Applied Linguistics and Language Teacher Education

Educational Linguistics

Volume 4

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Nat Bartels
Editor

Applied Linguistics and Language Teacher Education

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FOREWORD

Applied linguistics has a lot to offer language teachers. The field has produced a wealth of knowledge about language (KAL), from uses of a language's sound system to create meaning, to factors that affect language learning, to knowledge of how people structure conversations, to ways of using language to signal membership in particular language communities, among other issues. Courses on applied linguistics play a major and integral role in teacher education programs around the world and applied linguists are prominent in any discussion of language teacher education. However, any program conception, course, lesson plan, or interaction with learners of teaching can be seen as a theory of practice (van Lier, 1996); a theory of what language teachers need to know and what kind of learning experiences will help them develop this knowledge. Furthermore, while there has been much theoretical work on what teachers need to know about language and the role this knowledge might play in language teaching and learning to teach (e.g. Stern, 1983; Widdowson, 1990; Bardovi-Harlig & Hartford, 1997; Fillmore & Snow, 2002), there has been little systematic research on the effect of applied linguistics instruction on language teachers' knowledge and practice (Bartels, 2002; Borg, 2003). Not only might the relationship between applied linguistics knowledge and language teaching be more complex than theorized, it is also possible that we are, unwittingly and with the best of intentions, imposing practices of the applied linguistics discourse community on language teachers during teacher education which are not helpful for the practice of language teaching (Bartels, 2003; Bolitho, 1987; Clarke, 1994), something I refer to as *linguistics imperialism* (Bartels, in press).

Therefore, if we want to (a) avoid a situation where applied linguists are colonizing (Gee, 1990) novice teachers, however well meaning, by requiring them to apprentice themselves to the field of applied linguistics rather than to language teaching, and (b) defend our status as an applied science and make contributions to research questions shared by other disciplines, it is important for applied linguists working in language teacher education to investigate their theories of practice in a rigorous and thorough manner. This book is meant as a beginning to such an endeavor. It presents 21 studies by applied linguists investigating their own theories about language teachers' knowledge and language teachers' learning and use of KAL in pre-service or in-service programs. The purpose of this book is to provide teachers of applied linguistics with (a) state of the art knowledge about and insights on applied linguistics and language teacher education, (b) the tools needed to research their own theories of practice, and (c) an insider perspective of how a wide variety of teachers of applied linguistics perceive and investigate their own theories of practice. In order to accomplish the last goal, every effort has been made to preserve project the individual voices of the researchers within the book. The authors have been asked not only to situate their studies within the needs of the research community, but also to make clear their own personal reasons for pursuing their research questions and to make clear what they learned from engaging in their research projects. Furthermore, the authors have been encouraged to use a personal

tone in their chapters and their personal preferences in terms of the type of English they use, subject headings, length of bibliography, etc. have been preserved.

Furthermore, while this volume focuses on the relationship between applied linguistics and learning to teach languages, this is a much broader issue. In most university settings applied linguists actively teach knowledge about language to prepare people for a variety of vocations and tasks. While language teaching may be the most significant vocation in terms of numbers, KAL is also used in preparing people to be translators, interpreters, lexicographers, journalists, editors, formulators of policy on language planning, as well as to help people learn to diagnose and treat language disorders, examine linguistic issues in legal cases, etc. Therefore, I would propose that we also need a subfield of applied linguistics, *Metalinguistics*, devoted to investigating and theorizing about the acquisition and use of knowledge about language when learning any kind of vocation or task. Thus, the contents of this book should not only be important for those interested in a deeper understanding of the role of applied linguistics in teacher education and ways of investigating this role; the research methods and results in this book can also be used as a foundation for those interested in other *metalinguistic* topics.

The book is organized into 5 parts, the first of which is the most heterogeneous. Chapter 1 (Bartels) presents a wide variety of research tools that can be used for studies of learning and use of applied linguistics knowledge. The next chapters look at the impact of a particular KAL teaching activity, mini-language lessons, on novice teachers' knowledge and conceptions about language learning (Angelova: chapter 2), the use of an internet-based questionnaire to investigate students' post-hoc attitudes towards a sociolinguistics course (Owens & Edwards: chapter 3), and the extent to which the roles of language analyst, user and teacher are integrated in a language-focused course addressed to future non-native EFL teachers (Cots & Arno: chapter 4).

Section 2 focuses on changes in teachers' conceptions, attitudes and intentions due to educational experiences focusing on writing (Villamil & Guerrero: chapter 5), language variation (Attardo & Brown: chapter 6; Riegelhaupt & Carrasco: chapter 7), discourse analysis (Balocco, Carvalho & Shepherd: chapter 8), and second language acquisition (Lo: chapter 9).

The studies in section 3 and 4 investigate how teachers use their KAL in teaching. The studies in section 3 use a variety of laboratory-type tasks (analyzing and providing feedback on learner language, lesson planning) to look at what expert and/or novice teachers know and can do with their KAL on syntax and vocabulary (Andrews & McNeill: chapter 10), content-based teaching and grammar (Bigelow & Ranney: chapter 11), phonetics and phonology (Gregory: chapter 12), and orthography (Xiao: chapter 13). In section 4, however, the studies focus on teachers' use of KAL during actual classroom teaching, focusing on systemic-functional linguistics (Burns & Knox: chapter 14), pragmatics (Yates & Wigglesworth: chapter 15; Chaves de Castro: chapter 16), syntax (Hislam & Cajkler: chapter 17), and L2 writing (McKenzie: chapter 18).

Section 5 presents studies which investigate the complexity of teachers' knowledge about applied linguistics and the complexity of the process of using this knowledge for language teaching. This section includes studies focusing on knowledge of grammar (Borg: chapter 19), discourse analysis (Belz: chapter 20), systemic-functional linguistics and L2 writing (Hazelrigg: chapter 21), as well as an entire MA program (Popko: chapter 22). The final chapter in the book (Bartels: chapter 23) summarizes the findings from these studies, analyzes them using research and perspectives from fields such as education and cognitive psychology, and poses questions for future investigation in this field.

Finally, I would like to acknowledge my appreciation to those who made this book possible. I would like to thank the contributors to this volume who not only invested significant amounts of time to design, carry out, and write up research projects related to the theme of the book, as well as giving feedback on each others' chapters, but who were also very patient with all the mistakes that their novice editor made during the whole, long process, despite the strenuous circumstances in their own lives. I would also like to thank Leo van Lier for his impromptu suggestion to take the idea of a proposed conference symposium and make it into a book. I am very grateful to Julie Kerekes, Jennifer Ewald, and Lara Hermans for reading some of the chapters and providing insightful feedback to the authors. In addition, the comments of the two anonymous outside readers were very helpful in helping the other contributors and myself to tighten the focus of the book. Charlynn Christensen deserves special thanks for doing much of the formatting of the book manuscript. I am grateful also to Trevor Warburton for his work on the index and final formatting of the book. Finally, I would like to thank Henrike, Franziska and Marika Bartels for tolerating my many absences caused by work on this book and for taking over many of my family chores so I could complete this book. I could have not have done it without you.

Nat Bartels
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Chapter 1

Researching Applied Linguistics in Language Teacher Education

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INTRODUCTION

That language teachers need to know about applied linguistic fields such as pedagogical grammar, discourse analysis, second language learning, etc. would seem to be self-evident (Flynn, 1994; Tyler & Lardiere, 1996). However, the knowledge that teachers use in their practice, however, is more complicated that just knowing facts, using facts, and general conceptions of language and language learning. In order to produce quality research on language teachers' learning in applied linguistics courses and their use of their KAL in teaching, we need to move away from folk psychology conceptions of the mind (Strauss, 2001) to a more sophisticated and complex view of knowledge, knowledge acquisition, and knowledge use. If a broader conception of what kinds of knowledge language teachers need and use it to be investigated, a great variety of research methodology will be necessary. Therefore, the purpose of this chapter is to introduce to a wide range of data collection tools and indicate resources which can be used for those interested in investigating the theories behind their practices as teachers of applied linguistics. Lists of a number of studies using each research tool will be provided for readers who wish to familiarize themselves with ways that certain research methods have been used to investigate specific questions in order to deepen their knowledge of these research tools and, perhaps, to inspire their own research.

However, it will not be possible in the space available here for a complete presentation of various research perspectives or a full discussion of the task of researching teacher knowledge or each data collection tool. This has been done elsewhere and need not be repeated here. For summaries of research methodology in (a) applied linguistics see Freeman (1996; 1998), Hornberger & Corson (1999), Nunan (1992), and McDonough & McDonough (1998); (b) educational research see Bogdan & Biklen (1998), Byra & Karp (2000), Maxwell (1996), and Miles & Huberman (1994),

N. Bartels (ed.) Researching Applied Linguistics in Language Teacher Education, 1-26.

and Royer, Cisero & Carlo (1993); and (c) cognitive psychology see Cooke (1999), Patel & Arocha (1995) and Olsen & Biolsi (1991).

DATA COLLECTION METHODS

There are four main categories of data collection presented in this section: observation, documentation, reports and introspection, and tasks. Researchers seriously considering triangulating their research, i.e. using multiple sources of data to increase research credibility (Davis, 1995; Denzin & Lincoln, 1994), might want to consider choosing data collection instruments from a variety of these four categories. Foss and Kleinsasser (2001) have shown that different types of data , such as questionnaire data or observation data, reveal different aspects of teachers' knowledge and so the use of a variety of instruments is necessary to get a fuller picture of teachers' knowledge. (See Johnson, 1992, 1994, 1996, Westerman, 1991, or Woods, 1996, for excellent examples of triangulation in studies of teacher learning and teacher knowledge.) Triangulation is seen as increasingly important in the study of teacher cognition, as many studies have found that reliance on single or similar sets of data can result in misleading research results (e.g. Foss & Kleinsasser, 2001; Zeichner & Tabachnick, 1981).

OBSERVATION

One of the most common ways of collecting data about teachers' knowledge and knowledge use is by observing them teaching (Borg, 1998; 1999; Lamb, 1995: Grossman, 1990; 1991; Calderhead & Shorrock, 1997, Carpenter et al, 1989). While this usually entails observation of school teaching only, it may also include observing all aspects of a particular practice such as informal conversation with colleagues on goals for a course, discussions with parents or administrators, etc. (Dunbar, 1995). An alternative to direct observation is to tape classes and then analyze the transcripts (Johnston & Goettsch, 1999; Villamil & Guerero, 1998). Observation is good for looking at whether teachers really use the knowledge from applied linguistics courses in their teaching practice, and also produces data for examining their routines and schemata. However, observation can be very time consuming so most researchers limit the number of visits they make and the number of teachers the observe, which then raises questions about the generalizability of the findings. One potential problem with observing classes of your students or former students is that they may feel compelled to do things they think you want to see, rather than teach the way they would if you were not there (Duffy & Roehler, 1986). Therefore, it is important to gain the teachers' trust so that they feel free to teach in any way they wish. You also may be able to get around this by having them observed by a co-researcher who has not been their teacher. For suggestions of how to record data while observing see Freeman (1998), Boglan & Bicklen (1992), and Day (1990).

If you want to investigate the learning of teachers or novice teachers in a particular applied linguistics class or in-service training meeting, these situations can be observed as well. If you teach the class, you can either have a co-researcher observe your class or record the class and later analyze the transcripts (Southerland & Gess-Newsome, 1999; see also Samway, 1994, for further suggestions). Using observation data from applied

Table 1: *Sample studies of teachers' knowledge and learning using data from observation of teaching.*

Observation of Teaching		
Applied Linguistics	*Educational Research*	*This Book*
Borg (1998; 1999) Lamb (1995) Johnson (1992; 1994; 1996a) Johnston & Goettsch (1999) Pennington & Richards (1997) Woods (1996)	Grossman (1991) Calderhead & Shorrock (1997) Carpenter et al (1989) Sanders, Borko, & Lockard (1993) Kagan (1991) Borko & Livingston (1989) Leinhardt, Weidman & Hammond (1987)	Burns & Knox (Chapter14) Borg (Chapter 19) Lo (Chapter 9) Chaves de Castro (Chapter 16) Xiao (Chapter 13) Hislam & Cajlker (Chapter 17) Popko (Chapter 22)

linguistics classrooms can give you more detailed information about what students are really learning in your applied linguistics classes and can also be compared with observation of teaching data to investigate the extent of transfer from the applied linguistics class to language teaching. It is also fairly convenient because, if you are the instructor, you have to attend the class anyway.

Table 2: *Sample studies of teachers' knowledge and learning using data from observation of teacher education classes.*

Observing or Recording of Teacher Education Classes		
Applied Linguistics	*Educational Research*	*This Book*
Pennington (1995) Pennington & Richards (1997)	De Jong (2000) Ethell & McMeniman (2000) Southerland & Gess-Newsome (1999)	Angelova (Chapter 2) Riegelhaupt & Carrasco (Chapter 7) Wigglesworth & Yates (Chapter 15) Balocco, Carvalho & Shepherd (Chapter 8) Hazelrigg (Chapter 21) Cots & Arno (Chapter 4)

Some researchers use participant observation, meaning they use the knowledge they gained as a participant (usually the instructor) in the course (Bailey, 1996, Ramanthan et al, 2001; Belz, chapter 20; Bigelow & Ranney, chapter 11). Being a participant observer

can give you a richer, insider perspective on the learning taking place in an applied linguistics class, although the researcher may be so preoccupied in her view that important perspectives on the class are ignored. This can be alleviated by including data from other participants in the class, taping classes and analyzing transcripts, or by having an outside observer to compliment your perspective as participant observer. (See Byra & Karp, 2000, for descriptions of and guidelines for participant observation.)

Table 3: *Sample studies of teachers' knowledge and learning using data from participant observation.*

Participant Observation		
Applied Linguistics	*Educational Research*	*This Book*
Bailey (1996) Ramanthan et al (2001)	Oslin (1996) Macdonald & Tinning (1995)	Belz (Chapter 20) Bigelow & Ranney (Chapter 11)

DOCUMENTATION

A similar source of data are documents and artifacts from teaching, for example lesson plans, teaching materials, and student work. Such data provides a picture of teachers' knowledge in use, schemata and routines, especially when combined with data from observation and/or report data. It can also provide more detailed data than observation alone, for example if you want to look at teacher marking and comments on students' written work. However, this method can produce quite a lot of data, so it is wise to plan beforehand exactly what kind of documents you want to examine in order to reduce the volume of data to by analyzed.

Table 4: *Sample studies of teachers' knowledge and learning using data from teaching artifacts.*

Teaching Artifacts		
Applied Linguistics	*Educational Research*	*This Book*
Gutiérrez Almarza (1996) Tsui (1996) Woods (1996)	Artzt & Armour-Thomas (1998) Lederman (1999) Raymond (1997) Wilson & Wineburg (1988)	Borg (Chapter 19) Lo (Chapter 9)

Of course, you can also collect documents and artifacts from applied linguistics classes, too. Student work is a convenient source of data because you collect it anyway and then all you need to do, after getting the proper permission from the students and any research review board at your institution, is to copy the student work before handing it back to the students.

Table 5: *Sample studies of teachers' knowledge and learning using data from artifacts from teacher education classes and programs.*

Teacher Education Artifacts		
Applied Linguistics	*Educational Research*	*This Book*
Freeman (1991; 1993) Wallace (1996) Ramanthan et al (2001)	McAllister & Irvine (2002) Jones, Carter & Rua (1999) Jones, Rua & Carter (1998) Southerland & Gess-Newsome (1999)	Burns & Knox (Chapter 14) Wigglesworth & Yates (Chapter 15) Balocco, Carvalho & Shepherd (Chapter 8) Belz (Chapter 20) Hazelrigg (Chapter 21) Bigelow & Ranney (Chapter 11)

REPORTS AND INTROSPECTION

This category includes a number of data collection tools where teachers report or attempt to verbalize what they do, why they do it, what they believe, what they are or were thinking, and other reports of their cognitive activity. These methods can work very well to investigate propositional knowledge, procedural knowledge, and knowledge organization. This type of data is an ideal compliment to observation data because it focuses on the participants' "insider" perspective on what doing the task entails; perspectives which observation data seldom reveal. However, it is important to keep in mind that the participants verbalizations do not represent the actual thoughts of the participants, but rather their estimation of their thoughts (Freeman, 1994). For an in-depth discussion of introspective data collection methods see Ericsson & Simon (1993).

Interviews

Interviews are often useful for investigating teachers' insider perspectives on what they do and especially why they do the things they do. They also allow the researcher to focus on specific questions and to elicit attitudes and espoused conceptions, routines, agendas and scripts. Espoused knowledge, however, may vary from what is actually used when teaching. While most interviews are with individuals, focus groups can also be interviewed. (See Byra & Karp, 2000, for description and guidelines of both individual and focus group interviews.) A relative disadvantage of interviews is that they take a lot of time to conduct, transcribe and analyze, which usually limits the number of participants who can be interviewed. Interviews can focus on a specific body of knowledge (Alanen; 2003) or task (Strauss et al, 1999), be used to frame teachers' thoughts before and after teaching (Woods, 1996) or to investigate mental models (Gott

et al, 1993; Strauss et al, 1998). Table 1 presents a list of studies using interviews to research teacher knowledge and teacher learning. For more information on composing interview questions, see Foddy (1994) or Seidman (1998). For a finely detailed look at an interview tool see Kennedy, Ball and McDiarmid (1993).

Table 6: *Sample studies of teachers' knowledge and learning using interview data.*

Interviews		
Applied Linguistics	*Educational Research*	*This Book*
Alanen (2003) Borg (1998; 1999) Lamb (1995) Johnson (1992, 1994, 1996a) Sato & Kleinsasser (1999) Strauss et al (1998) Woods (1996)	Grossman (1990; 1991) Kagan (1991) Holt-Reynolds (1999) Strauss et al (1999) Gott et al (1993)	Burns & Knox (Chapter 14) Andrews & McNeill (Chapter 10) Borg (Chapter 19) Lo (Chapter 9) Wigglesworth & Yates (Chapter 15) Chaves de Castro (Chapter 16) Hazelrigg (Chapter 21) McKenzie (Chapter 18) Cots & Arno (Chapter 4) Popko (Chapter 22)

Questionnaires

There are several different kinds of questionnaires such as Likert scale questionnaires (where participants choose a response on a continuum), checklist questionnaires (where participants check of actions they do, values they share, information they are familiar with, etc.), and open-ended questionnaires (where participants write answers to specific open-ended questions). Likert scale questionnaires are convenient data collection instruments as they are easy to use with large numbers of participants and offer clear, numerical data which is easy to analyze. Questionnaires can focus on both specific knowledge about teaching and pedagogical content knowledge (for an excellent example see Kennedy, Ball & McDiarmid, 1993) or teachers' conceptions of and attitudes towards teaching and their content knowledge (Fang, 1996; Horwitz, 1985). When questionnaires are used to investigate teachers beliefs or conceptions of language learning, it should not be assumed that changes in these reported beliefs directly reflect changes in how teachers conceive of and carry out their teaching (e.g. MacDonald, Badger, & White, 2001) as studies have shown that general beliefs and those used for actual teaching are often divergent (Foss & Kleinsasser, 2001; Kennedy, 1996; Zeichner & Tabachnick, 1981)

In general, questionnaires should not be used alone, but triangulated with data from other sources in order to establish the credibility of the results (Fang, 1996; Kalaja & Barcelos, 2003; Kennedy, Ball & McDiarmid, 1993; Parajes, 1992). If used alone, they should have not only abstract, general questions, but should also include specific

questions on knowledge of classrooms and the teachers' classroom behavior (Attardo & Brown, chapter 5; Yaakobi & Sharan, 1985). Care needs to be taken when constructing questionnaire items and it is always a good idea to trial items, check if they are really testing what you want, and then revise items in the questionnaire (Brindley & Schneider, 2002, Yaakobi & Sharan, 1985). For example, the questionnaire used by MacDonald, Badger and White (2001) and Kerekes (2001) was not designed as a questionnaire tool and does not come from any data on teachers' beliefs, but was based on general ideas about language learning that Lightbown and Spada felt were important for teachers to explore in the context of SLA research (Lightbown & Spada, 1999). The items in the BALLI questionnaire developed by Horwitz (1985) were elicited from teachers. However, Horwitz only elicited general, context-less, espoused conceptions of language learning which are very different from the kinds of context-bound, in-action conceptions which shape teachers' plans and actions (Woods, 1996). One way of avoiding this problem is to use a questionnaire to provide information about a specific policy or document. For example, Allen (2002) investigated the extent to which teachers' conceptions of language teaching were similar to the standards for foreign language education. In this situation, revising the standards statements into questionnaire items is relatively easy. For more information on constructing questionnaire items see Converse & Presser (1986), Dörnyei (2003), or Fowler (1995). For more detail on the kind of knowledge questionnaires tap into and the influence of item construction on this see Tourangeau, Rips & Rasinki (2000) or Sudman, Bradburn & Schwarz (1996). The internet is also making questionnaires easier to distribute and fill out as well as to analyze the data. If you are interested in using a web-based questionnaire, Owen and Edwards (chapter 3) present and evaluate an example of a web-based questionnaire, while Dillman (1999) discusses ways of conducting survey research online.

Table 7: *Sample studies of teachers' knowledge and learning using Likert-scale questionnaire data.*

Questionaires: Likert		
Applied Linguistics	*Educational Research*	*This Book*
MacDonald, Badger & White (2001)	Brindley & Schneider (2002)	Attardo & Brown (Chapter 5)
Kerekes (2001)	Ferguson & Womack (1993)	Owen & Edwards (Chapter 3)
Peacock (1998; 2001)	Morris (1984)	(*Internet Questionnaire*)
Horwitz	Tillema (1998) c	
Pennington (1996)	Garet et al (2001)	
Johnson (1992)	Allen (2002)	
	Tatto, 1998	

A variation of the normal Likert scale questionnaires is the Q-Sort procedure or Q-Methodology (McKeown & Thomas, 1988). The Q-Sort procedure begins with statements much like a questionnaire. However, instead of rating each statement independent of the other, participants are asked to rank the statements on a scale

showing the extent of their agreement with the statements. This ranking, however, has to take the form of a normal, bell-shaped distribution. For example, in the study by Corthran and Ennis the participants:

> *systematically rank-ordered a series of cards... [containing] 40 statements that reflected possible values for physical education. The participants were asked to sort the cards along a 9 point continuum from the most to least valued. The number of cards allowed in each of the 9 points along the continuum was 3, 4, 4, 6, 6, 4, 4, 3, respectively. For example, the three most valued items were places on the farthest right hand column with the next four most valued items in the next column (Corthan & Ennis, 1998: 313).*

This procedure produces data that is easy to analyze statistically (because of the bell-shaped distribution) and allows for easier comparison of the items against each other.

Table 8: *Sample studies of teachers' knowledge and learning using Q-Sort data.*

Q Methodology		
Applied Linguistics	*Educational Research*	*This Book*
	Cothran & Ennis, 1998 Boscolo & Cisotto, 1999 Lecouteur & Delfabbro, 2001	

An alternative to Likert scale questions is to provide participants with lists of activities they do (Dunn & Shriner, 1999) or reasons they have for certain actions (Li, 1998) and have them select all relevant items. Questionnaires can also contain open-ended questions in order to collect extended qualitative data. Pennington (1996), for example, not only had the teachers she was studying rank different aspects of their teacher education program, but also to comment on why they gave a certain ranking.

Table 9: *Sample studies of teachers' knowledge and learning using data from check-list and open-ended questionnaires.*

Questionaires: Open-Ended		
Eisenstein-Ebsworth & Schweers (1997) Hughes-Wilhelm (1997) Li (1998) Pennington (1996)	Dunn & Shriner (1999) Gitlin et al (1999) Tamir (1992)	Wigglesworth & Yates (Chapter 15) Chaves de Castro (Chapter 16)

Journals

Data from journals or diaries kept for an applied linguistics class or during teaching is a common way to collect quality data on teachers' perspectives on their knowledge and knowledge use. Participants can either be requested to focus on particular topics (Angelova, chapter 2; Dunn & Shriner, 1999) or to simply reflect on their teaching and

learning (Numrich, 1996; Pennington, 1995). It can also be an excellent way of collecting longitudinal data (Hosenfeld, 2003). For teachers of applied linguistics, collecting journal data can be much less time consuming than other data collection methods, especially if learner journals are already integrated into the course or practicum you are investigating and the journals are submitted in electronic form.

Table 10: *Sample studies of teachers' knowledge and learning using data from journals.*

Journals		
Applied Linguistics	*Educational Research*	*This Book*
Numrich (1996) Pennington (1995) McDonough (1994) Woods (1996)	Borko, Lalik & Tomchin (1987) Dunn & Shriner (1999) Hosenfeld (2003) Jones, Rua & Carter (1998)	Angelova (Chapter 2) Riegelhaupt & Carrasco (Chapter 7) Belz (Chapter 20) Villamil & de Guererro (Chapter 6) Hazelrigg (Chapter 21) Bigelow & Ranney (Chapter 11)

Metaphors

Metaphors have also been used to investigate teachers' knowledge and cognition. This includes metaphors which occur naturally in interview or other data (source) as well as data from tasks that specifically ask participants to produce metaphors. The theory is that the metaphors people create or chose to use reflect their conceptions of the phenomena they are using the metaphors to represent. The analysis can include identifying themes or attitudes contained in the metaphors.

Table 11: *Studies of teachers' knowledge and learning using metaphors.*

Metaphors		
Applied Linguistics	*Educational Research*	*This Book*
Sakui & Gaies (2003) Block (1999) Kramsch (2003) Guerrero & Villamil (2002)	Cortazzi (1993) Cortazzi & Jin (1999) Johnston (1994)	Villamil & de Guererro (Chapter 6)

Narrative and Biographic Methods

As mentioned earlier, much of teachers' knowledge is bound up in stories of their experiences both as students and as teachers. An effective way of accessing this kind of knowledge is using narrative and biographic data collection methods. There are three general directions this can take. First, data can be either general stories ("How do you remember learning French?") or on specific aspects of teaching ("What happens when

you try to focus on fluency?"). Data collected from language learning/teaching autobiographies will be more filtered than just asking for stories, but it can produce more focused data because the participants explain how their experiences influenced their teaching. It is also possible to collect autobiographies at different points in a teacher's development in order to assess how their view of teaching has changed over time or due to the influence of a course in applied linguistics (Bailey et al, 1996; Polettini, 2000). Another advantage of the autobiographies is that many teacher educators use them as a teaching tool, so if you incorporate this into your teaching, data collection will be much easier. For data looking specifically at how experiences might have shaped a teachers' knowledge and conceptions of teaching, one can ask them to describe critical incidents in their lives where they learned something about teaching, language learning, phrase structure rules, or whatever you want to focus on (Flanagan, 1954; Kagan, 1993).

The caveat with such data is that such data represents teachers' interpretations of their experiences, not the actual knowledge itself. Wubbels, Brekelmans and Hooymayers (1992) showed that teachers' reports of instruction do not always match their actual behavior in those classes. However, analysis of ways experienced and inexperienced language teachers talk about teaching show that this does reveal differences in their knowledge (Meskill, Mossop, DiAngelo & Pasquale, 2002). For an introduction on using these methods see Clandinin & Connelly (2000), Kelchtermans (1994) or Solas (1993).

Table 12: *Sample studies of teachers' knowledge and learning using narrative and biographical data.*

Teachers' Stories		
Applied Linguistics	*Educational Research*	*This Book*
Johnson & Golombek (2002) Woods (1996)	Kelchtermans (1994) Kagan & Tippins (1991) Woods (1985)	
Autobiography		
Applied Linguistics	*Educational Research*	*This Book*
Antonek et al (1997) Bailey et al (1996)	Cortazzi, M. (1993) Eick & Reed (2002) Polettini (2000)	
Critical Incidents		
Applied Linguistics	*Educational Research*	*This Book*
	Coelho (2000) Parker (1995) Sutherland & Dennick (2002) Watts, Alsop, Gould & Walsh (1997)	

Think Alouds

In think aloud tasks participants are usually asked to think out loud or to vocalize every thought that passes through their heads while they are engaged in a task in the domain under scrutiny. As Ericsson and Simon (1993) point out, however, these are, in many ways, two very different tasks. When participants do their thinking out loud, this focuses on verbal thoughts and perceptions and non-verbal thoughts and knowledge such as images and feelings will not be part of the data. However, if participants are asked to verbalize every thought, putting non-verbal thoughts such as images or feelings into words is a difficult task, so such data may be problematic. Think alouds can be easily adapted to most kinds of solitary activities such as lesson planning (Byra & Sherman, 1993), responding to written work (Cohen & Cavalcanti, 1990), or assessing information in specific situations (Lesgold, 1984; Sabers, Cushing & Berliner, 1991). However, it is difficult to apply this methodology to tasks which are interactive such as classroom teaching or conferencing. (See also van Someren, Barnard & Sandberg, 1994). Within applied linguistics, think aloud methodology has been mainly used in investigating processes of language learning (Gass & Mackey, 2000).

Table 13: *Sample studies of teachers' knowledge and learning using think aloud data.*

Think Aloud		
Applied Linguistics	*Educational Research*	*This Book*
Burns (1992) Cohen & Cavalcanti (1990)	Byra & Sherman (1993) Chi & Bassok (1989) Hauslein, Good & Cummins (1992) Housner & Griffey (1985) Sabers, Cushing & Berliner (1991) Swanson, O'Connor & Cooney (1990) Wineburg (1998)	Xiao (Chapter 13)

Stimulated Recall

In stimulated recall tasks, participants perform a task (teach a lesson, mark a paper, consult with a student, etc.). Then they are presented with some kind of stimulus (usually a video or audio tape of them completing the task although the researcher may share notes taken during the activity) and asked to stop the tape (or interviewer) at any point in the task they think is significant and to say what they were thinking at that point. The researcher may also pose questions to elicit clues to the thinking behind certain actions or decisions during the task. One disadvantage is that this methodology requires a lot of organizational work. Besides coordinating recording and playback equipment for both the stimulus and the stimulated recall data itself, the stimulated recall task should be

done right after the teaching activity (Færch & Kasper, 1987), which can make data gathering in busy school contexts challenging.

Table 14: *Sample studies of teachers' knowledge and learning using stimulated recall data.*

Stimulated Recall		
Applied Linguistics	*Educational Research*	*This Book*
Burns (1992) Golumbek (1998) Llinares (2000) Gabonton (1999) Johnson (1992; 1994; 1996a) Woods (1996)	Byra & Sherman (1993) Ethell & McMeniman (2000) Leinhardt, Weidman & Hammond (1987) Morine-Dershimer (1989) Tjeerdsma (1997)	Burns & Knox (Chapter 14) Andrews & McNeill (Chapter 10) Hislam & Cajlker (Chapter 17) Popko (Chapter 22)

Repertory Grid

The repertory grid originates from Kelly's Personal Construct Psychology (Kelly, 1955). (See Solas, 1992, for further discussion of the theoretical background to the repertory grid.) The grid measures the strength of the relationship between teachers conceptions or "constructs" and the actions and ideas which could instantiate them. The study by Lehrer & Franke (1992) exemplifies the standard repertory grid process. They had teachers explain similarities and differences between a series of fraction problems. The similarities and differences described by the teachers were the "constructs", i.e. the conceptions and categories that, it was thought, these teachers used to analyze fraction problems. Then each problem was rated as to how relevant each construct was for that problem. This process, however, is not the only way to elicit constructs. Breen et al (2001) elicited their constructs from observations and interviews by asking teachers why they did certain actions in their observed teaching. Then they had the teachers rate the importance of constructs, for example: "Quieter students should have a chance to speak", with actions observed in that teachers' classroom such as "Accepts and encourages students' spontaneous suggestions" (high rating) or "Encourages students to write down new items of language" (low rating).

There are several advantages to this method of data collection. Since the constructs and ratings come from the student, it requires less interpretation from the researcher. Furthermore, the data is not restricted to a few a priori categories, rather the categories of data are what the participants find most relevant for their own understandings. In addition, this kind of data will not only reveal the conceptions teachers find important, but which conceptions are more important than others for particular aspects of the teachers' practice. A disadvantage to this method is that the data it produces is relatively abstract and general. Therefore, it is a good idea to triangulate grid data with detailed data of specific practices, for example, from observations, interviews or journals.

Table 15: *Sample studies of teachers' knowledge and learning using repertory grid data.*

Repertory Grid		
Applied Linguistics	*Educational Research*	*This Book*
Block (1997) Breen et al (2001) Kramsch (1983) Senden & Roberts (1998)	Corporaal (1991) Lehrer & Franke (1992)	

TASKS

Observation classroom teaching and asking teachers about their thoughts and reasons behind their actions can provide a solid overall picture of the general types of knowledge teachers have acquired and use. However, if very specific questions are being investigated, these methods might not provide specific data on the topic being investigated. In this case, it is a good idea to triangulate these methods with some sort of task which is specifically designed to gather data on look at the type of knowledge you are looking for. While it is important to remember that these tasks are often somewhat artificial and may not represent exactly what someone would do when teaching, they do provide evidence for the existence of specific kinds of knowledge.

Problem Solving Tasks

The most common type of task is problem solving tasks, in which participants are presented with a problem and their solutions serve as data. Those interested in use of KAL in planning, can have participants do a lesson planning task (Palfreyman, 1993; Richards et al, 1995) and those interested in teachers' skill in writing instructions for Table 16: Sample studies of teachers' knowledge and learning using data from performance tasks.

Table 16: *Sample studies of teachers' knowledge and learning using problem solving tasks.*

Problem Solving Tasks		
Applied Linguistics	*Educational Research*	*This Book*
Andrews (1997; 1999) Bartels (2003) Cajkler & Hislam (2002) Ma & Luk (1996) Morris (1999; 2002) Richards et al (1995) Palfreyman (1993) Williamson & Hardman (1995)	Carter et al (1987) Chi & Bassok (1989) Chi, et al. (1989) Boshuizen et al (1992) Wilson & Wineburg (1988)	Burns & Knox (Chapter 14) Andrews & McNeill (Chapter 10) Angelova (Chapter 2)

reading tasks (Ma & Luk, 1996) or explaining grammatical mistakes (Andrews, 1997; Morris 1999, 2002) can have them do these types of tasks. For more detailed data on the procedures teachers use in solving these tasks, you can have the participants engage in think alouds while they solve the problem or use stimulated recall after they are finished.

Reaction to Stimulus (cases, vignettes, videos)

Another task is to present some sort of stimulus (cases, vignettes, videos of teaching) and have the participants react to them in some way (Kagan, 1993). Unlike stimulated recall where each participant is asked to recall as much as they can of an incident they were involved in, reaction to stimulus tasks have participants respond in some way to a situation which they have not experienced personally before. They can be asked simply to explain what they saw (Copeland et al, 1994; Copeland & D'Emidio-Caston, 1998), evaluate what happened in the stimulus (Jacobs & Morita, 2002), or answer specific questions about the stimulus (Byra & Sherman, 1993). This is different from problem solving tasks in that there is no particular solution which the participants must come up with. While problem solving tasks allow you to focus on the procedures and knowledge used to work on a problem, data from reaction to stimulus tasks can reveal the kinds of recognition schemata teachers have and how these are used to interpret classroom or pedagogical situations. While this method does allow for the in depth data on particular actions the participants have taken (as stimulated recall does), but one advantage of this kind of task is that all the participants react to the same stimulus, so results from a number of participants are easier to compare.

Table 17: *Sample studies of teachers' knowledge and learning using data from reaction to stimulus tasks.*

Reaction to Stimulus		
Applied Linguistics	*Educational Research*	*This Book*
	Byra & Sherman (1993) Calderhead & Robson (1991) Copeland, et al (1994) Copeland & et al (1998) Jacobs & Morita (2002) Opewal (1993) Swanson, O'Connor & Cooney (1990)	

Memory and Recognition Tasks

Memory tests were pioneered by deGroot (1965) and Chase & Simon (1973) in their studies on chess experts. They found that if they showed experts a picture of a chess board in the middle of a normal game for 5 seconds and then removed it, the chess experts could place all the pieces on a chess board as they were in the picture with great

accuracy. However, when shown a picture of a chess board with pieces randomly placed, they were no better than chess novices. This difference was attributed to the chess masters' well developed schemata for chess positions. Similar results have been found in other domains such as electronics (Egan & Schwartz, 1979), computer science (McKeithen, Reitman, Reuter & Hirtle, 1981) and music (Halpern & Bower, 1982). Recognition tasks have also revealed the superiority of experts' schemata for more than memory. Allard and Burnett (1985) found that, when shown diverse pictures of a volleyball game, expert volleyball players were no better than novices at remembering features such as players, the referee or the ball, but they did notice the location of the ball *much more quickly* than novices. In the domain of education, Carter and her colleagues (1988) found that when shown slides of classroom situations, experienced teachers' schemata showed evidence of deeper categorization than novice teachers' schemata. For example, while novices talked about "students around a table", experts saw "group work". Research findings with this method have shown strong general trends, but it is not yet clear if such tasks can reveal specific, detailed data on teachers' knowledge.

Table 18: *Sample studies of teachers' knowledge and learning using data from memory tasks.*

Memory Tasks		
Applied Linguistics	*Educational Research*	*This Book*
	Allard & Burnett (1985) Behets (1996) Carter, Cushing, Sabers, Stein & Berliner (1988) Peterson & Comeaux (1987) Sabers, Cushing & Berliner (1991)	

Knowledge Organization Tasks

The following data collection tools focus on knowledge organization. Generally, it is not difficult to set up the tasks and quantify the results. What is difficult is to designing tasks to give detailed data on the kind of knowledge you are interested in.

Sorting Tasks

Sorting tasks involve giving participants a number of cards with either concepts, such as categories in biology (i.e. "photosynthesis"), examples of the aspect of knowledge under study (i.e. examples of "Wh- questions"), objects or scenes pictured on them. The participants sort the cards into groups, name each group and describe the differences between the groups. The participants can also be asked to try to combine their groups into bigger groups or to subdivide each group into smaller groups. There are many

variations to this type of task. In their study of chess expertise, Freyhof, Gruber & Ziegler (1992) had participants circle groupings on pictures of chess games. Allard and Burnett (1985) showed participants a sketch of a basketball play, had the participants draw what they could remember, and then repeatedly showed them the play and gave them time to draw until the participant was finished. The trick here was that each time the participant had a chance to draw, a different color pencil was used, which left a clear record of what and how much was drawn in each cycle. Studies using this method have shown that experts have deeper categories for analyzing information in their domain than novices (Chi et al, 1981). In subjects such as basketball (Allard & Burnett, 1985), biology (Tamir, 1992), math (Leinhard & Smith, 1985) and wh-questions (Strauss et al, 1998) sorting tasks have shown that teachers' knowledge is organized around the aspect of their subjects that they teach. A variation on this technique is to have participants rank the stimulus according to a specific criterion (Nathan & Koedinger, 2000). A downside is that the stimulus is chosen a priori and is not generated by the participants which might mean that important elements of the participants' knowledge may be missing from the data generated by these tasks.

Table 19: *Sample studies of teachers' knowledge and learning using data from sorting tasks.*

Sorting Tasks		
Applied Linguistics	*Educational Research*	*This Book*
Strauss, et al (1998)	Allard & Burnett (1985) Chi et al (1981) Freyhof, Gruber & Ziegler (1992) Jones & Vesilind (1996) Leinhardt & Smith (1985) Llinares (2000) Nathan & Koedinger (2000) Stein, Baxter & Leinhardt (1990) Tamir (1992)	

Concept Maps

Researchers have used a number of ways to generate concept maps. One method is to have participants brainstorm on a topic to generate concepts that can be organized graphically, either as a mind map or in a hierarchy (e.g. Morine-Dershimer, 1989). Researchers can also begin with a series of concepts printed on adhesive cards, have participants affix these on a piece of paper and indicate the relation between the cards (von Minden & Walls, 1998). A final approach is to present the participants with pairs of concepts which are rated in terms of their relatedness and then use a computer program to analyze the relationships between concepts and generate the concept maps (e.g. Chen

& Ennis, 1995). The teachers in Morine-Dershimer's (1989) and Meijer et al's (1999) studies reported that being able to generate their own list of concepts made it easier to represent their own knowledge the way they conceived it, so even if an a priori list of concepts is used, this list should probably be generated by teachers in a pilot study first. Concept maps can also be used for tracking changes in teachers' knowledge organization (Jones, Carter & Rua, 1999). For a guide to analyzing concept maps, see Morine-Dershimer (1993).

Table 20: *Sample studies of teachers' knowledge and learning using data from concept maps.*

Concept Maps		
Applied Linguistics	*Educational Research*	*This Book*
Cumming (1989) Farrell (2001) Strauss et al (1998)	Beyerbach (1988) Chen & Ennis (1995) Gess-Newsome & Lederman (1993) Jones, Carter & Rua (1999) Jones, Rua & Carter (1998) Markham, Mintzes & Jones (1994) Meijer, Verloop & Beijjaard (1999) Morine-Dershimer (1989; 1993) Tan (1996) von Minden & Walls (1998)	

Tracking Resources

Another way to examine the knowledge organization for a particular task is to try and track the resources someone uses when working on a problem. Gutherie and colleagues created a computer environment where they could present study participants with tasks (such as a travel agency task where participants had to find optimal flights and accommodation given the client's wishes) and track the resources participants used during problem solving (Guthrie, 1988; Guthrie, Britten & Barker, 1991). Ronan, Anderson & Talbert (1976) studied the expertise of fire fighters with a tab test. The participants were given a hypothetical fire situation with description and maps and were asked to find the best course of action for fighting the fire from a series of solutions in a series of folders. Each folder had a tab with either a "yes" (i.e. solution correct) or a "no" (i.e. solution incorrect) covered in silver ink. When a participant chose a solution, they rubbed off the ink to check their answer and records were kept of the number of solutions the participants tried and the order with which they were chosen. This was taken as an indication of fire fighters' schemata for dealing with such fires. In a similar

vein, Hershey, Walsh, Read and Chulef (1990) provided expert and novice financial planners with information on a series of cards and then tracked the order and nature of the information the participants used when solving a financial planning problem. It might be very interesting to develop a computer program or a set of materials which looks at, for example, what information teachers use when planning for different kinds of lessons (e.g. theme-based, grammar-based, content-based, etc.).

CONCLUSION

The purpose of this chapter was to explore the range of research methodologies which can be used to investigate questions about language teachers' acquisition and use of KAL and which can serve as models for further research. However, as can be seen from the tables in this chapter, there are a number of data collection tools which have not be fully utilized for looking at teachers' knowledge in our field such as Q methodology, critical incidents, think aloud protocols, stimulus tasks, sorting tasks, concept maps, and memory tasks. It is important that applied linguists begin to explore and evaluate how such data collection methods can be used to pursue our questions in the area of L2 teacher learning and knowledge use.

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