Language Teaching (2024), **57**, 101–112
doi:10.1017/S0261444822000027

CAMBRIDGE UNIVERSITY PRESS

FIRST PERSON SINGULAR

Transitioning from conversation analysis to mixed methods

Paul Seedhouse

Newcastle University, Newcastle upon Tyne, UK
Email: paul.seedhouse@ncl.ac.uk

(Received 24 January 2022; accepted 30 January 2022)

1. The supercomplexity of language learning talk

This reflective piece tells the story of how I started out doing Conversation Analysis (CA) and have been transitioning into doing mixed methods for some years now. My basic argument is that language learning talk[1] is too complex a phenomenon to analyse using a single methodology. Specifically, it is extremely difficult to isolate from the interaction concrete evidence of the learning of specific individual items in terms of change of cognitive state. This is owing to the singular complexity of language learning, which adds an extra level of complexity to language learning talk, hence supercomplexity. Of course, the counter-argument to this would be that CA as a methodology is designed to reveal the complexity and fluidity of spoken interaction. The complex organisation of ordinary conversation (Sacks et al., 1974) and of varieties of institutional interaction (Drew & Heritage, 1992) have been very well established for a very long time. CA has been extremely successful and popular as a methodology for the analysis of spoken interaction in a huge range of settings. There have been many CA studies of language learning talk over the last few decades, including my own. So why do I now feel that it cannot portray the full complexity of language learning talk on its own? There is an idiosyncratic problem with language learning talk, namely that it has an additional level of complexity superimposed on top of the regular problems of analysing spoken interaction. This is because language is the object as well as the vehicle of language learning talk.

What exactly is involved in this extra level of complexity? Second language (L2) learning is an extremely complex process, involving the interaction of many different interrelated components. It is also a complex system in the sense in which 'complex' is understood in complex systems research, that is, its order emerges from the interaction of its components. Complexity is evident on a number of levels, as follows (Seedhouse, 2010a):

(a) a language has many components, including morphology, syntax, lexis, phonology, semantics, pragmatics and discourse. Learning one component may involve different issues to learning another component.
(b) Each individual component of language may have a number of sub-components in relation to learning. For example, in relation to lexis, 'learning a word is a process by which different aspects of form (spoken and written), meaning (referential, conceptual, associative/paradigmatic, connotation, interpersonal, socio-cultural) and use (morphological, syntactic and collocational features and patterns of use, as well as constraints on use, such as register and frequency) are acquired' (Elgort & Nation, 2010).
(c) There are multiple definitions and conceptions of what language is (Cook, 2010).
(d) L2 learning may be investigated on very different scales. One may focus, on the micro level, on whether an individual has learnt a specific phonological point (Seedhouse & Walsh, 2010). Alternatively, one may investigate the overall size and depth of a learner's vocabulary

(Elgort & Nation, 2010) or a learner's stage of grammatical development. Here, there is a much broader perspective on an individual's overall ability in the L2. Studies at these two extremes of scale (and at points in between) may require very different approaches.

(e) Learning is both a process (an activity in which learners participate in relation to some kind of exposure to L2) and a product (a change in cognitive state). That L2 learning is both a process and a product gives language learning talk a distinctive duality that is not present in other varieties of talk.

CA is excellent for revealing L2 learning as a process, but not as a product – that is, a change in cognitive state. I'm not blaming CA for this – it's just a quirk of life. When I was a language teacher, I noted very early on that simply getting students to repeat a word verbally in class did not mean they had actually learnt the word. Verbal repetition of an L2 item does not necessarily demonstrate that language learning (the institutional business) has been achieved. This is an inherent paradox for CA as a sole method of analysis of language learning talk to grapple with. The process of learning can be portrayed very well, but the product – that is, the change in cognitive state – is very hard to portray.

What impact does this duality have on language learning talk? In ordinary conversation between native speakers, any utterance is a document on many levels. The utterance is a display of the speaker's analysis of the prior utterance of an interactant; it performs a social action in response and it positions the speaker in a social system. It displays an understanding of the current sequential and social context and renews it. It performs a social display of the speaker's cognitive, emotional and attitudinal state, but does not give a direct window into these states. However, by virtue of the dual nature of language learning talk, any utterance by the learner in L2 performs two additional functions in addition to those already mentioned above in relation to ordinary conversation.

Firstly, the learner's L2 utterance constitutes a display of his/her L2 developmental level or 'learning state' as well. This understanding is institutionalised in various ways. In language tests (e.g., IELTS), students are given scores or grades based on their spoken production during the test. In the classroom, L2 learner utterances are subject to evaluation and repair by the teacher (as we see in lines 5 and 7 of extract 1 below), since they are taken to be a display of a learning state. Secondly, interactants in language learning talk are always displaying to one another in their talk their analyses of the current state of the evolving relationship between the language learning focus and interaction. So, in extract 1 below, for example, the learner displays in line 4 his analysis that the current relationship between language learning and interaction is for him to take a turn in L2 to confirm the teacher's summary of the film's plot and to add information on the film's plot. What is meant by the learning state of a learner involved in language learning talk is inextricably entwined and engaged with the unique sequential, social and pedagogical environment in which he/she is engaged. This process can be portrayed emically in that unique sequential environment, so we can show the process of learning very well with CA. However, because learning in this process sense is so entwined in the progress of the interaction, it is very difficult to isolate and extract specific phenomena with certainty – that is, we cannot easily show the PRODUCT of learning in terms of change of cognitive state. For this, an additional methodology is required.

How did I come to this position? To explain the processes that led to my change of mind on this issue, I start by auto-critiquing my own earlier work using a CA methodology to analyse L2 learning talk. In my (Seedhouse, 2004) book, *The interactional architecture of the language classroom*, I analysed the short extract below in much more detail.

Extract 1

1 T: Vin, have you ever been to the movies? What's your favourite movie?
2 L: Big.
3 T: Big, OK, that's a good movie, that was about a little boy inside a big man, wasn't it?
4 L: Yeah, boy get surprise all the time.
5 T: Yes, he was surprised, wasn't he? Usually little boys don't do the things that men do, do they?
6 L: No, little boy no drink.
7 T: That's right, little boys don't drink. (Johnson, 1995, p. 23)

https://doi.org/10.1017/S0261444822000027 Published online by Cambridge University Press

In my analysis, I brought out the multiple layers of complexity involved in the processes of language teaching and showed how the teacher is orienting to five separate concerns on different levels at the same time. The analysis still seems to me to be successful in showing how the teacher created a learning environment in which appropriate learning might take place. It also did justice to the complexity of the language learning talk. Ultimately, however, I have to admit in retrospect that from the perspective of language LEARNING, we have no way of knowing whether the learner noticed the embedded correction/recast/scaffolding in line 5 and 7 or not, as no reaction or uptake to these is displayed. Even if the learner noticed the corrections, we still don't know whether the learner learnt anything as a result. This extract also provides a clear illustration of the supercomplexity of language learning talk. Line 5 contains a social action of affirmation combined with an embedded correction and followed by a tag question, thus operating on the social interactional level and the pedagogical level simultaneously. We know from the learner's response in line 6 that he has responded to the social action, but not whether he noticed the pedagogical one.

While my analysis was successful in portraying the process that facilitates learning, it fails in terms of revealing the product of learning in terms of evidence of changes in cognitive state. Of course, that was not my aim at the time, but on subsequent reflection, this did seem to me to be a serious problem. But then I thought to myself: surely it must be possible to uncover definite evidence of the products of language LEARNING using a CA methodology? So, in the later 2000s, I decided to search all of the transcripts of L2 classroom interaction that I could locate for concrete, indisputable evidence of learning.

2. Developing a definition and conceptualisation of language learning

Before conducting the search, though, it seemed clear to me that it would be necessary to agree a definition and conceptualisation of language learning to which all the different schools of second language acquisition (SLA) would be able to subscribe. There wouldn't be much point in doing long searches if people said that the evidence of learning wasn't conclusive enough, so we would need an agreement on what conclusive evidence of changes of cognitive state in language learning talk would look like. There were strong and well-publicised disagreements at the time between more socio-cultural (generally qualitative) approaches to SLA and more cognitive (generally quantitative) approaches. Researchers in the field of SLA often started with different basic assumptions about the nature of 'language' and 'learning', (as well as 'second', as Cook (2010) points out). This situation has generated several disputes in the field: Cook (2010) points out the danger that SLA researchers often do not realise that they are working from different maps and quarrel over differences in basic assumptions. This project therefore sought to establish the common ground contained in the diversity of views and to establish a broad framework for conceptualising language learning that could provide a basis for relating studies using different approaches to each other. So, it seemed to me and my colleagues in Newcastle that what was necessary was a definition and conceptualisation of L2 learning that everyone would agree would provide definitive evidence that learning had taken place.

We therefore held a two-day seminar, 'Conceptualising Learning in Applied Linguistics' at Newcastle University in June 2008. The seminar brought together leading names from around the world to represent many strands of SLA research with the aim of trying to agree a joint working definition of 'learning' to which all could subscribe. After much debate, drafting and re-drafting, we successfully agreed on a protocol and a definition as a group that were published in Seedhouse et al. (2010). The rationale for the use of a protocol for applied linguistic studies into 'learning' was to ensure comparability of studies and to enable meta-studies. The protocol would involve making the following components of the study explicit: the meaning of 'language' involved [preferably using Cook's (2010) scheme]; the component(s) of language or language use targeted for being learnt in the study; the definition or conceptualisation of 'learning' employed; the criteria employed for the evaluation of learning; the research methodology and epistemology employed; the aims of the research, or research questions; the circumstances of learning; and whether learning is being understood as a process, a product, or both.

https://doi.org/10.1017/S0261444822000027 Published online by Cambridge University Press

The agreed definition of learning was that L2 learning involves both a socio-cognitive process and a change in cognitive state. It involves adapting linguistic and other semiotic resources to communicative needs and represents an adjustment in a complex adaptive system. The change involves transcendence of a particular time and space in four stages, as follows: Stage 1 establishes a gap, that is, the learner could not do x at time a. Stage 2 shows social construction, that is, the learner co-adapted x at time b. Stage 3 demonstrates internalisation/self-regulation in that the learner initiated x at time c in a similar context as time b. Stage 4 displays transfer of learning because the learner employed x at time d in a new context. Here, 'x' refers to a feature of language or language use; for example, a lexical item, a genre, a pattern of participation in interaction.[2]

One significant achievement of this project is that it assembled a group of scholars who are operating in rather different paradigms and enabled them to make explicit their conceptualisations of 'learning', thereby increasing mutual understanding. So, the good news was that we now had an agreed conceptualisation of L2 learning, but it seems to me now in retrospect that we also had bad news, in that it required a very high threshold and burden of proof and very specific kinds of evidence. L2 teachers are rightly concerned with managing their classes, rather than providing evidence for researchers, and CA requires naturally occurring interaction rather than controlled, experimental interaction. The specific problem is that the definition's requirement for stage 4 is that the learning item must be produced by the same learner at a different time in a new context, suggesting that even a laboratory setting could not be used twice. I show below why this is so difficult to achieve. With hindsight, my conclusion is that although the definition was produced with the best of intentions to be sure of watertight evidence, stage 4 is not practical for L2 learning research using CA in practice and that stage 3 should be regarded as sufficient evidence for future research projects.

3. Searching interaction for evidence of learning

Now that we had an agreed definition and conceptualisation of language learning to which all the different schools of SLA would be able to subscribe, it became possible for me to carry on with my project, by making a thorough search of all the transcripts of L2 classroom interaction that I could find for concrete, indisputable evidence of learning. However, it was an extremely long search before I could find any concrete pieces of evidence of learning matching the definition that we had agreed on. Finally, I found one data extract that met stage 3 criteria, thanks to Loewen's (2002) work in New Zealand classrooms. To further auto-critique my earlier work, I took over six pages in Seedhouse and Walsh (2010) to analyse an extract from Loewen's data and show that one learner repeatedly made a pronunciation error that impeded communication. The teacher then corrected and drilled the error, the learner noticed the correction and repeatedly displayed uptake. The evidence that the learner had internalised the change was confirmed in that the learner was subsequently able to use the changed pronunciation correctly without prompting, in the context of a meaning-focussed discussion with another student later in the lesson. The learner showed very clear evidence of having reached stage 3 in the above definition of learning. It was unclear whether a change in lesson focus constituted a 'new context', therefore definitive evidence of stage 4 was lacking.

I felt that this had been an unproductive and excessive amount of work for me, searching through vast amounts of data just to locate one example of L2 classroom learning through interaction that met our definition. In my analysis, I had used many words to show that just one example of learning had taken place, so this was not at all a scalable approach. My conclusion was that evidence of the product of learning as required by the (2010) protocol and definition is just not 'visible' enough in recordings and transcripts of L2 classroom interaction. CA is well able to portray the process of L2 learning but on its own does not provide a scalable way of determining the product of L2 learning in terms of change of cognitive state. CA is well able to portray the complexity of ordinary conversation and institutional talk. However, L2 learning is an enormously complex process and gives language learning talk its idiosyncratic dual nature and supercomplexity. Adding this extra level of complexity on top of the regular demands of dealing with human spoken interaction means that extracting evidence of

https://doi.org/10.1017/S0261444822000027 Published online by Cambridge University Press

cognitive change is too great a demand for CA on its own. Introducing other methodologies, including testing for changes in cognitive state therefore seemed necessary to me. Cognitive approaches to L2 learning and testing have been developing robust procedures over many decades now in terms of gathering and analysing evidence of the products of L2 learning. I therefore thought: why not try to combine these procedures with CA studies of the learning process? This conclusion was rather painful to me in some ways as I had spent many years learning CA and, in fact, I think it took me 12 years of hard work before I fully grasped how the emic approach worked. Certainly, I could continue doing CA myself as part of projects, but I now had to find ways of blending it in with other methodologies. Furthermore, this change in direction to mixed methods did not mean that I actually had to spend time becoming expert in a range of other methodologies as well, but rather that I had to find other people to work with who were experts in other approaches.

4. Combining language testing with the study of language learning talk

Language testing specialises in the determination of L2 learner cognitive states of proficiency, often in relation to specific language items. So I planned to experiment with ways in which we might combine the study of language learning and testing within the same cycle. As luck would have it, I was then able to start working in a mixed methods paradigm with a group of people with very different expertises. In 2009, I started working with computing scientists (Human-Computer Interaction) at Newcastle University on educational technology projects. This was the result of a large Digital Institute that was set up, in which computing scientists established joint mini-hubs with other schools in the university in order to develop digital applications. I have been working with computing scientists for the last 13 years in the mini-hub or lab that we established, called ilab:learn[3], and we have completed four funded projects together, producing applications of educational technology for language learning.

In terms of the methodologies that we employed, computing scientists tend to employ quantitative approaches that collect numerical data from the systems (e.g. smartphone apps) as they operate. However, they are also very interested in studying how human subjects employ their digital systems and interact with them and so they tend to see the value of qualitative approaches for this. In particular, CA seemed to them to be helpful in recording and revealing (via analysis of talk and synchronised multimodal actions) the processes of Human Computer Interaction that took place when pairs of learners used the apps that we developed. One area in which we tried to integrate quantitative and qualitative approaches was in relation to evidence of language learning. An overall aim in the four funded projects was (and remains) to depict the process of vocabulary learning (using CA) in combination with the product of vocabulary learning in terms of cognitive change manifested in concrete evidence of pre- and post-test results. The trick would be to create a research design that enabled valid pre- and post-testing whilst at the same time allowing pairs of users to interact during a learning intervention that would not be constrained or perturbed by testing procedures. The question was then how to combine a task cycle with a testing cycle so they would not interfere with each other or create a tortuously long session for participants. The structure we designed and implemented is shown below.

Figure 1 portrays the intertwined cycles for tasks and tests that we used in the Lancook[4], Linguacuisine[5] and ENACT[6] digital learning environments. Tasks and tests were performed in relation to vocabulary learning of the L2 names for real tangible objects and cultural artefacts. The whole cycle normally takes no more than 1 hour of participants' time, although the amount of time relates to the nature of the task.

4.1. The task cycle

We adapted the cyclical pedagogic task-based language teaching (TBLT) framework put forward by Ellis (2003), which divides activity related to the completion of a task into three phases: pre-task, during-task and post-task. The pre-task involves presenting new language, framing the task and

https://doi.org/10.1017/S0261444822000027 Published online by Cambridge University Press

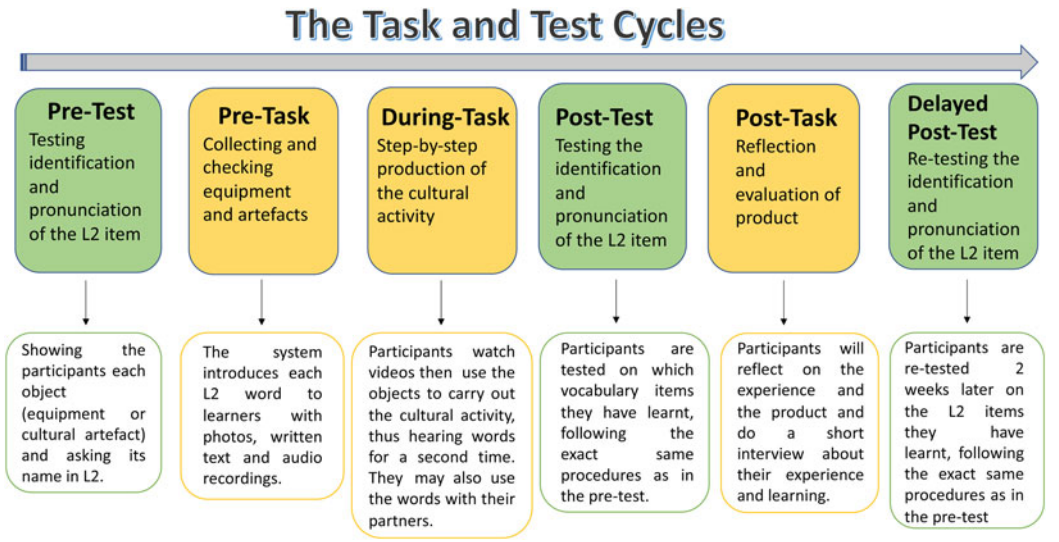

Figure 1. The task and test cycles

motivating learners. Users learn the key vocabulary necessary for the cultural activity by clicking on photographs, which then provide an audio file and the written form of the item, then practicing the pronunciation. In the during-task they physically carry out the cultural activity by watching a video with step-by-step instructions for them to follow. During this phase, users encounter the target vocabulary again in the video. As users work in pairs, they may also employ the target L2 items in their own interaction with each other whilst sharing task roles between them. The post-task involves an interview and reflection on what has been learnt in terms of language and evaluation of the task outcomes, that is, the cultural activity produced. The pre-task and during-task phases are intended to provide the L2 input for the learning that is evaluated in the immediate post-test. However, further vocabulary learning may take place in the post-task stage and this may influence the delayed post-test results.

4.2. The test cycle

We delivered the assessment in the three-stage test cycle of pre-test, post-test and delayed post-test (Figure 1), which was wrapped around the task cycle. We usually chose no more than ten vocabulary items (kitchen equipment and ingredients or cultural artefacts) that the learners would use during the task to complete a cultural task such as cooking, and then tested each individual of the cohort separately on them in the pre-test. We showed the testee each object and asked them to say its name in L2. We therefore established the extent to which each individual was able to actively produce each item prior to the cultural activity session, using a five-point lexical production scoring protocol (Pallotti et al., 2017). After they finished the cooking task, each individual completed the post-test separately following exactly the same procedure as the pre-test. We conducted a delayed post-test, generally two weeks later. We were therefore able to record granular evidence in terms of individual changes in active production of the specific vocabulary items over a period of two weeks.

How do these cycles work in practice and how can the quantitative and qualitative data from such a design be combined? In Park and Seedhouse (2017), we provided an example of how it is possible to present both the process and product of L2 learning using this approach. In this specific case, two learners were learning Korean L2 while cooking a Korean meal using the Lancook system (Seedhouse, 2017). We used multimodal microanalysis to examine the micro-detail of the interaction and the observable behaviour of both the users and the system.[7] We showed evidence of learners in

https://doi.org/10.1017/S0261444822000027 Published online by Cambridge University Press

this digital kitchen environment developing their own multimodal speech exchange system in which they employed physical objects as aids to vocabulary learning and, in effect, peer teaching. It is important to stress that the users themselves developed this speech exchange system on their own initiative, using the environmental supports of their own choice. One learner helped the other by producing the Korean word whilst simultaneously holding up the physical object.

We then referred to the vocabulary test scores, which showed that both learners had a score of 0 on the pre-test for the target item and a score of 1.0 in all of the post-tests. The combination of methods in this case generates convincing evidence that the item was learnt and retained for two weeks, together with evidence of HOW it was learnt in terms of the resources used and the talk and multimodal actions produced by the learners. My view is that the multimodal CA analysis is helpful from both the Human-Computer Interaction and pedagogical levels because it shows that: (a) the learners may themselves decide to insert a self-organised L2 vocabulary revision sequence that they were not prompted to undertake; and (b) the learners may use the objects/equipment as well as each other as learning/teaching resources, rather than relying on the system. The evidence of the product of language learning has become more 'visible' in this approach, which is also more scaleable.

5. Interviews and ethnographic information

The aim of CA is to portray the emic orientations of the participants in situ at a particular point in the interaction, rather than from outside the interactional sequence. 'Experience shows that participants may not afterwards "know" what they have been doing or why, and furthermore tend to justify their behaviour in various ways … CA tries to analyse conduct "in its own setting".' (ten Have, 1999, p. 33). CA has no substitute for detailed and in-depth analysis of individual sequences, which is why triangulation and data-gathering techniques typical of ethnography have generally not been undertaken. However, this traditional CA argument has been challenged. Arminen (2000) pointed out the extent to which CA analyses of institutional discourse do actually make use of ethnographic or expert knowledge of the institutional setting, which may derive from interviews, documentation and/or observation. Arminen's argument is that CA analysts inevitably do make use of such knowledge and should make as transparent as possible the extent to which their analyses derive from the details of the interaction or from use of ethnographic or expert knowledge.

A number of subsequent studies convinced me that it is possible to explicitly combine CA and ethnographic information in a mutually reinforcing way. Vinkhuyzen and Szymanski's (2005) recorded interactional data derive from one stage of a three-year ethnographic study, the other two stages being ethnographic observation, shadowing and interviewing as well as participant observation. The expert knowledge they obtained of the economics of the business helps the authors explain the institutional significance of the precise details of the talk. The authors explain how the interactional sparring between staff and customers relates both to the institutional goal of the business and to the linguistic formatting of the customers' requests.

Gafaranga and Britten (2005) combined CA analysis of 62 doctor–patient consultations with post-consultation interviews with doctors. They established that doctors systematically used different opening devices to start follow-up consultations with patients they knew, compared with new consultations with unrecognised patients. The CA analysis revealed one deviant case, where a doctor used the 'unrecognised opening' with a very familiar patient. The post-consultation interview with the doctor revealed that he was deliberately distancing himself from this extremely difficult patient by flouting the norm strategically. I was very impressed that ethnographic information was able to illuminate the deviant case.

I therefore concluded that interviews can be used to reveal factors that are not visible in the details of the spoken interaction, but that are nonetheless relevant and significant. Not only did I see that is it possible to integrate sequential analysis and ethnographic information from interviews, but that it is also good practice for CA analyses to make explicit exactly which ethnographic or expert knowledge of the setting they are making use of. This knowledge may come from contact with professionals in a

https://doi.org/10.1017/S0261444822000027 Published online by Cambridge University Press

setting or, in the case of experienced L2 teachers who then carry out CA analyses of language learning talk, the expert knowledge may come from themselves. In this case, it is even more important to be explicit about which elements of the analysis derive from the study of sequence and which elements derive from the analyst's expert knowledge of the institutional activity.

At this point, I therefore decided to engage in further auto-critique and went back to my (2004) book to check whether I revealed at any point exactly which ethnographic or expert knowledge of the setting I was making use of in my analyses. Fascinatingly, I discovered that I only outed myself as a former 'classroom language teacher' in the last paragraph of the epilogue, revealing my expert knowledge in a kind of final flourish. Looking at my analyses, it is clear to me that many of them are informed by my expert knowledge as a former classroom language teacher, rather than solely on sequential analysis. However, I did not acknowledge this in my book, apart from hinting at it in the last paragraph. I don't feel very guilty about this as this was not standard practice then in CA studies, but on the other hand I agree with Arminen that it is best to be explicit about the sources of ethnographic information feeding into CA analyses. It occurs to me that I have always been doing a triangulation of sequential and ethnographic information in my analyses of L2 classroom interaction, which brings us neatly to the question of mixed methods.

6. Mixed methods

So far, I have added language testing and interviews/ethnographic reporting to CA methodology and argued for a mixed methods approach. But what is the benefit of mixed methods for the study of the processes and products of language learning talk? A key point is that mixed methods studies can provide multiple perspectives on the supercomplex phenomena involved in language learning talk, thus providing triangulation or what Johnson et al. (2007, p. 123) call 'corroboration'. The specific type of mixed methods design best suited to the study of language learning talk [using the practical classification system proposed by Creswell and Plano Clark (2007, pp. 59–79)] is 'triangulation design', which can be glossed as follows: "This brings qualitative and quantitative methods to bear on a research problem in a single phase in order to better understand it. Typically, the researcher collects the data separately but at the same time, then brings them to bear on the problem, giving each element equal weight" (Richards et al., 2012). In terms of triangulation, the perspectives that are combined in our approach are: (a) the emic perspective of the participants engaged in language learning talk; (b) the post-hoc perspectives of the participants via interviews about their learning; and (c) the 'testing perspective' on changes in terms of participants' learning states, established by comparing pre-intervention state to post-intervention state.

7. The missing component: Complexity theory

I have not yet mentioned a missing component that helps us to pull all of the multiplex strands of language learning talk and its researching together and understand these as both a system and a series of interlocking systems, namely Complexity Theory (CT). This is a field that has grown greatly in significance over the last few decades. Briefly, CT is a science of the global nature of systems (Gleick, 1993). It reveals the subtle relationships between simplicity and complexity and between orderliness and randomness (Hall, 1991). A defining characteristic of a complex system is that its behaviour emerges from the interactions of its components (Larsen-Freeman & Cameron, 2008) and so CT always develops a holistic or ecological perspective rather than a reductionist or atomistic one (Gleick, 1993). Larsen-Freeman and Cameron (2008) suggest that spoken interaction is a complex adaptive system, and that L2 classroom interaction may be viewed in this way. Complex adaptive systems share certain crucial properties, which are specified in Seedhouse (2010b) and Larsen-Freeman (1997). The notion of the universal properties of nonlinear systems means that different complex adaptive systems will behave in similar ways (Sardar & Abrams, 1999). That is all very well, but does CT have any relevance to understanding L2 learning through interaction? My experience is

https://doi.org/10.1017/S0261444822000027 Published online by Cambridge University Press

that it most definitely does have relevance and that it provides a much larger-scale framework for understanding how language learning talk functions as a system. I describe below my personal experience of CT and how it has helped me to improve my understanding of language learning talk as a complex adaptive system.

The best-known interactional phenomenon in L2 classroom interaction is the three-part sequence generally known (Sinclair & Coulthard, 1975) as IRF (Teacher Initiation, Learner Response and Teacher Follow-Up or Feedback). This pattern has been identified in numerous research studies as ubiquitous throughout the world. When I completed my D.Phil. thesis (Seedhouse, 1996) on the organisation of L2 classroom interaction, I knew nothing of CT. I wrote that, in the context of my overall description of the interactional architecture of the L2 classroom, the IRF cycle can be seen as a 'replication in miniature' (1996, p. 354) of that architecture and specifically of its three interactional properties. I also added that, because the IRF cycle is so closely identifiable with the three interactional properties and with the institutional business, it is the most economical method of accomplishing the institutional business. I had derived my description of the interactional architecture of the L2 classroom by applying the principles of CA to as much interactional data as I could locate at the time. My guiding principle was Sacks's (1984, p. 26) quote:

> Our aim is to get into a position to transform, in an almost literal, physical sense, our view of 'what happened,' from a matter of a particular interaction done by particular people, to a matter of interactions as products of a machinery. We are trying to find the machinery.

So, during my D.Phil. research I thought I was trying to uncover the machinery (or system) that produced instances of interaction in L2 classrooms. I continued working in this area in the same way and by the time I completed my (2004) book in the same area, I still knew nothing of CT. This meant that when I made observations about the components, characteristics and functioning of the system (L2 classroom interaction) and how they interacted, I had to devise some of my own terminology, although in some cases there was existing terminology devised by applied linguists or CA practitioners that I could employ. However, I knew nothing of the terminology of CT. At the time of writing my book, I could not see how to develop any further the observation that I had made in 1996 (namely that the IRF cycle can be seen as a 'replication in miniature' of the overall interactional architecture), nor how to include it in my argument. The observation stood out on a limb in isolation and I therefore left the above observation out of the (2004) book. Soon after the book was published, however, I had a conversation with Diane Larsen-Freeman that impelled me to read about CT. Much to my frustration, I found that there were existing terminologies and procedures for describing the functioning of complex systems and that these were of universal applicability for all nonlinear systems in the world, whereas I had wasted a lot of time developing terminology and procedures for describing a single complex system!

However, this discovery of the science of complex systems meant that I was able to go back over the work I had done and could try to improve it using the universal framework of CT. One significant example was my isolated observation that the IRF cycle can be seen as a 'replication in miniature' of the overall architecture. The term used in CT for a 'replication in miniature' is a FRACTAL. This term FRACTAL is used to denote shapes that are irregular all over (fractional) and that have the same degree of irregularity on all scales. A fractal object looks the same when examined from far away or nearby – it is self-similar, which implies that any subsystem of a fractal system is equivalent to the whole system (Sardar & Abrams, 1999). Fractals have significance in CT as they are a key defining characteristic of a complex, non-linear system (Johnson, 2007). Therefore, the well-established universality of the IRF cycle around the world suggests that it is a fractal of the whole interactional architecture and provides evidence that language learning talk is indeed a complex adaptive system. So, the functional or rational explanation that we can offer for the importance and ubiquity of the IRF pattern in L2 classroom interaction is that it is the most compact vehicle imaginable for the accomplishment of what Drew and Heritage (1992, pp. 40–41) call the institutionalized activity. Because it is so closely identifiable with the interactional properties and with the institutional business, it is the most

https://doi.org/10.1017/S0261444822000027 Published online by Cambridge University Press

economical method of accomplishing a complete cycle of the institutional business. This explains why the IRF pattern has a satisfying, complete feel to it, or is an ATTRACTOR in the terms of CT (Larsen-Freeman & Cameron, 2008).

So, my personal experience is that CT is highly relevant to the study of L2 learning through interaction because we can understand specific features better via the procedures and terminologies of CT and by relating the specific feature to the complete system. As shown above, we can also understand the significance of individual features as components of the system. By understanding how other complex systems behave, we can understand more clearly how language learning talk functions as a system.

8. Conclusions

In the 'First Person Singular' series of articles, we are asked to reach a firm position. To summarise, I have explained in this article why I have transitioned from CA to mixed methods for the study of both the process and product of language learning talk. The key reasons for this are the extra level of complexity (supercomplexity) of language learning talk and the need to generate numerical testing data of cognitive changes. I have found that a design that interweaves a test cycle with a task cycle generates suitable qualitative and quantitative data without the two cycles interfering with each other. One advantage of the intertwined cycles in Figure 1 is that exactly the same people are involved in the testing and task cycles, in the same place during the same block of time. This integration gives ecological validity to the testing process and means we can record evidence of the same participants producing the same target word in both learning and testing environments, which can help with triangulation.

I have also concluded that CA analyses can work well in a complementary way with quantitative data on vocabulary learning and with self-report data from interviews. I have not found any serious incompatibilities in combining CA analyses with numerical data and self-report data. The CA perspective I was brought up on was very much that it was necessary to develop a single, unsullied emic perspective based on sequential analysis. In retrospect, however, I have to admit that I was not sufficiently conscious of the extent to which my analyses were based on my own expert knowledge as well as sequential analysis. Thus, in effect I was always doing a triangulation of sequential and ethnographic information in my CA analyses. My own experience is that it has not been a serious problem to integrate CA perspectives on language learning talk with other perspectives within a mixed methods triangulation approach – many things in life have been much harder. To summarise, the elements required to obtain mixed-methods evidence of the products and processes of L2 learning through spoken interaction as detailed above are:

(a) A brief statement of the conceptualisation of learning that is involved using the protocol and definition outlined above.
(b) A language learning task using the principles of TBLT and including a three-phase task cycle, which provides the L2 learning input.
(c) A pre-test/post-test cycle that wraps around the task cycle, as shown in Figure 1. This provides the quantitative evidence of the product of learning and may or may not include delayed post-tests.
(d) Video and audio recording of the task cycle undertaken by the participants. This facilitates CA studies of the process of learning through multimodal analyses.
(e) Interview evidence from the participants about their learning.
(f) A mixed methods framework (triangulation) for integrating the qualitative and quantitative components.
(g) A CT perspective to aid understanding of how all components combine to function as an eco-system.

Although the examples I have given above involve digital technology, this is not at all a necessary component. The examples provided above are of vocabulary learning, but it is in principle perfectly

https://doi.org/10.1017/S0261444822000027 Published online by Cambridge University Press

possible to include learning of other L2 items in this research design, such as phonological, grammatical or discoursal features. We have recently completed data collection for a project into the learning of Vietnamese tones using the above design, for example.

The approach that I have outlined above means that it is possible to record, describe, analyse in detail and evaluate both the product and process of language learning by pairs of learners whilst engaged on a task. There are potential criticisms of the approach: it can be seen as too laborious and time-consuming. It is true that the approach requires all angles to be covered, but this is the price for comprehensive coverage of the supercomplex phenomena involved in the processes of L2 learning through interaction. Another criticism is that the design removes the L2 teacher from the learning process, at least when the digital technology is used to provide standardised input and feedback. However, if the technology is not used, it is possible for a teacher to carry out the standard TBLT role of providing helpful feedback and interventions when requested by the learners.

I finish with a note on the writing of this article. I have tried to package my varied experiences to present a coherent narrative and clear direction of travel. However, I am aware that this might be wrongly giving the reader the impression that I always had a clear impression of the direction of travel and a sense of what the end position would be. That was certainly not the case. The reality is rather that the way has been very messy indeed with many wrong turns and wasting time up dead-ends. Nonetheless, I believe that we now have a comprehensive system to employ for describing and analysing data on the processes and products of L2 learning. We are currently using these in relation to studies of how participants learn languages through culture using our latest app ENACT.[8] It is certainly laborious and time-consuming, but it does mean we can gather data on both the product and process of L2 learning whilst still representing the supercomplexity of language learning talk.

Endnotes

[1] In this study, 'language learning talk' is defined as L2 talk in which the participants display an orientation to language learning processes in the details of their talk. This may occur anywhere, anytime and involve any kinds of participants, and it may be very temporary, lasting just for a turn. This orientation to (or foregrounding of) language learning processes may take very many different forms.

[2] This definition derives primarily from Ellis's chapter.

[3] https://www.ncl.ac.uk/ecls/about-us/facilities/ilab-learn/

[4] https://europeandigitalkitchen.com/

[5] https://linguacuisine.com/

[6] https://enacteuropa.com/

[7] Detailed multimodal CA analyses of how participants utilise opportunities and display orientations to learning Finnish L2 in the technology-mediated, task-based setting described above have been published by Kurhila and Kotilainen (2017), Kurhila and Kotilainen (2020) and Kotilainen and Kurhila (2020).

[8] https://enacteuropa.com/

References

Arminen, I. (2000). On the context sensitivity of institutional interaction. *Discourse & Society*, *11*(4), 435–458. https://doi.org/10.1177/0957926500011004001

Cook, V. (2010). Prolegomena to second language learning. In P. Seedhouse, S. Walsh, & C. Jenks (Eds.), *Conceptualising 'learning' in applied linguistics* (pp. 6–22). Palgrave Macmillan.

Creswell, J., & Plano Clark, V. (2007). *Designing and conducting mixed methods research*. Sage.

Drew, P., & Heritage, J. (Eds.) (1992). *Talk at work: Interaction in institutional settings*. Cambridge University Press.

Elgort, I., & Nation, P. (2010). Vocabulary learning in a second language: Familiar answers to New questions. In P. Seedhouse, S. Walsh, & C. Jenks (Eds.), *Conceptualising 'learning' in applied linguistics* (pp. 89–104). Palgrave Macmillan.

Ellis, R. (2003). *Task-based language learning and teaching*. Oxford University Press.

Gafaranga, J., & Britten, N. (2005). Talking an institution into being: The opening sequence in general practice consultations. In K. Richards, & P. Seedhouse (Eds.), *Applying conversation analysis* (pp. 75–90). Palgrave Macmillan.

Gleick, J. (1993). *Chaos*. Abacus.

Hall, N. (Ed.) (1991). *The New Scientist guide to chaos*. Penguin.

Johnson, K. (1995). *Understanding communication in second language classrooms*. Cambridge University Press.

Johnson, N. (2007). *Two's company, three is complexity*. Oneworld Publications. https://doi.org/10.1177/1558689806298224
Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, *1*(2), 112–133.
Kotilainen, L., & Kurhila, S. (2020). Orientation to language learning over time: A case analysis on the repertoire addition of a lexical item. *Modern Language Journal*, *104*(3), 647–661. https://doi.org/10.1111/modl.12665
Kurhila, S., & Kotilainen, L. (2017). Cooking, interaction and learning: The Finnish digital kitchen as a language learning environment. In P. Seedhouse (Ed.), *Task-based language learning in a real-world digital environment: The European digital kitchen* (pp. 157–179). Bloomsbury.
Kurhila, S., & Kotilainen, L. (2020). Student-initiated language learning sequences in a real-world digital environment. *Linguistics and Education*, *56*. [100807]. https://doi.org/10.1016/j.linged.2020.100807
Larsen-Freeman, D. (1997). Chaos/complexity science and second language acquisition. *Applied Linguistics*, *18*(2), 141–165. https://doi.org/10.1093/applin/18.2.141
Larsen-Freeman, D., & Cameron, L. (2008). *Complex systems and applied linguistics*. Oxford University Press.
Loewen, S. (2002). The occurrence and effectiveness of incidental focus on form in meaning-focussed ESL lessons. Unpublished doctoral thesis. New Zealand: University of Auckland.
Pallotti, G., Niemants, N., & Seedhouse, P. (2017). Vocabulary learning in a real-world digital environment. In P. Seedhouse (Ed.), *Task-based language learning in a real-world digital environment: The European digital kitchen* (pp. 207–230). Bloomsbury.
Park, J., & Seedhouse, P. (2017). Sight and touch in vocabulary learning: The Korean digital kitchen. In P. Seedhouse (Ed.), *Task-based language learning in a real-world digital environment: The European digital kitchen* (pp. 231–257). Bloomsbury.
Richards, K., Ross, S., & Seedhouse, P. (2012). *Research methods for applied language studies: An advanced resource book for students*. Routledge.
Sacks, H. (1984). Notes on methodology. In J. Atkinson, & J. Heritage (Eds.), *Structures of social action* (pp. 21–27). Cambridge University Press.
Sacks, H., Schegloff, E., & Jefferson, G. (1974). A simplest systematics for the organisation of turn-taking in conversation. *Language*, *50*(4), 696–735. https://doi.org/10.2307/412243
Sardar, Z., & Abrams, I. (1999). *Introducing chaos*. Icon Books.
Seedhouse, P. (1996). Learning talk: A study of the interactional organisation of the L2 classroom from a CA institutional discourse perspective. Unpublished doctoral thesis, University of York, U.K.
Seedhouse, P. (2004). *The interactional architecture of the language classroom: A conversation analysis perspective*. Blackwell.
Seedhouse, P. (2010a). A framework for conceptualising learning in applied linguistics. In P. Seedhouse, S. Walsh, & C. Jenks (Eds.), *Conceptualising 'learning' in applied linguistics* (pp. 240–256). Palgrave Macmillan.
Seedhouse, P. (2010b). Locusts, snowflakes and recasts: Complexity theory and spoken interaction. *Classroom Discourse*, *1*(1), 5–25. https://doi.org/10.1080/19463011003750624
Seedhouse, P. (Ed.) (2017). *Task-based language learning in a real-world digital environment: The European digital kitchen*. Bloomsbury.
Seedhouse, P., & Walsh, S. (2010). Learning a second language through classroom interaction. In P. Seedhouse, S. Walsh, & C. Jenks (Eds.), *Conceptualising 'learning' in applied linguistics* (pp. 127–146). Palgrave Macmillan.
Seedhouse, P., Walsh, S., & Jenks, C. (Eds.) (2010). *Conceptualising 'learning' in applied linguistics*. Palgrave Macmillan.
Sinclair, J., & Coulthard, M. (1975). *Toward an analysis of discourse*. Oxford University Press.
ten Have, P. (1999). *Doing conversation analysis*. Sage.
Vinkhuyzen, E., Szymanski, M. H. (2005). Would you like to do it yourself? Service requests and their non-granting responses. In K. Richards, & P. Seedhouse (Eds.), *Applying conversation analysis* (pp. 91–106). Palgrave Macmillan.

Paul Seedhouse is Professor of Educational and Applied Linguistics and Director of ilab:learn at Newcastle University, UK. Together with colleagues in Computing Science over 12 years, he has worked on four grants to use digital technology to teach users languages and cultural tasks simultaneously, resulting in the Linguacuisine and ENACT apps. He was also awarded five grants from the IELTS consortium to study spoken interaction in the IELTS Speaking Test. He has published ten books and over 70 articles and book chapters in the areas of spoken interaction, applied linguistics and language teaching. *The interactional architecture of the language classroom: A conversation analysis perspective* won the 2005 Modern Language Association of America Kenneth W. Mildenberger Prize.

Cite this article: Seedhouse, P. (2024). Transitioning from conversation analysis to mixed methods. *Language Teaching*, *57* (1), 101–112. https://doi.org/10.1017/S0261444822000027