1 INTRODUCTION

This thesis reports on the development of visualisation as a method for representing and analysing the dynamics of interaction between language learners. The development of the visualisation is in response to the perceived lack of existing methods designed to describe dynamics of learner interaction across the duration of language classroom activities. The visualisation is illustrated by an application to the interaction of three pairs of participants from a Norwegian language classroom.

The methods of applied linguistics are, on the whole, not designed to explore those dynamics of learner interaction that unfold over relatively longer timescales, such as e.g., the duration of a classroom activity. This holds for the methods of the more established perspectives in research on learner interaction, including the negotiation of meaning perspective (cf. Pica, 1994), the broader cognitive perspective (cf. Skehan, 1998), and the sociocultural perspective (cf. Lantolf, 2000). In general, the negotiation of meaning and cognitive research on learner interaction does not address the time-dimension, and instead offers powerful analyses of a range of variables in the frequency-domain. The sociocultural research does address the time-dimension. However, this is usually limited to in-depth analyses of brief events, or episodes, of learner interaction.

The development of visualisation as a method for researching the dynamics of learner interaction draws on sociocultural and complex systems theories. That is, the concepts and insights developed by sociocultural research, for dealing with the dynamics of learner interaction over shorter timescales (e.g., Brooks & Donato, 1994; Donato, 1994; Otha, 1995), inform the visualisation of those dynamics reaching beyond the timescale of single episodes. Moreover, there is a growing body of research on related forms of interaction that has put the concepts and insights of complex systems theory to use (e.g., Cameron, 1999, 2003; Cherkes-Julkowski & Mitlina, 1999; Fischer & Granott, 1995; Granott, 2002; Guastello, 2000). This research provides new ways of thinking about learner interaction from a dynamical perspective. Finally, there are a number of authors who have emphasised congruence between sociocultural and complex systems theories (e.g., Cameron, 1999, 2003; Fischer & Granott, 1995; Granott, 2002; Thelen & Smith, 1994). This congruence is a final valuable resource in the development of visualisation for representing and analysing the dynamics of interaction between language learners.

1.1 Research Aims

The research aims reflect the above stated interest in the dynamics of learner interaction, and visualisation as a method for representing and analysing these dynamics. This motivates the following overall research aim:

- The research aims to visualise the dynamics of learner interaction.

The following two more specific aims make this overall research aim more concrete. These more specific aims reflect the interest in learner interaction that takes place in language classrooms.

1. The research aims to visualise the dynamics of learner interaction across the duration of a language classroom activity.
2. The research aims to visualise changes in the dynamics of learner interaction across a series of similar language classroom activities.

Achieving these research aims crucially depend on what is meant by the 'dynamics of learner interaction'. For this reason, the research involves the development of theory, in the form of a dynamical perspective on learner interaction, which will provide the necessary definition. The preliminary view of the dynamics of learner interaction, which guides this, and the next chapter (until the dynamical perspective is developed in full in chapter three), is the view implicit in the text so far. That is, a view of learner interaction as *a process unfolding in the time-dimension*.

For the second specific research aim, 'a series of similar classroom activities' means that the same participants do an activity more than once. Responding to this second specific research aim is expected to generate additional insights into the dynamics of learner interaction, and to provide further evidence about the potential of visualisation as a method.

1.2 Structure of the Thesis

Figure 1.1 provides an overview of the structure of the thesis. Although the thesis follows a linear exposition, the 'sweeping' arrows in the figure attempt to capture the recursive nature of the research process. Moreover, the step-like character of the figure attempts to represent how each subsequent chapter builds on the previous ones, step-by-step moving the research as a whole closer to achieving the research aims.

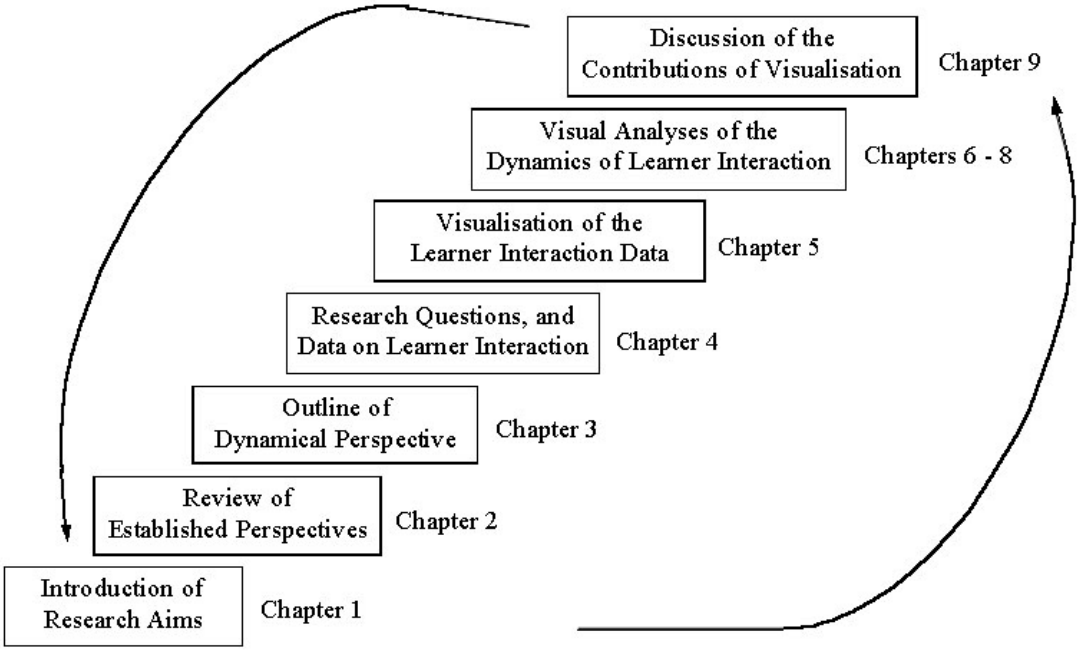

Figure 1.1: Structure of the thesis

The purpose of the first chapter has been to introduce the research aims, as well as providing the present overview of the structure of the thesis.

The second chapter is a review and critique of some established perspectives in research on interaction between language learners. The purpose of the review and critique is to establish the need for a method that can describe the dynamics of learner interaction. In addition, the limitations of the existing perspectives are used to formulate a set of implications for the development of such a method.

Chapter three develops a dynamical perspective on learner interaction. This development draws on dynamical frameworks provided by closely related research, as well as complex systems and sociocultural theory more generally. The chapter outlines implications for the formulation of research questions, the procedures for collecting data on learner interaction, and the development of visualisation as a method for representing and analysing the dynamics of learner interaction.

The fourth chapter includes the formulation of four research questions for the study. It also includes a description of the Norwegian primary classroom setting, the selection and profiles of the three pupil-pairs that participated in the research, the procedures followed in collecting data on these three cases of learner interaction, as well as a description of the series of similar classroom activities the participants were engaged in. In relation to the thesis as a whole, this chapter acts as a resource containing the research questions, data collection procedures, as well as the setting and circumstances in which the learner interaction took

place.

Chapter five provides an outline of the process leading to the visualisation of the learner interaction data. This process includes the transcription of the learner talk, the coding of the learner interaction data, and the eventual visualisation of this interaction. Figure 1.2 is included to give an early indication of what is meant by the visualisation of the learner interaction data, until its full presentation in chapter five. Consistent with the dynamical perspective outlined in chapter three, the aim of this novel form of visualisation is to represent multiple activity strands and threads (each signifying a different perspective on the learner interaction; cf. sub-section 3.2) in the time-dimension (rather like a musical score for an orchestra, where individual scores for many instruments are represented together). The contribution of this chapter, therefore, is to enable the visual analyses of the dynamics of learner interaction in chapters six through eight.

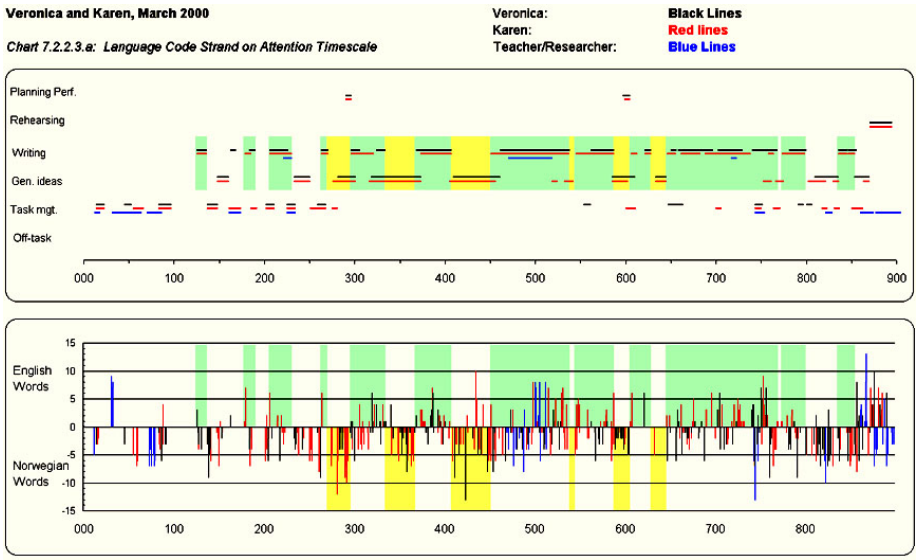

Figure 1.2: Sample visualisation of learner interaction

Chapters six through eight illustrate three different uses of the visualisation for analysing the dynamics of learner interaction. Chapter six introduces what is called a *visual dynamical analysis*. This analysis includes the first in the series of classroom activities, and encompasses all three cases of learner interaction. In chapter seven, the outcome of the visual dynamical analysis in chapter six is used to inform an in-depth analysis of the learner talk of one of the three cases of learner interaction. Finally, chapter eight contains a visual analysis of changes in the dynamics of learner interaction across the series of similar classroom activities, and for all three pupil-pairs.

The final chapter provides a discussion of the contributions and limitations of visualisation as a method for research on learner interaction. This chapter also makes

suggestions for how the method may be applied to additional data on learner and classroom interaction.