1 INTRODUCTION

Context-dependent interpretation has taken centerstage in the theatre of language interpretation. The interpretation of personal pronouns, for example, is known to depend on the linguistic as well as the nonlinguistic environment in which they appear. Moreover, it has become clear that very similar kinds of dependence on context apply to many other phenomena including, among other things, the contextually restricted interpretation of a full Noun Phrase, the determination of the 'comparison set' relevant for the interpretation of a semantically vague predicate, the determination of so-called 'implicit arguments' of words like local and contemporary. (For references to the literature, see [van Deemter and Odijk, 1997].) Inspired by this growing body of work, dependence on linguistic context has become the cornerstone of the so-called dynamic theories of meaning (e.g. [Kamp and Reyle, 1994]). These theories characterize the meaning of a sentence as its potential to change one 'information state' into another, and it is this dynamic perspective on which current natural-language interpreting systems are beginning to be based.

The importance of context for language interpretation raises the question to what extent context modeling is relevant for natural-language generation. In some sense, the relevance of contextual information for generation follows from the relevance of this information for interpretation, since the discourse generated has to be interpreted by the user of the system. For example, when a pronoun, a demonstrative ('this composition', 'those fugues'), or a definite description ('the man') is generated, its linguistic context determines how it will be interpreted by the user. But there is more. For example, context determines what may be called informally the relevance of a given item of information at a given point in the discourse. (Not all true statements on the topic of this paper could felicitously be expressed here, for example.) Furthermore — and this is where the relevance of context for speech comes in — those parts of a sentence that are responsible for novel information are likely to be accented in speech. Thus, both content and form of any utterance are affected by linguistic context.

Natural language generation systems are beginning to take these phenomena into account. Especially the generation of nominal expressions has attracted much attention (see e.g. [Dale and Reiter, 1995] for an overview).
and, to a lesser extent, the connection between (de)accenting and information status (e.g. [Prevost and Steedman, 1994]). A principled perspective on all the different roles of context in natural language generation has not been advanced, however. The present paper tries to chart the problem and compare some possible approaches.

The first five sections of this paper will explain informally how linguistic context can be taken into account by a system that generates discourse in an incremental (as opposed to a plan-based) fashion. We will use the so-called Dial-Your-Disc (DYD) system as an example [Collier and Landsbergen, 1995; van Deemter and Odiijk, 1997] because, on account of the ‘incremental’ approach to language generation of this system (outlined in Section 4), context modeling plays an even more central role in it than in most other natural language generation systems. The main novelty of this paper has to wait until section 6, which contains a comparison between the computationally motivated Context Model of the DYD system, on the one hand, and a number of context models that have come up in formal semantics and artificial intelligence, on the other. In this section, it will be argued that the framework of the 1st-theory of context (see e.g. [McCarthy, 1993]) could facilitate some types of reasoning that can be used by a dialogue system that exploits ‘domains of discourse’ in its generation and understanding of contextually appropriate quantified expressions.

2 A SKETCH OF THE DYD SYSTEM

The DYD system produces spoken monologues derived from information stored in a database about W. A. Mozart’s instrumental compositions. The purpose of the monologue generator is to generate from these data a large variety of coherent texts, including all information required for a correct pronunciation. A generator like this could be part of an electronic shopping system, where users can express their interest in a certain area without being completely specific, and where the system provides information and ‘sales talk’. The way in which users can indicate their areas of interest will not be discussed in this paper, which focuses on language and speech generation. A simplified database representation of a recording could be:

KV 309
DATE 10/1777 - 11/1777
SORT piano sonata
NUMBER 7
PERFORMER Mitsuko Uchida
PLACE London
VOLUME 17
CD 2
TRACK 4