even experience with formal education.

I have felt for a long time that language learning is an ideal topic of conversation in language classes (Horwitz, 1987, 1988). As contrasted with many conversational topics that teachers use in language classes, language learning is an authentic topic for language learners. I will conclude this discussion with a few suggestions for using language classes to think about language learning.

Talk with students about their language learning experiences. Ask them what they are doing outside of class to learn English.

Have students think about their own language learning histories. Appendix A includes a form that I use with **graduate** students in my SLA classes. Similar questions could be developed for specific populations of language learners.

Use "mini-belief projects". Students could interview each other, family members, or successful language learners about their language learning experiences and report their findings to the class, either orally or in writing.

Have students read about language learning. Choose accessible SLA materials. Lightbown and Spada's (2013) introduction to SLA might be a good choice for advanced students. Adults might be especially interested in reading materials that have suggestions for helping their children learn English. Students could write to give language-learning advice to friends, family members, or other language learners.

Conclusion

Over the last 30 years, teachers and applied linguists have maintained an interest in the characteristics of language learners and how these characteristics impact language learning. However, it is important to note that the focus of this interest has changed over this time period. When I started studying individual differences, researchers were primarily interested in the issue of language aptitude to explain why some learners were more successful than others. My study on Conceptual Level was of this type. I wanted to determine if Conceptual Level was a better predictor of language achievement than the long-used Modern Language Aptitude Test, especially in light of the instructional changes in language teaching that were being introduced in the 1970's. In retrospect, this focus

on prediction of success is at least problematic and perhaps even troubling. It seems to me that research on language aptitude can be used to justify excluding some students from language study and even to rationalize language instruction that does not meet the needs of many students.[7] Both the Modern Language Aptitude Test and Conceptual Level are measures of cognitive abilities that individual learners may have in greater or lesser amounts. In response to the sixth question I posed at the beginning of this paper, an aptitude view would depend on students' cognitive abilities to explain their success or lack thereof. That was one of the reasons I was originally attracted to the Conceptual Level paradigm. It suggested a way to match students' cognitive orientations by varying the number and kind of choices they would have to make offering a wider range of students a better opportunity to be successful.

Learner beliefs about language learning offered a more straightforward approach for helping language learners become more successful. Learner beliefs about language learning are generally classified as metacognitive factors in language learning because they deal with how learners think about and control their language learning. As I noted earlier, they are often linked to the strategies that language learners choose to employ, and strategies are important because class time is limited and much language learning must take place outside of the classroom. This is probably especially the case for adult second language learners without traditional academic preparation. Beliefs about language learning are also important with respect to student expectations for language classes. Learners are likely to anticipate that their classes will include activities consistent with common beliefs about language learning or with their previous classroom experiences. Teachers should acknowledge their students beliefs and help them understand the rationale for classroom activities (Kern, 1995).

Over the last 30 years, there have been a number of changes in the questions that language teaching professionals ask about language learners and the characteristics that language teachers see as important in successful language learning (Dörnyei , 2005; Horwitz, 2000). This paper considered an early change in this process: the move from a focus on cognitive differences in learners to a focus on metacognitive variables. By considering learners' metacognition, teachers can help their students develop more realistic expectations for language learning and choose more effective language learning practices.

7 Aptitude testing as a means for encouraging or discouraging students from language classes has been more common for foreign language learners than for English Language learners. Of course, English language learning is not optional and all students must be included.

References

Carroll, J. B. & Sapon, S. M. (1959). *Modern language aptitude test*. Psychological Corporation.

Dörnyei, Z. (2005). *The psychology of the language learner: Individual differences in second language acquisition*. Mahwah, NJ: Lawrence Erlbaum.

Gardner, R. C. & Lambert, W. E. (1972). *Attitudes and motivation in second-language learning*. Rowley, MA: Newbury House.

Gregersen, T. & Horwitz, E. K. (2002). Language learning and perfectionism: Anxious and non-anxious language learners' reactions to their own oral performance. *The Modern Language Journal*, *86*(4), 562–570.

Guiora, A. Z., Beit-Hallahmi, B., Brannon, R. C., Dull, C. Y., & Scovel, T. (1972). The effects of experimentally induced changes in ego states on pronunciation ability in a second language: An exploratory study. *Comprehensive Psychiatry*, *13*(5), 421–428.

Holec, H. (1987). The learner as manager: Managing learning or managing to learn. In J. Rubin and A. Wenden (Eds.), *Learner strategies in language learning* (pp. 145–157). Englewood Cliffs, NJ: Prentice-Hall.

Horwitz, E. K. (1982). The relationship of conceptual level to communicative competence in French. *Studies in Second Language Acquisition*, *5*, 65–73.

Horwitz, E. K. (1985). Using student beliefs about language learning and teaching in the foreign language methods course. *Foreign Language Annals*, *18*(4), 333–340.

Horwitz, E. K. (1986). Adapting communication-centered activities to student conceptual level. *The Canadian Modern Language Review*, *42,* 827–840.

Horwitz, E. K. (1987). Surveying learner beliefs about language learning. In J. Rubin and A. Wenden (Eds.), *Learner strategies in language learning* (pp. 119–129). Englewood Cliffs, NJ: Prentice-Hall.

Horwitz, E. K. (1988). The beliefs about language learning of beginning university foreign language students. *The Modern Language Journal*, *72*(3), 283–294.

Horwitz, E. K. (1999). Cultural and situational influences on foreign language learners' beliefs about language learning: A review of BALLI studies. *System*, *27*(4), 557–576.

Horwitz, E. K. (2000). Teachers and students, students and teachers: An ever-evolving partnership. *The Modern Language Journal*, *84*(4), 523–535.

Horwitz, E.K. (2013). *Becoming a language teacher: A practical guide to second language learning and teaching* (2nd ed.). Upper Saddle River, NJ: Pearson.

Horwitz, E. K., Horwitz, M. B., & Cope, J. (1986). Foreign language classroom anxiety. *The Modern Language Journal*, *70*(2), 125–132.

Hsiao, T. Y., & Oxford, R. L. (2002). Comparing theories of language learning strategies: A confirmatory factor analysis. *The Modern Language Journal*, *86*(3), 368–383.

Hunt, D. E. (1970). A conceptual level matching model for coordinating learner characteristics with educational approaches. *Interchange*, *1*(3), 68–82.

Hunt, D. E. (1971). *Matching models in education: The coordination of teaching methods with student characteristics*. Toronto: Ontario Institute for Studies in Education.

Hunt, D. E., (1977). *Assessing conceptual level by the paragraph completion method*. Toronto: Ontario Institute for Studies in Education.

Kern, R. G. (1995). Students' and teachers' beliefs about language learning. Foreign Language Annals, 28(1), 71–92.

Kunt, N. (1997). *Anxiety and Beliefs about Language Learning: A Study of Turkish Speaking University Students Learning English in North Cyprus* (Doctoral dissertation). University of Texas, Austin.

Lightbown, P. M., Spada, N. (2013). *How languages are learned* (4th ed.). Oxford: Oxford University Press.

McLachlan, J. F. & Hunt, D. E. (1973). Differential effects of discovery learning as a function of student conceptual level. *Canadian Journal of Behavioural Science, 5,* 152–160.

Park, G. P. (1995). *Language Learning Strategies and Beliefs about Language Learning of University Students Learning English in Korea*. (Doctoral dissertation). University of Texas, Austin.

Truitt, S. N. (1995). *Anxiety and Beliefs about Language Learning: A Study of Korean University Students Learning English* (Doctoral dissertation). University of Texas, Austin.

Wenden, A. L. (1986). What do second-language learners know about their language learning? A second look at retrospective accounts. *Applied Linguistics*, *7*(2), 186–205.

Wenden, A. (1987). How to be a successful language learner: Insights and prescriptions from L2 learners. In J. Rubin and A. Wenden (Eds.), *Learner strategies in language learning* (pp. 103–117). Englewood Cliffs, NJ: Prentice-Hall.

Yang, N. D. (1999). The relationship between EFL learners' beliefs and learning strategy use. *System*, *27*(4), 515–535.

Zampogna, J., Gentile, R. J., Papalia, A., & Silber, G. R. (1976). Relationships between learning styles and learning environments in selected secondary modern language classes. *The Modern Language Journal*, *60*(8), 443–447.

Appendix A

Language Learning Interview

- What languages do you speak? Have you studied? Assess your abilities in 1-2 languages.
- How do you come to know your second language(s)?
- What did you enjoy about your language learning experiences?
- What would you change about your language learning experiences?
- Do you have any particular "tricks" or strategies you use in language learning?
- If you had to learn a new language what would be your preferred way of going about it? How would you feel about learning a new language?
- Do you experience anxiety when studying a second language? Expressing yourself in a second language? Meeting members of your target culture? Visiting or living in the target culture?
- Is there anything else you would like to say about your language learning experiences?

LEARNER BELIEFS OF WORD FREQUENCY AND THE IMPACT ON VOCABULARY NOTEBOOKS

James McCrostie, Daito Bunka University

Abstract

This paper discusses the results of a study that examined vocabulary notebooks kept by 124 EFL university students in Japan. The study asked four main research questions. 1) What sources do learners believe are best to choose words from? 2) Why do learners select the words they want to learn? 3) Do learner beliefs of word frequency influence the words they choose? 4) Do learners believe keeping a vocabulary notebook helps them learn vocabulary? The results indicate that learners believe instructor provided materials to be the best source for words. Learners also have trouble justifying their word selections and choose words because they are unknown. They believe all unknown words to be equally important and had difficulty judging word frequency. Learners also expressed a belief in the need for teacher provided word lists.

Most vocabulary teaching literature advises learners to keep some kind of vocabulary notebook. Yet, few studies have investigated learner beliefs surrounding the strategy of keeping vocabulary notebooks or the actual notebooks kept by learners. As a result, researchers and instructors remain uninformed as to the effectiveness of keeping a vocabulary notebook. This study aims to explore Japanese learners' beliefs about vocabulary and vocabulary learning by examining their actions while they employ a vocabulary-notebook learning strategy.

Learner Beliefs Defined

Clearly defining the term *learner beliefs* has proven challenging for researchers. For example, according to Sakui and Gaies (1999), learners approach language learning with a range of "attitudes, experiences expectations, and learning strategies" which include "beliefs about the nature of language, about the language-learning task, about likely outcomes about learners' personal language learning strengths and limitations" (p. 474). However, Wenden (1999) differentiates between learner beliefs and metacognitive knowledge. Wenden defines metacognitive knowledge as "acquired knowledge about learning: the nature of learning, the learning process, and humans as learners" (Wenden, 1999, p. 435), elaborating that it can be acquired subconsciously, as the result of observation and

imitation, or consciously, by absorbing advice from teachers and peers. Wenden (1999) argues that beliefs are distinct from metacognitive knowledge because beliefs "are value-related and tend to be held more tenaciously" (p. 436).

This study defines learner beliefs as views about language and language learning held in a learner's mind. Learner beliefs are social in nature and may be influenced by learners' cultural and educational backgrounds but, in the end, are unique to each individual. Furthermore, a learner's beliefs are not fixed and can be changed by personal experience. Since language learning beliefs and language learning strategies are related, this paper takes the position that it is possible to examine the beliefs that learners hold about language and language learning by studying the strategies they employ to learn language.

Previous Research

Researchers studying learner beliefs tend to rely on learners' answers to interview questions or self-reported questionnaires (Benson & Lor, 1999; Brown, 2009; Horwitz, 1987, 1999; Matsuura et al. 2001; Richardson, 2011; Yang, 1999). Much of this research used or adapted Horwitz's (1987) *Beliefs About Language Learning Inventory* (BALLI). The BALLI consists of 27 statements which subjects respond to using a five-point Likert-type scale ranging from "strongly disagree" to "strongly agree". The widespread use of the BALLI questionnaire allows for a comparison of beliefs held by learners in a variety of ESL and EFL settings. For example, Horwitz (1999) compared the findings of several studies that examined learner beliefs of Americans studying French, German, Spanish, and Japanese as a second language as well as Turkish, Korean, and Taiwanese learners studying English as a foreign language. Horwitz concluded that learners must be considered as individuals and will hold a wide variety of different beliefs. She also expressed a reluctance to conclude that BALLI questionnaires can elicit any important cultural differences in beliefs about language learning. According to Horwitz, language-learning context often proves just as important as any perceived cultural differences.

Previous Research into Learner Beliefs about Vocabulary

Little previous learner-belief research has stressed vocabulary learning. For example, the BALLI questionnaire contains only one question examining student attitudes towards learning words. The BALLI asks learners to respond to the statement: *the most important part of learning a language was learning vocabulary words*. Published results show responses vary widely. EFL learners tend to agree but the strength of that agreement ranges from 42 to 79% (Horwitz, 1999; Yang, 1999). While American learners studying Japanese as a second language also agreed, American learners of French, German, and Spanish disagreed (Horwitz, 1999).

Researchers in Japan have employed the BALLI questionnaire, with responses as varied as those by American learners (Burden, 2002; Jones & Gardner, 2009; Keim et al., 1996). Two studies in which Japanese university students responded to a modified version of the BALLI found that Japanese undergrads slightly disagreed with the statement: *learning*

English is mostly a matter of learning a lot of new vocabulary (Burden, 2002; Jones & Gardner, 2009). A third study found 55% of first-year and 69% of second-year students expressing agreement (Keim et al., 1996). These conflicting results suggest the need for additional research into learner beliefs about vocabulary using alternative measures.

One study that has focused on vocabulary learning is Simon & Taverniers' (2011) investigation into the beliefs held by 117 Dutch university students studying English. Learners completed an 88-item questionnaire covering vocabulary, grammar, and pronunciation beliefs and strategies. Responses indicated that the learners considered vocabulary "significantly more important" than either grammar or pronunciation for efficient communication. Learners also expressed the belief that vocabulary errors were more likely to lead to communication breakdowns, attributing the belief to the fact they had most often encountered communication breakdowns because of problems with word usage (Simon & Taverneir, 2011, pp. 905 & 912).

The general lack of focus on vocabulary in relevant research means researchers remain largely uninformed as to learner's beliefs about vocabulary and vocabulary learning. Whether this is a serious problem depends on how important one believes learning vocabulary to be but as the linguist David Wilkins famously stated, "While without grammar little can be conveyed, without vocabulary nothing can be conveyed" (Wilkins, 1972, p. 111). In Japan, recent revisions to the national English curriculum have introduced English as a foreign language classes to elementary school and have increased the vocabulary size students should acquire in junior high school from 900 words to 1,200 words and in high school from 1,300 to 1,800 words (Tahira, 2012, p. 5). This makes a better understanding of learner beliefs towards vocabulary learning important for practical reasons and not merely as a matter of academic curiosity.

Current Study

This study is focused on four questions about learner vocabulary beliefs.

1. Where do learners believe it is best to find words for their notebooks?
2. Why do learners select the words they want to learn?
3. Do learner beliefs of word frequency influence the words they choose?
4. Do learners believe keeping a vocabulary notebook helps them learn vocabulary?

By investigating the answers to these four questions, this paper will examine in what ways and to what extent learner beliefs about vocabulary and learning through notebooks make a difference to vocabulary acquisition.

Vocabulary Notebooks Defined

The vocabulary teaching literature describes how notebooks can take several different forms, for example: bound notebooks with fixed pages, binders with moveable pages, or

index cards small enough to fit into a pocket (Carroll & Mordaunt, 1991; Fowle, 2002; Nation, 2001; Schmitt & Schmitt, 1995). The form is not important. The key is the amount and kind of information recorded in the notebook. A vocabulary notebook should contain more than a list of words and needs to include information beyond word definitions. This should include at least one example sentence along with some additional information such as: parts of speech, common collocations, pronunciation information, antonyms and synonyms, and pictures (Carroll & Mordaunt, 1991; Fowle, 2002; Schmitt & Schmitt, 1995).

The literature typically identifies two main benefits of keeping notebooks. Keeping vocabulary notebooks primarily helps learners acquire new vocabulary. Recording vocabulary notes of one kind or another in a notebook and the resulting practice appears to lead to better acquisition (Hulstijn, 1992; Walters & Bozkurt, 2009). However, the role that notebooks play in vocabulary acquisition remains understudied. The secondary aim for vocabulary notebooks is promoting learner autonomy and independence (Fowle, 2002; Schmitt & Schmitt, 1995; Waring, 2002). Several experts argue that learners should choose their own words for their notebooks to develop autonomy (Gairns and Redman, 1986; McCarthy, 1990; Schmitt and Schmitt, 1995). However, recent research found that keeping a vocabulary notebook failed to promote a sense of learner autonomy (Walters & Bozkurt, 2009).

Methodology

Participants

An analysis of the vocabulary notebooks kept by 124 EFL university students in Japan provides the main data for this study. The students came from five classes of first-year English majors in a single Japanese foreign language university and the subjects' level can be generally described as low-intermediate to intermediate. The university uses an in-house produced English language proficiency test that covers listening, reading, speaking, and writing skills to stream students before the start of each academic year. The five classes selected for inclusion in this study came from the university's intermediate level and are comparable in overall proficiency level.[1]

Data Collection

The learners started to keep vocabulary notebooks beginning in the eighth week of the 15-week first semester. They received instructions to record words they thought were useful and likely to use again, to indicate the meaning in Japanese, the word's part of speech, and an example sentence. Recording the definition in basic English was optional. Instructors collected the notebooks twice during the first semester to ensure they were being kept and to offer encouragement. The final seven weeks of the semester got students used to keeping notebooks.

1 For more information on the participants and their notebooks see McCrostie, J. (2007a). Examining learner vocabulary notebooks. *ELT Journal*, 61*(3)*, 246-255.

Go Back to Menu

In the second semester, students received instructions to record twenty words a week and two new pieces of information: the source of the word and the reason for recording it. Instructors collected the notebooks halfway through the semester to check progress and for the last time after twelve weeks. Out of 132 students, 124 handed a notebook assignment in to their instructor. The notebooks contained 17,129 words with 374 of these words being repeated, giving a total of 14,989 individual lexical items. After completing an analysis of the vocabulary notebooks, follow up interviews were conducted with twelve learners to provide more information on their beliefs. Three students were selected randomly from each of the five classes to participate in an open-ended interview with the author. However, mutually convenient interview times could only be arranged with twelve of the fifteen students.

Analysis of Notebooks

Analysing these notebooks provides insights into beliefs surrounding vocabulary and vocabulary learning because they reveal how learners actually study words and not merely what they profess to believe as reflected through questionnaire studies. Figure 1 shows the sources from which students drew their vocabulary items and helps answer research question number one: where do learners believe it is best to find words for their notebooks? Sources can be classified into five broad categories: 1) textbooks and class handouts at 82%; 2) other written sources such as books, newspapers, magazines at 6.5%; 3) electronic media which means primarily music but also TV and movies) at 5%; 4) spoken conversations at 2%; and 5) miscellaneous sources such as signs, computer games, and dictionaries at 4.5%).

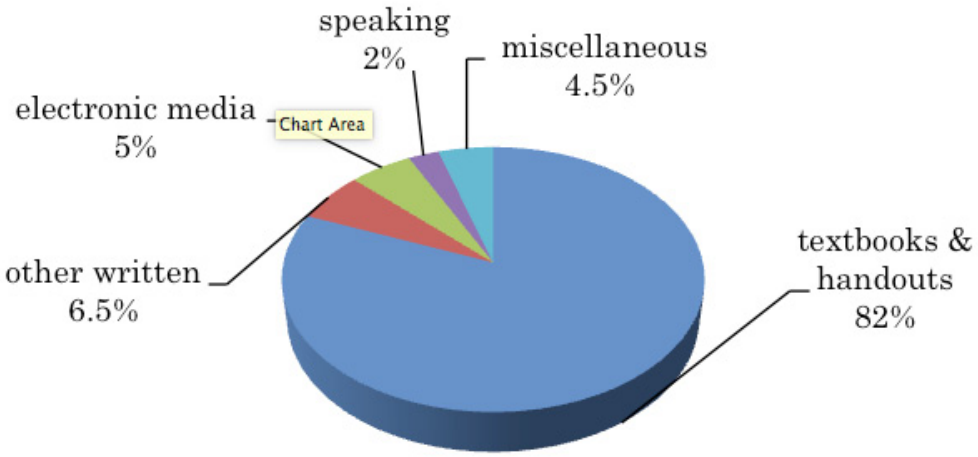

Figure 1. Word sources for words found in participant vocabulary diaries.

Most students studying English as a foreign language in school receive the majority of exposure to the language in the classroom. Consequently, it comes as no surprise that students drew words primarily from textbooks. A large majority of the words (82%) came from textbooks and class handouts and forty-eight found 90% or more of their words in textbooks. This was slightly disappointing because the university provides an elaborate

self-access centre where students receive training in how to study independently using a wide variety of authentic English materials, but students made little use of it to learn vocabulary. The fact that 88.5% of words came from written sources shows that for this study's Japanese learners, new vocabulary is nearly synonymous with written vocabulary. However, this belief and focus on choosing so many words from written sources is a concern because fluent listening and speaking requires fewer and different words than reading and writing (Schmitt, 2000)

The notebooks also show what learners believe constitutes a vocabulary item. Learners participating in this study recorded only individual words, showing that they believe vocabulary learning means learning one word at a time. However, vocabulary typically works in the form of collocations such as *have a drink* or *make a mess* (Schmitt, 2000; Waring, 2002). Given the importance of collocations, the learners in this study received instruction in their standardized freshman curriculum not to view vocabulary learning as memorizing single words but to focus on collocations. Alas, out of 17,129 words, students recorded only 99 collocations; all the other notebook entries represented single words. Even after instruction on the value of collocations, learners continued to view words in isolation and to believe learning vocabulary means memorizing the meaning of one word at a time. The learners' reluctance to view vocabulary acquisition as learning collocations also helps show how learner beliefs about vocabulary learning are quite fixed, especially the idea that learning vocabulary means learning one word after another. This finding lends support to Wenden's (1999) assertion that beliefs are something learners hold "tenaciously" and suggests that instructors should train their learners, not merely tell them, how to identify collocations.

Since learners who have not yet ascended to an advanced level swim in an ocean of unknown words, it is worthwhile examining the reasoning behind their word selections and trying to answer research question two: why do learners select the words they want to learn? Complications surround any analysis of the reasoning behind word selection. Different students relied on different answers to the question why they recorded the word. Furthermore, each student certainly defined the reasons in slightly different ways in their own mind. It is also conceivable their only reason for selecting the word was to satisfy

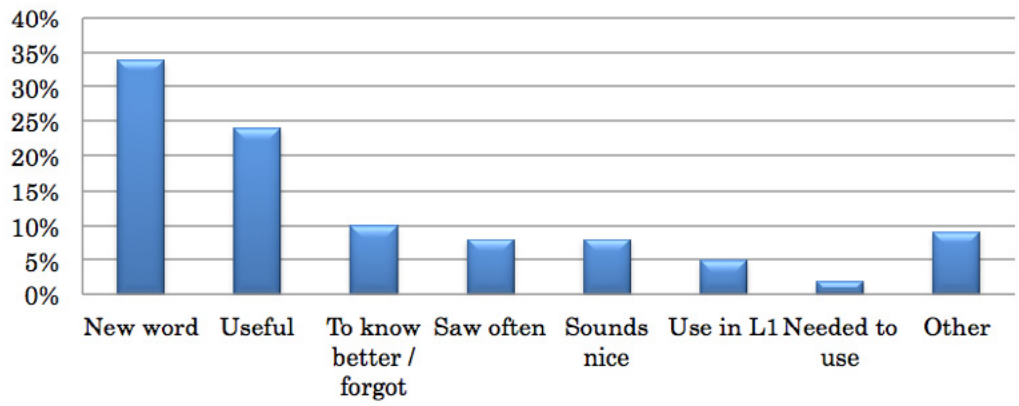

Figure 2. Reasons for word selection

the teacher forcing them to keep a notebook. However, it is possible to gain at least some insight into learner rationale behind their word selection. Students provided the reason for selection for 15,132 words and the breakdown by percentage is shown in Figure 2.

Learners selected most words for the somewhat vague reason that it was "a new word" or they "did not know the word" (34%). The next most popular rationale was that the word was "useful" or "important" (24%). Learners recorded 10% of words because they wanted to know the word better or had forgotten it, 8% because learners had seen the word frequently, 8% because the word sounded nice, 5% because the words were used frequently in Japanese, and 2% of words were looked up by students while speaking or writing. Learners recorded the remaining 9% of words for various reasons that did not fit into other categories. For example, a teacher told them it was important or because it was especially difficult and they wanted to learn difficult words. Since students received instructions to record only words they thought to be useful, these results show that students selected nearly two-thirds of words for essentially no clear reason.

Learner judgment of "useful" words also appears somewhat suspect. For example, one learner recorded the words: *effluent*, *heretofore*, *twixt*, *larynx*, *sediment*, and *prognosticator* in his notebook, believing they would be "useful for conversation."

These examples help show how learners tend to believe all words they do not know are equally important and indicate the difficulties they have distinguishing between high frequency, valuable words and words they simply do not know. Many learners recognize their difficulty identifying high frequency words. During follow up interviews, eight out of twelve students expressed frustration, without being prompted by the researcher, at not knowing whether the words they recorded were the best words to learn. For example, one student said, "When I write down words it worries me. I want to learn the words that will help my English the most, but I don't know the words to write." When specifically asked by the researcher, the remaining four learners agreed that it was almost impossible for them to determine whether a newly encountered word was a high frequency word.

Thus, the answer to research question three (do learner beliefs of word frequency influence the words they choose?) is essentially no. Even when they try to identify high frequency words, learner intuitions of word frequency tend to be highly inaccurate. This is by no means a critique of learners. Teachers also are poor judges of word frequency. A study of the accuracy of native English speaker word frequency intuitions found that experienced EFL teachers were no better than Canadian university undergraduates at judging English word frequency (McCrostie, 2007b).

This difficulty in accurately judging word frequency is probably one reason why so many learners relied almost exclusively on words from textbooks and teacher provided handouts. Of course, textbooks present the quickest and easiest source of words for learners being required to keep vocabulary notebooks. Yet it seems that students also rely on these sources because they represent vocabulary provided by the teacher. This probably ties into

traditional teacher and student roles in Japan, where learners tend to be passive and defer to teachers.

Another study, which took place at the same university as the present paper, compared the attitudes of 149 students who studied vocabulary with notebooks and from teacher provided word lists. Results showed that 80% expressed a desire to receive word lists from their teacher (Joyce & Sippel, 2004). While it may be fashionable for teachers to promote learner autonomy, most students taking part in this study believe teachers should provide more guidance when selecting notebook words. Teachers who do not want to provide guidance in the form of actual word lists will need to train students to look out for words they see repeatedly and are thus more likely to be high frequency, valuable words. Learners below the advanced level should also be trained how to consult word frequency lists and to focus on words from the 1,000–3,000 word levels (Nation, 2005).

This leaves the final research question: do learners believe keeping a vocabulary notebook helps them learn vocabulary? Overall, learners expressed positive opinions about keeping vocabulary notebooks. The opinion of one student who said during a follow up interview that notebooks "are a good way to remember new words that are important for me" being typical. Other researchers also found similar positive attitudes about the usefulness of vocabulary notebooks (Walters & Bozkurt, 2009).

However, this belief in the value of vocabulary notebooks is undercut by a simultaneously held belief that keeping notebooks takes so much time that little is left for actually studying the recorded words. Few of the learners participating in the study even kept the required number of words set out for the assignment. Although instructed to try and record about twenty words a week, which should have been 240 words over twelve weeks, the quantity of words recorded by learners varied widely. The notebook with the fewest words contained 71 and the notebook with the most had 287 words. The average number of words for all students was 142.

Several studies have found that learners believe keeping a notebook in which one records information beyond the word, meaning and perhaps example sentence takes too much time and is not worth the effort, with a majority admitting that they would not continue to keep vocabulary notebooks on their own (Joyce & Sippel, 2004; Rowland, 2011; Walters & Bozkurt, 2009). In one study, students who selected their own words for their notebooks spent nearly all their time finding and recording words and very little time actually studying them (Joyce & Sippel, 2004). As a result, these learners believe vocabulary notebook learning to be inefficient; 74% of learners either strongly agreed or agreed with the statement "I learn a lot of vocabulary when I use the word list method." However only 47% strongly agreed or agreed with the statement "I learn a lot of vocabulary when I use the vocabulary notebook method" (Joyce & Sippel, 2004).

Conclusion

Learner beliefs about vocabulary and learning through vocabulary notebooks will influence their vocabulary acquisition. The learners in this study believe textbooks and other written sources are the best source of words for vocabulary notebooks. They also believe that all unknown words are equally important and, thus, are generally poor judges in selecting vocabulary for their notebooks. Furthermore, even after instruction to the contrary, leaners continue to believe that vocabulary learning means learning one word at a time, rather than viewing collocations as a key part of vocabulary learning. Since such views run contrary to what researchers know about best practices for word learning, these beliefs can only hinder learner efforts to increase their vocabularies.

The learner preference, seen across multiple studies, for teacher provided word lists helps demonstrate learners themselves are aware of the problem in choosing which words to learn. Of course, vocabulary teaching and learning cannot be manacled to frequency lists. However, even if it is not the only criterion for word selection, frequency should be an important consideration (Waring, 2002). Educators should help students understand their vocabulary level and encourage them to consult with word frequency lists. If required to keep vocabulary notebooks, learners should receive guidance from teachers to help them make informed choices, not just independent decisions, when it comes to selecting words.

Instructors should take into account the commonly held learner belief about the inefficiencies of vocabulary notebooks (Joyce & Sippel, 2004; Rowland, 2011). For most learners, the time involved in keeping notebooks meant little time is spent actually studying the words. This does not necessarily mean teachers should give up assigning vocabulary notebook assignments but it does mean more classroom time should be spent using them, reviewing them, and helping learners focus on increasing their depth of vocabulary knowledge beyond the meaning of a word.

References

Benson, P. & Lor, W. (1999). Conceptions of language and language learning. *System*, *27*(4), 459–472.

Brown, A. (2009). Students' and teachers' perceptions of effective foreign language teaching: A comparison of ideals. *The Modern Language Journal*, *93*(1), 46–60.

Burden, P. (2002). A cross sectional study of attitudes and manifestations of apathy of university students towards studying English. *The Language Teacher*, *26*(3), 3–10.

Carroll, M. & Mordaunt, O. (1991). The frontier method of vocabulary practice. *TESOL Journal*, *1*(1), 23–26.

Fowle, C. (2002). Vocabulary notebooks: Implementation and outcomes. *ELT Journal, 56*(4), 380–388.

Gairns, R. & Redman, S. (1986). *Working with Words*. Cambridge: Cambridge University Press.

Horwitz, E.K. (1987). Surveying student beliefs about language learning. In Wenden, A. L. & Rubin, J. (Eds.), *Learner Strategies in Language Learning* (pp. 119–129). London: Prentice-Hall.

Horwitz, E. K. (1999). Cultural and situational influences on foreign language learners' beliefs about language learning: A review of BALLI studies. *System*, *27*(4), 557–576.

Hulstijn, J. (1992). Retention of inferred and given word meanings: Experiments in incidental vocabulary learning. In Arnaud, P. & Bejoint, H. (Eds.), *Vocabulary and Applied Linguistics* (pp. 113–125). London: Macmillan.

Jones, B. A., & Gardner, M. (2009). Language Learning Beliefs in Asia: A closer look at the BALLI. *OnCUE Journal, 3*(3), 202–219.

Joyce, P. & Sippel, C. (2004) Broadening students' lexicon: An investigation into learning methodologies. *Working Papers in Language Education, Research Institute of Language Studies and Language Education, Kanda University of International Studies*, *1*, 137–52.

Keim, B., Furuya, R., Doye, C., & Carlson, A. (1996). A survey of the attitudes and beliefs about foreign language learning of Japanese university students taking communicative English courses. *JACET Bulletin*, *27*, 87–106.

Matsuura, H., Chiba, R., & Hilderbrandt, P. (2001). Beliefs about learning and teaching communicative English in Japan. *JALT Journal. 23*(1), 69–89.

McCarthy, M. (1990). *Vocabulary*. Oxford: Oxford University Press.

McCrostie, J. (2007a). Examining learner vocabulary notebooks. *ELT Journal*, *61*(3), 246–255.

McCrostie, J. (2007b). Investigating the accuracy of teachers' word frequency intuitions. *RELC Journal*, *38*(1), 53–66.

Nation, I. S. P. (2001). *Learning Vocabulary in Another Language*. Cambridge: Cambridge University Press.

Nation, I. S. P. (2005). *Range program with British National Corpus list* [Data file]. Retrieved from http://www.victoria.ac.nz/lals/about/staff/paul-nation

Richardson, R. (2011). Comparing student and teacher views on effective language teaching. *OnCUE Journal*, *4*(3), 243–262.

Rowland, L. (2011). Lessons about learning: Comparing learner experiences with language research. *Language Teaching Research*, *15*(2), 254–267.

Sakui, K. & Gaies, S. (1999). Investigating Japanese learners' beliefs about language learning. *System*, *27*(4), 473–492.

Schmitt, N. (2000). *Vocabulary in Language Teaching*. Cambridge: Cambridge University Press.

Schmitt, N. & Schmitt, D. (1995). Vocabulary notebooks: Theoretical underpinnings and practical suggestions. *ELT Journal*. *49*(2), 133–143.

Simon, E. & Taverniers M. (2011). Advanced EFL learners' beliefs about language learning and teaching: A comparison between grammar, pronunciation, and vocabulary. *English Studies*, *92*(8), 896–922.

Tahira, M. (2012). Behind MEXT's new Course of Study Guidelines. *The Language Teacher*, *36*(3), 3–8.

Walters, J. & Bozkurt, N. (2009). The effect of keeping vocabulary notebooks on vocabulary acquisition. *Language Teaching Research*, *13*(4), 403–423.

Waring, R. (2002). Basic principles and practice in vocabulary instruction. *The Language Teacher*, *26*(7), 11–13.

Wenden, A.L. (1999). An introduction to metacognitive knowledge and beliefs in language learning: Beyond the basics. *System*, *27*(4), 435–441.

Wilkins, D. (1972). *Linguistics in Language Teaching*. London: Arnold.

Yang, N. (1999). The relationship between EFL learners' beliefs and learning strategy use. *System*, *27*(4), 515–535.

MINDSETS, GOAL ORIENTATIONS AND LANGUAGE LEARNING

What We Know and What We Can Do

Kimberly A. Noels & Mantou Lou, University of Alberta

Abstract

People hold diverse ideas about language learning, but a particularly important belief is whether the ability to learn a new language is fixed or malleable. In the research described herein, we consider how (a) people who ascribe successful language learning to a natural talent that cannot be further developed (i.e., a fixed mindset) and (b) people who believe that language intelligence is a flexible ability that can be improved (i.e., a growth mindset) differ in terms of their goals and reactions in language learning. The results of a series of studies showed that students with a growth mindset endorsed learning goals and reported greater mastery and less helplessness in failure situations, regardless of their competence level. Students who endorsed a fixed mindset adopted performance goals especially when they believed that they have strong language skills, but also reported greater anxiety. We also manipulated language learners' mindsets and found that this simple procedure affected the goals that learners set and ultimately their reactions. These findings' implications for theory and research on mindsets are discussed, as well as their implications for language education.

Teachers and researchers have long been interested in better understanding the various beliefs that people have about learning languages, whether accurate or inaccurate, and how these beliefs might be related to engagement in the learning process and outcomes. Elaine Horwitz's (1988) systematic review highlighted the fact that learners have diverse ideas about how difficult it is to learn a new language, the relative difficulty of different languages, the nature of the learning process, optimal strategies for learning and using a new language, and many other beliefs, and other researchers have added to this catalogue (see Bernat & Gvozdenko, 2005; Ellis, 2008; Horwitz, 1999 for reviews). In the present research, we focus on one set of beliefs that has been articulated in these reviews, specifically beliefs about the fixedness or malleability of the ability to learn a new language, that is, mindsets about language intelligence.[1]

1 For the present purposes, we construe language intelligence similarly to language aptitude, although we do not claim that lay persons would define language aptitude as language researchers would (e.g., in terms of phonemic coding ability, grammatical sensitivity, inductive ability, and associative memory (cf., Carroll & Sapon, 1959)).

To address this construct, we draw from the work of Carol Dweck, who since the early 1980s has studied people's beliefs about intelligence and other personal characteristics (e.g., personality, moral integrity, etc.; Dweck & Leggett, 1988). Dweck (2006) maintains that people hold implicit theories about the nature of intelligence: Some maintain that intelligence is a fixed entity that people are born with and cannot change much. Others hold implicit theories in which intelligence is viewed as a malleable characteristic that can be developed incrementally through effort. According to Dweck and her colleagues, these implicit theories, or mindsets, have implications for the kinds of goals that people set and the way in which they behave and feel in challenging situations.

Despite this longstanding research program, there has been relatively little research integrating Dweck's work regarding mindsets with what it is known about language learning beliefs. Thus, the purpose of this paper is to describe a research program that was undertaken to document language learners' beliefs about language intelligence, and the implications of such mindsets for engagement in the learning process and language learning outcomes (Lou & Noels, 2015a, 2015b). To this end, we first review the few existing studies of language mindsets in the SLA literature, in order to describe the diverse opinions that people hold. We then present an instrument to assess mindsets in these different domains and describe some validity research that compares responses on this instrument to language learners' extemporaneous expressions of their beliefs. Next, we test a model to explain how people's mindsets predict the goals they adopt and the responses they have in failure situations. We then consider whether and how mindsets can be changed, along with changes in goal orientations and behavioral and emotional responses. We conclude with suggestions for future intervention studies that can elucidate how teachers might promote mindsets that best serve students in the challenging process of learning a new language.

Beliefs About Language Learning Mindsets

Research on mindsets in the language learning context is relatively recent. Mercer and Ryan (2010) interviewed nine first-year EFL learners at universities in Austria and Japan, and based on their respondents' expressed beliefs, they concluded that, although some learners may have a tendency towards one or the other mindset to varying degrees, it would be better to conceive of mindsets as a continuum rather than as dichotomous categories. Not only did most respondents report both types of beliefs, they held different mindsets for different domains of language learning (e.g., writing vs. speaking vs. pronunciation), and their beliefs were qualified by their level of ultimate attainment. Respondents felt that whereas most people could achieve a moderate level of competence, only some could attain the level of native-like expertise characteristic of professional translators and interpreters. There were national differences in the patterns of response: Japanese students emphasized hard work more and differentiated domains less than Austrian students. However, because the Japanese respondents were generally less proficient than the Austrian ones, it is difficult to determine whether these differences were due to cultural systems, proficiency level, or both. A further report of two Austrian advanced EFL learners, however, showed that each

person held different mindsets about language learning (Mercer, 2012), suggesting that proficiency level may not differentiate patterns of beliefs. In sum, these results suggest that language learning mindsets are complex, situated, socially constructed beliefs systems (Mercer & Ryan, 2010; Ryan & Mercer, 2011, 2012).

In light of these findings, we decided to further investigate mindsets about language learning and their relations with several motivational variables through two larger-scale studies (Lou & Noels, 2015a, 2015b). In this paper we describe two sets of findings, the first pertaining to the kinds of beliefs that people have about language intelligence and the second concerning the implications of these beliefs for the types of goals that people adopt when learning and using an L2 and for the kinds of responses they have in challenging or "failure" situations.

Studies 1 And 2a: What Kinds of Beliefs Do People Hold about Language Intelligence?

To examine the kinds of beliefs that people have and their interrelations, we developed the Language Mindsets Index (LMI; Lou & Noels, 2015a). Its items were based on Dweck's (1999) research with math ability and intelligence and Mercer and Ryan's (2010; Ryan & Mercer, 2012) studies of language learners' beliefs. The LMI consists of three dimensions: six items to assess fixed and growth beliefs about general language intelligence (GLB; e.g., "Your language intelligence is something about you that you can't change very much"), six items to assess second language learning beliefs (L2B; e.g., "Many people will never do well in foreign language even if they try hard because they lack a natural language ability"), and six items to assess beliefs about the age sensitivity of language learning (ASB; e.g., "People can't really learn a new language well after they reach adulthood"). We presented the items to 1,633 university students who responded to the 18 items on six-point Likert scales from "strongly disagree" to "strongly agree".

Confirmatory factor analysis supported a six-factor model, reflecting (1) fixed GLB, (2) fixed L2B, (3) fixed ASB, (4) growth GLB, (5) growth L2B, and (6) growth ASB dimensions (see Lou & Noels, 2015a, for statistical details). A second-order confirmatory factor analysis was conducted to further reduce the complexity of this structure. The results showed that the six factors could be grouped into two more general factors: growth mindset and fixed mindset. Because the correlation between growth and fixed mindsets was strong (r = -.78, p < .001), we created a composite language mindsets index by combining the fixed items and growth items (reverse scored), such that a higher score indicates a higher fixed mindset and lower growth mindset.

One way to validate the LMI is to see how well scores on the index correspond with students' written descriptions of their language beliefs. Accordingly, in a second study (Lou & Noels, 2015a), we asked 189 university students registered in language courses to respond to the LMI and answer an open-ended question regarding their beliefs about language intelligence. Many of the 180 participants who provided responses referred

to multiple aspects and beliefs, for a total of 376 codable responses. For example, one participant who expressed only growth beliefs stated, "I think that people, with time and clear devotion, may be able to manipulate their language intelligence. We believe that if someone wants to learn a language, no matter, their age, despite proofs otherwise, that a person can manipulate their language intelligence actively through diligence and constant practice." A person who expressed only fixed beliefs said, "I feel as if language intelligence is inherent, it is something that you are born with. You are either born with ability to pick up languages well or you are not, it is not something that you have a lot of control over, and you can work at it your whole life, and you can improve, but you will never really ever be able to compare with someone who has a natural affinity for languages." A third person who was coded as holding both mindsets said, "I believe some people are naturally gifted in learning languages, they would have an easier time learning a new language than someone else. However I do not believe that language intelligence is fixed because with hard work and dedication anyone can learn a language well." In sum, this analysis shows that, as a group, learners hold diverse beliefs, and, even within individuals, both types of beliefs can be espoused.

We then examined the relation between participants' scores on the LMI and their written reflections. We used one-way ANOVAs to test the mean differences on the LMI across the three groups of participants who mentioned fixed beliefs, growth beliefs, and both. The results showed that the participants' extemporaneous written responses corresponded well with their LMI scores. For instance, in the domain of general language intelligence, participants who provided responses reflecting only a fixed mindset tended to score towards the "fixed" extreme of the LMI whereas participants who expressed only growth beliefs scored more towards the "growth" extreme, and participants who expressed both beliefs scored between these two extremes (see Table 1). A similar pattern was found with the other aspects. Thus, the LMI captured the participants' expressed beliefs, usefully differentiating those who endorsed fixed beliefs, growth beliefs, or both.

Table 1

Mean scores on the Language Mindsets Index as a function of belief domain as coded in written statements

	Mindset		
Belief Domain	Growth	Both	Fixed
General Language Intelligence	2.26	2.89	3.47
Second Language Aptitude	2.51	2.82	3.07
Age Sensitivity	2.40	2.86	3.32

Note. A higher mean score indicates stronger fixed beliefs and a low score indicates stronger growth beliefs.

Study 2b: How Do Mindsets Relate to Goals and Responses in Challenging Situations?

We did not want to solely document people's language beliefs but also to see if these beliefs relate with other constructs that have been shown to be important to academic success, particularly in challenging situations. Based on the work of Dweck and her colleagues, we hypothesized that people who endorse a growth mindset would adopt learning goals, such that when faced with a threatening situation (e.g., being ignored because their L2 competence is not strong), they would try to harder to master the skills required in the situation (e.g., by persisting in joining in with the group). In contrast, people with a fixed mindset would likely adopt a performance orientation, although the type would depend on their perceived competence. If they felt confident in their L2 skills, we expected they would adopt a performance-approach goal, such that they would try to demonstrate their skills but feel fearful about potential failure. If they did not feel confident about their L2 skills, we expected they would adopt a performance-avoidance goal, such that they would withdraw from the challenging situation and feel anxious and fearful of failure.

To test this model, we assessed participants' self-perceived language competence, goal orientations, fear of failure, intention to continue L2 studies, and responses in failure situations. Self-perceived language competence was assessed with the "Can-do" test (Clark, 1981), including aspects of L2 speaking, reading, writing, and comprehension. The Goal Orientations Scale (Elliot & Church, 1997) measured students' goals in their L2 class. This instrument included three different dimensions, including learning goals (e.g., "I want to learn as much as possible from this class"), performance-approach goals (e.g., "My goal in this class is to get a better grade than most of the students"), and performance-avoidance goals (e.g., "My goal for this class is to avoid performing poorly"). The Performance Failure Appraisal Inventory (Conroy, Willow, & Metzler, 2002) was adapted to the language class context to assess fear of failure (e.g., "When I am not doing well in language class, I worry about what others think about me"). A higher mean score represents a greater fear of failure in the language class. The students' intention to continue L2 studies was assessed with 5 items (Noels, Pelletier, Clément, & Vallerand, 2000; e.g., "I intend to study the L2 again in the future").

To assess students' responses to failure situations (i.e., mastery, helplessness, and anxiety responses), we developed eight failure scenarios relating to writing, reading, speaking, and listening comprehension that students might encounter when they learn an L2. A sample scenario is, "imagine that you are in a [L2] Club. The organizer asks students to form several groups for discussion, but you are left out probably because your [L2] is not as good as the others." Students rated the likelihood that they would respond in a mastery-oriented manner on a six-point scale from "very unlikely" to "very likely" (i.e., "What is the likelihood that you will keep going to the club and try to try to learn from the others"). They also rated the likelihood that they would respond in a helplessness-oriented manner (i.e., "What is the likelihood that you won't take part in the club again?") and how anxious/

concerned they would be in each situation on a six-point scale from "not anxious/concerned at all" to "very anxious/concerned". We combined the standardized helplessness-oriented responses and the anxious responses into a single index.

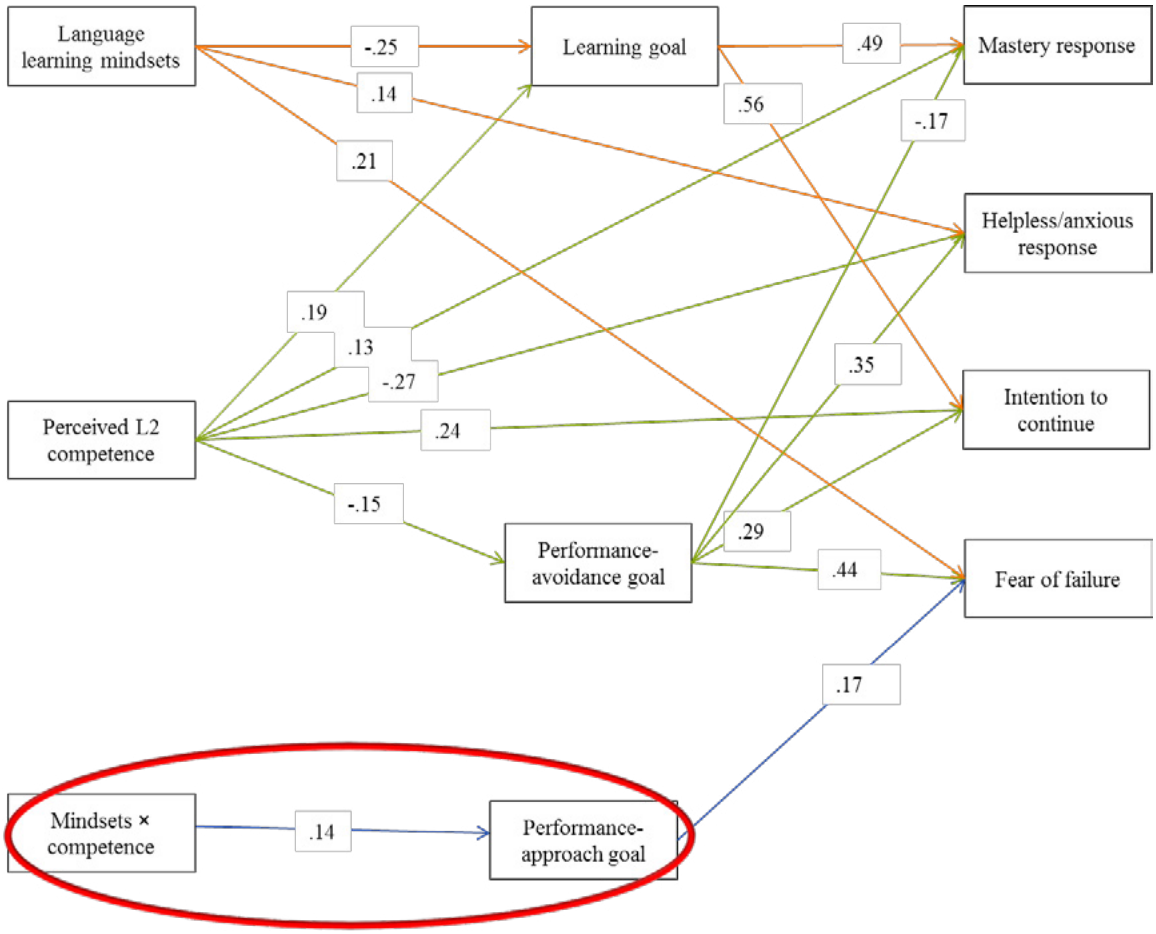

Figure 1. Final path analytic model depicting the relations between language mindsets, goal orientations, and responses to failure situations. Numbers represent standardized and significant path coefficients. A high score on "language learning mindsets" indicates a greater fixed mindset and a low score indicates a greater growth mindset. The circled path represents a moderated relation, more fully depicted in Figure 2.

The hypothesized path model was analyzed with Mplus, and the final model was an excellent fit to the data (see Lou & Noels, 2015b, for statistical analyses; see Figure 1). Participants who endorsed in a fixed (vs. growth) mindset were less likely to set a learning goal, and in turn they responded to failure with less mastery and less intention to continue studying the L2, and they were also more fearful of future failure (represented by the orange lines in Figure 1). We also found an interaction effect between mindsets and perceived language competence, such that participants who believed in a fixed (vs. growth) mindset and who believed they very competent in the L2 were more likely to set a performance-approach

goal (i.e., strive to outperform others; see Figure 2), which in turn was associated with greater fear of failure (portrayed by the blue lines in Figure 1). Contrary to expectation, those who endorsed a fixed theory and perceived themselves as having poor competence were not more likely to endorse performance goals of either type. Instead, we found that perceived language competence predicted a higher learning goal and a lower performance-avoidance goal, and all responses to failure (indicated by the green lines in Figure 1). Of particular interest, the less competent participants felt, regardless of their mindset, the more likely they were to set a performance-avoidance goal, and thereby felt more anxious and responded to threatening situations in a more helpless and less masterful manner.

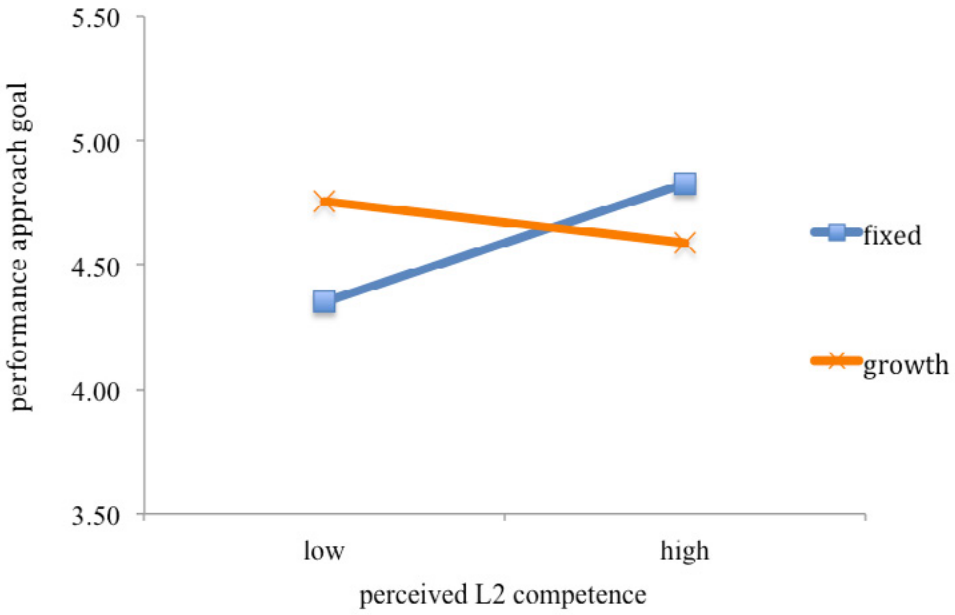

Figure 2. Mean endorsement of performance-approach goal as a function of perceived L2 competence and mindset

Study 3: Can we change people's mindsets?

In Study 3, we wanted to see if we could shift learners' language mindsets and thereby change their goal orientations and responses to failure situations (Lou & Noels, 2015b). We reasoned that if people hold complex beliefs about language ability, we might be able to convince them to think in a more fixed- or growth-oriented manner. Under the guise of a language comprehension task, we asked 150 university-level students enrolled in L2 courses to read a mock magazine article that reported scientific findings supporting either a fixed perspective on language ability or a growth perspective (cf. Hong, Chiu, Dweck, Lin, & Wan, 1999). For example, the opening paragraph of the fixed-mindset-inducing article read:

> Current research shows that a person's language ability is either inherited or determined at a very young age … after the age of three, environmental factors such as language training, exposure to multiple languages and so on (barring brain damage) seem to have almost no influence on language intelligence … Knowles found that twins raised apart had very similar levels of language ability. Twins separated at birth sometimes had small differences in language ability … Knowles found some other interesting results: people cannot learn a second language fluently even when they received sufficient exposure to the language environment.

And the growth-mindset-inducing article read,

> Current research shows that language intelligence can be increased substantially by environmental factors … 'I see increases in language intelligence up to 50 points when people enter stimulating environments such as language training, exposure to multiple languages and so on' … Knowles found that twins raised in different environments had very different levels of language ability … Knowles found some other interesting results: people can learn a second language fluently if they received sufficient exposure to the language environment.

After reading the two-page article and completing some other tasks, participants then completed indices of their self-perceived language competence, goal orientations, fear of failure, responses to failure situations, and the LMI, as described in Study 2b.

The results showed that participants who read the growth-mindset article had stronger growth (vs. fixed) beliefs than participants who read the fixed-mindset article. Moreover, those people who read the growth-mindset article had a stronger learning orientation, which in turn predicted stronger mastery responses (and weaker helplessness and anxiety responses). In sum, path analyses replicated the final model from Study 2b as described in the Figure 2, with some minor revisions. These findings indicate that we can encourage language learners' to shift their mindsets in ways that affect their goal orientations and their responses to failure situations, even with a seemingly small manipulation such as a magazine article.

Implications for Pedagogy

Although these results suggest that teachers might be able to alter their students' mindsets relatively easily, unfortunately, we don't know how long-lasting this change is, and so future research is necessary to see if it is possible to shift language learners' mindsets over the long run. Research in the general academic domain suggests that teachers and parents can effect such change through two, not necessarily exclusive ways (Yeager, Paunesku, Walton, & Dweck, 2013).

A first way in which we can affect learners' beliefs is through the manner by which we interact with them on a day-to-day basis. Mueller and Dweck (1998) showed that praising students in terms of how "smart" they are generally orients students into a mentality in which they view intelligence as a fixed entity. Praising students in terms of the process (e.g., the strategies used or the effort they exerted) can help students to see intelligence as a changeable characteristic, regardless of their ability level. This kind of "person praise" vs. "process praise" has also been shown change the direction of a fixed mindset over six months: when mothers praised their children's smartness, the children tended to avoid challenges and chose activities at which they would not fail (Pomerantz & Kempner, 2013). Rattan, Good, and Dweck (2012) found that teachers who comforted their students by saying something to the effect of "even some smart people just aren't good at math" encouraged a fixed mindset and undermined students' motivation. It is not difficult to see how a vicious cycle could result, such that students who feel that they are less competent and view their ability as unchangeable, would be less engaged in activities this domain, fail to develop their skills and competencies, and continue to have a sense of themselves as less competent and incapable of change.

Such subtle messages can also be delivered electronically, involving less time and resource commitment, and less teacher training. For instance, a study of over 250,000 Khan Academy students learning mathematical concepts online promoted a growth mindset with an onscreen header that stated, "when you learn a new kind of math problem, you grow your math brain." This intervention increased the rate at which students successfully solved math problems compared to controls, and the effect was seen for months after the message was removed from the website.

A second manner in which we can change students' mindsets is through workshops and other formal interventions that directly promote a growth mindset (Yeager et al., 2013; see also Yeager & Walton, 2011). Dweck and her colleagues developed an eight-session classroom-based workshop to teach seventh graders about mindsets and study skills, in which students are taught to imagine their brains as muscles that get stronger when they are exercised by attempting difficult math problems (e.g., Blackwell, Trzesniewski, & Dweck, 2007). In contrast with a group that learned only study skills, students who received the growth mindset in addition to study skills performed better at the end for the semester. In sum, this research in the general academic domain indicates that teachers can adopt implicit practices and explicit strategies to help students to develop an orientation towards language learning that can improve their learning process and facilitate positive outcomes. It would be important to examine such tactics in language classrooms, to better understand how these apparently successful strategies can be implemented in the language domain.

A note is warranted regarding the ubiquitous associations of perceived competence with other variables in the model. Perceived competence is an aspect of linguistic self-confidence (Clément, 1980), a motivational complex that is an important predictor of many outcomes valued by learners and teachers, including engagement, proficiency,

willingness to communicate, identity profiles, and well-being (see Sampasivam & Clément, 2014, for review). The present findings suggest that supporting learners' self-confidence by providing structure and constructive feedback to help them develop their L2 competence (e.g., Jang, Reeve, & Deci, 2010; Reeve, 2011) would be crucial to developing learning goals and mastery responses, eschewing performance goals, lessening anxiety, and discouraging withdrawal from language learning. Although the present research was focused on language mindsets, this finding regarding perceived competence underscores that other beliefs also merit increased research attention, in addition to and in concert with mindsets.

Conclusion

The diverse beliefs that people have regarding language have been well documented (e.g., Horwitz, 1988, 1999; Bernat & Gvozdenko, 2005; Ellis, 2008). To advance this area of research we need to delve more deeply into the implications of these beliefs for the learning process and eventually learning outcomes. Along with several other social psychologists and applied linguists (e.g., Mercer & Ryan, 2010), we have only just begun to examine in depth how language learners' beliefs about language ability are linked to academic engagement and outcomes. The results of the studies reported here and elsewhere suggest that these beliefs are important determinants of students' motivation, academic success, and possibly better psychological adjustment (King, 2012; see also Yaeger & Dweck, 2012). Given this fact, future research should include intervention studies to determine which teaching strategies and practices best help students to frame language learning as a process of incremental growth rather than as a demonstration of a fixed capacity.

It may be the case that some people have greater or lesser aptitude of language learning; such variations in personal propensities contribute to each student's unique learning experiences. But as Mercer (2012, p. 28) states "although there is recognition of the potential for individuals to differ in terms of their natural predispositions, the overwhelming trend is to also accept the capacity of every learner to "grow" and develop their abilities, possibly beyond their expectations, given the right context, environmental support, and personal willingness to invest time and effort and engage in repeated practice." Like Mercer and Ryan (2010), we maintain that a better understanding of people's mindsets may be an important avenue to facilitating such growth in our students.

References

Bernat, E. & Gvozdenko, I. (2005). Beliefs about language learning: Current knowledge, pedagogical implications, and new research directions. *TESL-EJ, 9*, 1–21.

Blackwell, L. S., Trzesniewski, K. H., & Dweck, C.S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development, 78*, 246–263.

Carroll, J. B., & Sapon, S. M. (1959). *Modern language aptitude test*. San Antonio, TX: The Psychological Corporation.

Clark, J. L. D. (1981). Language. In T. S. Barrows (Ed.), *A survey of global understanding: Final report* (pp. 87–100). New Rochelle, NY: Change Magazine Press.

Clément, R. (1980). Ethnicity, contact and communicative competence in a second language. In H. Giles, W. P. Robinson, & P. M. Smith (Eds.), *Language: Social psychological perspectives* (pp. 147–154). Oxford, UK: Pergamon.

Conroy, D. E., Willow, J. P., & Metzler, J. N. (2002). Multidimensional fear of failure measurement: The performance failure appraisal inventory. *Journal of Applied Sport Psychology, 14*, 76–90.

Dweck, C. S. (1999). *Self-theories: Their role in motivation, personality, and development*. Philadelphia, PA: Taylor & Francis.

Dweck, C. S. (2006). *Mindset*. New York, NY: Random House.

Dweck, C. S. & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review, 95*, 256–273.

Elliot, A. J. & Church, M. A. (1997). A hierarchical model of approach and achievement motivation. *Journal of Personality and Social Psychology, 72*, 218–232.

Ellis, R. (2008). Learner beliefs and language learning. *Asian EFL Journal, 10*, 7–25.

Hong, Y., Chiu, C., Dweck, C. S., Lin, D., & Wan, W. (1999). Implicit theories, attributions, and coping: A meaning system approach. *Journal of Personality and Social Psychology, 77*, 588–599.

Horwitz, E. K. (1988). The beliefs about language learning of beginning foreign language students. *Modern Language Journal, 72*, 283–294.

Horwitz, E. K. (1999). Cultural and situational influences on foreign language learners' beliefs about language learning: a review of BALLI studies. *System, 27,* 557–576.

Jang, H., Reeve, J., & Deci, E. L. (2010). Engaging students in learning activities: It is not autonomy support or structure but autonomy support and structure. *Journal of Educational Psychology, 201*, 588–600.

King, R. B. (2012). How you think about your intelligence influences how adjusted you are: Implicit theories and adjustment outcomes. *Personality and Individual Differences, 53*, 705–709.

Lou, M. & Noels, K. A. (2015a). *Language mindsets: Measurement and implications for goal orientations and responses to failure in language learning*. Manuscript submitted for review.

Lou, M. & Noels, K. A. (2015b). *Changing language mindsets: Implications for goal orientations and responses to failure*. Unpublished manuscript.

Mercer, S. (2012). Dispelling the myth of the natural-born linguist. *ELT Journal, 66*, 22–29.

Mercer, S. & Ryan, S. (2010). A mindset for EFL: Learners' beliefs about the role of natural talent. *ELT Journal, 64*, 436–444.

Mueller, C. & Dweck, C. (1998). Praise for intelligence can undermine children's motivation and performance. *Journal of Personality and Social Psychology, 75*, 33–52.

Noels, K. A., Pelletier, L., Clément, R., & Vallerand, R. (2000). Why are you learning a second language? Motivational orientations and self-determination theory. *Language Learning, 50*, 57–85.

Pomerantz, E. M. & Kempner, S. G. (2013). Mothers' daily person and process praise: Implications for children's theory of intelligence and motivation. *Developmental Psychology, 49*, 2040–2046.

Rattan, A., Good, C., & Dweck, C.S. (2012). "It's ok – Not everyone can be good at math": Instructors with an entity theory comfort (and demotivate) students. *Journal of Experimental Social Psychology, 48*, 731–737.

Reeve, J. (2011). Teaching in ways that support students' autonomy. In D. Mashek & E. Yost Hammer (Eds.), *Empirical research in teaching and learning: Contributions from social psychology* (pp. 90–103). Malden, MA: Wiley-Blackwell.

Ryan, S. & Mercer, S. (2011). Natural talent, natural acquisition, and study abroad: Learner attributions of agency in language learning. In G. Murray, X. Gao & T. Lamb (Eds.), *Identity, motivation and autonomy in language learning* (pp. 160–176). Bristol, UK: Multilingual Matters.

Ryan, S. & Mercer, S. (2012). Implicit theories: Language learning mindsets. In S. Mercer, S. Ryan, & M. Williams (Eds), *Psychology for language learning: Insights from research, theory, and practice* (pp. 74–89). Basingstoke, UK: Palgrave Macmillan.

Sampasivam, S. & Clément, R. (2014). The dynamics of second language confidence: Contact and interaction. *Multiple perspectives on the self in SLA* (pp. 23–40). Bristol, UK: Multilingual Matters.

Yaeger, D.S. & Dweck, C.S. (2012). Mindsets that promote resilience: When students believe that personal characteristics can be developed. *Educational Psychologist, 47*, 302–314.

Yeager, D. S., Paunesku, D., Walton, G. M., & Dweck, C. S. (2013). How can we instill productive mindsets at scale? A review of the evidence and an initial R&D agenda. *White paper prepared for the White House meeting on Excellence in education: The importance of academic mindsets*.

Yaeger, D. S. & Walton, G. M. (2011). Social-psychological interventions in education: They're not magic. *Review of Educational Research, 81*, 267–301.

THE MEMORY EFFECT

Does working memory predict how people learn new second language grammar?

Philippa K. Bell, Université du Québec à Montréal

Abstract

This paper reports findings from two studies investigating the role of working memory (WM) in the processing and learning of novel grammar. Participants were exposed to one natural language (French) and one semi-artificial language (German word order rules presented in English) incidentally (focus on meaning not grammar) before being asked to complete a surprise test which focused on the grammar of the languages. Measures were used to establish how participants had processed the language during exposure (implicit and explicit processing) and how they had learned the grammar (incidental learning, which could then be divided into explicit and implicit learning depending on how they had processed the language). The findings showed that WM did not play a role in determining whether participants processed the grammar explicitly or implicitly. However, it did play a small role in incidental learning. Furthermore, when the incidental learning was divided into explicit learning and implicit learning, WM was strongly related to explicit learning scores: for the participants who processed the language explicitly, those learners with a greater WM capacity were more successful (greater explicit learning).

Most teachers have experienced the considerable differences amongst language students in the ease with which they learn English as a second or foreign language. Teachers and researchers try to find reasons to explain why one student seems to effortlessly pick up the language while another student struggles to understand or produce even the simplest of sentences. Many possible reasons exist to explain these differences such as motivation, proficiency, and first language background. In this paper, I explore the role that memory may play in explaining differences among learners in their ability to learn new grammar when they read or hear meaningful input. Meaningful input here refers to any type of input that is processed for communicative purposes (e.g., ordering a coffee at Tim Horton's; discussing Canadian history, learning about Halloween). As such, this type of input is typical in second language (L2) classrooms that are content-based (e.g., French immersion) and meaning-based (e.g., communicative classrooms; intensive English classrooms in Quebec).

However, it is also common in form-focused classrooms when teachers ask learners to read or listen to input for meaning (e.g., newspaper articles, a story, an advertisement).

The objective of this paper is to further understanding of whether a person's working memory (WM) capacity predicts how he/she processes new grammar (consciously or unconsciously) and how accurate he/she is with this grammar after reading/hearing it in input that focuses on meaning only (e.g., reading a story to answer comprehension questions). To achieve this objective, I will begin by defining WM capacity before discussing its role in terms of explicit and implicit language processing, incidental language learning, and explicit and implicit language learning[1]. I will then present data from two research studies investigating this relationship. I will end the paper with a discussion of what this means for teachers in the classroom and whether they need to consider their students' WM if they are to help them learn L2 grammar.

Working Memory Capacity

An individual's WM capacity refers to their ability to store and manipulate information while performing a cognitive task (e.g., working out how many scoops of baby formula should be added to 150 millilitres of water). Since the mid-1970s (Baddeley & Hitch, 1974), WM has been conceptualised and researched as consisting of two components; one for storage (short-term memory), and one for executive functioning (labelled the Central Executive). Short-term memory refers to the storage of information only and it has been proposed that there are two domain-specific short-term memory systems: the phonological loop, which stores and rehearses sounds and language, and the visuospatial sketchpad, which stores visual and spatial information (Baddeley, 2003). The Central Executive has been proposed as the system that is responsible for controlling, maintaining, and managing the necessary stored information in order to complete the task at hand.

As WM capacity differs amongst individuals, it is a cognitive individual difference that researchers have suggested may be a crucial component of second language learning aptitude (Miyake & Friedman, 1998; Sawyer & Ranta, 2001), a person's ability to learn an L2 efficiently. As such, research has been conducted to understand the role of working memory and phonological short-term memory (PSTM; a subset of working memory that measures storage only) in language learning success. The research findings of interest to the present study are from studies investigating the roles of WM/PSTM in L2 grammar learning and this, in terms of how learning occurs (consciously or unconsciously) and subsequent accuracy.

1 Explicit processing of grammar occurs when a person tries to learn grammar. Implicit processing of grammar occurs when a person learns grammar without being aware of doing so. As such, processing tells us only how the person is interacting with the language. It tells us nothing about how well the grammar has been learned. Incidental language learning refers to the accuracy with which newly learned grammar is used after exposure that focuses on meaning not grammar (at this point, the processing could have happened explicitly or implicitly). Finally, explicit and implicit learning divide accuracy based on whether the processing occurred implicitly (unconsciously) or explicitly (consciously).

Working Memory Capacity and the Processing of New Grammar

Before presenting research that has investigated WM in terms of language learning, it is necessary to define processing. In order to explain how such a complex system as a language can be learned (both first and second languages), it has been proposed that people use two different types of learning processes that are frequently referred to as explicit learning (EL) and implicit learning (IL). EL occurs consciously and with intention: individuals know they are learning something. IL occurs unconsciously and without intention: individuals do not know they are learning something. The vast majority of first-language acquisition occurs implicitly. Infants learn to comprehend and produce language long before they have the metalinguistic abilities necessary to reflect on it. This was first demonstrated by Berko-Gleason (1958) with the *wug* test. This test uses fake words with fake objects. Children are shown a picture of one object, a *wug*. They are told 'this is a *wug*.' They are then shown a picture with two of these objects and told 'now there is another one. There are two of them. There are two _____,' in order to elicit a response. Children as young as four are able to complete this with the accurate plural *–s* morpheme.

In terms of L2 learning, administering the *wug* test does not provide the same proof that learning occurred implicitly (except with very young children) as L2 learners already have a first language, they are usually cognitively able to reflect on language, and they may have received explicit instruction in their L2 about plural *-s*. However, due to the complexity of a language, many theories of SLA assume that IL is also extremely important for L2 success (e.g., Associative-Cognitive CREED, N.Ellis, 2007; Autonomous Induction Theory, Carroll, 2007; Input Processing Theory, VanPatten, 2007). Researchers have attempted to demonstrate that adult L2 learners are capable of learning implicitly by training them on artificial languages and then testing their learning while using methodological instruments to understand whether the learning occurred consciously or unconsciously. Trying to demonstrate consciously that something has been learned unconsciously is, of course, extremely challenging. Furthermore, as conscious and unconscious processing occur all the time (Reber, Allen, & Reber, 1999), teasing apart the two is difficult. However, there is mounting evidence that adults are capable of learning some grammar without their realising they have learned anything (Bell, 2012; Chen, Guo, Tang, Zhu, Yang & Dienes, 2011; Leung & Williams, 2011; Rebuschat & Williams, 2012; Rebuschat, Hamrick, Sachs, Riestenberg, & Ziegler, 2013; Williams, 2005).

If L2 learners are indeed able to learn both explicitly and implicitly, it is important to understand whether WM/PSTM plays a role in how language is processed. One question is whether people with large WM capacities are more likely to process language consciously (explicitly) as they are able to store and manipulate more information simultaneously than people with smaller WM capacities.

Little research has investigated this issue due to the difficultly of demonstrating that what the researcher is classifying as IL actually occurred unconsciously. Robinson (1997) investigated the role of memory on learners of English who were exposed to two grammar

points through the presentation of 40 sentences. The learners were placed in one of four conditions: instructed, rule-search, incidental, and implicit. The instructed learners were told the grammar rules, and then they read the 40 sentences in order to answer questions about the grammar. The rule-search learners were told to read the sentences to find rules. After each sentence, they were asked whether they had found the rules. The incidental learners read each sentence in order to answer a meaning-focused question (e.g., Down the hill slid Jack; question = Was Jack in the classroom? p. 97). The implicit learners were told to memorise the sentences. After each sentence, they were asked whether two words from within the sentence were next to each other or not. Robinson used a paired-associate test to measure memory capacity, which would be considered a test of short-term memory as it requires storage only. Robinson also asked participants, regardless of condition, whether they had noticed any rules, whether they had looked for rules, and whether they could verbalise any rules. In terms of type of learning (here, whether learners noticed, looked for, or verbalised rules), Robinson found that memory was related to the likelihood that learners noticed rules in the instructed condition only. In other words, when learners receive instruction before being exposed to the language, those learners with larger memory capacities are more likely to notice rules than learners with smaller memory capacities. In all the other conditions, memory played no role in whether rules were noticed, looked for, or verbalised.

The results from this study suggest that a person's capacity for storing information does not play a role in how he/she processes grammar. However, as this study employed a short-term memory measure and the measurement of type of learning did not require the participants to report what they had looked for, noticed, or verbalised, more research is needed. The experiments reported in the present paper will shed more light on this issue.

Working Memory Capacity and the Incidental Learning of Grammar

More research has been conducted to understand the role that WM may play in language learning success. Robinson's (1997) study summarised above also investigated whether memory (STM) played a role in terms of accuracy (quantity of learning). He found that it did, but only for learners in the instructed and rule-search conditions - learners in these conditions with high scores on the memory test were more accurate than learners in these conditions with low memory scores. This suggests that in learning contexts where the focus is on meaning not form, memory capacity may not predict the accuracy with which grammar is learned (performance).

Robinson (2005) investigated the role of WM on the incidental acquisition of Samoan. Participants were taught Samoan words and then presented with sentences to which they responded based on meaning only. The sentences contained examples of three grammar rules. Post-tests completed immediately, after one week, and after six months demonstrated that WM was related to incidental grammar learning on a grammaticality judgement test (listening comprehension) immediately and after one week, and production (at the sentence level) after one week and after six months. This finding differs from the previous finding

that STM was not related to learning in an incidental condition. However, as one study employed a measure of WM and one a measure of STM, it may be that there are differences between the importance of storage, and the importance of storage and manipulation for incidental grammar learning. Other research has also demonstrated that incidental L2 grammar learning may be affected by WM (e.g., Martin and Ellis, 2012; Wright, 2013), but more research is needed to understand this relationship. The present study will add to this literature.

Working Memory Capacity and the Implicit and Explicit Learning of New Grammar

When learners interact with language for meaning and they learn grammar incidentally, it is uncertain whether they have learned this grammar implicitly or explicitly. That is, it is not clear whether the processing of the grammar occurred implicitly or explicitly, and hence whether any learning (improvements in performance) is explicit learning or implicit learning. Robinson's (1997) study, as mentioned above, identified a relationship between learning and STM for learners in rule-search and instructed conditions (more likely to reflect explicit learning), but no relationship between learning and STM for learners in incidental or implicit conditions (more likely to reflect implicit learning). However, this study is reflective of instructional conditions rather than learning conditions and, as such, learning can only really be discussed in terms of its being incidental.

The present paper will provide important information concerning the role of WM in terms of whether participants have learned explicitly (created explicit knowledge) or learned implicitly (created explicit knowledge).

Research Questions and Hypotheses

The present paper reports results from two different studies that both investigated the role of WM in terms of how learners process grammar and in terms of how much of this grammar they learn during meaning-focused exposure[2]. The research questions that will be addressed are:

1. Does WM play a role in how grammar is processed during meaning-based exposure?
2. Does WM play a role in incidental learning during meaning-based exposure?
3. Does WM play a role in how much is learned explicitly and how much is learned implicitly during meaning-based exposure?

It was hypothesised that a relationship would be found between WM and incidental learning (research question 2) based on previous findings (Martin & Ellis, 2013; Robinson, 2005).

2 The primary research objective of these two studies was to understand the importance of explicit learning and implicit learning. As such, the second study was not conducted due to the findings from the first study concerning WM.

In the following sections, I will detail the methodology and results for study 1 then the methodology and results for study 2. I will then interpret the findings from both studies.

Methodology, Study 1

Participants

Thirty-six adult Anglophones were recruited via personal contacts and internet classified sites. They were paid $10 for their time. They were all beginner learners of French, which was established based on a multiple-choice proficiency test and self-report.

Working Memory Measure

The participants' WM was measured using the reading span test (Daneman and Carpenter, 1980). This test requires participants to read a sentence aloud and to memorise the final word. After reading a set number of sentences, they must recall the final words from each sentence. The set of sentences begins with two sentences. After six trials, it increases to three for six trials and so on until a maximum of six sentences are presented before recall. Therefore, the storage component of this measure relates to the memorisation of the final word of each sentence. The manipulation component is the continued processing of novel sentences to be read aloud while maintaining the memorised words.

Grammar to Be Learned

The target of learning was French grammatical gender. More specifically, participants were provided with input of eight female nouns ending in *–elle* and eight masculine nouns ending in *–eau*.

Exposure

The participants were exposed to the grammar via a crossword that focused on meaning. As the participants had low proficiency French and it was essential that they received input of the 16 target nouns for them to become potentially available for learning, these nouns were provided in an answer key. The participants therefore read the crossword clues and tried to find a suitable response. They then had to write the response with the determiner (*le* or *la*) in the crossword.

Test of Learning

Participants completed a multiple-choice posttest with 82 items that included 16 words ending in *-elle* and 16 words ending in *-eau*. For each item, they had three choices (e.g., *le chateau, la chateau,* I don't know). The 50 non-gender-related items were included as distractors.

Pretest scores to check participant knowledge prior to exposure showed that participants frequently categorised all nouns as feminine. Based on a similar issue in previous research on learners' assignment of French grammatical gender (Harley, 1998), it was decided that only the scores for masculine nouns ending in *-eau* would be analysed.

Establishing How Learning Occurred

Two measures were used to establish whether a participant was learning explicitly or implicitly. The first measure was a think-aloud protocol, which requires participants to say all their thoughts aloud while completing the exposure task (the crossword). Their speech is recorded then analysed for any reference to gender (e.g., mention of any of the following words *le* and *la*, *-elle* and *-eau*, determiners, articles, gender, and any other indication that they were paying attention to the predictive relationship of noun endings to gender assignment). The participants were also asked a probe question on completing the crossword and on completing the posttest ("What do you think the linguistic purpose of the task was?").

Results, Study 1

Before addressing the three research questions, it is necessary to present the data analysis to determine which participants were explicit learners and which participants were implicit learners. The researcher and a research assistant completing a master's in applied linguistics coded the think-aloud protocol data independently and the responses to the two probe questions. They strongly agreed (inter-rater reliability = 91.6%) that 18 participants provided information to suggest they had realised the exposure task was related to French grammatical gender. Eighteen participants provided no indication that they had noticed anything about gender. Table 1 provides descriptive statistics for the explicit participants and implicit participants on the WM measure and the test of learning measure (maximum score of 16).

Table 1

Study 1 Descriptive Statistics

Participants	WM *Mean*	WM *SD*	Learning *Mean*	Learning *SD*
Explicit (n = 18)	23.5	10.97	5.61	5.28
Implicit (n = 18)	21.67	11.50	2.94	2.84

Note. SD = standard deviation.

To address research question one (Does WM play a role in how grammar is processed during meaning-based exposure?), an independent samples *t*-test was conducted to compare scores on the WM measure for the explicit participants and the implicit participants. No significant difference was found (p = .63), which suggests that WM capacity does not predict whether meaning-based language will be processed for grammar form explicitly or implicitly.

To address research-question two (Does WM play a role in incidental learning during meaning-based exposure?), scores from all participants on the posttest were entered into a regression with WM scores (WM = predictor variable, posttest results = outcome variable). The regression model was significant (p < .05) with a small effect size (adjusted r-squared = .09). This means that WM capacity explains 9% of the variance in the amount of incidental

learning. Learners with higher WM capacity learn more incidentally than learners with low WM capacity. However, as it only explains 9% of the variance in the scores, it is considered a small effect size.

To address research-question three (Does WM play a role in how much is learned explicitly and how much is learned implicitly during meaning-based exposure?), two regression analyses were conducted. In the first analysis, WM was entered as the predictor variable and results on the measure of learning for the implicit participants was the outcome variable. This analysis was non-significant ($p = .76$). For the second analysis, WM was the predictor variable and learning scores for the explicit participants was the outcome variable. This analysis was significant ($p < .01$) and the effect size was large (adjusted r-squared $= .41$).

Methodology, Study 2

Participants

Seventy-seven adult Anglophones with knowledge of at least one other language were recruited via personal contacts and internet classified sites. They were paid $10 for their time.

Working Memory Measure

Working memory was tested using the Letter-Number Sequencing subtest from the Weschler Adult Intelligence Scale (WAIS III; Weschler, 1997). Participants hear sequences of numbers and letters starting with two digits and ending with a maximum of eight digits. They are asked to report the sequence verbally in a rearranged order: numbers first in numerical order and letters second in alphabetical order. This on-line manipulation of the input requires storage and processing, the two requirements for a test of WM (Gathercole & Baddeley, 1993).

Language and Grammar to Be Learned

In this study, a semi-artificial language was used that combined English vocabulary with two word-order rules adapted from German (Rebuschat & Williams, 2012). The two rules were that the verb phrase always came in second phrasal position in main clauses (verb-second rule, e.g., *quickly dressed Jimmy in his Christmas sweater*) and in final phrasal position in subordinate clauses (verb-final rule, e.g., *Really loves Jimmy gifts so Christmas his favourite holiday is*). Participants received 102 examples of the verb-second rule and 42 examples of the verb-final rule.

Exposure

Participants were exposed to the language through two crosswords and two stories. One story and one crossword discussed vacations. The other story and crossword focused on animals. Participants answered crossword clues and story comprehension questions.

Test of Learning

Participants completed a grammaticality-judgement test consisting of 72 items to understand how much grammar they had learned. For each test item, participants read a sentence and were asked to judge whether it was accurate or inaccurate. They then provided their confidence in their response (the measure of how learning occurred; see below).

Establishing How Learning Occurred

In order to establish how learning had occurred, participants provided confidence ratings while completing the test of learning. A relationship between confidence and accuracy is assumed to demonstrate explicit learning and no relationship, implicit learning (Dienes, Altmann, Kwan, & Goode, 1995).

Results, Study 2

In order to determine whether participants had processed the language explicitly or implicitly, a *d* prime score was calculated for each participant. This score measures the relationship between accuracy and confidence, and it removes response bias (a participant's willingness to say *yes* or *no*; Kunimoto, Miller, & Pashler, 2001). A negative *d* prime score is assumed to reflect implicit learning as it signals no relationship between accuracy and confidence. A positive *d* prime score denotes a relationship between accuracy and confidence, and thus explicit learning (see Rebuschat & Williams, 2012 for more information concerning the calculation and theoretical interpretation of this measure in second language learning research). Out of the seventy-seven participants, thirty-six learned implicitly (negative *d* prime score) and forty-one learned explicitly. Table 2 provides descriptive statistics for the explicit participants and implicit participants on the WM measure and the test of learning measure.

Table 2

Study Two Descriptive Statistics

Participants	WM *Mean*	WM *SD*	Learning *Mean*	Learning *SD*
Explicit (n = 41)	10.98	2.2	36.98	6.89
Implicit (n = 36)	10.92	1.92	29.17	4.9

Note. SD = standard deviation.

To address research question one (Does WM play a role in how grammar is processed during meaning-based exposure?), an independent samples *t*-test was conducted on the scores from the WM measure for the explicit participants (n = 41) and the implicit participants (n = 36). No significant difference was found (p = .901).

To address research question two (Does WM play a role in incidental learning during meaning-based exposure?), scores from all participants on the posttest were entered into a

regression with WM scores (WM = predictor variable, posttest results = outcome variable). The regression model was not significant (p = .90).

To address research question three (Does WM play a role in how much is learned explicitly and how much is learned implicitly during meaning-based exposure?), two regression analyses were conducted. In the first analysis, WM was entered as the predictor variable and results on the measure of learning for the implicit participants was the outcome variable. This analysis was non-significant (p = .11). For the second analysis, WM was the predictor variable and learning scores for the explicit participants was the outcome variable. This analysis was non-significant (p = .45).

Summary of Results

The findings from the two studies with respect to language processing were the same: WM did not predict whether participants processed the grammar implicitly or explicitly while their attention was focused on using language for meaning. However, in terms of incidental learning and whether this learning reflected explicit learning or implicit learning, the study results differed. In study one, with a natural language (French), WM played a small role in how much incidental learning occurred. Furthermore, when learning was classified as having occurred explicitly or implicitly, WM was strongly related to explicit learning: for the learners that processed the language explicitly, those learners with a larger WM learned more. In study two, with an artificial language, no relationship for WM and different types of learning were found.

Discussion

WM has been proposed as an important cognitive factor for the successful learning of an L2 (Miyake & Friedman, 1998) and some previous research has documented a relationship between WM and how grammar is learned in an instructed condition (Robinson, 1997). However, in the present studies, WM did not play a role in how learners processed new grammar during meaning-based exposure. The findings from these two studies complement Robinson's findings. Robinson only found a relationship between memory (here STM) and likelihood of noticing rules in an instructed condition. In the incidental condition (and in rule-search and implicit-memorisation conditions), the most similar to the type of exposure provided in the present studies, no relationship was found. Therefore, it appears that WM does not play a role in whether one chooses to process grammar explicitly or implicitly during meaning-based exposure. Despite this finding, it is important to note that some research has found that WM may help learners to notice corrections to erroneous lexical and grammatical utterances (Mackey et al., 2002). This would suggest that learners with larger WM capacities may be more likely to start processing explicitly if external intervention is provided (e.g., a correction). However, during meaning-based exposure without a focus on form, WM does not appear to play a role in how language is processed.

The present studies had contradictory results in terms of the role of WM on incidental, explicit, and implicit learning. Therefore, I will first discuss why these results may differ

before turning to the possible relationship between WM and incidental learning, and explicit learning that was found in study one. There are a number of possible reasons for the discrepancy between the findings in study one and study two. Firstly, the two studies employed different measures to ascertain how the participants processed the language (explicitly or implicitly). Both on-line/off-line verbal reports and confidence ratings are frequently used. However, it has been discussed that in order to capture how grammar is processed while participants interact with input, it is necessary to have an on-line measure (Schmidt, 2001). As such, the measures used in study one may have been more sensitive to dividing these two types of processing and subsequent learning. Secondly, study one employed a natural language while study two employed an artificial language. Extant research (Robinson, 2005) has shown that the results from experiments using artificial languages cannot always be compared to the learning of natural languages, and this with respect to both learning and its relationship to cognitive abilities such as WM. Finally, the targeted linguistic features differed in terms of their linguistic description. French grammatical gender in study one focused on adjacent dependencies: a determiner followed immediately by its noun (*le+chateau*) within a noun phrase. However, in study two, the location of the verb phrase within the clause depended on the clause type, which is a long-distance dependency. Therefore, it may be that insufficient input was provided in study two as long-distance dependencies take longer to learn than adjacent dependencies and may be less available, at least in the short-term, for implicit processing (Williams, 2009). To summarise, there are a number of reasons to explain the different findings. Importantly, study one, which used a natural language, found that WM played a small role in predicting incidental learning and a large role in predicting the quantity of explicit learning that occurred. I will now turn to discuss these findings.

In terms of incidental learning, the findings from study one suggest that a person's WM capacity plays a small role in their ability to learn grammar while focused on meaning. From a theoretical perspective, this is to be expected as WM is believed to be an important cognitive individual difference in overall language learning success (Miyake & Freedman, 1998), and as such, a small difference from immediate exposure could be expected. Furthermore, previous research has found that the effects of WM on incidental grammar learning may not be evident immediately. Robinson (2005) found that Samoan grammatical structures were more accurately used as measured on a listening grammaticality judgement test (one-week after exposure) and a sentence production test (one-week and six-months after exposure) for learners with larger WM capacities. This suggests that learners with larger WM capacities may be better able to retain what they have learned over time, as Robinson's participants were not exposed to more Samoan after the treatment. At present, little is known about the role WM plays in the long-term development of grammar from meaning-based exposure. The results point towards a small relationship, but further research is needed to help teachers understand whether meaning-based exposure needs to be complemented with more form-focused exposure based on WM differences in classrooms.

Study one found a large relationship between WM and explicit learning: those learners that processed the grammar in the meaningful input explicitly were affected by their WM capacities. Those with smaller WM capacities were less accurate (learned less) than those with larger WM capacities. Previous research has also found instructed learners' accuracy (so likely mainly explicit) to be affected by their WM capacity (Robinson, 1997). This suggests there is a relationship between explicit knowledge (about grammar) and WM capacity – learners that have larger WM capacities may be more able to employ their explicit knowledge about a particular grammar point (e.g., we need to add *-ed* to verbs if we are talking in the past). This is an important area for future research for a number of reasons. Firstly, the teaching of grammar frequently occurs with the aim to help students create explicit knowledge (Ellis & Shintani, 2014), but this type of teaching may favour students with large WM capacities. Secondly, study one found that the implicit learners were as accurate as the explicit learners, but their WM capacities played no role in their learning. If implicit learning during meaning-based exposure leads to the same learning gains as explicit learning, but without a WM effect, it may be that encouraging students to focus solely on meaning could level the playing field. Of course, much more research is needed as research using form-focused or decontextualised tasks has always found explicit processing to lead to much more learning than implicit processing (Leow, 2000; Rebuschat & Williams, 2012). It is clear that a large number of variables are at play (e.g., type of task, type of grammar point, type of test to measure learning) and they need to be investigated in order to help teachers provide optimal grammar instruction for long-term language development regardless of WM capacity (or at least with knowledge concerning the role of WM on these variables).

Conclusion

The studies reported in this paper investigated the role of WM on implicit and explicit processing, incidental learning, and implicit and explicit learning. Despite conflicting findings, it is suggested that WM does not play a role in how a person processes L2 grammar while focusing on using language for meaning. However, with natural languages, it appears that WM plays a small role in how much grammar will be picked up. Furthermore, learners that naturally choose to focus on grammar explicitly during meaning-based exposure will be affected by their WM capacity: those explicit learners with large WM capacities will be advantaged.

At present, it is premature to draw pedagogical conclusions from these data as more research is needed. However, it may be useful for teachers to bear in mind that the provision of explicit knowledge by the teacher and the creation of explicit knowledge by students may widen the gap based on WM capacity. If the goal is to create accurate and fluent language users, it is important to also focus on providing input and output opportunities so learners can, over time, create implicit knowledge, which may be less open to WM differences.

References

Baddeley, A. (2003). Working memory: Looking back and looking forward. *Nature Reviews Neuroscience, 4*(10), 829–839.

Baddeley, A. & Hitch, G. (1974). Working memory. In G. Bower (Ed.), *The psychology of learning and motivation* (pp. 47–89). New York: Academic Press.

Bell, P. (2012). *Incidental, explicit, and implicit language learning during meaning-based exposure: Their effectiveness and relationship to individual cognitive abilities*. (Unpublished doctoral dissertation). Concordia University, Montreal.

Berko, J. (1958). The child's learning of English morphology. *Word*, *14*, 150–177.

Carroll, S. (2007). Autonomous induction theory. In VanPatten and Williams (Eds.), *Theories in Second Language Acquisition*. Mahwah: Lawrence Erlbaum.

Chen, W., Guo, X., Tang, J., Zhu, L. Yang, Z, & Dienes, Z. (2011). Unconscious structural knowledge of form-meaning connections. *Consciousness and Cognition, 20,* 1751–1760.

Daneman, M. & Capenter, P. A. (1980). Individual differences in working memory and reading. *Journal of Verbal Learning and Verbal Behavior, 19*(4), 450–466.

Gathercole, S. E. & Baddeley, A. D. (1993). *Working memory and language*. Mahwah: Lawrence Erlbaum.

Dienes, Z., Altmann, G, Kwan, L., & Goode, A. (1995). Unconscious knowledge of artificial grammars is applied strategically. *Journal of Experimental Psychology, 21*, 1322–1338.

Ellis, R. & Shintani, N. (2014). *Exploring language pedagogy through second language acquisition research*. London: Routledge.

Ellis, N. (2007). The associative-cognitive CREED. In VanPatten and Williams (Eds.), *Theories in second language acquisition*. Mahwah: Lawrence Erlbaum.

Harley, B. (1998). The role of focus-on-form tasks in promoting child L2 acquisition. In C. Doughty & J. Williams (Eds.), *Focus on form in classroom second language acquisition* (pp. 156–174). Cambridge: Cambridge University Press.

Leow, R. P. (2000). A study of the role of awareness in foreign language behaviour: Aware versus unaware learners. *Studies in Second Language Acquisition, 22*, 557–584.

Leung, J. H. C. & Williams, J. N. (2011). The implicit learning of mappings between forms and contextually derived meanings. *Studies in Second Language Acquisition, 33*, 33–55.

Kunimoto, C., Miller, J., & Pashler, H. (2001). Confidence and accuracy of near-threshold discrimination responses. *Consciousness and Cognition, 10,* 294–340.

Mackey, A., Philp, J., Fujii, A., Egi, T., & Tatsumi, T. (2002). Individual differences in working memory, noticing of interactional feedback and L2 development. In P. Robinson (Ed.), *Individual Differences and Instructed Language Learning* (pp. 181–208). Philadelphia, PA: John Benjamins Publishing Company.

Martin, K. & Ellis, N. (2012). The roles of phonological short-term memory and working memory in L2 grammar and vocabulary learning. *Studies in Second Language Acquisition, 34*(3) 379–413.

Miyake, A. & Friedman, N. P. (1998). Individual differences in second language proficiency: The role of working memory. In A. F. Healy & L. E. Bourne Jr. (Eds.), *Foreign language learning: 196 Psycholinguistic studies on training and retention*. Mahwah: Lawrence Erlbaum.

Reber, A. S., Allen, R. A., & Reber, P. J. (1999). Implicit and explicit learning. In R. Sternberg (Ed.), *The nature of cognition*. Cambridge, MA: MIT Press.

Rebuschat, P. & Williams, J. (2012). Implicit and explicit knowledge in second language acquisition. *Applied Psycholinguistics, 33,* 829–856.

Rebuschat, P., Hamrick, P., Sachs, R., Riestenberg, K., & Ziegler, N. (2013). Implicit and explicit knowledge of form-meaning connections: Evidence from subjective measures of awareness. In J. M. Bergsleithner, S. N. Frota, & J. K. Yoshioka (Eds.), *Noticing and second language acquisition: Studies in honour of Richard Schmidt* (pp. 249–269). Honolulu: University of Hawai'i, National Foreign Language Resource Centre.

Robinson, P. (1997). Individual differences and the fundamental similarity of implicit and explicit second language learning. *Language Learning, 47*(1), 45–99.

Robinson, P. (2005). Cognitive abilities, chunk-strength, and frequency effects in implicit artificial grammar and incidental L2 learning: Replications of Reber, Walkenfeld, and Hernstadt (1991) and Knowlton and Squire (1996) and their relevance for SLA. *Studies in Second Language Acquisition, 27,* 235–268.

Sawyer, M. & Ranta, L. (2001). Aptitude, individual differences, and instructional design. In P. Robinson (Ed.), *Cognition and second language instruction* (pp. 319–353). Cambridge: Cambridge University Press.

Schmidt, R. (2001). Attention. In P. Robinson (Ed.), *Cognition and second language instruction* (pp. 3–32). Cambridge, UK: Cambridge University Press.

VanPatten, B. (2007). Input processing adult second language acquisition. In VanPatten and Williams (eds.), *Theories in Second Language Acquisition.* Mahwah: Lawrence Erlbaum.

Wechsler, D. (1997). *Wechsler adult intelligence scale—3rd Edition (WAIS-3®).* San Antonio, TX: Harcourt Assessment.

Williams, N. J. (2005). Learning without awareness. *Studies in Second Language Acquisition, 27,* 269–304.

Williams, J. N. (2009). Implicit learning in second language acquisition. In W. C. Ritchie & T. K. Bhatia (Eds.), *The new handbook of second language acquisition* (pp.319–53). Bingley, UK: Emerald Publishing.

Wright, C. (2013). An investigation of working memory effects on oral grammatical accuracy and fluency in producing questions in English. *TESOL Quarterly, 47*(2), 352–374.

LEARNING AND USING LANGUAGE, FROM THE INSIDE OUT

Recent perspectives on the nature of real-time spoken language processing

Craig Chambers, University of Toronto

Abstract

The idea that context matters is generally well appreciated in relation to the task of language learning and the use of language in everyday situations. That is, the contextual backdrop against which linguistic activities take place is intuitively recognized as reinforcing the meaningfulness and coherence of these activities. However, what is less intuitive is the way in which contextual cues can affect unconscious aspects of spoken language processing at the millisecond level. This article describes a range of recent experimental studies on this topic, focusing on the real-time recognition of individual words in running speech as a case in point. Together, these studies highlight the ways in which various linguistic and non-linguistic information sources are attended to and rapidly used to streamline the course of processing, thereby reducing the burden on cognitive resources. The particular ways in which the observed phenomena relate to the case of L2 listeners are also discussed.

When it comes to language learning and language use, educators, researchers, and laypersons alike tend to be confident in their opinion that "context matters". Fluent speakers do not use language in a vacuum, so it makes sense that the contextual backdrop against which natural communication takes place should play some kind of role when language is taught and learned. But what is the right way to define context, and exactly when and how does it matter?

In day-to-day educational practice, the notion of context is often understood in terms of the **coherence** that is provided when we restrict the theme or topic of an exercise or learning activity to some particular setting or event. For example, new vocabulary items or new aspects of grammar might be introduced within the framework of familiar events such as a birthday party, making a restaurant reservation, or going to the movies. It seems natural to assume that the added meaningfulness and predictability that comes from familiar scenarios such as these can help maintain interest levels and could also provide a kind of

crutch to help learners organize the knowledge they are acquiring. As a result, it is perhaps no surprise that the mental "scripts" or "schemata" stored in our mind for familiar events have long been known to facilitate various kinds of cognitive processing, including not only the interpretation of language, but also the perception of visual scenes and the organization of memory, among other things (e.g., Bower, Black, & Turner, 1979; Brewer & Treyens, 1979; Friedman, 1979; Rumelhart & Ortony, 1977; Schank & Abelson, 1977). By drawing on these kinds of mental templates in the context of **learning**, the outcome is that learners can free up cognitive resources that would otherwise be used in the course of making sense of what going on. This, in turn, allows resources to be available for more relevant aspects of the learning situation, with the result that our understanding and retention of information should be improved (Chiang & Dunkel, 1992).

It is clear, then, that context can provide coherence, but perhaps there is more to the story. Indeed, a large body of research from across the field of psycholinguistics demonstrates that this is clearly the case. This work shows that, as we produce and understand language, core perceptual and cognitive processes operating at the level of milliseconds are affected by various kinds of contextual cues in ways that are often quite sophisticated and sometimes even unexpected. To appreciate these influences fully, it is first important to understand certain details regarding the way in which spoken language is processed as the speech signal unfolds in time.

The Process of Recognizing Spoken Words

As a starting point, a critical observation is that the dynamic nature of the speech signal entails a situation where utterances, words, and even individual speech sounds do not arrive all at once but rather unfold sequentially over a certain span of time. In view of this, one possibility is that an optimal strategy for the mechanisms that underlie speech processing would be to wait until a reasonable "chunk" of the speech signal had been heard before beginning to attempt to assign some kind of structure or interpretation to it (such as the task of identifying of where words begin and end, or the mapping of sequences of speech sounds to stored candidates in the mental lexicon). The evidence, however, shows that linguistic processing at different levels of analysis is engaged immediately from the point at which the first individual sounds begin to arrive and operates rapidly and continuously from that point forward in reaction to the unfolding speech input (see, e.g., Marslen-Wilson & Tyler, 1980; Tanenhaus, Spivey-Knowlton, Eberhard, & Sedivy, 1995).

One consequence of this is that, at any given point in time in the course of understanding an utterance, the relevant mechanisms are normally working with only *partial* information about the unfolding message. Consider, for example the way in which the sounds in the word *shark* unfold in time, starting with /ʃ/ and ending with /k/. Before the final sound in the word is encountered, it is not possible to make a clear decision about the word that is being heard in this case. For example, at the point in time where /r/ has been heard, the acoustic information is still compatible with a number of word possibilities (lexical candidates). These candidates include words like *shard*, *sharp*, and *Chardonnay*, among

other things (including of course *shark*). However the critical point is that, even though the unfolding word is indeed indeterminate until the final sound is heard, the mechanisms that underlie the word recognition process are continuously updating a mental checklist of all the lexical candidates that are compatible with the speech information at each time step. The recognition of an individual spoken word is therefore a dynamic process of updating and refining the set of possibilities on this checklist as each speech sound is encountered by the auditory system. This way of continuously generating expectations about the form and meaning of what is being heard is not in fact specific to the case of individual words but captures a general property of the language comprehension system that is often described with the term INCREMENTAL PROCESSING. One interesting feature of incremental processing is that it usually occurs without any explicit effort or conscious awareness on the listener's part. Another noteworthy aspect of incremental processing is that the ability to keep pace with the signal (roughly matching the rate of processing with the rate of information delivery) involves the coordination of different levels of processing, all occurring in parallel (the identification of sounds, words, phrases, sentence structure and meaning, along with the planning of speech). Indeed, analyses of the timing of telephone conversations have shown that listeners can "take over" as the speaker (at the end of the current speaker's turn), within 200 milliseconds of the current speaker finishing (Beattie & Barnard, 1979). This shows that not only can listeners effectively keep up with the content of the unfolding signal, but they can simultaneously understand that the speaker's conversational turn is about to end and begin planning their own utterance.

However, where does context enter into the picture? An important role for context in incremental processing is that it can provide valuable informational cues that allow certain possibilities to be prioritized over others. In the case of the recognition of spoken words, this translates to an effect whereby the set of candidates that is continuously generated and refined on the basis of the unfolding linguistic signal is further influenced by a kind of ranking scheme the promotes some of the possible candidates to a greater degree. Consider, for example, the sentence, "I think I'll have a glass of Chardonnay". Even though, the first three or four phonemes in *Chardonnay* are in principle compatible with candidates like *shark*, *shard*, and *sharp*, the cues provided by the earlier words in this sentence can be used to quickly generate expectations about the form and meaning of what will come next. These cues will work implicitly to narrow consideration to certain lexical candidates by excluding incompatible alternatives (we don't normally drink shark or anything starting with /ʃark/ for example), although the weaker candidates will still be active in the competition process to some minor extent until additional speech information in the unfolding word rules them out (Dahan & Tanenhaus, 2004). So in essence, the task of incrementally updating lexical candidates in real time can benefit from the "head start" that contextual cues provide, thereby streamlining the task of recognizing an individual word. Interestingly, the uptake and use of contextual cues in this way is also an overwhelmingly unconscious process that rarely requires deliberate thinking on the part of listeners.

In summary, then, the influence that context has on language is something that can be explored and understood at a type of micro level that focuses on time-sensitive aspects of processing, and not only the more familiar macro level whereby familiar themes or topics have the more general effect of increasing the coherence of linguistic activity.

Spoken Word Recognition in the Non-Native Speaker

To this point, this description of the language processing system has not included any reference to the case of a listener who is not proficient in the language being heard. To what extent is real-time language comprehension different in this case? Continuing with the focus on the recognition of individual words, there appear to be two critical factors in characterizing how word recognition occurs when individuals are listening in their non-native language. The first has to do with a listener's potential to selectively "disregard" a language that is known to the listener but is not relevant for the given situation. Although at one time it was thought that an individual who is bilingual or learning another language would be able to simply switch the cognitive settings regarding which language was currently being used, there is now substantial evidence based on a variety of experimental methodologies suggesting that this is simply not the case. Instead, the irrelevant language for a given situation can "intrude" into aspects of processing (for overviews, see Desmet & Duyck, 2007; Dijkstra, 2005; Kroll & Dussias, 2004).

To illustrate, consider a native speaker of Spanish listening in English. The evidence shows that, as a word like *feel* unfolds in time, this individual will not only consider other lexical possibilities in English such as *fear* and *feature* (consistent with the description of incremental spoken word recognition provided earlier), but also candidates from Spanish such as *fila* ("row") and *ficha* ("token"). In other words, candidates in the listener's Spanish lexicon that in principle are irrelevant for the communicative situation (where English is being used) nonetheless compete in the same processing arena as the lexical candidates that are relevant. As before, however, the implicit consideration of lexical candidates from both the irrelevant and relevant languages occurs below the threshold of awareness. Listeners may not feel consciously burdened with the task of mindfully and deliberately considering these intrusions, and these lexical candidates are also eventually pruned from the set of implicit possibilities as speech information continues to unfold. This temporary *cross-language lexical competition* is a characteristic feature of language processing for individuals who know more than one language, and seems to be present even in individuals who are extremely proficient at speaking and listening in their non-native language(s).

Unfortunately for non-native listeners, the processing situation is further complicated by a second factor. Here, the problem involves the fact that the individual speech sounds that serve as the building blocks of spoken words are not the same from language to language. Not only do different languages have different inventories of speech sounds, meaning that one language may have vowel or consonant sounds that are not necessarily present in another (e.g., standard English has more than twice as many vowels as standard Spanish), but even in the case of speech sounds that are shared across languages, the precise mechanics

of their pronunciation, or PHONETIC IMPLEMENTATION, might be slightly different (see, e.g., Ladefoged & Maddieson, 1996). Learning a new language therefore involves developing sensitivities to the specific acoustic characteristics of speech sounds in that language, and this is not always an easy thing. The contrast between the vowel sounds in *heat* and *hit* can often be a difficult thing to master for Spanish leaners of English, for example, because the latter vowel is not part of the Spanish speech sound inventory. In addition, even the /i/ vowel, which is shared across these two languages, differs slightly in its pronunciation (specifically: differences in the specific tongue posture as well as the precise millisecond duration of the vowel).

Although it is common to consider these kinds of differences in speech sounds in relation to the task of learning to speak a second language (i.e., learning to produce speech sounds without an accent that impedes comprehension), the fact that language learners possess speech sound categories that are different from those in the target language also has an impact on an individual's listening ability. Once again, the issue has to do with the number of lexical candidates that are present in the mental processing arena during incremental interpretation. A study by Weber and Cutler (2004) demonstrated this using first language (L1) Dutch learners of second language (L2) English. They found that, when the Dutch listeners heard the first three sounds in the word *panda*, they implicitly considered English lexical candidates like *pen,* despite the fact that the vowels in *panda* and *pen* are different. The reason for this is that the Dutch language does not have the /a/ vowel in *panda*, and so this vowel is difficult to Dutch listeners to differentiate from the vowel in English *pen* (a vowel that *is* in the Dutch inventory). So not only does listening to a non-native language involve intrusion from irrelevant (native) language, but in addition L2 listeners consider words in the *relevant* language that do not fully match the information in the actual acoustic signal.

Although all of this lexical competition occurs at an implicit level of processing, there is nonetheless a consequence to having this rather sizeable number of competitors in the mental arena, and this impact is seen in the speed at which words can be recognized. In their study, Weber and Cutler (2004) demonstrated a consistent penalty on the time-course of word recognition stemming from the consideration of additional candidates by non-native listeners. Even with a small effect of this sort (on the order of 100 or 200 milliseconds), the added catch-up burden for an entire sentence can obviously have implications for processing effort and will increase the risk of missing relevant information, even when all the words are known to the listener.

Context and Processing in a Non-Native Language

To this point, it is clear that second language learners and even more proficient bilinguals are faced with extensive intrusion from irrelevant lexical candidates, which, although largely unconscious, can nonetheless affect the overall efficiency of the process of real-time word recognition. This is where the effects of context enter back into the picture. As mentioned earlier, information that has been heard earlier in a sentence can play a strong

role suppressing the amount of implicit competition coming from lexical candidates that are not compatible in meaning or form in the traditional monolingual case. It is therefore relevant to ask if these cues also help to reduce intrusions from the irrelevant language.

In one study (Chambers & Cooke, 2009), this question was explored using English-speaking undergraduate students who were at various stages in learning French. The students were first administered a questionnaire to assess their self-rated proficiency in French, as well as their experience with various French language contexts. They then participated in an experiment in which their eye movements were recorded as they heard spoken sentences relating to visually-depicted objects, which was the same methodology used in some of the studies mentioned earlier (e.g., Dahan & Tanenhaus, 2004; Weber & Cutler, 2004).

The utility of this methodology is that it provides a comparatively direct means to capture listeners' implicit consideration of lexical alternatives. For example, as the first half of the English word *candle* is heard, data averaged across English-speaking listeners shows that they are equally likely to visually fixate an image of a candy or the (target) candle image. When the final part of the word is heard, fixations to the candy image become very unlikely, and listeners' gaze will instead settle on the intended target object (cf. Allopenna, Magnuson, & Tanenhaus, 1998). This experimental technique has also been shown to detect the intrusion of words from the currently irrelevant language (e.g., Spivey & Marian, 1999).

In Chambers & Cooke (2009), the experimental materials were designed to test the potential for listeners operating in their second language to draw on contextual cues provided by words earlier in the sentence, and to gauge how this affected cross-language lexical competition. Participants simply listened to recorded sentences, and when the sentence was over, they selected an image corresponding to something that was mentioned and moved it to a center square containing a question mark. An example of one of the visual object arrays that tested this question contained the following images: a hen, a strawberry, a boot, and a swimming pool (see Figure 1). One version of the corresponding recording was *Marie va décrire la poule* ("Marie will describe the hen").

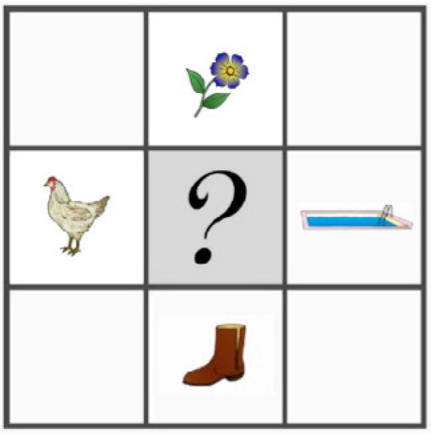

Figure 1. Example display from Chambers and Cooke (2009). Reprinted with permission of the publisher (American Psychological Association).

Even though the task requires participants to actively select and move an object with the computer mouse, the measures of interest involve what the eyes were doing at an earlier point in time, namely as the words in the sentences were unfolding. The data showed that, upon hearing the final word in the sentence, the English learners of French showed the relevant intrusion effect. That is, even though the entire experiment was conducted in French, listeners showed temporary eye gaze fixations on the swimming pool upon hearing *poule* because the sound pattern corresponds to a large degree to the English word *pool*. When presented with this same object array, other participants in the experiment got a slightly different sentence, namely *Marie va nourrir la poule* ("Marie will **feed** the hen"). Whereas swimming pools and hens are both the kinds of things that can be easily described, it is odd to expect that someone might feed a swimming pool. The predicate term in the latter case is therefore likely to provide a contextual cue that would reduce the lexical competition stemming from the lexical candidate *pool* in the irrelevant language (English). Indeed, this is the effect that was observed: average gaze patterns showed much less consideration of the swimming pool upon hearing *poule* in the latter case, and this is due to the contextual cues provided by the predicate information encountered less than half a second earlier. Interestingly, this effect did not seem to depend on the proficiency of individual participants in the study. That is, the less proficient and more proficient learners showed the same benefit from the contextual cues. This means that the effect was not related to the more advanced or fluent language processing abilities of individuals with a better command of French.

If this test is used as a model of what happens in the minds of second language listeners in general, and if it is recognized that many utterances encountered in the real world would be normally contain helpful contextual cues, then this points to a very positive outcome: The extra lexical competition associated with L2 listening can be managed to a considerable degree by the presence of contextual cues and by the automatic way in which these cues are used by processing systems to narrow the set of possible lexical candidates.

Contextual Cues Stem from Many Different Sources

One question is whether the contextual cues that help streamline real-time comprehension are limited to those provided by words or phrases heard earlier in the utterance or discourse. In fact, recent research has highlighted a wide range of linguistic and non-linguistic information sources that listeners use in an implicit way to influence core aspects of spoken language comprehension. In many cases, the "helpful" aspect of these informational cues is not unexpected, even though it might not have been obvious that the information could play a role in the very earliest moments of processing. These include the gestures that speakers unconsciously produce while talking (e.g., Wu & Coulson, 2007), the intonation contours in speech (e.g., Dahan, Tanenhaus, & Chambers, 2002), and situation-based information, such as listeners' knowledge of the objects available for reference in the physical here-and-now and the actions that can be performed with them (e.g., Chambers, Tanenhaus, Eberhard, Carlson & Filip, 2002).

A perhaps more surprising example comes from recent evidence showing that disfluencies produced in the course of speaking can actually help rather than hinder processing on the part of the listener. In psycholinguistic research, the term DISFLUENCY refers to phenomena in speech production that arise from a problem in the fluent implementation and execution of an utterance, including FALSE STARTS (where a speaker stops her or his utterance and starts over), REPETITIONS (where a word or string of words is repeated) and HESITATIONS (see Corley & Stewart, 2008). In many cases, hesitations involve so-called fillers like *um* and *uh*, which can occur alone, with brief periods of silence, or alongside words with stretched-out pronunciations (e.g., pronouncing *the* as /ði:/). Interestingly, fillers and these elongated words are not randomly distributed in speech, but tend to occur at points where speakers are experiencing increased cognitive load, such as when they are about to mention something that has not already been mentioned in the conversation (and for which their speech planning systems have not already settled on a particular name or description). As it turns out, listeners' unconscious reactions to these disfluencies can appear to be relatively intelligent and adaptive in that they reflect some implicit understanding about the points at which speakers are likely to produce disfluencies of this type. More specifically, when listeners heard an *um*, they can generate an extremely rapid expectation that the speaker is about to refer to something that hasn't been mentioned or discussed yet. This streamlines the task of processing by ruling out as candidates things that have been mentioned before in the course of conversation (Arnold, Fagnano, & Tanenhaus, 2003).

A recently completed study (with preliminary findings reported in DeSantis, Chambers, and Johnson, 2013) explored how robust this effect is, using a population that is typically characterized as more disfluent than young adults, namely older adults over the age of 70. Hesitation disfluencies are known to be more prevalent in this age group, and are often characterized as less predictable as well (Bortfeld, Leon, Bloom, Schober, & Brennan, 2001; Pakhomov et al., 2011). Surprisingly, the results showed that, despite these characteristics of older talkers' speech, listeners implicitly react to the *um*'s and *uh*'s produced by older talkers in the same way as those produced by younger talkers. Moreover, it does not seem to matter whether listeners are themselves in their 20s or in their 70s; the same implicit effects were found. This suggests that our language processing systems are relatively indifferent to age-related differences in patterns of disfluency. However, recent research suggests that when we listen to non-native speakers, the processing effects of hearing of *um* and *uh* are not quite the same (Bosker, Quené, Sanders & de Jong, 2014). More specifically, filler disfluencies in the speech produced by non-native speakers do not trigger the same implicit effects, presumably because we expect non-native speakers to have more difficulty retrieving and producing words *of all sorts*, not just words that are easily accessible for native speakers. This outcome suggests the language comprehension system is highly adaptive and can shift its ability to draw on certain cues (even ones we are not consciously aware of) from talker to talker.

Is Contextual Information Always Helpful?

It is tempting to begin thinking that any kind of information accompanying spoken language could provide helpful and supportive cues that could be used by real-time language comprehension mechanisms to facilitate the course of processing. But of course this isn't so: noise is a component of many contexts where spoken language is used, and it seems clear that noise will not confer much of a benefit on spoken language processing. Part of the challenge created by the presence of noise is actually "hearing" the signal of interest. This is because noise can often mask the speech we are trying to follow to the point where it becomes nearly inaudible. A second challenge has to do with distraction (even in cases where we can still hear the speech we are trying to follow with a reasonable degree of success), particularly when the source of the noise is localized rather than broad-based. In this case, the challenge has to do with maintaining attention on the relevant sound source. However, even with fairly "even" kinds of noise that do not eliminate our ability to hear individual words, there may be subtle impacts at the micro level of processing that has been the focus of this article, impacting the way in which lexical candidates are considered in real time as individual words unfold.

In a recent study (Ben-David, Chambers, Daneman, Pichora-Fuller, Reingold, & Schneider, 2011), an eye tracking methodology similar to the one described earlier was used to explore how patterns of lexical competition change when speech is or is not accompanied by a kind of non-distinct noise, similar to the white noise found with poor radio reception. The focus was on cases where listeners correctly selected the object that was referred to in instructions like "Look at the knife." In other words, of interest were listeners' real-time comprehension patterns on trials where the listeners were ultimately successful at overcoming the noise (so there is no apparent or obvious cost associated with the noisy environment), but where noise may have nonetheless affected word recognition in certain ways in the course of processing.

Some of the core findings were that the challenge stemming from noisy situations was most obvious with words that overlapped at the beginning (e.g., confusing *knight* with *knife*) rather than at the end (e.g., *pickle* vs. *nickel*), and when listeners had to differentiate short words from each other (e.g., differentiating *knight* vs. *knife* was more difficult than longer words like *sandal* vs. *sandwich*). The results also showed that older adults (adults in their seventies) showed comparatively more difficulty than younger adults in discriminating words that rhymed (like the *pickle-nickel* case). These and other results suggest that noise has important effects on the mechanistic components of the language comprehension process, even when there are no apparent impacts on listening comprehension (i.e., when listeners are in the end successful at identifying the intended word). Evidence of this type indicates that the effects of noise can easily be underestimated if we are simply monitoring for the overt signs of (mis)comprehension that might be available to us in a given situation.

Summary

It is obvious that individuals learning a second language face challenges in communication that are not faced by native speakers. But what may be less obvious are the various ways in which underlying mental processes are affected by the task of listening in a second language. These latent challenges arise in part from the instinctive and unstoppable way in which the human mind continuously attempts to process language input **incrementally**, mapping individual speech input to possible word candidates in our stored mental repository, and the fact that a listener's native language cannot be effectively "shut off" by processing systems in L2 contexts. Fortunately, however, the impacts on implicit processing can be offset to some degree by the contextual cues that are naturally provided by the meaning of other words within sentences. Psycholinguistic research has also shown that even non-linguistic cues from the broader communicative context can help streamline real-time spoken language processing in the monolingual case, and there is little reason to expect these are not also helpful for second-language listeners. Intonational patterns, and even the unconscious gestures and *um*'s and *uh*'s that occur in natural language interaction are among the cues that can play a helpful role.

To conclude, using language in context has always been understood as solid educational practice. But a growing body of psycholinguistic research is underscoring exactly why and how contextual factors are implicated in even the most basic aspects of language processing and use. By ensuring that language activities occur within activities and situations that are rich with contextual cues, instructors working in classroom settings, small group settings, or one-on-one should be able to capitalize on learners' innate and powerful ability to use these cues in the service of real-time comprehension.

References

Allopenna, P. D., Magnuson, J. S., & Tanenhaus, M. K. (1998). Tracking the time course of spoken word recognition using eye movements: Evidence for continuous mapping models. *Journal of Memory and Language, 38*, 419–439.

Arnold, J.E., Fagnano, M., & Tanenhaus, M.K. (2003). Disfluencies signal theee, um, new information. *Journal of Psycholinguistic Research, 32*, 25–36.

Beattie, G. W. & Barnard, P. J. (1979). The temporal structure of natural telephone conversations (Directory Enquiry calls). *Linguistics*, *17*, 213–229.

Ben-David, B., Chambers, C. G., Daneman, M., Pichora-Fuller, M. K., Reingold, E., & Schneider, B. A. (2011). Effects of age and acoustic environment on real-time spoken word recognition: Evidence from eye movements. *Journal of Speech, Language, and Hearing Research, 54,* 243–262.

Bortfeld, H., Leon, S., Bloom, J., Schober, M., & Brennan, S. (2001). Disfluency rates in spontaneous speech: effects of age, relationship, topic, role, and gender. *Language and Speech 44*, 123–47.

Bosker, H. R., Quené, H., Sanders, T., & de Jong, N. H. (2014). The perception of fluency in native and nonnative speech. *Language Learning*, *64*, 579–614.

Bower, G. H., Black, J. B., & Turner, T. J. (1979). Script in memory for text. *Cognitive Psychology, 11*, 177–220.

Brewer, W. F. & Treyens, J. C. (1979). Role of schemata in memory for places. *Cognitive Psychology, 13*, 207–230.

Chambers, C. G. & Cooke, H. (2009). Lexical competition during second-language listening: Sentence context, but not proficiency, constrains interference from the native lexicon. *Journal of Experimental Psychology: Learning, Memory & Cognition, 35,* 1029–1040.

Chambers, C.G., Tanenhaus, M. K., Eberhard, K. M., Carlson, G. N., & Filip, H. (2002). Circumscribing referential domains during real time language comprehension. *Journal of Memory and Language*, *47*, 30–49.

Chiang, C. S., & Dunkel, P. (1992). The effect of speech modification, prior knowledge, and listening proficiency on EFL lecture learning. *TESOL Quarterly, 26*, 345–374.

Corley, M., & Stewart, O. W. (2008). Hesitation disfluencies in spontaneous speech: The meaning of um. *Language and Linguistics Compass, 2*(4), 589–602.

Dahan, D. & Tanenhaus, M. K. (2004). Continuous mapping from sound to meaning in spoken-language comprehension: Immediate effects of verb-based thematic constraints. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 30*, 498–513.

Dahan, D., Tanenhaus, M. K., & Chambers, C. G. (2002). Accent and reference resolution in spoken language comprehension. *Journal of Memory and Language, 47*, 292–314.

DeSantis, D., Chambers, C. G., & Johnson E. K. (2013). Disfluencies in the speech of the elderly: Effects on real-time interpretation. Poster presented at the 2013 of the Psychonomic Society, Toronto, Canada.

Desmet, T. & Duyck, W. (2007). Bilingual language processing. *Language and Linguistics Compass, 1,* 168–194.

Dijkstra, T. (2005). Bilingual visual word recognition and lexical access. In J. F. Kroll & A. M. B. de Groot (Eds.), *Handbook of bilingualism: Psycholinguistic approaches* (pp. 179–201). New York: Oxford University Press.

Friedman, A. (1979). Framing pictures: the role of knowledge in automatized encoding and memory for gist. *Journal for Experimental Psychology: General, 108*, 316–355.

Kroll, J. F. & Dussias, P. (2004). The comprehension of words and sentences in two languages. In T. Bhatia & W. Ritchie (Eds.), *Handbook of bilingualism* (pp. 169–200). Cambridge, MA: Blackwell.

Ladefoged, P. & Maddieson, I. (1996.) *Sounds of the world's languages*. Oxford: Blackwell.

Marslen-Wilson, W. D., & Tyler, M. K. (1980). The temporal structure of spoken language understanding. *Cognition, 8*, 1–71.

Pakhomov, S., Kaiser, E., Boley, D., Marino, S., Knopman, D., & Birnbaum, A. (2011). Effects of age and dementia on temporal cycles in spontaneous speech fluency. *Journal of Neurolinguistics, 24*, 619–635.

Rumelhart, D. E., & Ortony, A. (1977). The representation of knowledge in memory. In R. C. Anderson, R. J. Spiro, & W. E. Montague (Eds.), *Schooling and the acquisition of knowledge* (pp. 99–135). Hillsdale, NJ: Erlbaum.

Schank, R. C. & Abelson, R. (1977). *Scripts, plans, goals and understanding: An inquiry into human knowledge structures*. Hillsdale, NJ: Erlbaum

Spivey, M. & Marian, V. (1999). Crosstalk between native and second languages: Partial activation of an irrelevant lexicon. *Psychological Science, 10,* 281–284.

Tanenhaus, M. K., Spivey-Knowlton, M. J., Eberhard, K. M., & Sedivy, J. E. (1995). Integration of visual and linguistic information in spoken language comprehension. *Science, 268*, 1632–1634.

Weber, A. & Cutler, A. (2004). Lexical competition in non-native spoken-word recognition. *Journal of Memory and Language, 50*, 1–25.

Wu, Y.C. & Coulson, S. (2007). How iconic gestures enhance communication: An ERP study. *Brain & Language, 101*, 234–245.

KNOWLEDGE SOURCES IN L2 WRITING AND THEIR CONTRIBUTIONS TO THE RESOLUTION OF LANGUAGE-RELATED EPISODES

Xavier Gutiérrez, University of Alberta

Abstract

While the general agreement is that implicit, intuitive knowledge of the second language is essential for language use, some authors (e.g., N. Ellis, 2005) point out that learners draw on whatever resources they have available, including explicit, conscious knowledge, when attempting to convey their intended meaning. The present study explores how the use of different knowledge sources in individual and collaborative writing tasks contributes to the resolution of language-related episodes. Twenty-two English as a second language learners attending a French high school located in a mainly English-speaking urban centre in Canada participated in the study. For the individual writing task, using stimulated recall the participants were asked to discuss the changes made between the first and final drafts of their text. Regarding the group-writing task, the collaborative dialogue was recorded and transcribed. The results show that the participants resorted to both implicit and explicit knowledge when writing their texts, and that both types of knowledge representations contributed significantly to the successful resolution of the episodes, although explicit knowledge seemed to lead to higher success.

Research on knowledge representations occupies a central role in the field of second language acquisition (SLA; DeKeyser, 2003; Doughty, 2003; N. Ellis, 2005; R. Ellis, 2004, 2005; R. Ellis et al., 2009). The focus of this research has been on the relationship between implicit and explicit knowledge of language, on how these two types of knowledge contribute to second language (L2) development, and on what kind of knowledge representations L2 learners draw in language use. R. Ellis (2005) defines implicit knowledge as the tacit, intuitive and procedural knowledge of language that is automatically accessed in spontaneous performance, and explicit knowledge as the conscious, declarative, and potentially verbalizable knowledge that is typically accessed in controlled production. Because knowledge representations are mental phenomena that cannot be directly accessed, they have to be examined in activities in which they are

applied (R. Ellis, 2004). Thus, many studies use measures such as elicited imitation tasks, grammaticality judgement tests, and metalinguistic knowledge tests to examine learners' representations (e.g., Bowles, 2011; R. Ellis et al., 2009; Gutiérrez, 2013). Alternatively, other studies explore knowledge representations in learners' actual language use through the examination of language-related episodes (LREs; e.g., García Mayo, 2002a, 2002b; Storch, 1998; Swain & Lapkin, 1995).

In SLA there is certainly consensus that implicit L2 knowledge is at the core of automated language processing, and that the development of this type of representations is the ultimate goal of L2 acquisition. On the other hand, there is disagreement as to what the role of explicit knowledge is. For some, its role is simply as a monitor of controlled L2 production (Krashen, 1981; Paradis, 1994). For others, however, it plays a facilitative role in L2 acquisition by accelerating the establishment of links between form and meaning (DeKeyser, 2003; N. Ellis, 2011). Explicit knowledge is also considered necessary for successful performance in uses of language such as writing (Hinkel & Fotos, 2002; Johns, 2003) because those uses involve a continuous evaluation of linguistic operations, which entails reflecting on one's own language (Rodríguez Gonzalo, 2000). Indeed, reflection on language (i.e., metalinguistic reflection) is an inherent characteristic of these forms of communication (Camps, 2000).

An interesting point about explicit knowledge is the fact that its role might diminish as proficiency develops. From a Skill Acquisition Theory perspective, the explicit, declarative knowledge that learners resort to in initial stages of development is gradually replaced by proceduralized knowledge through a process of automatization. According to DeKeyser (2007), this process entails "a qualitative change over time, as a result of practice, in the basic cognitive mechanisms used to execute the same task" (p. 99) to the point where explicit knowledge is no longer needed (Camps, Guasch, Milian, & Ribas, 2000). Gombert (1992) calls this process the "automation of metalinguistic processes." Explicit knowledge does not disappear or become inaccessible, but access to it "is not effected unless an obstacle is encountered while the activity is being performed or the subject decides to pay particular attention to the task which is to be accomplished" (p. 191). Similarly, N. Ellis (2005) notes that implicit processes are usually at the basis of reception and production of language, but when learners encounter a linguistic problem they resort to any resources at their disposal in order to solve it, including explicit knowledge: "when automatic capabilities fail, there follows a call recruiting additional collaborative conscious support" (p. 308).

Based on the above discussion, L2 learners at a high proficiency level would be expected to draw mainly on implicit knowledge in their language use. However, given the argument that resorting to explicit representations might be essential in writing, it could be expected that such learners would also make use of this type of knowledge in those situations. Thus, the goal of the present small-scale study is to examine the kind of knowledge representations that high proficiency learners of English as a second language (ESL) resort to in academic writing tasks and also to examine how these knowledge representations contribute to the

resolution of language-related episodes. These goals are specified in the following research questions:

1. What kind of knowledge representations do participants resort to in academic writing tasks?

2. How do these knowledge representations contribute to the resolution of LREs?

The Study

Context and participants

The study took place in a French school located in a mainly English-speaking urban centre in Canada. The participants were 22 students in two Grade 11 classes whose parents signed a consent form. These students' L1 is French, which they use mainly at home with parents, siblings and grandparents, and at school, where all subjects except the English as a second language (ESL) class, in which the study was carried out, are taught in French. However, since English is the dominant language in the city where they live, they use this language in many activities outside the home and school contexts. Given their upbringing in a mainly Anglophone community and their regular contact with English, these participants can be considered highly proficient in this language.

Data collection and analysis

Data for the study were collected through two writing tasks, one individual and one collaborative, that were part of the assignments for the ESL class.

For the individual task, the participants had to write a report about Ray Bradbury's novel *Fahrenheit 451* following a set of specific guidelines that they received from the teacher. In preparation for the task, the teacher and the students examined and discussed two models of the same type of text. After this discussion, the participants wrote their first draft at school and at home, did a peer-review session with a classmate, and finally wrote their final draft at home. Stimulated recall was used to access the knowledge representations to which the participants resorted in this task. After the students handed in their first and final drafts of their text, the differences between the two drafts were identified and the students were asked to explain the reasons why they made those changes. These individual interviews were carried out one or two days after the final draft had been handed in so as to avoid a long lapse between the writing of the text and the stimulated recall session (Gass & Mackey, 2000). It must be noted that, even though all participants completed the individual writing task, three of the 22 did not take part in the stimulated-recall interview.

The collaborative task was written in groups of three or four students, and consisted of a poetry analysis paper about a poem chosen by them and following guidelines given by the teacher. Before the actual writing task, the students analysed several poems as a whole class and in small groups in order to get some practice for their paper. The process of writing the text took three class sessions, in which the participants planned the text, wrote the first draft, revised it, and wrote the final draft.

The individual stimulated-recall interviews and the sessions during which the groups wrote their poetry analysis were recorded and subsequently transcribed for coding and analysis. The first step in the coding process consisted of identifying the language-related episodes in the transcriptions. LREs are defined as "any part of a dialogue in which students talk about the language they are producing, question their language use, or other- or self-correct" (Swain, 1998, p. 70). Once the episodes were identified, they were analysed regarding the type of knowledge sources, implicit or explicit, to which the participants resorted in order to solve the episode. As discussed in detail below, it was not possible to identify a knowledge source in all the LREs. The episodes were also analysed with respect to their resolution in terms of success. Successful resolution was operationalized as either providing a better alternative than the initial formulation of the text or providing an adequate solution to the linguistic problem of the episode.

By way of example, the following excerpts show, respectively, an unidentified episode from the collaborative task, an episode with implicit knowledge from the individual task, and an episode with explicit knowledge from the collaborative task. For the latter two, the knowledge source is underlined in the excerpts, and both of them constitute examples of successfully resolved LREs. In Excerpt 1, student 1 changes the verb in her initial formulation to *sacrifices* instead of *sacrifice*. Student 2 disagrees and explains that it is not possible to say *they both sacrifices*. Even though the episode is resolved successfully, we cannot discern whether student 2 is resorting to his intuitions about English, or to his knowledge of the rule about verb conjugation in present simple. In Excerpt 2, the participant had written the verb *say* without the third person singular *s* in his first draft, but he corrected it in the final draft. As the underlined parts show, the participant resorted to his intuitions to make the change in his text. In Excerpt 3, one of the group members wonders whether the word *verse* has to be singular or plural when following *each*. To this, the other participant explains in her own words that *verse* has to agree with *each* in number, thus demonstrating explicit knowledge.

Excerpt 1. Unidentified LRE, collaborative writing task

<S1> *Yeah*, (dictates) *"Shakespeare's Romeo, Romeo and Juliet". Un autre* xxx *deux-points* [Another xxx colon] *"These young people both sacrifice their young lives … to be with each other*

<S2> (Writes) *"Each other"? … "Each other"*

<S1> (Proposes) *"Sacrifices"*

<S2> *No.*

<S1> *It's right?*

<S2> (Proposes) *"These young people both sacrifice" … You can't say "they both sacrifices their young lives."*

<S1> *Yeah, it's true.*

Go Back to Menu

Excerpt 2. Implicit LRE, individual writing task

<R> *Here*, (reads) *"In this quote Montag the main character of the book says" and you have "say" here*

<S> *Well, as I said when I correct I look at the word. I didn't find that "say that books" doesn't sound quite …*

<R> *Why doesn't it sound good to you? I mean, "Montag the main character of the book say"…*

<S> *Well I don't know it's just* xxxx

<R> *You think you need an "s"?*

<S> *Yeah, it sounds better with an "s", like "says"*

Excerpt 3. Explicit LRE, collaborative writing task

<S1> *If I say "each verse," is it "each verse" or "each verses"?*

<S2> *"Each verse." "Each" is singular.*

<S1> *Yeah, but it's more than one verse.*

<S2> *No, but "each," "each" is singular, so "verse" has to be conjugated singular or accorder avec le-* [agree with the]

<S1> *Is that right?*

Results

A total of 309 language-related episodes were identified in the transcriptions of the stimulated-recall interviews for the individual writing task.[1] However, it was only possible to identify a clear knowledge source in about 60% of these LREs. In the remaining episodes, the participants did not overtly express their conscious knowledge of language, nor did they give an indication of resorting to their intuitions. Of those 309 episodes, 69 were identified as containing evidence of the participants resorting to their implicit knowledge, and 112 of them contained verbalizations of explicit knowledge of language. A paired-samples *t*-test indicated that, on average, participants produced significantly more explicit episodes (M = 5.89, SE = .82) than implicit ones (M = 3.63, SE = .56), $t(18) = 2.73$, $p < .05$, $r = .54$.

With respect to the resolution of the episodes, of the 69 implicit episodes identified in the individual writing task, 41 were successfully resolved, whereas 28 of them were not. Regarding the 112 explicit episodes, the participants successfully resolved 98 of them, and fourteen were unsuccessfully resolved. Table 1 shows the results of a paired-samples *t*-test computed to examine the difference between successful and unsuccessful resolution in

1 For the sake of space, the raw data for each individual participant and each group are not provided.

Go Back to Menu

the implicit and explicit LREs from the individual writing task. As the data show, there was no significant difference between the successfully resolved implicit LREs and the unsuccessfully resolved ones. However, there was a significant difference with a large effect size between the explicit LREs with a successful resolution and those without.

Table 1

Paired-samples t-*test in individual writing task*

	Paired differences				
		Std. Error			
LREs	Mean (%)	Mean	*t*	*df*	*r*
SR vs no SR Implicit	12.89	13.18	.98	18	.22
SR vs no SR Explicit	76.19	5.90	12.91**	18	.95

Note. ** $p < .01$; SR: successful resolution

Regarding the collaborative writing task, there were a total of 346 LREs identified in the transcriptions of the seven groups. As in the individual writing task, it was not possible to identify a clear knowledge source in all the episodes. In this case, knowledge sources were identified only in close to 40% of the episodes. In terms of resorting to implicit or explicit knowledge, the participants drew on the former type of representations in 56 of the 346 episodes and on the latter type in 80 of the episodes. Unlike the individual writing task, the difference between explicit episodes ($M = 11.49$, $SE = 5.71$) and implicit ones ($M = 8.00$, $SE = 1.41$) was not statistically significant, $t(6) = .744$, $p > .05$, $r = .29$.

Out of the 56 implicit LREs identified in the collaborative writing task, 32 were resolved successfully whereas 24 were not, and of the 80 explicit episodes, 59 were resolved successfully whereas 21 were not. A paired-samples *t*-test (Table 2) indicated that the differences between LREs with a successful resolution and those without were statistically significant with large effect sizes for both the implicit and the explicit episodes.

Table 2

Paired-samples t-*test in collaborative writing task*

	Paired differences				
		Std. Error			
LREs	Mean (%)	Mean	*t*	*df*	*r*
SR vs no SR Implicit	18.87	5.87	3.22*	6	.80
SR vs no SR Explicit	57.86	12.53	4.62*	6	.88

Note. * $p < .05$; SR: successful resolution

Following previous research on LREs (e.g., Fortune, 2005; Fortune & Thorp, 2001; Leeser, 2004; Swain & Lapkin, 2001), the episodes were classified according to the linguistic aspect at the centre of the episode: lexis, grammar, discourse, and mechanics. Tables 3 and 4 present the LREs in the individual and collaborative tasks, respectively, classified into

these four categories and according to the knowledge source and the presence or absence of improvement. The data show that lexical LREs were the most frequent type in both writing tasks. Grammatical and discursive LREs had similar percentages in the individual writing task, but discursive LREs were slightly more frequent in the collaborative task. Finally, LREs dealing with mechanics were the least frequent in both tasks, although there were almost as many as grammatical episodes in the collaborative task. With respect to successful resolution of the episodes, as the tables show, there were more successfully resolved episodes than not in all types of LREs, irrespective of the knowledge source, except implicit episodes about mechanics in the individual task, and implicit episodes about grammar and discourse in the collaborative task. Furthermore, it is important to note that a cursory look at Tables 3 and 4 reveals that the differences between successful and unsuccessful LREs are apparently larger in the explicit episodes than in the implicit ones.

Table 3

Type of LREs in individual writing task

	Lexis				Grammar				Discourse				Mechanics				
Type	(70; 38.67%)*				(43; 23.76%)				(39; 21.55%)				(29; 16.02%)				
KS	Implicit		Explicit		Implicit		Explicit		Implicit		Explicit		Implicit		Explicit		
SR	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Total
N	14	11	39	6	18	8	14	3	3	2	31	3	5	8	14	2	181
%	7.73	6.08	21.55	3.31	9.94	4.43	7.73	1.66	1.66	1.10	17.13	1.66	2.76	4.43	7.73	1.10	100

Note. *Total number of LREs in each category and their percentage; KS: knowledge source; SR: successful resolution; Y: yes; N: No

Table 4

Type of LREs in collaborative writing task

	Lexis				Grammar				Discourse				Mechanics				
Type	(60; 44.12%)*				(23; 16.91%)				(31; 22.79%)				(22; 16.18%)				
KS	Implicit		Explicit		Implicit		Explicit		Implicit		Explicit		Implicit		Explicit		
SR	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Total
N	20	13	17	10	5	6	10	2	5	5	18	3	2	0	17	3	136
%	14.71	9.56	12.50	7.35	3.68	4.41	7.35	1.47	3.68	3.68	13.23	2.21	1.47	0	12.50	2.21	100

Note. *Total number of LREs in each category and their percentage; KS: knowledge source; SR: successful resolution; Y: yes; N: No

Discussion

The data reported in the previous section show that the participants produced a considerable number of LREs in the individual and the collaborative writing task (309 and

346, respectively). However, it was not possible to determine a clear knowledge source in all those episodes. Indeed, the participants displayed more knowledge sources in the stimulated recall interviews about the individual writing task (about 60% of the LREs) than in the collaborative writing task (close to 40% of the LREs). This large proportion of LREs in which no knowledge source could be identified needs to be taken into account when considering the findings of the present study. While the types of knowledge identified in the LREs give us an indication of the sources used, it is not possible to determine with any degree of certainty whether the same proportion of implicit and explicit LREs would hold if the knowledge sources in all the LREs produced had been identified.

The difference regarding the display of knowledge sources between the two tasks might be due to the nature of the data collection method. For the individual writing task, the participants' responses were elicited through the stimulated recall, which may have led to a higher degree of verbalization. Conversely, the data for the collaborative writing task consisted of the naturally occurring interaction among the group members. With respect to group-writing tasks, Camps et al. (2000) note that representations might be automated or shared by the learners in such a way that it is not necessary for them to verbalize them in the interaction. Lack of talk about language (metatalk) is a common finding in studies about LREs (e.g., García Mayo, 2002a, 2002b; Kuiken & Vedder, 2002; Qi & Lapkin, 2001; Storch, 1998) and it has sometimes been identified as resorting to implicit knowledge (Fortune & Thorp, 2001), but also unarticulated (i.e., non-verbalized) explicit knowledge (Fortune, 2005). In Gutiérrez (2011) I argued that the latter is most likely in writing tasks. It is worth noting that, in the individual writing task, there were instances in which the participants seemed to engage in what R. Ellis (2004) calls "on-line analysis": in some of the episodes, it seemed as if the participants were guessing the reasons why they made certain changes in their text using the two versions of their text to help them in their verbalization, rather than reporting the reason for the change. This on-line analysis seemed evident in cases where there were somewhat long pauses and hesitations in the participants' responses. This is a limitation of this method of data collection and there seems to be no foolproof way to determine whether participants are reporting what they actually did as opposed to what they think they did.

With respect to the type of knowledge representations identified in the episodes, the participants displayed more explicit than implicit representations in both the individual and the group-writing task. Interestingly, of the episodes in which a knowledge source was identified, there was a similar proportion of LREs with explicit knowledge and with implicit knowledge in both tasks: 62% and 59% of explicit LREs in the individual and collaborative task, respectively, and 38% and 41% of implicit episodes in the individual and collaborative task, respectively. It is worth noting that, in the individual writing task, the majority of the participants (68%) produced more explicit than implicit episodes. However, in the collaborative writing task, five out of the seven groups produced more implicit than explicit LREs. Interestingly, the majority of participants who had more explicit than implicit episodes in the individual task also had a larger number of LREs with

an identifiable knowledge source than those who had more implicit than explicit episodes. Likewise, the two groups with more explicit than implicit episodes had almost 65% of the total episodes with an identifiable knowledge source in the sample. In other words, it seems that the individual participants and the groups that had more explicit episodes were more engaged in the task than those with more implicit episodes. Previous research examining knowledge sources in LREs in individual (Swain & Lapkin, 1995) and collaborative writing tasks (García Mayo, 2002a, 2002b; Storch, 1998) also shows that learners resort to explicit knowledge more than to implicit knowledge.

Regarding the resolution of LREs, the data show that resorting to implicit or to explicit knowledge contributes to the successful resolution of the episodes, and the differences between successfully and unsuccessfully resolved episodes were significant in all instances except for the implicit LREs in the individual writing task. The data also show that the mean differences between successfully and unsuccessfully resolved episodes were higher for the explicit episodes than for the implicit ones. Thus, it seems that resorting to explicit knowledge led to higher successful resolution of LREs than drawing on implicit knowledge. Of the aforementioned studies that examined knowledge sources in LREs, Swain and Lapkin (1995) found an association between the use of explicit knowledge representations and greater L2 accuracy in the participants' texts, whereas Storch (1998) found no significant relationship between verbalization of knowledge and correct resolution of LREs.[2]

With respect to the type of LREs, the data show that lexical episodes were the most frequent in both writing tasks, followed by episodes dealing with grammar and discourse. It is worth pointing out that most of the studies about LREs distinguish between lexical and grammatical episodes only (e.g., Leeser, 2004; Swain & Lapkin, 2001). Those that also classify episodes into discursive LREs (e.g., Fortune, 2005; Qi & Lapkin, 2001) often find low percentages of this category, with grammatical and lexical episodes being the most frequent types. However, the data in the present study show that LREs dealing with discursive aspects were frequent in both tasks. A plausible explanation is that learners at a very high level of proficiency pay more attention to this language aspect than learners at lower levels of proficiency. In addition, the instruction that the participants in this study had received emphasized textual features as part of the preparation for the tasks, which might have led them to pay more attention to this aspect.

Finally, the examination of the resolution of the LREs in relation to the type of language aspect at the centre of the episode indicates that both implicit and explicit knowledge often lead to successful resolution of LREs in most of the categories (lexis, grammar, discourse, and mechanics). However, the implicit episodes of a few of the categories (mechanics in the individual task, and grammar and discourse in the collaborative task) had more instances of unsuccessful resolution, and, in general, implicit episodes in the remaining categories showed a lower rate of success than explicit episodes. This finding provides further evidence that the contribution of explicit knowledge to the successful resolution of the LREs was

2 García Mayo (2002a, 2002b) did not examine the successful resolution of LREs in relation to the knowledge sources that the participants used.

Go Back to Menu

higher than that of implicit knowledge. Regarding these types of language aspects, it is necessary to mention the fact that most studies about explicit knowledge examine this type of representations in relation to grammar (i.e., morphology and syntax). However, the results of the present study show that explicit knowledge about other aspects of language such as lexis and discourse also needs to be taken into account.

Conclusion

To sum up, the results of the study reported here showed that high-proficiency ESL learners resorted to both their implicit and explicit knowledge representations while writing a text, either individually or collaboratively, and that both types of representations contributed to the successful resolution of LREs. However, the data indicate that resorting to explicit knowledge led to higher success than drawing on implicit knowledge. The presence of explicit knowledge in the LREs supports N. Ellis's (2005) and Gombert's (1992) idea that learners resort to this type of representations when they encounter a linguistic problem that cannot be solved with their intuitions. Overall, although the ultimate goal of acquiring an L2 is the development of implicit knowledge representations, the usefulness of explicit knowledge cannot be underestimated. In any case, the results of this study need to be taken with caution given the small number of learners that participated in it, as well as the large number of episodes in which a knowledge source could not be identified. Therefore, further research is needed to investigate the use of explicit knowledge by high proficient learners in writing, as well as in other types of tasks.

References

Bowles, M. (2011). Measuring implicit and explicit linguistic knowledge: What can heritage language learners contribute? *Studies in Second Language Acquisition, 33*, 247–271.

Camps, A. (2000). Aprendre gramàtica [Learning grammar]. In A. Camps & M. Ferrer (Eds.), *Gramàtica a l'aula* [Grammar in the classroom] (pp. 101–118). Barcelona: Graó.

Camps, A., Guasch, O., Milian, M., & Ribas, T. (2000). Metalinguistic activity: The link between writing and learning to write. In A. Camps & M. Milian (Eds.), *Metalinguistic activity in learning to write* (pp. 103–124). Amsterdam: Amsterdam University Press.

DeKeyser, R. M. (2003). Implicit and explicit learning. In C. J. Doughty & M. H. Long (Eds.), *The handbook of second language acquisition* (pp. 313-348). Oxford: Blackwell.

DeKeyser, R. M. (2007). Skill Acquisition Theory. In B. VanPatten & J. Williams (Eds.), *Theories in Second Language Acquisiton: An introduction* (pp. 97–113). Mahwah, NJ: Erlbaum.

Doughty, C. (2003). Instructed SLA: Constraints, compensation, and enhancement. In C. Doughty & M. H. Long (Eds.), *The handbook of second language acquisition* (pp. 256–310). Oxford, UK: Blackwell.

Ellis, N. (2005). At the interface: Dynamic interactions of explicit and implicit knowledge. *Studies in Second Language Acquisition, 27*, 305–352.

Ellis, N. (2011). Implicit and explicit SLA and their interface. In C. Sanz & R. P. Leow (Eds.), *Implicit and explicit language learning. Conditions, processes, and knowledge in SLA and bilingualism* (pp. 35–47). Washington, DC: Georgetown University Press.

Ellis, R. (2004). The definition and measurement of L2 explicit knowledge. *Language Learning, 54*, 227–275.

Ellis, R. (2005). Measuring implicit and explicit knowledge of a second language. A psychometric study. *Studies in Second Language Acquisition, 27*, 141–172.

Ellis, R., Loewen, S., Elder, C., Erlam, R., Philp, J., & Reinders, H. (2009). *Implicit and explicit knowledge in second language learning, testing and teaching*. Bristol: Multilingual Matters.

Fortune, A. (2005). Learners' use of metalanguage in collaborative form-focused L2 output tasks. *Language Awareness, 14*, 21–38.

Fortune, A. & Thorp, D. (2001). Knotted and entangled: New light on the identification, classification and value of language related episodes in collaborative output tasks. *Language Awareness, 10*, 143–160.

García Mayo, M. P. (2002a). The effectiveness of two form-focused tasks in advanced EFL pedagogy. *International Journal of Applied Linguistics, 12*, 156–175.

García Mayo, M. P. (2002b). Interaction in advanced EFL pedagogy: A comparison of form-focused activities. *International Journal of Educational Research, 37*, 323–341.

Gass, S., & Mackey, A. (2000). *Stimulated recall methodology in second language research*. New York: Routledge.

Gombert, J. -É. (1992). *Metalinguistic development*. New York: Harvester Wheatsheaf.

Gutiérrez, X. (2011). Knowledge representations underlying covert metalinguistic activity: a working hypothesis. *Language Awareness, 20*, 239–254.

Gutiérrez, X. (2013). The construct validity of grammaticality judgment tests as measures of implicit and explicit knowledge. *Studies in Second Language Acquisition, 35*, 423–449.

Hinkel, E. & Fotos, S. (2002). From theory to practice: a teacher's view. In E. Hinkel & S. Fotos (Eds.), *New perspectives on grammar teaching in second language Classrooms* (pp. 1–12). Mahwah, NJ: Lawrence Erlbaum Associates.

Johns, A. M. (2003). Genre and ESL/EFL composition instruction. In B. Kroll (Ed.), *Exploring the dynamics of second language writing* (pp. 195–217). Cambridge: Cambridge University Press.

Krashen, S. D. (1981). *Second language acquisition and second language learning*. London: Pergamon Press.

Kuiken, F. & Vedder, I. (2002). The effect of interaction in acquiring the grammar of a second language. *International Journal of Educational Research, 37*, 343–358.

Leeser, M. J. (2004). Learner proficiency and focus on form during collaborative dialogue. *Language Teaching Research, 8*, 55–81.

Paradis, M. (1994). Neurolinguistic aspects of implicit and explicit memory: Implications for bilingualism and SLA. In N. C. Ellis (Ed.), *Implicit and explicit learning of languages* (pp. 393–419). San Diego, CA: Academic Press.

Qi, D. & Lapkin, S. (2001). Exploring the role of noticing in a three-stage second language writing task. *Journal of Second Language Writing, 10*, 277–303.

Rodríguez Gonzalo, C. (2000). Els problemes de la transposició didàctica. La gramàtica des de dins de l'aula [The problems of didactic transposition. Grammar from within the classroom]. In A. Camps & M. Ferrer (Eds.) *Gramàtica a l'aula* [Grammar in the classroom] (pp. 64–76). Barcelona: Graó.

Storch, N. (1998). Comparing second language learners' attention to form across tasks. *Language Awareness, 5*, 176–191.

Swain, M. (1998). Focus on form through conscious reflection. In C. Doughty & J. Williams (Eds.), *Focus on form in classroom second language acquisition* (pp. 42–59). Cambridge: Cambridge University Press.

Swain, M. & Lapkin, S. (1995). Problems in output and the cognitive processes they generate: A step towards second language learning. *Applied Linguistics, 16*, 371–391.

Swain, M. & Lapkin, S. (2001). Focus on form through collaborative dialogue: Exploring task effects. In M. Bygate, P. Skehan, & M. Swain (Eds.), *Researching pedagogic tasks: second language learning, teaching and testing* (pp. 99–118). London: Longman.