Language Learning & Language Teaching

Individual Differences and Instructed Language Learning

EDITED BY

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Language Learning and Language Teaching

The *LL&LT* monograph series publishes monographs as well as edited volumes on applied and methodological issues in the field of language pedagogy. The focus of the series is on subjects such as classroom discourse and interaction; language diversity in educational settings; bilingual education; language testing and language assessment; teaching methods and teaching performance; learning trajectories in second language acquisition; and written language learning in educational settings.

Volume 2

Individual Differences and Instructed Language Learning
Edited by Peter Robinson

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Preface

Learners differ in how successfully they adapt to, and profit from instruction. This book aims to show that this fact cannot be explained by research into individual differences (IDs) in such areas as aptitude, anxiety and motivation *alone*, or by debates over the merits of one form of pedagogic intervention versus another *alone*. Rather, learning (and relative success) is a result of the *interaction* between learner characteristics, and learning contexts. Describing, and explaining these patterns of ID-intervention interactions is fundamentally important to theories of instructed second language acquisition (SLA), and for effective pedagogy.

Researching such interactions, while therefore necessary, is both theoretically, and empirically challenging. Research into IDs, and their effects on learning, is a huge field of study, with an academic journal (often multiple journals) dedicated to reporting findings about almost every ID variable one could name (*Intelligence*; *Journal of Personality and Social Psychology*; *Motivation and Emotion*, etc.). Debate about the optimal conditions for instructed language learning, often drawing on findings from SLA research, also fills the pages of many major journals each month (*Language Learning*; *Studies in Second Language Acquisition*; *TESOL Quarterly*, etc). This book brings these two areas of research *together*, providing an up-to-date perspective, from leading researchers interested in both, on how individual differences affect second language learning in a variety of contemporary instructional contexts and settings. The first section, 'Theoretical Issues', contains chapters summarizing relevant recent research into the roles of intelligence, language learning aptitude, and motivation, anxiety and emotion during SLA, and contains a number of programmatic proposals for future research in these areas. In the second section, issues raised in earlier chapters are further explored in empirical studies of the effects of these ID variables on language learning in classroom (task-based, immersion and communicative), naturalistic, and experimental settings.

Many people provided the theoretical input, and practical help that led to this book. My own interest in this area was kindled by a finding from my Ph.D

research, supervised by Dick Schmidt (and reported in chapters by Skehan, and Robinson, this volume) that L2 learning in an incidental, processing for meaning, condition, showed no significant relationship to two traditional subtests of aptitude, in contrast to learning in an instructed, and rule-search condition, and even an implicit condition, where learners memorized examples. I thought then that this result was found because the measures of aptitude were insensitive to the processing requirements of incidental learning (Robinson, 1997a), but that other measures may be sensitive to these — an issue I explore in detail in Chapter 10. At the same time I had begun to examine ways in which pedagogic tasks could be sequenced for learners on the basis of intrinsic differences in the processing demands contributing to their relative cognitive complexity, and the implications of this for syllabus design (see Long & Crookes, 1992; Robinson, 1995a). But I was also interested in how differences *between* learners (in say aptitude, or anxiety) contributing to their perceptions of the 'difficulty' of any one task type would affect learning and performance, as well as how such differences would affect uptake of focus on form (Long, 1991), delivered via various techniques during on-task interventions. These two lines of research, then, are fairly typical examples of aptitude (individual differences) — treatment (task or processing condition) interaction research, as described by Richard Snow (1994), and also in the work of Robert Sternberg, and Peter Skehan (see their chapters, this volume).

The idea for this book led first to a conference, *Individual differences in foreign language learning: Effects of aptitude, intelligence and motivation*, held at Aoyama Gakuin University in March, 1999. I am very grateful to all those English Department members, faculty and students who made that conference possible, and successful; in particular, Tamae Yoshino and Kasumi Kohno, Ben Saito and Greg Strong, and two graduate students, Yukiko Niwa and Yuki Yoshimura, all helped considerably. Thanks are also due to the many paper presenters and other attendees who contributed to the discussions, to Steve Cornwell for helping edit the proceedings, and to the plenary speakers, Elena Grigorenko, Peter MacIntyre, Peter Skehan and Robert Sternberg for travelling to Tokyo, and for subsequently agreeing to write their chapters for the first section of this book. Following the conference contributors to the second section agreed to submit complementary data-based studies, and I am extremely grateful for their subsequent hard work and e-mail cooperation in preparing and revising their chapters. I thank also the blind, external reviewers of those chapters, Robert DeKeyser, Robert Gardner, Michael Harrington, and Mark Sawyer, for their prompt, critical, and helpful reviews. Larry

Selinker, and above all Peter Skehan, have been very supportive of this project as it approached publication, and I thank them warmly for that. Finally, my thanks go to the series editors, Jan Hulstijn and Birgit Harley, and to Kees Vaes at John Benjamins for all they have done, and for their commitment to seeing this project to completion.

Peter Robinson, January, 2002

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CHAPTER 1

Introduction

Researching individual differences and instructed learning

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The broad aim of this book is to present recent theoretical thinking about, and empirical research into, the fit between person (second language learner) and situation (learning condition) in second language (L2) classrooms. As such the chapters in this book are concerned with what has been called aptitude-treatment interaction research and theory (see Corno, Cronbach, Kupermintz, Lohman, Mandinach, Porteus & Talbert, 2002; Cronbach & Snow, 1977), as it applies to L2 learners in instructed settings.

The studies presented in the second section of this book illustrate three complementary, contexts for conducting such research. The approach, illustrated by Dörnyei, and Ranta, in their chapters, is to use *intact classes* to examine the interaction of individual difference variables with learning over extended periods of time in classrooms following different instructional programs (task-based, and communicative instructional programs respectively). The chapters by Mackey, Philp, Egi, Fujii and Tatsumi, and by Robinson adopt *experimental* designs, and random selection, and allocation of participants to learning conditions with the aim of investigating the interaction of individual difference variables with specific learning processes, such as (in Mackey et al.'s case) noticing and uptake of recasts, or (in Robinson's case) incidental learning during processing for meaning. Finally, since one aim of recent communicative and task-based approaches to classroom instruction is to accommodate as far as possible — while 'speeding up' — naturalistic processes (Long, 1988), a third option is to examine aptitude-learning relationships both *within* as well as *outside* classrooms in order to examine areas of difference, and similarity between them (see the chapters by Harley & Hart, and Ross,

Yoshinaga & Sasaki on learning during study abroad programs, and the effects of early, naturalistic, versus late, instructed exposure on learning).

Person variables can be broadly classified as cognitive and affective/conative, where cognitive abilities (such as intelligence, language learning aptitude, or working memory capacity and speed) are distinguished from affective/conative factors (such as anxiety, motivation, and emotion). The five chapters in the first section of this collection describe recent theoretical developments in thinking about cognitive abilities and affective/conative variables, and their relationship to instructed language learning, in a variety of contexts. As Snow (1987) and others (see e.g., Sternberg & Wagner, 1994) have pointed out, it is only in establishing and researching the interaction of each of these kinds of person variables with the learning context that the nature of the optimal 'fit' between learning and instruction can be identified. In the domain of L2 learning in instructed settings there is considerable need for renewed research effort into establishing this optimal fit. There are four main reasons for this.

The differentiation of cognitive abilities, intelligences, and aptitudes

Firstly, theoretical perspectives on the nature of the relevant cognitive abilities for language learning, and their structure, have progressed considerably in recent years. It is now widely argued, for example, that intelligence, and language learning aptitude, are not monolithic and general, but differentiated concepts, and that there are likely multiple intelligences, as well as multiple aptitudes for language learning. This is the theme of the chapters by Sternberg, Grigorenko, and Robinson, in the first section of this book. Sternberg (1985a, 1990) has long challenged the traditional, psychometric notion of intelligence as an overarching, general ability or '*g*' (see Gustaffson, 1988; Jensen, 1998 for review), in favor of a model that proposes three types of intellectual competence; *analytic* abilities used in analyzing, judging and comparing and contrasting; *creative* abilities used in creating, inventing and discovering; and *practical* abilities used to apply, implement or use knowledge. Individual differences in each of these abilities need to be considered in matching learners to appropriate instructional methods, and in his chapter Sternberg describes research into how this can be — and has been — done, and its implications for language aptitude testing, in particular the design of the CANAL-F aptitude test (Grigorenko, Sternberg & Ehrman, 2000).

Sternberg therefore strongly argues that the abilities necessary for suc-

cessful learning must be more than those memory and analytic abilities largely measured by traditional intelligence tests such as the Wechsler Adult Intelligence Scale (Wechsler, 1939, 1997), or language learning aptitude tests such as the Modern Language Aptitude Test (MLAT, Carroll & Sapon, 1959). While traditional measures of memory and analytic abilities are still important predictors of instructed L2 learning, as Skehan (1998a, this volume) has argued, and as some of the studies in the second section of this volume show (e.g., Ranta, and Harley & Hart), other studies lend support to Sternberg's claim that there is a need to supplement traditional ways of measuring these (see Mackey et al., and Robinson), and to motivate a broader range of component aptitude processes and abilities which can be matched to specific instructional options. This is an area for much needed future research.

In her chapter Grigorenko provides a detailed summary of research into individual differences in cognitive abilities — and at the lower tail of their distribution in populations, what can be called deficits or 'disabilities' — across a variety of language learning contexts and skill domains. One issue she explores is the extent to which native language (NL) disabilities, as manifest, for example, in specific language impairment, or dyslexia, are related to poor aptitude for foreign language learning, proposing a number of explanations for why this may be so. Grigorenko's review of NL deficiencies in speech perception, and how they might be related to phonological working memory provides an interesting link to the later chapter in the second section of this volume by Mackey et al. who explore L2 differences in phonological working memory capacity as it affects 'noticing' (Schmidt, 1990, 2001), and uptake of 'focus on form' (Long, 1991) prompted via recasts. Grigorenko's review of NL abilities and disabilities in phonological, morphological and syntactic awareness, also has implications for many other focus on form techniques for prompting 'noticing' (see Doughty & Williams, 1998), and the extent to which the success of each may be facilitated, or inhibited, in L2 classrooms by the residue of NL abilities possibly contributing to L2 aptitude — an issue Robinson takes up in his chapter.

Robinson, adopting the interactionist framework of Snow (1987, 1994) identifies a number of 'aptitude-complexes' or combinations of cognitive abilities that he argues are differentially related to processing under different conditions of instructional exposure to L2 input, and therefore that strengths in one or another of these complexes of abilities can be expected to be important to learning from one instructional technique, or under one condition, versus another. Sternberg, in his chapter comments on his own attempts to learn

three different languages — with very different degrees of success — that '...my aptitude was not internal to me, but in the interaction between my abilities and the way I was being taught'. Robinson's framework is an attempt to specify the information processing details of this observation, and to relate them to current issues in SLA theory and pedagogy. Robinson also argues, as Grigorenko illustrates, that some learners may have more clearly differentiated abilities than others — and it is particularly important to match these learners to instructional conditions which favor their strengths in aptitude complexes, in contrast to other learners who may have less differentiated abilities, and equivalent strengths, and aptitudes for learning under a variety of conditions of exposure.

Evidence of second language acquisition processes and constraints

It is also clear that the last two decades of second language acquisition (SLA) research have added considerably to our knowledge of the cognitive processes, and constraints, implicated in instructed SLA. We know not only considerably more about the course of L2 morphological and syntactic development, and stages of acquisition (e.g., Andersen, 1991; Li & Shirai, 2000; Meisel, Clahsen & Pienemann, 1981; Perdue, 1993), but more about such processes as L2 automatization and restructuring (DeKeyser, 2001; McLaughlin & Heredia, 1996; Segalowitz, in press); lexical access and retrieval in a second language (Kroll & de Groot, 1997; Pienemann, 1998); differences in the processes underlying, and the scope of, implicit, incidental and explicit L2 learning (de Graaff, 1997b; N.Ellis, 1994; Hulstijn, 2001, in press; Robinson, 1996a); form-function mappings in L2 development (Becker & Carroll, 1997; Sato, 1990; Slobin, 1993); and the extent to which interaction can facilitate these and other L2 learning processes (Doughty, 2001; Gass, 1997; Gass, Mackey & Pica, 1998; Long, 1996; Mackey, 1999; Pica, Young & Doughty, 1987; Sato, 1990).

We also have much more evidence for the existence of a critical period for L2 learning, and the extent of its effects on language development in such areas as phonological, lexical, and syntactic development (Birdsong, 1999; DeKeyser, 2000; Long, 1990; Skehan, 1998a, this volume). Critical period effects have often been considered important to the debate over whether, and to what extent, adult L2 learners have '*access*' to the innate knowledge and mechanisms described in theories of, or programs for investigating, Universal

Grammar (Chomsky, 1986, 1995) which some argue guide L1 acquisition (see e.g., Gregg, 2001; Schachter, 1996; Schwartz & Sprouse, 2000; White & Genesee, 1996). But they also imply (in the absence of convincing evidence that such access is obligatory, and automatic — see Carroll, [2001]) that age of onset of L2 acquisition (before versus following the critical period) might be expected to draw on *different clusters* of cognitive abilities — an interaction illustrated by Ross, Yoshinaga, and Sasaki, and Harley and Hart in their studies in the second section of this volume, and a finding of considerable consequence for both SLA theory and pedagogy.

As Skehan points out in his chapter, the information summarized briefly above was not available to researchers investigating the structure of foreign language learning aptitude in the 1960s and 1970s. Consequently, some reconceptualisation of language learning aptitude is currently necessary, in order to bring conventional measures more closely into line with what we now know of language learning processes, and mechanisms, and Skehan (1998a, this volume) makes a number of suggestions about how this could best be done. The core of Skehan's proposal in his chapter is that aptitude measures need to be differentiated according to the SLA processing stage they correspond to, and he identifies four broad stages; *noticing* the input; *patterning* the input to facilitate further analysis and generalization; *controlling* the analyzed knowledge in production; and *lexicalising*, or variegating the patterns learned to suit different communicative, and situational contexts.

This sequential, processing stage approach to identifying the components of aptitude is similar in conception to one approach adopted by MacIntyre and Gardner (1994a; MacIntyre, this volume; Onwuegbuzie, Bailey, & Daley, 2000) to measuring the effects of anxiety on L2 learning and use at the input, central processing, and output stages (the Input, Processing, Output Anxiety Scale, IPOAS), and it is an interesting question whether aptitude and anxiety at these different stages are related, such that, for example, poor aptitude for noticing input leads to greater input anxiety. If so, then this would be evidence in support of Sparks and Ganschow's claim (1991, 1993a, 1993b; see Grigorenko's review, this volume), that anxiety is largely an epiphenomenon (not a cause) of poor L2 performance, and further that poor aptitude for L2 learning (which does cause poor performance) may also be related to deficits in L1 encoding abilities (an issue which Skehan also addresses). However, reviewing the evidence in this area, MacIntyre (this volume) argues that while there is some support for the anxiety-as-epiphenomenon claim made by Sparks and Ganschow, other research has shown anxiety to directly influence

L2 learning and performance (both positively and negatively), independently of learners' current level of L2 ability, or level of aptitude.

Robinson and Skehan's frameworks, while ultimately complementary, therefore address the issue of reconceptualising aptitude (urged by Sternberg, this volume) from different directions. Robinson, following Snow (1987), attempts to describe aptitude as it is relevant to learning under different conditions of exposure to input. Starting from a description of different *learning conditions* (see Robinson, 1996a, 1997b; Robinson & Ha, 1993, for studies) he then attempts to match them to aptitude complexes which complement the information processing abilities they draw on. In contrast, Skehan takes as his starting point the *information processing operations* implicated in learning under *any* condition of exposure (see also Skehan, 1998a for discussion) and attempts to match stages in global information processing to aptitude characteristics and potential subtests. These different emphases, and frameworks, also point to different potential applications of aptitude tests — Robinson's to *matching* of learners to optimum learning conditions based on strengths in aptitude complexes — Skehan's to *diagnosing* (and subsequently supporting) poor aptitude at one or another processing stage.

Skehan's and Robinson's introductory chapters, dealing directly as they do with issues in current SLA research, such as the nature of automatization in access to L2 knowledge, and control of L2 production (DeKeyser, 2001; Hulstijn, 2001; Segalowitz, in press); the nature of implicit versus explicit SLA processes (de Graaff, 1997b; DeKeyser, in press; N. Ellis, 1994; Hulstijn, in press); the putative necessity of 'noticing' for L2 learning (Schmidt, 1990, 1993, 2001; Tomlin & Villa, 1994), and effective options for delivering 'focus on form' during communicative interaction which aim to facilitate it (Doughty & Williams, 1998; Long, 1991; Long & Robinson, 1998), therefore lead in naturally to the issues addressed in the second section of this book, where empirical studies of learning inside and outside classrooms are reported.

The changing nature of second language instructional practices

Second language instructional practices have also changed and diversified over the last twenty years. While measures of ability for language learning such as the MLAT were found to have predictive validity as measures of learning in predominantly audiolingual classrooms in the 1960s (see the chapter by Skehan for historical review) there is likely a need to revise them in line with