

5 VISUALISING THE LEARNER INTERACTION DATA

This chapter sets out the process leading to the visualisation of the learner interaction data. A simplified account of this process is illustrated in figure 5.1.

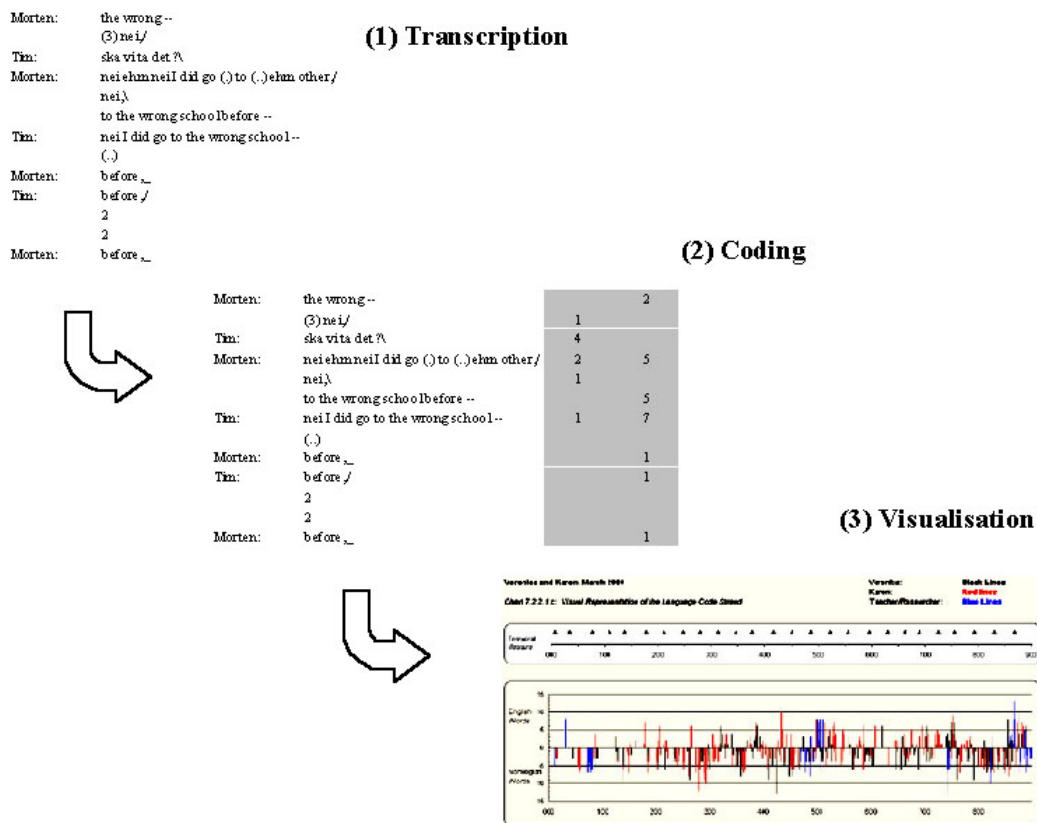


Figure 5.1: The process leading from transcription to visualisation

The chapter begins with a section that discusses the transcription of the learner interaction data, which is the first step in figure 5.1. A next section covers the remaining two steps in figure 5.1, leading to the eventual visualisation of the data. A final section discusses the identification, the coding, and the visualisation of each activity strand and thread in detail.

5.1 Transcription of the Learner Interaction Data

The transcription of the learner interaction data was guided by two objectives. The first one only emerged as important from the activity of transcribing itself. That is, it emerged that in order to visualise the learner interaction data in the time-dimension, it was desirable to achieve a certain level of what will be called *temporal accuracy* of transcription. This concept, and the rationale behind it, will be explained in detail in a first sub-section. The second objective is an implication of the dynamical perspective on learner interaction,

developed in chapter three. That is, the transcription should take into consideration the conceptualisation of talking-and-thinking, which was central in how the dynamics of learner interaction was defined (cf. sub-section 3.2.2). This objective will be discussed in detail in a second sub-section. A final sub-section discusses the transcription conventions used for the study.

5.1.1 Temporal Accuracy of Transcription

What emerged from the actual transcription of the data was that the choice of transcription conventions could affect how the data would look when visualised. This observation was not made through visualisation. Rather, the case was compelling by comparing the different possible transcription conventions.

The basic idea behind the visualisation developed in this chapter is that the vertical organisation of transcribed interaction, in the form of lines of text, is transferred to a visualisation that is organised horizontally, along a virtual time-dimension (cf. figure 5.1). Working backwards, if the learner interaction is visualised in the time-dimension, then the transcription, in the form of lines of text, should be a reasonably detailed representation of such a time-dimension. Hence, the temporal accuracy of transcription refers to whether the vertical organisation of a transcript is a sufficiently detailed representation of time. The observation relates to two different transcription conventions: the unit used to represent talk in transcription, and how pauses are represented (in particular longer pauses).

Maybe the most basic unit of transcription one can use is the *turn*. However, there are a number of more theoretically motivated units available in the discourse analysis literature. Some of these include *utterances* (cf. Crookes, 1990), *turn-constructive units* (cf. Schegloff, 1996), *t-units* (Tonkyn, 1996), and *AS-units* (Foster, Tonkyn & Wigglesworth, 2000). However, for the present study the *intonation unit*, as proposed by Du Bois, Schuetze-Coburn, Cumming and Paolino's (1993) framework of transcription conventions, was selected as the unit of transcription. In general terms, an intonation unit is "a stretch of speech uttered under a single coherent intonation contour" (Du Bois et al., 1993, p. 46). The rationale for this choice will make the above conceptualisation of the temporal accuracy of transcription clearer.

The 'smaller' a unit of transcription is, the 'better' the temporal accuracy of transcription will be. A simple illustration shows why this is so. Extract 5.1 is transcribed using turns, which is one of the larger units of transcription that can be used for spoken discourse data. Note that for the present limited purpose the only conventions used are line numbers, names to identify speakers, and pausing, which is indicated by the numbers (length of pause in seconds) and period marks (pauses shorter than a second) in parentheses.

Extract 5.1: Turn-based transcription

Line	Speaker	Text
770	Morten:	we only do one more then
771	Tim:	yes like that and I (2) and I ehm and I (..) forget forgot to do my homework

The turn-based transcription in extract 5.1 contains only two lines of text, i.e., lines 770 and 771. The fact that line 771 physically takes up two lines is only an artefact of the margins set for this page. These two lines of text are not only of very different lengths, there are also just two lines of transcription to represent a period of about 10 seconds of spoken interaction. The first turn (770) contains six words, while the second turn (771) contains 15 words. In temporal terms, the first turn (770) lasts about 2 seconds, while the second turn (771) lasts for as long as 7 or 8 seconds (note the two second pause in the middle of this turn). This difference in the length of turns will have a knock-on effect across the pages of a transcript. More importantly, once converted to the horizontal organisation required for visualisation, only two lines of text might not be a sufficiently detailed representation of this 10 second segment of interaction.

Extract 5.2: Intonation unit-based transcription

Line	Speaker	Text
770	Morten:	we only do one more then
771	Tim:	yes like that
772		and I
773		(2) and I ehm
774		and I
775		(..) forget
776		forgot to do my homework

Contrast the turn-based transcription in extract 5.1 with extract 5.2, which represents the same spoken data transcribed using intonation units. The intonation-unit based transcription also has lines of text of different lengths, both in terms of words and time. The temporal distribution across lines of text is now roughly (beginning with line 770) 2 sec; 1 sec; 1 sec; 3 sec; 1 sec; 1 sec; 2 sec. However, this misses the fact that the difference between 1 second and 3 seconds, in extract 5.2, is smaller than the difference between 2 seconds and 8 seconds in extract 5.1. In effect, any temporal incongruity is now distributed over more lines of text, and any knock on effect will therefore be distributed more widely across the pages of a transcript. More importantly, the intonation unit-based transcription has a greater number of lines

corresponding to the same period of time as the turn-based transcription. In other words, the intonation-unit based transcription provides a more detailed representation of this 10-second segment of interaction.

Nevertheless, intonation units are not the only ‘small’ unit of transcription. Depending on the nature of the spoken discourse, turn-constructive units, utterances, t-units and AS-units can be ‘small’ as well. However, in terms of the present conceptualisation of the temporal accuracy of transcription, intonation units are associated with another important benefit. This has to do with how pauses, and especially extended pauses, can be represented in an intonation-unit-based transcription.

Extract 5.3 illustrates the traditional way to deal with pauses in transcription. In line 777 there is a two second pause, and in line 781 there is an eight second pause (note the numbers inserted in parentheses). For most purposes this way of representing pauses is not a problem. However, in the present research, where the vertical organisation of lines of transcription has to be converted into a visualisation in the time-dimension, the difference between two seconds and eight seconds becomes a problem. This was especially so because there were frequently long pauses in the learner interaction data collected for the study.

Extract 5.3: Transcription with ‘traditional’ convention for pauses

Line	Speaker	Text
777		(2)
778	Morten:	too worry
779		(.) too worry to do my homework
780	Tim:	do (..) my (.) homework
781		(8)
782	Morten:	okay

It is possible to exploit the empirical evidence for the average length of intonation units to arrive at a different way to represent pauses in transcription. That is, the average duration of intonation units in spoken English is two (2) seconds (Chafe, 1980). There may be a question as to the validity of this empirical observation for representing discourse from a Norwegian foreign language classroom context. Nevertheless, none of the other candidate units are associated with any such empirical evidence, and at a minimum, the two-second average length of intonation units observed for spoken English offers a starting point for the present need to tackle pauses of different length in some principled manner.

To overcome the problem of long pauses, therefore, the transcription conventions developed for the present research represent longer pauses as multiple two-second ‘blocks’. Hence, in temporal terms each line of transcription with a pause corresponds to the average

length of intonation units. Extract 5.4 represents the same interaction as in extract 5.3, but with the eight second pause represented in four two-second ‘blocks’.

Extract 5.4: Transcription with pausing represented as two second ‘blocks’

Line	Speaker	Text
777		(2)
778	Morten:	too worry
779		(.) too worry to do my homework
780	Tim:	do (..) my (.) homework
781		(2)
782		(2)
783		(2)
784		(2)
785	Morten:	okay

In sum, as compared to other units of transcription available in the discourse analysis literature, intonation units were deemed the most effective unit for achieving the degree of temporal accuracy of transcription necessary to visualise learner interaction in the time-dimension.

5.1.2 Transcribing Talking-and-Thinking

The concept of talking and thinking was central in how the dynamics of learner interaction was defined in chapter three (cf. sub-section 3.2.2). Moreover, the summary of implications provided at the end of chapter three emphasised that transcription should take into consideration this conceptualisation of talking-and-thinking (cf. section 3.3).

A potential similarity between intonation units and talking-and-thinking is suggested by the separate definitions of these concepts. Chafe suggests that intonation units can be “viewed as the verbal representation of just the information that is in the speaker’s focus of consciousness at the moment it is uttered” (1993, p. 39). Furthermore, Chafe argues that careful examination of smaller constituents of intonation units, such as accent units (a sub-unit containing only *one* primary accent, and identified according to syntactic constituency; cf. Chafe, 1993), may make available to the observer “the movement of ideas into and out of the consciousness of speakers and hearers” (1993, p. 33). Compare this to Slobin’s suggestion, which was quoted in chapter three, that “there is a special kind of thinking that is intimately tied to language - namely, the thinking that is carried out, on-line, in the process of speaking” (1996, p. 75). Both of these definitions make a close link between speech and thought. In the case of intonation units, the link is between units of speech and the movement

of ideas in and out of consciousness. In the case of talking-and-thinking, or Slobin's original 'thinking-and-speaking', the link is between the process of speaking and the thinking carried out in the process of speaking.

Any in-depth examination of intonation units, and in particular the smaller constituents of intonation units such as accent units, is beyond the scope of the research aims for this study. However, the similarity in how intonation units and talking-and-thinking are construed adds to the rationale for selecting intonation units as the unit of transcription for the study.

To the researcher's knowledge there is no precedent for making such an explicit parallel between intonation units and the concept of talking-and-thinking. Consequently, the suggestion may be seen as a small step along the path Chafe suggests for using intonation units. In his words, "these are the kinds of considerations ... [of which the] ... potential for studies of both first and second language acquisition should be apparent, but to date this potential remains untapped" (1993, p. 41).

5.1.3 Intonation Units and Transcription Conventions

The transcription conventions used for the study centre on the use of intonation units. With some exceptions, the conventions follow the framework for transcription proposed by Du Bois et al. (1993). Those conventions that are central to an informed reading of the extracts used in the later chapters are discussed in this sub-section. Appendix E gives a full overview of the transcription conventions.

The accurate identification of intonation units was an important part of the transcription process. Musing on this subject, Cruttenden remarks that "the majority of linguists assume that the phonetic correlates of boundaries between intonation-groups [or intonation units] are far more straight forward than they actually are" (1997, p. 29), and he goes on to say that "those who do discuss the subject vary considerably in their judgement of the ease with which an analyst can unambiguously divide a text into intonation-groups" (1997, p. 29). Cruttenden's himself advocates a position that is somewhere in the middle.

The multi-lingual nature of the learner interaction data was another factor that sometimes made it difficult to identify intonation units. It seemed that common intonation contours, such as questions, which in English normally are associated with rising final intonation, were slightly different in Norwegian. In addition, intonation contours tended to vary according to which dialect of Norwegian was spoken. Hence, the identification of intonation units was a painstaking task. However, there was an effort to apply the experiences gained uniformly across the transcription of all the learner interaction data. That is, after all the learner interaction data had been transcribed, all the transcripts were re-examined for internal consistency, by once again listening to the tape recordings. This revealed some 'drift' in the

researcher's identification of intonation units across the cases of learner interaction and successive activities. Any inconsistency was corrected through editing the affected transcripts. Hence, a reasonable level of internal consistency will have been achieved in the transcription.

Two transcription conventions, which relate to the identification of intonation units, are the marking of transitional continuity between intonation units, and the marking of the terminal pitch direction of intonation units. Du Bois et al. provide the following description of transitional continuity.

When a speaker arrives at the end of an intonation unit, poised to continue on to the next - or not continue - the intonation contour usually gives a fairly clear indication of whether the discourse business at hand will be continued or has finished. (1993, p. 53)

The three categories of transitional continuity are *final*, *continuing* and *appeal*. In the transcripts these are marked by a period, comma, and question mark, respectively. Extract 5.5 illustrates these three categories of transitional continuity.

Extract 5.5: Transcription of transitional continuity

Line	Speaker	Text	Transitional continuity
231	Tim:	no,	Continuing (comma)
232		Erik (.) how did you.	Final (period)
233		(2) hæh,	Continuing (comma)
234		<L1 what is it you write now L1>?	Appeal (question mark)
235	Morten:	Erik,	Continuing (comma)

There are three possible terminal pitch directions for intonation units. These include *rise*, *fall* and *level*. In the transcription these are marked by slash (/), backslash (\), and underbar (_), respectively. Extract 5.6 represents the same segment of interaction as in extract 5.5, but with conventions for terminal pitch direction of intonation units added.

Extract 5.6: Transcription of terminal pitch direction

Line	Speaker	Text	Terminal pitch direction
231	Tim:	no,_	Level (underbar)
232		Erik (.) how did you.\	Fall (backslash)
233		(2) hææ,/	Rise (slash)
234		what is it you write now?\	Fall (backslash)
235	Morten:	Erik,/	Rise (slash)

A convention that is important in the later coding and visualisation is the marking of so-called *truncated intonation units* (Du Bois et al., 1993), or *fragmented intonation units* (Chafe, 1993). Normally an intonation unit has a clearly defined intonation contour, with a terminal pitch that signifies that the intonation unit has come to an end (Cruttenden, 1997). In a truncated intonation unit, however, a speaker “utters the initial portion of a projected intonation unit but abandons it before finishing” (Du Bois et al., 1993, p. 47). In extract 5.7 some intonation units are followed by a set of dashes (--). These dashes signify that an intonation unit has been truncated.

Extract 5.7: Transcription of truncated intonation units

Line	Speaker	Text
770	Morten:	we only do one more then
771	Tim:	yes like that
772		and I --
773		(2) and I ehm --
774		and I --
775		(..) forget --
776		forgot to do my homework

In terms of talking-and-thinking (cf. discussion in the previous sub-section) truncated intonation units seemed to represent a different kind of activity as compared to fully formed intonation units. For example, in extract 5.7, the halting starts in lines 772 through 775 (‘and I --‘; ‘and I ehm --‘; ‘and I --‘; ‘forget --‘) seem to play an important role in Tim’s eventual production of the full utterance: ‘forgot to do my homework’. After Engeström (1996), on a very short timescale these truncated intonation units may be seen as buds or shoots of a possible future. In this case, this possible future is the full utterance in line 776.

The transcripts also included an additional column with the researcher’s comments. These comments were generated by observing the pupils engaged in the dialogue-writing activity of the role-play task (cf. sub-section 4.4.2), as well as by observations made in the transcription of the tape-recorded data. This included, among other things, information such as time, topical and procedural boundaries in the task/lesson, pupils’ non-verbal actions, who speech was addressed to, and miscellaneous noises/sounds. These comments were an aid in the coding of the data, but do not feature in any of the extracts used in the text of the thesis.

Finally, other than for the purpose of presenting episodes of learner talk in the text of the thesis, the transcripts were not translated in any part of the research process. That is, all transcripts were coded (cf. sub-section 5.2.3 and section 5.3) in their original language form.

In the presentation of extracts of learner talk in the text of the thesis, however, Norwegian speech is translated into English. Where this is done it is marked with '<L1 *translated text* L1>?'.

Extract 5.8: Transcription of translated text

Line	Speaker	Text
688	Veronica:	<L1 what are you writing there L1>?/
689	Karen:	I played football,/
690		(.) outside the school._
		(9)
696	Karen:	you know that it's not --
		(6)
700	Karen:	<L1 hold on L1>.\

In extract 5.8, which illustrates this convention, the speech in lines 688 and 700 has been marked as translated. By contrast, the speech in lines 689, 690 and 696 was spoken in English. Note also that the more traditional pause convention is used in extract 5.8. That is, in extracts presented in the text of the thesis, pauses are not represented as two-second 'blocks'. The 'gaps' in the line numbers in extract 5.8 (e.g., between line numbers 690 and 696) reflects the fact that in the original transcription, which was used in the coding and visualisation of the data (cf. sub-sections 5.2.3 and 5.2.4), pauses were represented as two-second blocks (cf. sub-section 5.1.1).

5.2 Facilitating Coding and Visualisation

Moving from transcription of the data to the eventual visualisation of the dynamics of learner interaction involved identifying activity strands and threads, consistent with the dynamical perspective developed in chapter three. In addition, because of the lack of any precedent for the type of visualisation developed by the thesis, the constraints and conventions of visualisation needed careful consideration. Next, the transcripts needed to be exported to spreadsheet software where they could be coded. Finally, the coded transcripts needed to be visualised. These different elements in the development of the visualisation are discussed in the following four sub-sections.