

Book Review

Research methods for complexity theory in applied linguistics

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When I found out about the upcoming publication of a book devoted in its entirety to research methods that can be used to investigate issues in applied linguistics (AL) within the framework of complex dynamic systems theory (CDST), I immediately decided to include it in my reading list and, time permitting, review it for *SLLT*. On the one hand, research into learning and teaching second and foreign languages is one of the most vibrant lines of inquiry in AL and therefore it is only fitting that the appearance of such a ground-breaking volume should be recognized by the journal. After all, it is an indisputable fact that CDST has made major inroads into the domain of second language acquisition (SLA) and it is beginning to change or, should I say, revolutionize the ways in which different aspects of SLA are examined. This is perhaps most evident in the case of studies of individual difference (ID) factors (e.g., Dörnyei, MacIntyre, & Henry, 2014; Hiver, 2017; Oxford, 2017) and has also found its reflection in the special issue of *SLLT* (1/2020), titled *Investigating the Dynamic Nature of Individual Differences in L2 Learning*, guest-edited by Laura Gurzynski-Weiss. In addition, one cannot help but notice that this theoretical stance has started to be seen as

a new creed for many specialists, to the point that there is perhaps a danger of its being perceived as the only “correct” approach to shedding light on various facets of SLA. As Diane Larsen-Freeman writes in her excellent foreword to the book, “this new way of thinking has called into question the conventional ideas about language and its learning/development” (p. vii). On the other hand, I cannot call myself an ardent enthusiast of CDST, not because I cannot see its many merits or do not acknowledge its enormous potential for expanding our understanding of how languages are learnt or taught, but because I believe that only a diversity of approaches can help us better grasp the intricacies of these processes. Still, I was certainly thrilled to finally see a publication that, instead of merely trying to convince us that SLA research should be grounded in CDST, in fact makes an earnest attempt to illustrate how this can be done in practice.

The book is divided into four parts. Part One, “Introduction to Complexity Theory,” is composed of three chapters (Chapter 1 is an introductory one), and, as the title suggests, aims to introduce readers to the main tenets of CDST (Chapter 2) as well as delving into philosophical and methodological issues involved in carrying out research within this theoretical framework (Chapter 3). Drawing upon their previous work (Hiver & Al-Hoorie, 2016), the authors present here what they refer to as the dynamic ensemble, or guidelines that should be heeded when planning and designing empirical studies informed by CDST. These are considered with respect to operational, contextual, macro-system and micro-system decisions. In the following two parts of the book, emphasis is placed on specific methods that have originated with different disciplines and can be potentially harnessed for CDST-driven research in AL. Accordingly, Part Two is devoted to the discussion of qualitative methods which are as follows: qualitative comparative analysis (Chapter 4), process tracing (Chapter 5), concept mapping (Chapter 6), agent-based modeling (Chapter 7), retrodictive qualitative modeling (Chapter 8), social network analysis (Chapter 9), and design-based research methods (Chapter 10). Part Three, in turn, is dedicated to quantitative methods, that is, panel designs (Chapter 11), latent growth curve modeling (Chapter 12), multilevel modeling (Chapter 13), time series analysis (Chapter 14), experience sampling method (Chapter 15), single case designs (Chapter 16), and idiodynamic method (Chapter 17). For reasons of space, it is not feasible to even very briefly characterize all of these research methods here and, thus, suffice it to say that while some have already been quite successfully applied in SLA research (e.g., retrodictive qualitative modeling, idiodynamic method, experience sampling), others are newcomers to the field and it remains to be seen whether they will be adopted and in fact catch on at some point. It should also be noted that chapters dealing with specific methods follow the same structure, whereby each method is briefly introduced, possible research

questions are specified, technical features are considered, and an example study is presented. Finally, Part Four illuminates how different methods used in CDST research can be beneficially integrated (Chapter 18), as well as providing a useful glossary of terminology related to CDST and a list of resources that interested readers can reach for in order to further explore this theoretical perspective.

Not being a great fan of CDST myself, I strongly applaud the publication of Hiver and Al-Hoorie's book for several reasons. First, it is reassuring that researchers at long last have at their disposal a manual which can guide their efforts to apply complexity theory to different areas of AL in general and SLA in particular. Therefore, I could not agree more with another comment made by Larsen-Freeman in the foreword: "The potential to deliver robust findings, consistently and convincingly, through powerful analytical tools is a most welcome next step in the evolution of CDST in service to furthering our understanding of second language development" (p. ix). Second, the volume has the potential to become a valuable resource also for scholars who may be reluctant to embrace the principles of CDST since they adhere to other theoretical positions or simply wish to keep an open mind about the utility of different theories. This is because they can fall back upon some of the methods introduced in Part Two and Part Three to pursue their own research agendas. For example, experience sampling has been successfully employed to explore changes in levels of motivation, willingness to communicate or boredom, even though the relevant studies have not drawn upon CDST (e.g., Pawlak, Mystkowska-Wiertelak, & Bielak, 2016; Pawlak, Kruk, & Zawodniak, 2020). Third, the authors should be commended for making it clear that adept integration of various methods may be indispensable but also for admitting that not all research has to be anchored in complexity theory and use its theoretical apparatus. This is how I understand the comment, for instance, that "good applications of CDST research will be transparent about the reasons for choosing to adopt a complexity framework and specifying why situating the study within this perspective is a sound theoretical and empirical choice" (p. 55). Fourth, one simply cannot help being impressed by the authors' extensive knowledge of CDST as well as methods of investigating it, their erudition, or the rigor and logic with which the volume is structured. It is evident how much effort must have gone into studying this theoretical position and putting the book together but, looking at the final product, this was surely time well spent.

This review would be incomplete without mentioning what I see as limitations of the volume. For example, the overview of the principles of CDST in Chapter 2 does not make for easy reading and it is doubtful whether those with limited understanding of this theory will be able to process all the information included, but this is a problem that the authors themselves openly recognize. In addition, while there are differences in this respect between chapters, the book

would probably better serve its purpose as a guide for applied linguists if the discussion of the research methods were more firmly grounded in AL or SLA. I do understand that many of the methods were imported, so to speak, from other disciplines and no relevant example studies were available, but I would argue that the research questions listed or the procedures outlined could include more references to issues specific to our field. The danger is that if such links are not highlighted, some readers may simply fail to see their immediate relevance to their own research endeavors. Although I appreciate the inclusion of a framework for integrating different methods for the sake of CDST-driven investigations, I am not entirely convinced that the somewhat lengthy elaboration on how mixing methods is distinct from integrating them amounts to much more than splitting hairs. At the end of the day, any study should include some kind of justification for why different instruments were used or how different data sources contribute to the interpretation of the findings. Finally, what seems to be missing is a concluding chapter that would offer even a very sketchy research agenda concerning the areas of AL that the CDST-based methods could help us illuminate. I do realize that this would have been a somewhat daunting task, but such an effort could get some skeptics to actually test the potential of complexity theory in their own studies.

Despite these critical comments, which are obviously very subjective and which other readers may disagree with, I would like to emphasize that Hiver and Al-Hoorie's book is a landmark publication and an invaluable contribution to our field. Of course, it remains to be seen whether and to what extent the specific methods will find successful applications, but it is quite clear to me that researchers have been equipped with requisite tools of the trade that they can put to the test in their specific contexts to advance their own research agendas. Whatever sentiments about CDST one may have, it is undeniable that with the publication of the book, this theoretical perspective stands a much greater chance of helping us understand different aspects of AL and in particular SLA than before. I hope that Phil Hiver and Ali Al-Hoorie will continue their efforts to show the utility of CDST and perhaps one day they will also write a book about how adopting complexity theory can actually translate into more effective instruction in the language classroom.

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