The Production of Anaphoric Reference in the Written Narratives of Seven-year-old Children: Analyzing the Requirements for a Computational Teaching System Based on a Psycholinguistic Model

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Abstract

This thesis brings together one aspect of language development, the production of anaphoric pronouns in the written narratives of seven-year-old children, with the design of technology appropriate for teaching using whole texts, and pedagogical goals involved in teaching mother-tongue language.

A five-stage methodology is proposed for analyzing the requirements for designing a Mother Tongue Language Teaching System (MTLTS) and is used to generate an informal specification of requirements for a prototype system called PROTEUS. PROTEUS is a system for teaching seven-year-old children about the production of pronouns in written narratives.

The analysis of requirements includes five stages beginning with the proposal of an adult model of pronoun production having a 'process' orientation. Experimental work is described in which written narratives were elicited and analyzed for the purpose of modelling pronoun production relative to the adult model.

A psycholinguistic model of the production of anaphoric reference in the written narratives of seven-year-old children identifies heuristic production strategies which represent a gradual simplification of behavior. These strategies are found to be implemented within local units of text, and range from pronominalization of the only character a local unit of text is about, (by default, pronominalization in clause-initial position), to the emergence of a full-blown position conservation strategy. Children are also found to produce 'pronominal confusion' when they referred to interacting characters in less constrained environments; or, they avoided the use of pronominals altogether.

A statement of pedagogical goals for PROTEUS is set out, followed by a review of manual and computational methods for teaching language. Finally, it is concluded that an electronic text should be used to teach about pronominalization, and a system model for PROTEUS, which could be mapped to a system implementation, is proposed.

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Chapter 1

Introduction

In a report issued by the Scottish Council for Educational Technology it is recommended that teachers "...be encouraged to look at technology as a means of helping them to deliver the [mother tongue language] curriculum" (McLeod, 1991a: 15). This recommendation was made in the face of results of two surveys conducted in 1987 and 1989, which indicated that teachers were reluctant to use computers in the classroom because of "the poor quality of much of the software" and the lack of help and support for realizing the full potential of "open-ended" or "content-free" software for which they were required to devise their own work materials.

The issues raised in Scotland were similarly addressed in a seminar about information technology and language development held at Lancaster University in 1989. An 'occasional paper' was issued following the seminar which identified key emerging research areas "setting an agenda for future phases of research"[3] which included "IT and curriculum policy" and "classroom practice with IT" (Rymaszeweki, 1989: 3) . However, the seminar in Lancaster also took a broader view of the problem of exploiting technology for language teaching, identifying a need to research "the interaction of linguistic theory, IT [computer-based information technology] design and applied pedagogical issues" (1989: 18) in order to fill the gap between language-learning theory and practice.

This thesis takes the broader view expressed at Lancaster as a starting point, bringing together the psycholinguistic study of one particular aspect of language development — the production of anaphoric pronouns in the written narratives of seven-year-old children, the design of technology which may be appropriate for teaching using whole texts, and pedagogical goals involved in teaching mother-tongue language. The interaction of these elements is studied within a proposed methodology for analyzing the requirements for developing a mother tongue language teaching system, culminating in the proposal of a system model. The analysis of requirements is broken down into stages, providing the foundation for

proposing a full-scale methodology for developing software which could potentially be integrated into mother-tongue language curricula as an alternative to open-ended, content-free or poor quality software.

The analysis of requirements occurs during an 'analysis phase' and in this study it is set within an experimental framework of a 'system lifecycle' which implements the software as a 'prototype' within the paradigm of 'rapid prototyping' (Luqi, 1989). Building the first version of a system through rapid prototyping would involve implementing key portions of the system based on an informal specification of 'requirements', hence the resulting prototype would be "a partial representation of the system, including only those attributes necessary for meeting the requirements" (Luqi, 1989: 13). This experimental framework is chosen because it would allow for iterative evaluation and redesign during the subsequent design phase of development which, it is hoped, would involve collaboration between teachers and children who use the system, and professional system developers.

The informal specification of requirements is a document which is produced as the end-product of the analysis phase, and constitutes a description of what the system should 'do'. On the basis of the requirements analysis, a working prototype would be built and test driven and evaluated by its users. Then, recommendations for changes would be considered for incorporation in the next working prototype, and each time a prototype was redesigned it would be expanded or refined, and the informal specification of requirements produced in the analysis phase progressively updated and formalized (see Gupta *et al.* (1989) for a case study of rapid prototyping).

1.1 Tools and techniques

The widespread acceptance of the *necessity* of using computational language teaching systems in the second-language learning curriculum (*e.g.* see Fox (1986), Kenning (1986), Lonergan (1991)), or the mother tongue language learning curriculum (*e.g.* see McLeod (1991a), National Association for the Teaching of English (1988), ILECC (1991)) has spawned a proliferation of tools for guiding the development of a class of programs commonly referred to as 'computer assisted language learning programs'. These tools provide a 'technology-led' solution to language teaching; with the aid of a computational authoring tool, courseware is implemented directly from an idea of how the courseware should be designed. One example of such a tool is 'HyperReader' which, it is claimed is a "powerful tool for rapid prototyping of ...educational software" which "utilises the basic user-interface mechanisms provided by HyperCard: scrollable and possibly editable text fields, push buttons and simple pop-up dialog windows" (Kalaja *et al.*, 1991:

6). Another package is 'MCAL', developed by the Centre for Computer Based Learning at the Queen's University of Belfast, which is described as a "DOS based productivity tool for the development of computer based teaching support materials for just £99" (Centre for Computer Based Learning, 1992). MCAL consists of a set of tools for creating computer screens containing text, pictures and animated sequences.

According to Fichman and Kemerer (1992), a systems development methodology requires tools and techniques to guide the process of systems development. Computational authoring tools fail to fulfill this basic purpose for at least three major reasons: 1) because they provide a technological solution to a problem before a formal assessment has been made of the computer's possible contribution to teaching; 2) because they fail to make a provision for an analysis of requirements; and 3) because they fail to make a provision for integrating the system within the domain of the classroom.[1] Similar failures have been noted by Bedford (1991), who argues the case in favor of establishing a methodology for developing 'CALL' (computer assisted language learning) systems within a formalized systems lifecycle and Dudley-Marling and Searle (1989) who criticize the rapid increase in the availability of computer assisted instruction software for teaching oral language skills.

1.1.1 Articulating a methodology

This thesis is concerned with finding tools and techniques for guiding an analysis of requirements for a mother tongue language teaching system (MTLTS) and translating them into clearly defined stages to be completed during an analysis phase which has, as its final output, an informal specification of requirements. These tools and techniques are by necessity, derived from sources outside of the computer assisted language learning literature. As has already been explained, a major source has been rapid prototyping, which is an evolutionary approach to systems development. However, because it is important to describe the requirements in terms which the users (in particular, teachers) could understand, especially during the subsequent design phase, the programming terms of fourth generation languages are avoided[2] and the specification of requirements is written in both natural language and in 'object-oriented' programming terms. The latter

[1] The idea that there is generally a failure to adequately provide for an analysis of requirements and to consider how the system would be integrated in the classroom parallels the idea that there is a general failure to adequately assess requirements for information technology within its 'context of use' for business applications (Liebenau & Backhouse, 1989).

[2] See Grindley (1989) for a discussion about the weakness of fourth generation languages for providing an evolutionary approach to programming.

consists of classes of objects which can easily be related to objects found in the real-world (*e.g.* Meyer (1988)). In addition, several non-computational sources influence the articulation of the analysis phase for an MTLTS. One is the idea that the teaching of mother tongue language should involve the use of whole texts (Stubbs, 1986), another is Crystal's (1976) enumeration of four tasks which teachers would need to carry out in order to introduce systematic ideas about language through the use of language.

1.1.2 Stages of analysis

The analysis phase begins once a specific language problem is chosen as the focus for an MTLTS. The analysis of requirements for a MTLTS should be guided by discrete and tangible stages, having as their output components of the informal specification of requirements, as follows:

Stage 1 The proposal of an adult model of the language use being aimed for.

Stage 2 The development of a model of the current use of a particular language feature for a specified age group. This would involve consideration of previous related studies and further experimental work.

Stage 3 The identification of pedagogical goals which the system aims to implement.

Stage 4 The review of manual and computational methods for implementing the chosen pedagogical goals.

Stage 5 The proposal of a system model which integrates the first four stages by proposing guidelines for writing whole texts to be used for teaching, and proposing how users of the system, children of a specified age group, will "build up a use of language in some graded, structured way"(Crystal, 1976: 79). The system model functions as a model of 'the problem domain' which could be 'mapped' to a system implementation (Fichman & Kemerer, 1992).

1.2 Anaphoric reference

This thesis is organized around a case study of an analysis of requirements for a MTLTS, following the five stages outlined above. The aspect of language development which is focussed on is the production of anaphoric reference to characters in the written narratives of seven-year-old children; *i.e.*, the use of non-possessive personal pronouns which refer to characters. A non-grammatical approach to this problem is taken, so 'intrasentential' syntactic constraints on the production of pronouns are not considered (see, for example, Lust (1986) for a collection of papers about theoretical studies on the nature of anaphora and the theory of binding). The investigation of children's pronouns is given a 'processing' and 'discourse' orientation and is therefore related to studies of anaphora in adult and child language within the fields of psychology and linguistics, such as: Marlslen-Wilson *et. al.* (1982), Fox (1987b), Tomlin (1987), Sanford and Garrod (1989a), Karmiloff-Smith (1987), and Bamberg (1987). These studies are generally concerned with either modelling the processes involved in pronoun comprehension, or how the production of pronouns is integrated with the production of the text as a whole.

In this thesis experiments are carried out which focus on the production of anaphoric reference in the written narratives of seven-year-old children. These experiments anticipate that children will not have acquired the adult ability to enable interpretation of the pronouns they produce; rather, that they will be shown to have acquired behavioral strategies for the production of pronouns which are constrained by the limited capacity (or 'inefficiency') of their working memories.

The following section gives a general introduction to the topic of anaphoric reference.

1.2.1 Reference as a semantic relationship

One important component of the speech message is 'reference' which can be defined as a semantic relationship which "holds between words and the things, events, actions and qualities they stand for" (Lyons, 1968: 424). The semantic relationship of reference presupposes existence; so, when a speaker or writer uses a word to refer to a particular event, object (entity) or relationship, this implies that its referent 'exists' in the universe of discourse. The referential meaning of a word is therefore the particular event, object or relationship "which the word represents in a specific context" distinguishable from the denotative meaning of which refers to "the class of items which are exemplars of the generic idea or concept represented by a word" (Glucksberg *et al.*, 1975: 307).

Reference to entities, *i.e.* , 'things', persons or animals has been described

as the most 'basic' kind of reference (Lyons, 1979). A pronominal used for non-possessive reference to a person or animal is said to be 'coreferential' with its antecedent when it refers to the same person or animal in the universe of discourse which its 'antecedent' in the text refers to. If a pronominal is classed as being anaphoric rather than cataphoric it occurs in the text after its antecedent has been explicitly introduced into the discourse using a non-pronominal form, such as a name or common noun, typically, an 'indefinite NP'; *e.g.* in the following passage, 'this guy' is an 'antecedent' followed by three examples of anaphoric reference: 'He', 'he' and 'ø' (Hickmann, 1980: 192):

Yesterday this guy came up to me in the street.
He was so drunk that he fainted
and ø was taken to the hospital.

(A cataphoric pronominal would occur in a written or spoken text before its antecedent.)

When a listener or reader perceives an anaphoric reference s/he decodes it by identifying the person or animal in his/her mental representation of the text; this is the same person or animal which its 'antecedent' refers to. The process of identification is often called 'resolution' or 'matching'. The extent to which a speaker or writer successfully encodes anaphoric reference, *i.e.* successfully enables a listener or reader to match references with their antecedents, has a significant effect on the overall communicative function of the speech message.

Excluding reference by a speaker or writer to his/herself, the personal pronouns which can be used for anaphoric reference in English are classified according to number and gender. The following are singular forms:

male
he, him
female
she, her
unspecified
it

And, the following are plural forms:

any combination of male, female or unspecified entities
they, them

In addition, the lexically empty specification of reference, known as a zero anaphor (ø) which occurs when a reference is missing in the text (as shown in the example above), is considered to be a form of anaphoric reference.

1.3 Summarizing objectives

The main objective of this thesis may be summarized as: to bring together one aspect of language development — the production of anaphoric pronouns in the written narratives of seven-year-old children — the design of technology which may be appropriate for teaching using whole texts, and pedagogical goals involved in teaching mother-tongue language. This is accomplished by:

- proposing a methodology for analyzing the requirements for designing a MTLTS; and
- using the proposed methodology to generate an informal specification of requirements for a MTLTS for teaching seven-year-old children about the production of anaphoric pronouns in written narratives.

In addition, it is expected that the proposed methodology:

- could be generalized for the development of any MTLTS focussing on one aspect of language development.
- would establish a foundation for a MTLTS methodology which would include a design phase.

1.4 Thesis Overview

The rest of this thesis follows the five stages of analysis described on page 4. The next chapter, Chapter 2, considers studies of pronoun comprehension and production for the purpose of proposing an adult model of pronoun production within the 'mental model' paradigm. Underlying the adult model is the hypothesis that pronoun production is tuned to a pronoun comprehension process which is integrated with the interpretation of the text as a whole.

Chapter 3 provides a critical review of studies concerning the comprehension and production of pronouns by children, and explains their influence on the design of experimental work reported in this thesis.

Chapters 4, 5 and 6 describe experiments which were carried out to analyze pronoun production. Chapter 4 consists of an introduction to three experiments, including an hypothesis which predicts that children may take a variety of preferred options for producing pronouns, and that they may use a variety of cognitive (heuristic) strategies. Chapter 4 includes sections describing these experiments under the headings: Method, Subjects, Procedure, Materials, and Coding of Narratives. Chapter 5 reports results, consisting of a general overview of the features of the narratives produced (which are listed in Appendices A, B and C), and a

detailed analysis of narrative structure, utterances, all references to characters, and an analysis of 'pronominalization strategies' and 'chains'. Chapter 6 presents a summary of results, a discussion of results, and finally, a model of children's pronominalization relative to the adult model proposed in Chapter 2.

Chapter 7 sets pedagogical goals to be implemented in a MTLTS for teaching about pronouns which is named PROTEUS. Then, Chapter 7 reviews manual and computational methods for implementing pedagogical goals similar to PROTEUS. Chapter 8 presents the final stage of analysis, which consists of specifying a system model of PROTEUS: a set of guidelines for producing narratives to be included in PROTEUS, classes of objects defined for PROTEUS, and a set of tasks through which children and teachers could interact with electronic texts stored in the system.

Finally, the main thesis closes with Chapter 9 which briefly reviews the analysis of requirements for PROTEUS and suggests future research concerning the investigation of children's pronoun production and the development of systems for teaching about mother tongue language.

Chapter 2

An adult model of pronoun production

The main purpose of this chapter is to propose an adult pronoun production model, to which a model of children's pronoun production can be related in later chapters, and which serves as a model of adult pronominalization which children are to be guided toward in PROTEUS.

The adult anaphoric pronoun production model is proposed as a model of how a speaker or writer enables a listener or reader to interpret an anaphoric pronoun in the text. Comprehension and production are given a 'process orientation' (Smyth, 1986), as the comprehension model to which production is tuned is presented as a model of the processes (operations) involved in pronoun interpretation. Both production and comprehension are presented as working hypotheses, developed from a review of a selection of psychological studies, in which, generally, no distinction is made between speaking and writing, or listening and reading. Thus, production and comprehension models are described in terms of how cognitive representations interact or are manipulated by speakers/writers (S/W's) and listeners/readers (L/R's). Description at the psychological level is used for convenience, as it is assumed that production and comprehension may be more precisely described in terms of underlying physical representations of the cognitive system (Churchland, 1986).

In summary, the structure of this chapter is as follows: first, a model of the operations likely to be involved in pronoun comprehension is presented, after which it is explained how a production model would ideally be tuned to this comprehension model. Then, production and comprehension studies are reviewed in order to further develop a working hypothesis for a production model, which is given at the end of this chapter.

2.1 The 'mental model' paradigm

Underlying the adult model of pronoun production is the hypothesis that pronoun production is tuned to a pronoun comprehension process which is integrated with the interpretation of the whole text. More specifically, that S/W's enable interpretation of pronouns by enabling L/R's to initially implement a pattern matching mechanism which forges conceptual links between anaphoric expressions and antecedent expressions in 'real-time' (Sanford & Garrod, 1989a), and pronoun interpretation (resolution) is integrated with the 'on-line' construction of a unitary mental representation of the whole text called a discourse, or mental model. A mental model is defined as a mental representation in which the L/R recovers the S/W's intended meaning, although the exact nature of how text is represented mentally remains a controversial issue (Johnson-Laird, 1981; Garnham *et al.*, 1982; Oakhill *et al.*, 1989; van de Velde, 1992).

This is an extremely powerful model of pronoun production, because it does not exclude any knowledge sources produced by the S/W which may enable the L/R to understand the text as a whole; any linguistic element manipulated by the S/W in the text can potentially interact with the L/R's store of general knowledge, and be involved in pronoun processing.

The approach taken is to refine this powerful model of pronoun production by first proposing psychological operations which are likely to be implemented in pronoun interpretation: from initial 'matching' to final 'resolution' of a pronoun; these would be the operations a S/W would enable L/Rs to implement when they interpret pronouns. The production model is further refined on the basis of a review of adult comprehension and production studies; the main purpose of the review is to attempt to isolate cues which may be involved in pronoun comprehension. Finally, a proposal is put forward about how the production of independent or interacting linguistic cues may be involved in enabling psychological operations involved in pronoun interpretation to take place in real-time.

2.2 The pattern matching mechanism

The starting point for the *comprehension model* is the pattern matching mechanism proposed by Sanford and Garrod (1989a; 1989b). This mechanism implements an 'immediate evidence accumulation' algorithm whenever an anaphoric pronoun is read which operates (Sanford & Garrod, 1989b: 25):

> ... [by] forging initial conceptual links between anaphor[ic] expressions and antecedent expressions [*i.e.* all potential antecedents], serving as loci around which more specific semantic analysis might take place.

> ...The pattern-matcher itself could be regarded as real-time, hence "immediate" and could be realized within a connectionist framework.

Initial pattern-matching is followed by a period of 'inferencing' over which the L/R accumulates evidence while continuing to read the text, and evaluation of antecedents proceeds in parallel. This means that all candidate antecedents are evaluated in parallel as the text is being read, until eventually a full-blown inference is made in favour of one candidate antecedent, described by Sanford and Garrod (1989a: 253) as occurring after text has been processed "well down stream of the pronoun itself".

While the simplicity of Sanford and Garrod's model is appealing, it is not sufficiently specified for proposing a production model which enables it to operate, as Sanford and Garrod themselves imply when they explain that "other processes" may be the key to anaphor resolution, and that "the very serious question arises as to which key process takes precedence over any other" (Sanford & Garrod, 1989a: 258).

2.2.1 Adding detail

In order to propose a production model which takes into account other key processes which may be involved in pronoun resolution, a number of proposals by other researchers are taken into consideration (listed below) and a more detailed hypothetical model of the psychological operations likely to be implemented during resolution is proposed.

- In Graesser *et al.'s* (1986) model of pronoun processing they propose that a discourse model is a recursive *knowledge representation* (also called a 'knowledge structure') within which meaning is represented by networked knowledge structures, and knowledge structures represent the meaning of entities in the discourse model. When a pronoun is processed, knowledge representations of entities flow into working memory to be evaluated as candidate antecedents if their activation state is above a minimum threshold when the pronoun is read, and working memory converges on a set of inferences to resolve the pronoun.

- Johnson-Laird models parallel inferential activity by an adult working memory as the evaluation of alternative hypothetical discourse models (Johnson-Laird, 1990).

- McKoon and Ratcliffe propose a three component model of a pronoun processing subsystem which describes the completion of pronoun processing as

the storage of an updated antecedent in the discourse model (McKoon & Ratcliffe, 1980).

In summary, it is proposed that pronoun processing may consist of the following psychological operations:

1. **Selection of a set of candidate antecedents:** When a pronoun is read, the L/R makes conceptual links between the pronoun and knowledge representations of entities which are stored in the discourse model (itself a knowledge representation) in an activation state above the threshold to attract the L/R's attention; these knowledge representations represent the entities which are the members of the set of candidate antecedents, and which *flow into working memory for evaluation* in parallel.

2. **Evaluation of candidate antecedents:** The L/R evaluates by inferencing, which involves the on-line parallel *construction* of as many alternative hypothetical discourse models as there are candidate antecedents, so that the knowledge representation of one candidate antecedent is recursively networked in each hypothetical model. If there is only one candidate antecedent, only one model is constructed.

3. **Inference generation, cues converge :** Inferential activity culminates when enough text is interpreted for cues to converge, in parallel, in working memory to allow the L/R to make the inference that only one discourse model is *true.* When this occurs, the knowledge representation of the entity which is the antecedent will already have been updated in the discourse model, as the proposition associated with the pronoun will have been integrated while the hypothetical discourse model was being evaluated.

   If there was only one candidate antecedent, this process is described as verification: only one hypothetical discourse model was constructed, as there is only one 'candidate antecedent', and interpretation of the pronoun occurs when enough text 'downstream' of the pronoun is read to verify that the discourse model is true.

2.2.2 Converging cues

Ideally, a production model would show how S/W's manipulate linguistic elements of the text to enable operations involved in pronoun resolution to occur in real-time. This would entail showing how S/W's produce independent or interacting linguistic cues in the text to enable:

- The knowledge structure representing the entity to which the pronoun refers to be stored in the discourse model with a level of activation high enough for it to attract the L/R's attention *and* high enough for it to flow into working memory to be evaluated; this would enable the choice of candidate antecedents to include the correct antecedent; and
- The collection of cues to converge on the correct interpretation of the pronoun.

The following section presents a review of studies of adult comprehension and production in an attempt to isolate cues which may enable the correct antecedent to be evaluated and working memory to converge on the correct interpretation of the pronoun.

2.3 Review of comprehension and production

2.3.1 Thematic subjects: faster processing?

In an experiment which tested the relative processing speeds of noun anaphors and unambiguous pronouns, Purkiss (1978) found repeated noun anaphors to be more rapidly interpreted than unambiguous pronouns when the antecedent was *not* the 'focus' of the discourse and had been presented at least three sentences earlier than the pronoun; in contrast, pronouns which *were* the focus of the discourse, were interpreted faster than noun anaphors, regardless of their 'location'.

In a later series of comprehension experiments Garrod and Sanford (1985) found, on the basis of the speed of processing predictable *vs.* unpredictable verbs, that subjects processed pronouns referring to a thematic subject faster than those referring to a secondary character. This evidence motivates an argument in favour of 'primary processing' of pronouns referring to thematic subjects; primary processing means that no evaluation of candidate antecedents occurs when a pronoun is used to refer to thematic subject and the following cues converge: the thematic subject is 'in focus', the pronoun occurs in subject (initial) position, and a number and gender match can be made between the pronoun and the thematic subject.

From another set of comprehension experiments, Sanford, Moar and Garrod (1988) conclude that *naming* a character contributes to pronoun resolution, because they found shorter reading times for sentences containing anaphoric reference to named characters than 'role-described' characters, such as 'Mr. Bloggs' *vs.* 'the manager'. Sanford *et al.* explain that L/R's perceived the 'salience' of a *named* character to be greater than that of a role-described character, and that naming a character cues main characterhood. They further conclude that the

greater perceived salience of a named character enhances 'access' for pronominal anaphora.

Virtual resolution

None of the experiments reviewed above have been fully accounted for in Sanford and Garrod's model of pronoun processing, in which a processing mechanism forges initial conceptual links between an anaphoric expression and potential antecedents, as described in (1989a). However, the possibility is suggested (Sanford & Garrod, 1989b) that when a pronoun is encountered which refers to a thematic subject, an immediate 'bonding' occurs between thematic subject and the pronoun; they call this phenomenon "a strong top - down influence of theme [and] if the fit is good (in terms of gender), virtual resolution has taken place..." (1989b: 18). It is not clear, however, that, given their own comprehension model, or the model developed in this chapter so far, that virtual resolution would speed up processing of pronouns which refer to thematic subjects. This is because both models allow for *parallel processing* during all stages; so, for example, it would not take longer for a L/R to 'evaluate' two hypothetical discourse models than it would take to 'verify' one.

Filtering the interpretation

One possibility is for the comprehension model to allow for backtracking without cost, as it does in Carlson and Tanenhaus' model of interpretation of thematic roles (Carlson & Tanenhaus, 1988) in which a temporary assignment of a thematic role is made while all other possible thematic roles remain available on the 'active grid'. This type of model would allow for *temporary assignment* of an antecedent referring to the thematic subject as soon as a pronoun is read. The other candidates would remain 'active', and the proposition associated with the pronoun would act like a 'filter' for the proposed interpretation (rather than as 'input').

If this feature is added to the model, backtracking without cost would mean backtracking without interfering with on-line processing, and any measurable difference in processing speed could be accounted for in a number of ways: 1) the extra time it takes to reassign an antecedent, if a L/R incorrectly assigns an antecedent to a thematic subject; 2) eliminating the necessity for candidate antecedents to flow into working memory to be verified or evaluated; 3) the difference between the time it would take to 'filter' an interpretation and the time it would take to 'verify' or 'evaluate' a candidate antecedent when text 'downstream' of the pronoun itself is 'collected' as a cue ('input') to enable interpretation of the pronoun.

It is noted, however, that despite the appeal of adding virtual resolution and backtracking without cost to the comprehension model, it is not clear from the experiments reported above, precisely how thematic subjecthood is cued in different types of naturally occurring discourse. The complexity of establishing such cues is demonstrated by van de Velde (1992) in a comparison between the two following passages; in the first 'he' is not interpretable as a thematic subject, but in the second 'he' *is* interpretable as a thematic subject because 'cotextual' information has been added, and because the L/R calls up 'contextual information' and "integrates[s] the referentially unconnected utterance into this co(n)textual information"(van de Velde, 1992: 173):

(1)The Pope of Rome looked at the poor people of Brazil.
He was the winner of the Wimbledon final.
He was the first man to land on the moon.
He defended the economic views of OPEC.

(2)The *Pope of Rome looked at the poor people of Brazil.*
He remembered the dream in which he was together with
rich people who celebrated his first victory.
He felt they all admired the way he had beaten McEnroe.
Everyone had applauded.
He was the winner of the Wimbledon final.
He was sure he would give all the money he got for his victory
to the poor people of Brazil. Now, his dream had a dramatic relevance...

2.3.2 Episodic boundaries and scene shifts

The next study to be reviewed, (Tomlin, 1987) is, according to its author, presented within the 'episode/paragraph' paradigm, which is based on the hypothesis that pronoun production is tuned to the constraints of working memory of pronoun processors. However, no specific proposal about how the speech producer enables pronoun processing is made.

In two experiments, Tomlin tested the production of referential forms in structured 'narratives'. In the first experiment, the stimulus material consisted of a sequence of pictures presented on slides, and in the second, a cartoon video; both were 'on-line' narration tasks. In the slide narration task, Tomlin randomly placed visible breakpoints which he called "artificially stimulated episodic boundaries"(1987: 463), consisting of a perceptual disruption caused by the shutter release cycle of a slide projector. He found that regardless of where episodic boundaries were placed, reference was usually 'reinstated' through the use of a full noun phrase upon first mention of a referent at the start of a new episode,

followed by a series of pronominal references. In the cartoon video task he found a similar result when subjects reinstated reference using a noun phrase at 'perceptually salient breakpoints', which were induced by video cuts occurring at major scenery changes, while pronouns were used to refer to entities, within episodes. From these results, Tomlin concludes that narrative structure controls the 'syntax of reference', *i.e.* the use of full noun phrases *vs.* pronouns.

Even though it is unlikely that adults would naturally produce narratives which have episodic boundaries occurring at breakpoints similar to those induced in Tomlin's stimulus materials, Tomlin's results can be taken as a starting point for proposing how the synchronization of referential forms and structural boundaries may act as cues to the L/R to adjust the activation state of entities.

If a full noun phrase is used on a scene boundary this may cue the L/R to refresh the activation state of the entity referred to so that it can be included in the set of candidate antecedents for subsequent pronouns matching in number and gender. Or, the use of a full noun phrase may cue the L/R to attenuate the activation state of entities referred to in the previous structural unit, so that they will not be included in the set of candidate antecedents for subsequent pronouns matching in number and gender.

The main difficulty with these hypotheses is their similarity to Chafe's proposal (1976) that items do not remain in a listener's 'consciousness' when the 'focus' shifts from one scene to another, which Smyth (1986: 35-36) has refuted using the following examples and arguments:

> ...it can be readily demonstrated that scene shifts do not necessarily eliminate NP's from the former scene as antecedents for a pronoun mentioned after a scene shift has taken place:
>
> > ...and that's why Bob had decided to stay behind in New York. Meanwhile, off in Cairo, Greg was writing to *him* every day.
>
> If *Bob* were indeed no longer retrievable, the full NP would be necessary in the second sentence. Moreover, it is possible for the scene shift itself to invite the inference that the antecedent must be in a prior scene:
>
> > ...and that's why Bob had decided to stay behind while Fred and Greg taught French at the American school in Cairo. So a month later in Cairo, Fred was writing to *him* every day.

Smyth's arguments are interesting, particularly when considered within a model of how production is tuned to comprehension. In particular, that the S/W may

use the propositional content of the text to cue the L/R to activate a referent from a previous scene to be sufficiently activated to be included in the set of candidate antecedents, *before the pronoun occurs in the text.* For example, the text "So a month later in Cairo, Fred was writing to" could cue the L/R to activate a referent who Fred might be writing to before *him* is read.

Smyth's analysis also highlights the difficulty in defining structural boundaries which 'eliminate' antecedents and challenges Chafe's notion of 'consciousness'. For example, in the first passage, although there is a shift of location, from New York to Cairo, orientation by time, cued by the word "Meanwhile", results in a simultaneous focus on both locations, rather than shifting the scene.

2.3.3 Hierarchical structure

In another study, which examines the relationship between referential forms and text structure, Fox (1987a) proposes that S/W's of action novels produce anaphoric patterns according to the hierarchical structure of the text. For example, she proposes that one condition which "does not necessarily trigger the use of a full NP" (1987a: 163) is when a gap between references to the same character is concerned with something off the 'event-line' or does not introduce the actions of another character; this would account for the use of the pronoun *She* at the beginning of the second paragraph, in the following text (1987a: 163):

> She took a deep breath and tested the firmness of her grasp on the wood. When Jobim had first taught her to swim, he had told her always to get in and out of the water quickly, for it was in the marginal moment — half in, half out of the water — that a person was most vulnerable to shark attack: it was then that the person looked truly like a wounded fish; most of the body was out of the water so it appeared smaller, and what remained in the water (lower legs and feet) kicked erratically and made a commotion like a struggling animal.
>
> *She* spun, grabbed the gunwale ...
>
> (*The Girl of the Sea of Cortez, p.78*)

Viewed in terms of cues involved in pronoun processing, Fox may be describing conditions under which the S/W uses a pronoun to refer to an entity when the L/R is expected to have maintained its representation in a high enough activation state to be included in the set of candidate antecedents. It is, among other things, not clear that the relationship between the pronoun and *hierarchical structure* adequately explains this phenomenon.

Possibly, 'She' is used to refer to 'The Girl of the Sea' not because the intermediary text is 'off the event line', or because the actions of another character have

not been introduced, but because the S/W maintains the L/R's orientation of attention toward 'The Girl of the Sea' throughout the passage, even though 'The Girl' is not explicitly referred to with the pronoun 'she'; The Girl remains 'in focus' because the salient points of her swimming lessons with Jobim are described (and, in fact, reference to The Girl as 'her' occurs in the second sentence). Hence, the L/R may be influenced to maintain the activation state of the representation of 'The Girl' at a sufficient level for it to be included in the set of candidate antecedents when 'She' is read, or, possibly 'She' should be processed as a pronoun referring to the thematic subject.

2.3.4 Number and gender

The lexical properties of the pronoun itself, number and gender, are widely recognized to be involved in pronoun interpretation (Ehrlich, 1980). In a discussion about number and gender, Webber (1980) explains that in the second sentence, below, 'they' cannot refer to 'the zoo', because 'they' "must refer to something interpretable as a set of more than one item," and 'he' cannot refer to 'Mary' because 'he' must "refer to an animate entity that is not explicitly marked 'female'" (1980: 155):

> Fred left his niece at home and went to the zoo with Mary and John.
> *It* had not yet opened, so *they* sat down on the grass outside.
> Suddenly near John *he* saw a snake.

Expressed in terms of the model being developed in this chapter, the lexical cues number and gender carried by a pronoun may be important cues for enabling pronoun processing, as they appear to cue the L/R *not to include* entities which do not match in number and gender in the set of candidate antecedents when the pronoun is read. Possibly, this is accomplished by lowering the activation states of entities which do not match (or, conversely, raising the activation states of entities which do match). Furthermore, number and gender cues may trigger virtual resolution of thematic subjects, as described in Section 2.3.1 above. However, it is explained below that manipulating and interpreting number and gender cues for plural entities may involve more complex 'mapping' processes than for singular entities.

Plurals are more complex

One proposal for how plural pronouns are interpreted is given in a study by Hielscher and Műsseler (1990). They used a sentence completion task and an on-line reaction time task and found that L/R's interpreted conjunctions such as

"and", or "as well as" as cues to 'install a complex', meaning that S/W's use conjunctions to cue L/R's to *conjoin singular objects* in a discourse model.

For example, installing a complex would enable a L/R to interpret the potentially ambiguous pronoun *Sie* in the second sentence of the following passage to refer to *Mary und John*, even though, in German, 'sie' refers to either a singular, female entity, or a plural, neuter entity (1990: 348):

Mary und John wollten picknicken.
(Mary and John wanted to have a picnic.)
Sie mussten zunächst die Zutaten einkaufen.
(They had to buy the picnic supplies first.)

If the S/W uses conjunction to cue the installation of a complex to enable processing plural pronouns in English referring to 'compound entities', such as *Mary and John*, then the 'compound entity' would have to be represented in the L/R's discourse model in order for it to be included in the set of candidate antecedents when the plural cue carried by the pronoun was processed. This is an appealing and simple process; however, it can be seen from Webber's example above, in which 'they' refers to *Fred, Mary and John*, that including a complex entity in a set of candidate antecedents might involve inferencing to establish more complex relationships between knowledge representations in the discourse model than conjunction alone could cue. For example, *Mary and John* are conjoined by *and*, but Fred is conjoined with *Mary and John* by the assertion that he went to the zoo with them.

2.3.5 Inferences and thematic subjects

The discussion in this section is centered around Marslen-Wilson, Levy and Tyler's speech production experiment (1982), having as its working hypothesis that pronoun resolution is an 'on-line' process, integrated with the general process of utterance resolution. Although their model of comprehension has some similarities to the one presented in this chapter, it does not enumerate the psychological operations likely to be involved in pronoun processing. Marslen-Wilson *et al.* are mainly concerned with the role of "inferentially based constraints" and thematic subject constraints in pronoun production and resolution, as explained below.

Inferentially based constraints

The use of inferentially based constraints as cues in pronoun resolution is demonstrated for pronouns for which there is either *one* or *more than one* 'potential antecedent'. For example, the following passage is used to demonstrate how a

pronoun having only one 'potential antecedent' would be interpreted (1982: 360-361):

> ...in the utterance 'When John came into the room, he switched on the light', the resolution of the anaphor involves not only checking the number and gender of the potential antecedent, but also whether the property predicated of the anaphor (*i.e.* switching on the light) is consistent with what is already known about the potential antecedent (*i.e.* that he has just entered a room).

In the following passage Marslen-Wilson *et al.* demonstrate how pragmatic inferencing would operate when, on the basis of number and gender, there is more than one 'potential antecedent' (1982: 361):

> In many cases ...inferentially based 'pragmatic checking' will appear to be the only way of discriminating among antecedents — as, for example, in the following utterance-pair: 'Bill took his dog to the vet this morning. He injected him in the shoulder and he should be all right now'. The resolution of various pronouns in the second sentence primarily depends on an inferential assessment of the three possible antecedents in the light of pragmatic assumptions about the likely agents and patients of the action of injecting, taking into account the relationships between the antecedents that the first sentence suggested.

Using text produced in an on-line narration task based on a comic book picture story, Marslen-Wilson *et al.* proceed to demonstrate how a speaker pragmatically constrains pronominal reference, even when two same number/gender characters interact, by conveying the actions and states which the characters are involved in. For example, in the following passage, (1982: 363):

> '...so *The Thing*$_i$ has to get down to ...to the ground level ...before *The Hulk*$_{ii}$ recovers enough ...while *he*$_{ii}$ *'s* still stunned ...so *he*$_i$ rips open the elevator doors and just sort of slides down the cable ...'

it is explained that (1982: 363):

> ...for the utterance containing *he*$_{ii}$,[1] the critical information is clearly carried by the verb 'stunned'.

This is because *The Hulk*$_{ii}$ has just fallen from a sixty storey skyscraper, and hence is more likely to be stunned than *The Thing*$_i$. The second pronoun, *he*$_i$ refers to

[1]Italics and subscripts have been added for clarity.

The Thing$_i$, by 'pragmatic implication', because the speaker has established his desire to get down to the ground level in a hurry; and, the fact that he is not stunned means that he is able to rip open the elevator doors.

In contrast it is explained, using the passage below (1982: 252) that the S/W does not produce a pronoun in cases where the use of pronoun would cause either reference failure or misreference:

> 'so then it cuts back ... to The Hulk and The Thing and *they're* still battling and knocking down chimneys ... and nothing ... no- nobody's really getting any ... temporary advantage ... and *The Hulk* is getting stronger ... but *The Thing* keeps catching him off guard and tripping him up ... so then they cut back to the laboratory ...'.

Marslen-Wilson *et al.* analyze this passage by explaining that the first two italicized uses of the actors' names cannot be pronominalized (1982: 352):

> In the first case, substituting 'he' for 'The Hulk' simply fails to refer, while zero disastrously misrefers .... In the second case, the substitution of either a pronoun or zero for 'The Thing' would clearly misrefer.

However, it seems simpler to explain that the first two references to 'The Hulk' and 'The Thing' are explicitly conjoined to cue the representation of a 'compound entity'; hence, only the italicized references, which refer to each character *individually* could serve as explicitly cued textual antecedents for subsequent pronominalized references to these characters.

Thematic subject strategy

In the same study (1982), Marlsen-Wilson *et al.* propose that when they produce zero anaphors, adults use a 'thematic subject strategy', which they describe as being like the thematic subject strategy which Karmiloff-Smith (1980) proposed that children use. They propose that a 'thematic subject strategy' is used when there is a 'strict parallelism' between successive clauses, and, reference occurs in clause initial position. This 'strict parallelism' cues the L/R to interpret the pronoun as a 'zero element' (or zero anaphor) which does not function as an anaphoric referential device. For the L/R this means that the pronoun which is the zero element is "necessarily taken as coreferential with the structurally parallel element in the immediately adjacent clause" (1982: 353), because once a thematic subject is established over a stretch of discourse, there "is no choice to be made" as to who is the referent of the anaphor.

Thus, Marslen-Wilson *et al.* propose that structural parallelism is sufficient to cue the L/R to interpret zeros or clause initial pronouns as thematic subject,

although they do not make clear how a thematic subject is established in the first place. It is not clear that their argument is not circular, because they also hypothesize that the use of zero anaphors in clause initial position cues thematic subjecthood. Furthermore, if the possibility is accepted that zero anaphors successively produced in clause initial position are interpretable even when they do not refer to a thematic subject, then, in effect, Marslen-Wilson *et al.* are simply proposing an adult version of a *parallel function strategy*, similar to that discussed in Caramazza & Gupta (1979), which states that there are conditions under which a pronoun is interpreted as being coreferential with the previous noun phrase serving the same grammatical function.

It is not clear why Marslen-Wilson *et al.* do not involve the establishment of pragmatic coherence in the production or processing of zero anaphors. Instead, they imply that for adult L/R's, interpreting the zero anaphor and establishing 'pragmatic coherence' between the entity which the zero anaphor refers to and the proposition associated with the zero anaphor are separate processes, and, conversely, for adult S/W's enabling interpretation of zero anaphors does not involve producing a pragmatically coherent proposition to be associated with the zero anaphor. Clearly, the production of zero anaphors is more elegantly handled within a production/comprehension model in which the production of a zero anaphor enables the temporary (virtual) assignment of an antecedent, which may or may not be the thematic subject.

2.4 A refined production model

It was originally proposed in this chapter that a model of pronoun production which was tuned to comprehension would have to account for how S/W's manipulate linguistic elements of the text to enable operations involved in pronoun resolution to occur in real-time. For comprehension to proceed in real-time converging cues would have to be collected to enable the correct candidate antecedent to be included in the set of candidate antecedents, and converging cues would have to enable verification of one possible antecedent or evaluation of candidate antecedents.

The comprehension model was then refined by adding the facility for 'virtual resolution' of pronouns which refer to thematic subjects, although it was not possible, on the basis of previous studies to precisely enumerate a set of cues which a S/W would produce to enable a pronoun to be processed as a thematic subject. It was proposed that if the appropriate cues were produced by the S/W to be processed by the L/R *before the pronoun was read* and a number and gender match between the pronoun and thematic subject could be made, the processor

would assign the thematic subject as the antecedent, but leave open the possibility of backtracking, and continue to process text as a 'filter' for the proposed interpretation. Furthermore, it was proposed that this type of 'virtual' resolution may also take place for zero anaphors.

Regardless of whether pronouns are verified, 'virtually' resolved, or evaluated, it should, ideally, be possible to show precisely how a S/W produces independent or interacting cues in the text to enable the L/R to process each pronoun. However, the review in this chapter has shown how difficult it is to disentangle the production of cues which enable pronoun processing from the production of cues involved in enabling other levels of text processing. For example, establishing a character's thematic status is not specific to enabling pronoun processing, nor are the creation of episodic boundaries, scene shifts, the conjunction of entities, production of a reference in clause initial position, or pragmatic coherence. In fact, the only cues which appear to be specific to pronoun production are the lexical cues carried by the pronoun itself, number and gender, and these cues were shown to interact with other levels of the text when they contributed to pronoun interpretation.

The model of pronoun production which has emerged is still an extremely powerful one. Enabling pronoun interpretation involves producing a complex set of converging cues which, with the exception of number and gender, are all somehow involved in enabling *dynamic* interpretation of the text as a whole. And, it appears that S/W's do not enable the interpretation of each pronoun *in the same way.* For example, some cues, like the ones which 'add up to' thematic subjecthood may be used to enable a L/R to *expect* a pronoun matching in number and gender to refer to the thematic subject and for virtual resolution to take place, while pronouns which do not refer to thematic subjects may be used in contexts in which they can only refer to one entity because no other entities having the same number and gender have been explicitly or implicitly introduced in the text; or, they may be used in contexts which have invited the L/R to expect a pronoun to be used, but still require the selection of a set of candidate antecedents for evaluation and require interpretation of text 'well downstream' of the pronoun itself to effect resolution.

In summary, pronouns appear to function as textual 'chameleons', which are intrinsically constrained when they are explicitly encoded with number and gender cues. However, even these cues are not necessities; in English, zero anaphors are not encoded with these cues at all, and the pronoun 'they' does not encode gender. When adult S/W's enable processing of pronouns to occur in real-time, regardless of whether they enable *virtual resolution*, *verification* or *evaluation*, they appear to express the Gricean maxim of 'Quantity' (Grice, 1975): an interpretable pronoun

is as informative as is required, but not more informative than is required: a pronoun refers to an entity that the text enables it to refer to. The L/R who interprets a pronoun is, in turn, able to economize in processing when pronoun interpretation is integrated with the 'on-line' construction of a unitary mental representation of the whole text. This symbiotic relationship between pronouns and the text as a whole is clearly demonstrated by Carlson and Tanenhaus (1988: 284):

> Consider, for example, a case of a conversation in which two people think they are discussing the same person, but the listener is mistaken about the identity of the person under discussion. Upon finding the error, the listener transforms information formerly believed to be about the mistaken individual into information about the actually intended individual (*Oh, so that's who said all those nasty things, etc.*) It does not appear one must go back and recompute the meanings individually of all propositions understood incorrectly, since this transformation is achieved so rapidly and easily.

Chapter 3

Children's pronouns

In this chapter, previous studies of children's comprehension and production of pronouns in spoken and written texts are reviewed. The structure of this chapter is as follows. First, several comprehension studies are reviewed which focus on comprehension strategies and a model of comprehension which emerges from this review is outlined. This is followed by a critical review of production studies. Finally, the relevance of both types of reviewed studies is assessed with respect to the investigation of children's pronoun production presented in this thesis.

3.1 Comprehension

3.1.1 Recency: Chomsky

A 'recency' strategy is a comprehension strategy involving *previous mention*, as identified by Carol Chomsky (1969). Chomsky tested children's interpretation of pronominal reference in order to determine whether children had knowledge of the 'nonidentity' requirement, and therefore knew that a pronoun in a main clause correctly refers to someone outside the sentence when it precedes an NP [full noun phrase], as shown in *Structure 1* below (1969: 104):

Structure 1
nonidentity requirement: pronoun in main clause, precedes NP
He found out that Mickey won the race.

Chomsky also tested children with sentences in which a pronoun occurred in the subordinate clause and preceded or followed the NP, in which the pronoun correctly refers to either the NP in the sentence or to someone outside the sentence, as shown below, in *Structures 2* and 3 (1969: 104):

Structure 2
pronoun in subordinate clause, precedes NP
After he got the candy, Mickey left.
Structure 3
pronoun in subordinate clause, follows NP
Pluto thinks he knows everything.

While she does not feel that enough data was collected to make generalizations, Chomsky observes that because three children, ages 6.5, 7.0, and 7.0 chose the referent for most pronouns to be the previously mentioned referent, regardless of whether it occurred within the same sentence or in a previous sentence, they (1969: 109):

> ... seem to be operating with the simple principle that the basic function of a pronoun is to refer to what precedes, without further refinements.

In other words, they seem to use a *recency* strategy to identify pronominal referents.

3.1.2 Role cues

Four studies are now reviewed which identify comprehension strategies involving role cues.

Maratsos: maximal stability

Maratsos (1973) performed a series of experiments with 3, 4 and 5 year-old children to test comprehension of stressed *vs.* unstressed pronouns in sentences pairs such as (1) and (2) below, in which the pronoun is in the position of grammatical object and (3) and (4) below, in which the pronoun is in the position of grammatical subject (1973: 2):

(1) John hit Harry and then Sarah hit him.
(2) John hit Harry and then Sarah hit *him.*

(3) John hit Harry, and then he hit Sarah.
(4) John hit Harry, and then *he* hit Sarah.

Maratsos found that before the age of five, children could not accurately identify referents of stressed pronouns such as *him* and *he* above, although they accurately identified referents of unstressed pronouns such as 'him' and 'he' above. He proposes that this is because children use a heuristic 'natural cognitive' strategy of 'maximal stability' to interpret pronouns. By this Maratsos means that children interpret pronouns based on the stability of one or all of the following roles: surface grammatical role, deep structure grammatical role, and possibly stability of 'clause position'. So, younger children do not respond to 'emphatic stress' on pronouns as older children and adults do, and interpret stressed reference as they would unstressed reference "so as to disturb the situation as little as possible" (1973: 7).

Sheldon/Solan: Parallel function

In a study concerned with the acquisition of relative clauses, Sheldon (1974) proposed a 'parallel function strategy' predicting that children will interpret the grammatical function of a relative pronoun as being the same as its antecedent.[1]

Solan (1983) studied the role of 'parallel function' in children's comprehension of pronouns. Children were asked to use plastic animals to act out the second clause of a two-clause sentence after the sentence had been read to them. Two types of two-clause sentences were used which Solan calls 'LIKE' and 'UNLIKE'. In the former, both clauses were active or both were passive, and the latter contained one of each type of clause, *i.e.* active-passive or passive-active, as shown below:

LIKE
The dog hit the sheep, and then she hit the cow.
The dog was hit by the sheep, and then she was hit by the cow.
UNLIKE
The dog hit the sheep, and then she was hit by the cow.
The dog was hit by the sheep, and then she hit the cow.

Children were found to use a *semantic parallel function strategy* to choose antecedents in both types of sentences. This is a strategy whereby an 'agent' pronoun is most easily matched with an 'agent' antecedent, and a 'patient' pronoun is most easily matched with a 'patient' antecedent, *e.g.* in the second clause of the second *UNLIKE* sentence above, the antecedent of the 'agent' pronoun 'she' would be the agent in the first clause, 'the sheep'.

[1] A comprehensive criticism of Sheldon's experiments is contained in Correa (1982).

Wykes: grammatical relationships

From the results of two experiments designed to test children's use of inferencing in pronoun comprehension, Wykes (1981) found the 'grammatical relationship' between a pronoun and its antecedent to be an 'important factor' in comprehension, while number and gender cues may not be attended to, nor inferences drawn to interpret pronouns. Wykes proposes a model for children around the age of five to account for her experimental results as follows (1981: 277):

> ...pronouns are given an assignment as soon as they appear in the text. This assignment being based upon the syntactic positions of putative referents, the subject or focus taking precedent. The initial assignment is then compared with its inferential consequences in the remaining text. If the assignment does not make sense it is abandoned in favor of the next likely putative referent. In the case of:
>
> Jane needed Susan's pencil. She gave it to her.
>
> the initial assignment for *she* would be *Jane*. This assignment is then abandoned as it does not fit with the inferences drawn.

Chipman: role conservation

Chipman (1988) asked children to act out the meaning of the two sentences, below, and found that children up to the age of seven consistently made errors in understanding (2):

(1) The boy pushes the girl and then he washes the other girl.
(2) The boy pushes the girl and then she washes the other girl.

Chipman explains the mismatch in number and gender between pronoun and antecedent when children choose 'she' to refer to 'the boy' in (2) by proposing a *role conservation strategy*. When children use a role conservation strategy they are using an 'invented' strategy whereby they do not take into account number and gender cues and the role of agent is conserved; therefore the pronominalized agent of the second clause is interpreted to be the agent of the first clause. Consequently, in the second sentence (above), children kept (1988: 173):

> ...the same agent for both actions (having the boy push *and* wash), thus treating (2) as if it contained *he* instead of *she*.

3.1.3 Role cues: summary

Maratsos has explained that in proposing the natural cognitive strategy of 'maximal stability' for understanding pronominal 'co-reference', "questions do remain as to exactly what factors were most effective in this strategy" (1973: 7). The review above shows that questions still remain as to what factors are most effective in a children's role-cue strategy. It does seem likely that at least until the age of seven, children use some kind of general heuristic strategy for interpreting pronouns to filter out number and gender cues in favor of one or more parallel function or clause position cues. Furthermore, if text-based inferences are not involved in assigning antecedents, as Wykes (1981) proposes, then the model of comprehension which begins to emerge would have to propose that, for children up to the age of seven, pronoun interpretation is a separate process from interpretation of the whole text. This theme is taken up in the next two comprehension studies reviewed.

3.1.4 On-line interpretation

Tyler: thematic subject, pragmatic plausibility

Tyler (1983) presents a study of pronoun comprehension in which she is concerned with individual cues or combinations of cues children use to integrate on-line pronoun interpretation with their ongoing interpretation of text. Using a probe task, she found 'thematic subjecthood' to be a dominant cue when five-year old children chose antecedents; but, when there is no thematic subject, five-year-old children do not assign an antecedent at all: they do not use number and gender cues carried by the pronoun nor do they assess the 'pragmatic plausibility' of potential antecedents. In other words, they do not assess whether potential antecedents, in Wykes' (1981) terms 'make sense' in the sentence in which pronouns are used. In contrast, older children (ages 7–10) and adults were found to assign antecedents on the basis of a "variety of different sources of information", specifically (1983: 339):

> ...the lexical properties of pronouns, the pragmatic plausibility of potential antecedents and the thematic structure of the discourse all contribute towards the selection of a referent.

One major problem with Tyler's study is that she does not consider the possibility that her results are just as likely to indicate that five-year-old children use some version of a parallel function strategy to interpret pronouns than that they do not interpret pronouns at all. Tyler bases her hypothesis, that five-year-old children do not interpret pronouns at all in the absence of a 'thematic subject'

cue, on their failure to be disturbed by the *pragmatic implausibility* of sentences such as (2b) below, while she finds that they *were* disturbed by the implausibility of np-anaphors in sentences such as (1b) below. Tyler interprets these results to indicate that *She* in (2b) has not been interpreted at all, while *Mother* in (1b) has. However, an alternative explanation might be that children interpret *She* by immediately processing *She* on the basis of parallel function, and they may not be disturbed by pragmatic implausibility because they do not subsequently assess the assignment for pragmatic plausibility (1983: 337):

(1a) Mother saw the postman coming from a distance.
(1b) *Mother* brought a letter from Uncle Charles who ...
(2a) Every now and then, the princess goes to see the old shepherd.
(2b) *She* takes good care of the sheep and ...

If five-year-olds do choose an antecedent on the basis of parallel function but do not assess the antecedent's pragmatic plausibility, Wykes' model, in which inferential consequences are considered after an antecedent is selected for reassignment if necessary, would be contradicted. In addition, whether children use a 'thematic subject strategy' to interpret pronouns at all would have to be further investigated, because they may be using a parallel function strategy to interpret pronouns which refer to a thematic subject as well. Furthermore, choosing antecedents but not assessing antecedents for pronouns implies that children process pronouns differently than they process np-anaphors, because Tyler found children to be disturbed by the 'pragmatic implausibility' of an np-anaphor (2b above).

Yuill and Oakhill: recency/plausibility

Yuill and Oakhill (1991) suggest that seven-year old children, classified as 'poor comprehenders', used a combination *recency/plausibility strategy* to interpret the first occurrence of 'he' in the last sentence in the passage below (1991: 92):

> Bill was proud of his new fishing rod and reel. His mother had given it to him for his birthday. On Saturday morning, Bill was going on a fishing trip with his Uncle, the Captain. As he carried his rod to the bus stop, he met Mrs. Tripp from next door.

Yuill and Oakhill explain that when 'he' occurs, four characters have already been mentioned, two female (Bill's mother and Mrs. Tripp), and two male (Bill and his Uncle, the Captain), and Bill has been established as the main character. They further explain that the female characters "can be ruled out as antecedents" (although one child did give a female as the answer), and that "several features

of the context suggest that Bill is the answer: he is the main character as he is mentioned in the title, he has just been given a fishing rod and going on fishing trip" (1991: 92).

Yuill and Oakhill suggest that it would be easy to find the correct answer to be 'Bill' if the reader had built up a "model of the story so far" (1991: 92). However, they found that a majority of poor comprehenders interpreted 'he' as referring to *Bill's uncle*, and propose that this is because Bill's uncle is "the most immediately preceding plausible response" (1991: 92). These results lead to a comparison between how poor and skilled comprehenders interpret pronouns (1991: 92–93):

> ...it looks as though less-skilled children sometimes look for the nearest plausible response, whereas skilled children are more likely to use a mental model of the text.

In summary, Yuill and Oakhill propose that some children may use a *recency* strategy to interpret pronouns and check the pragmatic plausibility of their choice, while others use more adult-like strategies to integrate pronoun resolution with interpretation of the text as a whole.

3.1.5 Summary: comprehension strategies

The review of pronoun comprehension has shown that a variety of strategies are proposed for children up to the age of seven, such as recency, maximal stability, parallel semantic function, grammatical relationships and assignment checking, role conservation, thematic subject strategy, non-interpretation, and recency/plausibility. Overall, it seems likely that, at least until the age of seven, children use some kind of 'natural cognitive' heuristic strategy to filter cues to interpret pronouns, and that their interpretation of pronouns proceeds separately from the interpretation of the text as whole. So, a model of children's comprehension is likely to be quite different from the adult model of comprehension proposed in the previous chapter.

In the next section, pronoun production studies are reviewed, and then the relevance of comprehension and production studies to the investigation presented in Chapters 4–6 of this thesis is explained.

3.2 Production studies

This section looks at several studies which are about pronominalization in spoken narratives, beginning with an overview of Karmiloff-Smith's work (1986; 1987)[2]. Then follows a review of a study by Bamberg (1987), and then one by Wigglesworth (1990), both of which follow on from Karmiloff-Smith. All three studies have as their main goal the study of how children use referential forms to organize their narratives cohesively. Following these three studies, is a review of an experiment by Yuill and Oakhill (1991) which is generally concerned with assessing the usage of cohesive devices in narratives.

3.2.1 Karmiloff-Smith: cognitive model

Based mainly on data collected in an on-line narration task in which children told a story of a boy and a balloon-vendor depicted in six pictures, Karmiloff-Smith (1986; 1987) argues for a three-level 'cognitive' model of pronoun production:

- *Level 1* (4 – 5 years old): At Level 1 no evidence is found that referential forms are used to globally organize the text as a single unit. Rather, children use pronouns and noun phrases deictically in discourse generated by predominantly data-driven processes "producing a description of each picture", (1987: 190), and one example from this age group given in Karmiloff-Smith (1987) is described as containing "rich lexical variety" [190]. Karmiloff-Smith describes each utterance as being "a unit unto itself" (1986: 472), while narratives are 'held together' by the spatial deictic or frequent paralinguistic gestures (pointing, eye gaze, head movements, *etc.*) which accompany pronominalization, rendering pronouns interpretable.

  The following example of text is typical of Level 1 (1986: 471):

  > There's a little boy in red. He's walking along and he sees a balloon man and he gives him a green one and he walks off home and it flies away into the sky so he cries.

- *Level 2* (6 – 7 years old): Children are described as starting "to use referential expressions in their discourse function", *i.e.*, they (1987: 188):

  > ...introduce a referent with an existential expression, or if the referent is already shared knowledge with the addressee, then a definite referential expression or a proper name is used. The child

[2]Karmiloff-Smith (1986) and (1987) consist of a reanalysis of Karmiloff-Smith (1980) and (1981).

> then implicitly raises the following question: is there a main protagonist involved in a sequence of events? If the answer is affirmative, the child creates a thematic subject and generates a series of reference-maintenance procedures and constraints. The output is governed by the thematic subject constraint, which preempts pronominalization in initial utterance slot for thematic subject.

Children of this age are also described as monitoring the flow of their connected utterances, and as organizing their text as a single unit, by generating *top-down control procedures.* The following example is an excerpt from a story narrated by a child in the 6–7 year old age group (1986: 472):

> There's a boy going along. He gets a green balloon. He lets go of the balloon and he starts crying.

- *Level 3* (8 – 9 years old): Children use pronominalizations and noun phrases as *differential markers* to structure their narratives as a whole. Narratives are globally organized through the 'dynamic interaction' between data-driven and top-down control processes, which "interact smoothly" (1987: 192). The thematic subject is pronominalized in utterance initial slot, but nonthematic subjects also occupy utterance-initial slot, clearly 'marked' by the use of noun phrase or a stressed pronoun, for example (Karmiloff-Smith, 1986: 472):

> A little boy is walking home. He sees a balloon man. The balloon man gives him a green balloon so he happily goes off home with it, but the balloon suddenly flies out of his hand and so he starts to cry.

Karmiloff-Smith: critique

Karmiloff-Smith identifies what appears to be three clearly marked stages of development. However, it is difficult to accept that any of the children in her study chose referential forms in order to organize their narratives globally, using 'top-down' control procedures, as she proposes for the two older age groups. Subjects performed an on-line narration task, so they would have produced referential forms incrementally, and so it was unlikely that they would have used any global strategies. For example, they could not have known in advance that 'the boy' would appear in each picture, so they would not have had the opportunity to organize the story around a thematic subject.

Karmiloff-Smith is not able to explain why, when faced with the same on-line narration task, children of different ages take different 'preferred options' or 'exit

routes' (Aitchison, 1989)[3] for producing referential forms incrementally. A more detailed study of their choice of referential forms, along the lines of a study by Harris (1980), (as reported in Perera (1984: 242–3)) may have provided further insight about the differences between how Karmiloff-Smith's subjects produced pronouns. Harris found that from the ages of 12–15 children had difficulty disambiguating pronominal reference when they produced written texts in which they wove together two or more strands of action or description. However, when there was only one central character in a narrative, who typically occupied the 'subject slot' in successive sentences, pronominal reference in the 'subject slot' presented no serious problems for the same children.

In the narrative excerpt by the 6–7 year old child shown above, concerning 'the boy' who buys a balloon, 'the boy' typically occupies the 'subject slot' in successive sentences, and pronominal reference to the boy appears to present no serious problems, particularly as no other character is even mentioned. However, the older child, in the 8–9 year-old age group, produced a narrative excerpt in which the two singular, male characters interacted, both male characters are referred to, and only 'the boy' is pronominalized. Initially, 'the boy' is walking home and when he sees a 'balloon man', 'the boy' is referred to with the pronoun *He*. When the balloon vendor sells the boy a balloon, the reference in initial position is 'switched' from 'the boy' to 'the balloon man', a full noun phrase is used to refer to 'the balloon man' and the boy is pronominalized in non-initial position.

These observations could be further analyzed to determine how (or whether) pronouns were used to enable (or not enable) pronoun processing. However, the type of task which Karmiloff-Smith performed would have limited the analysis, because there would have been no opportunity for subjects to have *constructed* a narrative, nor to have perceived the boy to be a thematic subject. Furthermore, the stimulus material is not sufficiently varied to elicit narratives in which it would have been possible for extensive interaction between two or more characters to have taken place.

3.2.2 Bamberg: global-local model

Like Karmiloff-Smith, Bamberg (1987) presents a study of a wordless picture book on-line narration task to analyze the relationship between referential forms and organization of the text. The major differences between his study and Karmiloff-Smith's are that in Bamberg's study:

[3]Aitchison uses these terms in a different context — an article about the evolution of the tense-mood-aspect system of the pidgin-creole language Tok Pisin.

- German-speaking subjects belonging to slightly different age groups, $3\frac{1}{2}$–4, 5–6, and 9–10, were tested;
- German-speaking adult subjects (one parent, per child) were tested as a control group;
- A longer stimulus story was used (Mayer, 1969) which was a textless picture book consisting of twenty-four pictures. The story is described by Bamberg as conforming to a prototypical adult story grammar, as the characters develop a series of goals based on internal responses to external stimuli (1987: 22):

  > ... at the beginning the protagonists — a little boy and his dog — are confronted with the problem of the disappearance of a frog. This problem induces plans and sequences of activities on the part of the two protagonists, as they aim to find the frog, and, towards the end of the story, they find a frog which they appear to believe is the same frog as the missing frog.

- The experiment was conducted in four phases, preceded by a 'warm-up' phase. In the warm-up phase the investigator and subjects interactively narrated a slide show of the story as they watched it. After this, (Phase 1) each child was taken out of the classroom individually, and asked to get to know the story and the book, and asked to retell the story. In Phases 2 and 3, the child was told the story on two consecutive days by a parent. Then, at school, the child told the story to the investigator, while turning the pages of the picture book at his/her own pace (Phase 4).

In addition to these differences in subjects, materials and method, Bamberg analyzed character references in narratives according to their form and function making no distinction as to utterance position or grammatical case. Character references are classed as either 'nominal expressions' or 'pronominals', which implement either the function 'switch' or 'maintain'.

An adult model

As Bamberg expected, he found his adult group to use what he calls an *anaphoric strategy* to form a cohesive narrative. The form/function pairings produced for both main character (a boy) and secondary protagonist (a dog) were the same; when characters were introduced or reintroduced *i.e.* when reference was *switched*, they primarily used a nominal, and, when they *maintained* reference they primarily used a pronominal. Adults were found to deviate from this strategy when they

used a 'definite noun' or 'name' to *maintain* reference to mark the beginning of a new information unit, a process Bamberg calls 'foregrounding' a new paragraph.

Bamberg attributes the adult strategy to "diametrically operating text-building strategies" (1987: 65) in which bottom-up local and top-down global discourse 'subsystems' are pulled together to form a narrative. Which forms to use in the current (local) narrative context are considered in the local subsystem and results in form/function regularities (pronominals to maintain and nominal expressions to switch reference). The advancement of thematic progress over the whole text in the global 'subsystem' results in the form/function 'exceptions', such as the use of a nominal expression to maintain reference when it is produced at the beginning of a new 'paragraph', as foregrounding gives " ... *coherence* or shaping to the overall structure of the narrative" (1987: 188).

Developing the adult system

Children's development of the adult system is modelled in three phases. In each successive stage of development Bamberg proposes *strategies* to describe how children produce form/function relationships when they refer to each protagonist and how this gives coherence or shape to the overall structure of their narratives and, finally, how children progress toward the use of an adult 'anaphoric strategy':

- *Stage 1*: The application of a *thematic subject strategy* in the youngest age group ($3\frac{1}{2}$–4) marks the creation of a global subsystem in which advancement of thematic progress over the whole text is considered by the child, based on the overgeneralized principle formed from parental input, that pronominal forms are used for advancing the plot and nominal forms are used to provide background information and for reference to characters when plot progression is interrupted. Bamberg's version of a *thematic subject strategy*, is "marked by a predominance of pronominal forms as reference maintaining *and* reference switching devices" (1987: 93) when children refer to the main protagonist, *the boy*. The secondary protagonist, *the dog*, is referred to with pronominal forms to maintain reference and full noun phrases to switch reference.

- *Stage 2*: The thematic subject strategy is still predominant in the middle age group (5–6), but children in this age group show evidence of developing a *locally contrasting strategy* to advance thematic progression (Bamberg, 1987: 93):

  > ...that shows no clear preference towards a clear separation of form-function pairing, between two protagonists but ...seems to

> depend on ... decision[s] based in the 'here-and-now' of the narrative.

Unlike an adult anaphoric strategy, the locally contrasting strategy does not exploit form-function relationships to keep reference switching and maintenance apart. (Reference is not consistently switched with a full noun phrase, nor maintained with a pronoun.) Rather, when the form of the reference to a character is chosen 'locally', it is solely for the purpose of distinguishing one character from another — regardless of whether reference is being switched or maintained. For example, if *the boy* is pronominalized, then *the dog* is referred to with a full noun phrase.

- *Stage 3*: Children in the oldest age group (9–10) predominantly use an adult-like *anaphoric strategy* which marks the integration of local and global subsystems, evidence that they have gradually recognized that adult usage differs from theirs, and that they have inherently reorganized their linguistic system. Like adults, children at this age use nominal expressions to switch and pronominals to maintain reference, and nominal expressions to maintain reference on paragraph boundaries. They therefore show that they organize local segments of text from a holistic perspective.

Bamberg: critique

Bamberg uses more sophisticated stimulus materials, data collection, and data analysis techniques than Karmiloff-Smith; hence, it is not surprising that even though his overall goal is similar, he finds children to use more complex strategies. Still, like Karmiloff-Smith he proposes a three-staged model of production which shows children to progressively develop an adult system of pronominal usage to organize their narratives.

Even though he proposes clearly demarcated stages, one of the most striking features of Bamberg's analysis is that he devotes a great deal of effort to explaining deviations from the general patterns which he identifies, particularly in the middle age group. This feature of his study has elicited praise in a review of his work (Preece, 1992: 484):

> Bamberg's analysis is impressive ... after identifying general and group trends, he meticulously and systematically unpacks his data, directing close attention to individual children, to particular cases, to seemingly idiosyncratic responses and to all instances that appear to deviate from any general pattern described.

However, it seems more likely that Bamberg's close attention to individual children stems from his difficulty in identifying general patterns within the constraints of the adult model which he proposes. In the adult model, form/function pairings are clearly regular, with exceptions accounted for by their role in demarcating narrative structure, following the ideal syntactic structure of an adult story grammar.

Even though Bamberg's subjects were familiarized with the story which they narrated, they may have, as Karmiloff-Smith's subjects appear to have done, produced references incrementally, as each picture was presented to them. As an alternative, Bamberg could have admitted to finding 'a fairly messy situation' (Aitchison, 1989: 168)[4] in the pronominalization strategies of children, particularly in the middle (5–6 year old) age group. He could then have enumerated the preferred pronominalization options which children took. This type of analysis may have required an attention to details which Bamberg omitted, such as an account of whether pronominals were produced in initial and/or non-initial position instead of, as Bamberg explains for his coding procedure (1987: 48–49):

> ... collaps[ing] the different use of the different cases (nominative, dative and accusative) regardless of the position in the sentence they [took].

Alternatively, assuming that some children (perhaps in the oldest age group) did organize the narratives they produced in Bamberg's study, an analysis of preferred options may have led to an understanding of whether, and if so how, narrative structure was involved in enabling interpretation of the pronouns produced rather than an analysis of how pronouns shaped the overall structure of the narrative. But, this would have required a more psychologically plausible model of how children structure their narratives than the adult story grammar used by Bamberg (Rumelhart, 1975).[5]

3.2.3 Wigglesworth: linguistic cohesive devices

Wigglesworth (1990) studied children in three age groups: 4;0-4;11, 6;0-6;11 and 8;1–8;11, and one adult control group, in a series of experiments which is described

[4]This expression is used by Aitchison in a different context — the study of the evolution of the tense-mood-aspect system of Tok Pisin.

[5]This criticism is based on the acceptance of a theoretical position that maintains that story grammars fail to capture a psychologically plausible descriptions of how narratives are produced or understood because they fail to describe the structure of narratives according to their content, and they fail to reflect how adults understand or construct narratives to be referentially continuous; see Black & Wilensky (1979) and Garnham *et al.* (1982).

as following on from both Karmiloff-Smith's and Bamberg's studies. She states her goal as the study of how children organize their stories through the use of referential forms by examining how children develop 'linguistic cohesive devices', mainly pronouns, for switching and maintaining reference.

Two picture-prompt stories were used in an on-line narration task to elicit narratives in which Wigglesworth attempted to control the effects of thematic subjecthood. The first story, consisting of eight pictures, was designed so that no strong thematic subject would emerge "since no single character could be easily singled out as a major protagonist" (1990: 111). The second story, on which the discussion is centered, was designed to encourage the development of a thematic subject. In this story, a 'main character' (a girl) is established. The girl waits for a train in the first three pictures, and then, in the fourth picture, a second protagonist of the same sex (a woman) is introduced as the girl enters the train carriage in which the woman is already seated; then, the two characters interact when the woman offers the girl some sweets.

Another thematic subject strategy

Wigglesworth expected the results of her experiment to support Karmiloff-Smith's three-level cognitive model (Karmiloff-Smith, 1986; Karmiloff-Smith, 1987). However, on the basis of the results shown in the middle age group (6–7), she concludes that "Karmiloff-Smith's formulation of the thematic subject constraint was too strongly stated" (1990: 123), and therefore most of the discussion is about this age group; three different strategies are proposed to account for how the twenty 6–7 year-old subjects maintained and switched reference in *utterance initial position*, mainly in the story about a girl and a woman on a train, designed to encourage the development of a thematic subject (as described above).

The strategy which Wigglesworth calls a thematic subject strategy, is used by $\frac{4}{20}$ of her subjects (20%). This thematic subject strategy is characterized by the use of a pronoun to refer to 'the girl' in utterance initial position following reference to 'the granny' in the same utterance position. *I.e.* , reference is *switched* to 'the girl' with a pronoun, and subsequently *maintained* with a pronoun, while reference is *switched* to 'the granny' with a full noun phrase and *maintained* with a pronoun as shown the following passage (to which the notation [S] has been added to indicate *switch* and [M] to indicate *maintain*, and bold face type and subscripts have been used to identify referents, and italicized text in parentheses represents Wigglesworth's own comments) (1990: 120):

> '...and there's **a granny**$_{ii}$ [S] there and **she**$_{i}$ [S] (*i.e. girl*) put her luggage in her net ... and **she**$_{i}$ [M] sits down ... **the granny**$_{ii}$ [S] looks

> in her basket ... and **she**$_{ii}$ [M] finds some/and **she**$_{ii}$ [M] finds some sweets for her (*i.e. girl*) ...'

Both characters treated in the same way

The thematic subject strategy is contrasted with a strategy used by only one child, in which reference to 'the girl' and 'the woman' is produced in the same way: *switched* using a full noun phrase, and *maintained* using a pronoun in utterance initial position (1990: 120):

> '... and then **another lady**$_{ii}$ [S] comes in and **she's**$_{ii}$ [M] got a book with her ... and then **the little girl's**$_{i}$ [S] sitting down ... and **the lady's**$_{ii}$ [S] looking in her bag and **the little girl**$_{i}$ [S] is still sitting down wondering what to do ... and then **the lady**$_{ii}$ [S] gives her ... some sweets and **the little girl**$_{i}$ [S] looks happy ... then **she**$_{i}$ [M] takes one ... and **she**$_{i}$ [M] says 'thank you' ... then **she**$_{i}$ [M] pu/ ... then **she's**$_{i}$ [M] ... eats it ... and the li/and the/and **she's**$_{ii}$ ... **the lady's**$_{ii}$ [S] looking at the book'

Avoiding pronominals

The remaining *fifteen* subjects (75%) used a strategy whereby they avoided using pronominals altogether; full noun phrases are used to refer to both characters as in the following passage (1990: 121):

> '... and now the girl's looking at that girl/at that woman and the woman's trying to get something ... the woman gave the little girl some sweets... and the little girl is picking one of them/the sweets up ... and the woman ... is holding her bag of sweets ...'

Local/global strategies

Wigglesworth proposes that, together, the three strategies described above "indicate the emergence of an awareness that pronouns referring to the thematic subject can function intersententially as discourse organizers" (1990: 120) as they do in the narratives of Karmiloff-Smith's 6-7 year old group, and that the three strategies indicate that "six-year-olds were generally concerned with their use of referring expressions, and overall narrative organization" and more importantly that (1990: 121):

> ... these children are beginning to understand the different functions of anaphoric pronouns at both a local level and as mechanisms for

> establishing the thematic subject at the level of overall discourse organization.

In contrast, four-year-olds favour the use of deictic pronouns, and (1990: 124):

> ... showed some attempt at organizing their narratives into a cohesive unit with the use of temporal connectives and adverbials and with some use of zero anaphora.

Although eight-year-olds produced more complex and detailed narratives, Wigglesworth explains that their (1990: 124):

> ... organizational processes were not yet complete, suggesting that the task of becoming fully competent in the complex skills of discourse organization is one which takes place over a substantial period of time.

Wigglesworth critique

The main criticism of Wigglesworth's study is similar to that of Karmiloff-Smith's and Bamberg's. The pursuit of a staged model of how referential forms are used to organize narratives, seems to have led her away from an in-depth analysis of the diversity of strategies ('exit routes' or 'preferred options'), which children in her study appear to have taken, particularly in the 6–7 year old age group. Like Karmiloff-Smith and Bamberg, Wigglesworth does not consider pronouns in non-initial position, relies on a three-staged model, and does not contend with the 'fairly messy situation' which she finds in her data. Ironically, because she does not pursue the possible relationship between the establishment of a thematic subject and the ability to organize discourse as a whole, Wigglesworth contradicts herself when she identifies both the use of a thematic subject strategy in the 6–7 year old age group and the incomplete development of the ability to organize discourse as a whole in the 8–9 year old age group.

3.2.4 Yuill and Oakhill: a variety of strategies

Yuill and Oakhill (1991) performed a production experiment using a spoken story task with children having a mean age of 7;11, and having different reading comprehension skill levels. Their main purpose was to generally assess the establishment of cohesive ties. Subjects were presented with sequences of six pictures in a 'serial' and 'simultaneous' condition. The serial condition was similar to Karmiloff-Smith's on-line narration task; serial presentation of pictures was used to elicit an on-line narration, while in the 'simultaneous' condition subjects viewed pictures which told a story simultaneously, laid out in their correct order, and were asked

to tell the story themselves. Children were found to use more 'repetitions' (defined by Yuill and Oakhill as repetitions of pronouns *or* full noun phrases) in the serial than the simultaneous condition, a result Yuill and Oakhill term the use of 'embedded' references. These results lend some support to the idea that different types of tasks may lead children to produce pronouns differently, as there appears to be some correlation between serial presentation and repetition. However, it is difficult to make detailed comments on these results, as Yuill and Oakhill do not distinguish between repeated pronouns or full noun phrases.

Another interesting feature of Yuill and Oakhill's experiments is that they found much variation in how referential forms were produced, and that, generally, they found referential devices to be used more 'effectively' in stories where characters were of different sexes, implying that when characters were of the same sex (and number), children did not enable listeners to disambiguate reference.

In general, this experiment highlights the importance of considering that when faced with the same task, children *in the same age group*, who have varying linguistic abilities, may find a variety of exit routes and appear to be influenced by the complexity or type of the data-driven task they are asked to perform.

3.2.5 Summary: pronoun production

The main problem which has been isolated in the three main production studies reviewed (Karmiloff-Smith, 1986; Bamberg, 1987; Wigglesworth, 1990) is the failure to tease out various strategies to adequately describe how children incrementally produce pronouns in on-line narration tasks and take different 'exit routes' when they use referential forms. Further problems are insufficient variety of stimulus material and data-driven tasks, the failure to analyze non-initial pronouns, and an inadequate analysis of narrative structure.

3.3 Influence of comprehension and production studies

In this thesis, the goal of the study of written narratives is to propose a model of how children enable, or fail to enable pronoun processing, relative to the adult model of production proposed in Chapter 2. An attempt is made to overcome the limitations identified for the production studies reviewed, and an analysis is made of children's preferred options or exit routes for producing reference to characters in their texts. Pronouns are analyzed in both clause-initial and clause non-initial position, in narratives which children construct themselves, using stimulus materials which gives them opportunity to pronominalize interacting characters of

female, male and 'unspecified' gender, in the singular or plural.

As explained in the Hypothesis section of the following chapter, it is expected that the inefficiency of the working memories of seven-year-old children will limit their ability to integrate pronoun production with the construction of narratives as a whole. This may result in a 'fairly messy situation'. At the same time, it seems likely that children will take a variety of preferred options when they pronominalize which resemble the comprehension strategies reviewed in this chapter, and hence may be identifiable as heuristic production strategies.

The three production experiments performed are fully described in Chapters 4, 5 and 6 which have the following contents:

Chapter 4: Introduction; Hypothesis; Method; Description of Subjects; Procedure; Materials; and Coding of Narratives for Analysis.

Chapter 5: Results;

Chapter 6: Summary of Results; Discussion, and a Psycholinguistic Model of Children's Pronoun Production.

Chapter 4

Investigating pronoun production

This chapter introduces the investigation of the production of pronouns in written narratives of seven-year-old children reported in this thesis, and consists of the following sections: Hypothesis, Method, Subjects, Procedure, Materials, Coding of narratives, Data analysis programs, and Summary of coding.

4.1 Hypothesis

The review of production studies presented in the previous chapter has shown that despite efforts to account for data in clear-cut three-staged models, pronoun production gives the appearance of being a highly variable and messy situation. This study attempts to formulate a coherent model from the messy situation by teasing out preferred options which children take before they have developed the ability to 'enable' pronoun interpretation.

If it is assumed that the limited capacity or inefficiency of children's working memories would limit the ability to integrate pronoun production with the construction of their narratives as a whole, then it follows that children are unlikely to enable operations involved in pronoun resolution to occur in real-time. They would not be able to enable readers to collect cues which would converge in real-time as they dynamically constructed a mental model of the text.[1]

[1]Yuill and Oakhill (1991) argue that "the successful comprehension of text requires the production of a *mental model* of what the text is about" and investigate children's reading comprehension in terms of whether inefficiency of working memory in poor comprehenders is caused by "difficulty with making inferences from text and integrating the ideas in it" (1991: 21). Similarly, the 'inefficiency' of children's working memories could affect their ability to *produce* texts from which a coherent mental model could be built up by a reader. (See also Hitch *et al.* (1991) for a study about the development of short-term memory.)

So, what do seven-year-old children do if they do not *enable*? Wigglesworth (1990) has shown that they sometimes avoid pronominalization altogether, or they may pronominalize only one character, or pronominalize two interacting characters. Yuill and Oakhill (1991) have found that children's pronouns were easier to interpret when characters had the same number and gender, and that children tended to repeat pronominal references more often when they were asked to relate a sequentially presented narrative rather than to construct a narrative from simultaneously presented pictures. Karmiloff-Smith's seven-year-old subjects (1980) repeatedly pronominalized one character in 'utterance-initial position', and Bamberg's subjects (1987), who were younger than seven, showed a tendency to pronominalize only one of two interacting characters having the same gender.

Pronoun comprehension studies reveal a less messy or varied situation. Chomsky (1969) has proposed a 'recency' strategy whereby pronouns are understood to refer to the preceding entity, and a number of 'strategies' which are commonly referred to as 'parallel function' strategies have been proposed which predict that children interpret pronouns on the basis of one or more role cues. For example, Maratsos (1973) proposes that children use a 'general' cognitive heuristic strategy which he calls 'maximal stability', and Chipman (1988) offers the hypothesis that children filter cues other than semantic roles when they interpret pronouns.

Clearly, all of these comprehension strategies can potentially be accounted for in a model of children's comprehension in which the limited capacity of working memory is manifested in strategies which separate pronoun processing from the interpretation of the text as a whole. It would therefore be convenient if mirror-image strategies could be proposed for production. For example, a strategy whereby pronouns were repeated in children's narratives to successively implement the same syntactic or semantic roles to cue pronoun interpretation; or, a strategy whereby the basic function of a pronoun is to refer to the previous entity. However, Karmiloff-Smith (1980) has objected to studying parallel function and recency in relation to pronoun production on the basis that these strategies are used as convenient descriptions by psycholinguists concerning the comprehension of individual sentences.

This study attempts to find a way out of the dilemma of choosing between accepting production to be a 'messy situation' and using the convenient descriptions of comprehension. Whole narratives are elicited and analyzed with the expectation that children will show that they have acquired 'behavioral strategies' for the production of pronouns. These would be heuristic 'natural cognitive' strategies constrained by the development of working memory (Bever, 1970). Hence, production strategies are expected to most closely resemble the comprehension strategy identified by Maratsos (1973) as 'maximal stability' of syntactic posi-

tion, semantic position or clause position. However, it is expected that when children are confronted with the task of constructing their own narratives, they will use heuristic strategies as 'preferred options' for pronominalization which may involve cues produced above the level of the individual utterance. If behavioral production strategies can be identified in connected discourse, then some progress toward formulating a coherent account of what appears to be a highly variable and messy situation will have been made.

4.2 Method

Three main experiments were carried out: the **Sneetch** experiment, the **Ugly Duckling** experiment and the **Tortoise and the Hare** experiment. In each experiment children viewed a cartoon video, and then were asked to write the story of the cartoon in their own words. Listings of narratives produced in each experiment are contained in Appendix A: Sneetch; Appendix B: Ugly Duckling; and Appendix C: Tortoise.

In addition, one pilot adult experiment was carried out, the **Sneetch Adult** experiment. Narratives were produced by four adult subjects who were employed as Research Assistants at the Microcomputer Center at the University of Dundee, Scotland. They viewed the Sneetch cartoon and then were asked to write the story in their own words; all writers completed their task within twenty minutes, without revision. These narratives are used for reference in the Discussion contained in Chapter 6, but were not further analyzed. Narratives produced in the adult experiment are listed in Appendix D and are not further referred to in this chapter.[2]

4.3 Subjects

4.3.1 The Sneetch experiment

Twenty-four children in the lower-third (Primary 3) class of Our Lady's School, Dundee, Scotland, participated in the Sneetch experiment. The chronological ages of the subjects who participated ranged from 6;11–8;0 with a mean age of 7;5 and a median age of 7;6.5.

[2]The adult narratives were elicited as a pilot experiment and could not be analyzed in the same way as children's narratives. Children's narratives were analyzed in relation to the adult model of pronoun production given in Chapter 2.

4.3.2 The Ugly Duckling experiment

Eighteen children from the same lower-third (Primary 3) class of Our Lady's School, Dundee, Scotland participated in the Ugly Duckling experiment. The chronological ages of the subjects who participated ranged from 6;11–8;0 with a mean age of 7;5 and a median age of 7;4.

4.3.3 The Tortoise and the Hare experiment

Thirty children in the upper-third (Primary 3) class of Park Place School, Dundee, Scotland, participated in the Tortoise and the Hare experiment. The chronological ages of the subjects ranged from 7;1–8;3 with a mean age of 7;7 and a median age of 7;8.

4.4 Procedure: data collection

Each of the three experiments lasted one class period (approximately 50 minutes). Children viewed a cartoon video which lasted from 10–13 minutes and then were asked to write the story depicted in the cartoon in their own words for the remainder of the class period.

During the course of writing, subjects were given help spelling words which were peculiar to the stories they were writing when requested, *e.g. Sneetches, Sylvester, belly, duckling, tortoise.* Correct spellings were written on the blackboard for the benefit of the whole class. Subjects who participated in the Tortoise experiment were given permission to use their personal dictionaries in which they regularly kept a record of words they found difficult to spell.

4.5 Materials

Materials for the three experiments consisted of three different cartoon videos:

1. *The Sneetches*, a Dr. Seuss story;
2. *The Ugly Duckling*, a Walt Disney 'classic' adaptation of a Hans Christian Andersen story; and
3. *The Tortoise and the Hare*, a Walt Disney 'classic' adaptation of an Aesop's fable.

The cartoon of *The Sneetches* contained dialogue throughout; the cartoon of *The Ugly Duckling* contained continuous background music and no dialogue; and

the cartoon of *The Tortoise and the Hare* continuous background music and only a few lines of dialogue.

Following are neutral summaries of the plots of each of the stories shown in the cartoon videos. After each summary, a table is given showing a list of the story's principal characters. The term 'character' is used to mean either an individual character, such as **Sylvester the conman**, or a 'group' of characters, such as **The Sneetches with stars on their bellies**. Each character's *number* and *gender* is noted in the same table. The *gender* of characters is, where possible, determined by visual cues from the videos. However, the gender of some characters, such as **The Ugly Duckling**, could have been either male or female. The gender noted for such characters was determined by the gender used by subjects in their stories.

The Sneetches

All of the Sneetches live on a beach. Some of the Sneetches have stars on their bellies and some Sneetches do not have stars on their bellies. The Sneetches with stars on their bellies feel they are superior to the Sneetches without stars on their bellies and therefore do not mix with them socially. This makes the Sneetches without stars very unhappy and jealous.

One day Sylvester, a conman, comes to the beach with a machine which can put stars on Sneetch bellies. So the Sneetches without stars decide to pay him to put stars on their bellies, and are duly processed in his machine. After this, Sylvester cons the Sneetches with original stars to have their stars removed, so that they can still be differentiated from the Sneetches who now have stars but did not originally have stars!

After creating a new batch of Sneetches without stars (who were originally the Sneetches *with stars*) Sylvester is able to con the Sneetches who now have stars to have their stars removed, so they can look the same as the other Sneetches who are still snubbing them. Several cycles of adding and removing stars occur, until Sylvester has conned all of the Sneetches out of all of their money. Then Sylvester leaves, and it is impossible to determine who is who and some Sneetches have more than one star on their belly and some have none.

The Sneetches finally see the absurdity of their situation, and decide to call an end to their feud, and they all become friends.

Table 4.1: The Sneetches: principal characters

	number		*gender*		
Character	*plural*	*singular*	*male*	*female*	*unspecified*
all Sneetches	+				+
Sneetches with stars (original)	+				+
Sneetches without stars (original)	+				+
Sylvester		+	+		

The Ugly Duckling

At first, a mother duck is sitting on her nest while a father duck paces back and forth waiting for baby ducklings to hatch from five eggs. Four of the five eggs hatch and the ducklings which appear are yellow. Then the fifth egg hatches, and the duckling which appears is white — this white duckling is the 'ugly' duckling. The father duck, mother duck argue and together with the four yellow ducklings reject the white 'ugly' duckling and leave him on his own.

So, the ugly duckling wanders off (forlorn) in search of happiness. He jumps into a pond and notices a duck bobbing in the water, but he does not realize that it is wooden. He jumps on the duck and tries to play with it, but, the wooden duck does not reciprocate. Instead, it hits him on the head when it rocks in the water. So the ugly duckling, still not realizing that he is trying to play with a wooden duck, feels rejected once more, and cries and swims away.

Eventually, the ugly duckling is found by a single-parent family of swans, consisting of a mother swan and her baby swans, and the baby swans look just like the ugly duckling. They accept him as one of the family, and they all swim away, presumably to live happily ever after.

Table 4.2: The Ugly Duckling: principal characters

	number		*gender*		
Character	*plural*	*singular*	*male*	*female*	*unspecified*
the daddy duck		+	+		
the mummy duck		+		+	
the four yellow baby ducklings	+				+
the ugly duckling		+	+		
the wooden duck		+			+
the mummy swan		+		+	
the baby swans	+				+

The Tortoise and the Hare

A tortoise and a hare prepare for a race in front of a huge crowd of animals. When the hare comes to the starting line, he is cheered by the crowd, and when the tortoise comes to the starting line, he is laughed at. The hare adds to the tortoise's humiliation by pretending he is going to shake hands with him, but withdraws his hand at the last moment. A raccoon blows the starting whistle, whereupon the tortoise disappears into his shell, while the hare runs ahead to gain an early lead. The raccoon shoots his gun at the tortoise, who finally begins the race.

The hare decides to have a nap, as he is so far ahead of the tortoise. However, during the hare's nap, the tortoise tiptoes past him, unnoticed. When the hare awakes, he sees the tortoise ahead of him, and whizzes past him. He passes a girls' school, and wooed by the sight of four cute young female bunny rabbits sitting on the wall of the school, he returns to show off to them. He shoots an arrow through an apple, plays baseball (by hitting the ball and then catching it himself), and then also plays tennis with himself by running from one side of the court to the other. The girl bunny rabbits are suitably impressed.

While this is going on, the tortoise creeps past the girls' school and is sweating it out on the way to the finish line. His legs grow quite long and his speed increases. The hare, having realized that the tortoise has gained the lead (again) makes a sprint for the finish line, but can't catch up, and the tortoise wins the race while the crowd cheers wildly.

Table 4.3: The Tortoise and the Hare: principal characters

	number		*gender*		
Character	*plural*	*singular*	*male*	*female*	*unspecified*
the crowd	+				+
the raccoon		+	+		
the hare		+	+		
the tortoise		+	+		
the four bunny rabbits	+			+	

4.6 Coding of Narratives

Each narrative was transcribed into a typeset version, which shows original spellings, and includes all text produced except a narrative title, if one was given, and any incomplete clauses produced at the end of a narrative. Narratives are listed in Appendices A, B, and C as follows:

- Appendix A: 24 'Sneetch' narratives (**S** set)
- Appendix B: 18 'Ugly Duckling' narratives (**D** set)
- Appendix C: 30 'Tortoise and the Hare' narratives (**T** set)

Each transcribed narrative is divided into alphabetized *scenes* and numbered *utterances*, to which a table has been appended containing six categories of judgments about each reference to a character in the text (in columns **form**, **syn**, **sem**, **prag**, **cont** and **strat**). The basis and notations for divisions into scenes, utterances, and the six categories of judgments about character references noted in the appended table are described and illustrated by examples in the rest of this chapter.[3]

A summary of all coding and notations is given in Figure 4.4 at the end of this chapter.

[3]Ideally, 10% of all coding judgments would have been blind checked or assessed by a separate judge; this would have increased reliability and shown which judgments were relatively clear-cut and, conversely, which were less so. In practice, only the semantic role judgments (approximately 40%) were checked against those of a separate judge.

An attempt was made to code data consistently; however, it is noted that the semantic role judgments and scene boundary judgments were found to be extremely difficult to code. This was due mainly to the difficulty in applying precise definitions of these judgments to the naturally occurring data.

4.6.1 Scenes

The structure of each narrative is marked by the division of narratives into scenes denoted by letters, **A**, **B**, *etc.* as can be seen in the sample narrative shown below in Figure 4.1. This narrative, Tortoise narrative 1, is divided into five scenes: **A**–**E**.

Note that in this example, and all subsequent examples of narratives in this chapter, attention is drawn to the column referred to in the text with the '⇓' symbol. Other symbols which have been added to draw attention to particular features are: '•', '⇐' and '⇒'. In addition, text may be enclosed by a square box, *e.g.* '$\boxed{\text{text}}$', and the caption for each Figure contains a reference to the narrative from which a sample has been extracted; *e.g.* (T1) = Tortoise and the Hare, narrative 1, listed in Appendix A. Footnotes associated with narratives have been deleted in this chapter.

Figure 4.1: Scene divisions (T1)

⇓ SceneNo	Utterance	form	syn	sem	prag	cont	strat
•A1	One day a race was with **the hare**$_i$	np	O	Sr	Co	introduce	*chANT*⟩
	and **the tortoise**$_{ii}$.	np	O	Sr	Co	introduce	*chANT*⟩
2	**the man**$_{iii}$ said	np	S	A	To	introduce	–
	redy get set GO						
3	and **they**$_{i+\ ii}$ were off	pro	S	A	To	reestablish	re/PC-/R-⟩
•B4	**the hare**$_i$ was in the lead	np	S	Th	To	reestablish	–
5	**the tortoise**$_{ii}$ was trying hard	np	S	A	To	reestablish	–
	to keep up.						
•C6	**the hare**$_i$ decided	np	S	A	To	reestablish	–
	to go to sleep.						
7	**the hare**$_i$ did not now	np	S	Ex	To	maintain	*chANT*⟩
	that **the tortoise**$_{ii}$ sneeked	np	S	A	To	reestablish	–
	past **him**$_i$	pro	O	RO	Co	maintain	main/PC-/R-⟩
8	but **he**$_i$ woke up	pro	S	Th	To	maintain	main/PC-/R+⟩
9	and ø$_i$ saw	zero	S	Ex	To	maintain	main/PC+/R+⟩
	that **the tortoise**$_{ii}$ was ahead	np	S	Th	To	reestablish	–
	of **him**$_i$	pro	O	RO	Co	maintain	main/PC-/R-⟩
10	so **he**$_i$ zoomed right past	pro	S	A	To	maintain	main/PC-/R+⟩
	poor tortoise$_{ii}$.	np	O	RO	Co	maintain	–
•D11	**he**$_i$ made	pro	S	A	To	maintain	main/PC+/R-⟩
	4 bunys$_{iv}$ jump.	np	O	P	Co	introduce	⟨*chANT*
12	**they**$_{iv}$ called	pro	S	A	To	maintain	⟨main/PC-/R+
	him$_i$ back	pro	O	P	Co	maintain	main/PC-/R-⟩
13	**he**$_i$ showed	pro	S	A	To	maintain	main/PC-/R+⟩
	them$_{iv}$ some tricks	pro	O	B	Co	maintain	⟨main/PC-/R-
14	and then ø$_i$ went away	zero	S	A	To	maintain	main/PC+/R-⟩
•E15	**the tortoise**$_{ii}$ was near the finish line	np	S	Th	To	reestablish	–
16	and **the tortoise**$_{ii}$ won	np	S	Th	To	maintain	–
17	**crowdes**$_v$ were chearing.	np	S	A	To	introduce	–

Scene definition

A **scene** is defined as a local unit of text which orients the reader's attention *implicitly* or *explicitly* by time frame or location to a set of events (which may include a description of states of mind and/or evaluation of events) in which one or more characters participate; or, failing orientation by time frame or location, orientation of the reader's attention through a discontinuity in the narrative.[4] So, a *scene boundary* was judged to occur between utterances whenever the writer reoriented the reader's attention through the use of:

- An implicit or explicit change in spatial location. For example:
  - In Figure 4.1, above, an implicit change in spatial location occurs between Scene A and Scene B;
  - In Figure 4.1, above, an explicit change in spatial location occurs between Scene D and Scene E.
- An implicit or explicit temporal break. For example:
  - In Figure 4.1, above, an implicit temporal break occurs between Scenes C and D;
  - In Figure 4.3 below, an explicit temporal break occurs between Scenes C and D.
- An obvious discontinuity in the narrative. For example,
  - In Figure 4.2 below a discontinuity occurs between Scenes A and B.

Figure 4.2: Scene boundaries (T2)

⇓ SceneNo	Utterance	form	syn	sem	prag	cont	strat
A1	one day **the hare**$_i$ and	np	S	Th	To	introduce	–
	the tortoise$_{ii}$ going to have a race	np	S	Th	To	introduce	–
B2	and **the hare**$_i$ was going very fast	np	S	A	To	maintain	–

[4]Changes in spatial location and temporal breaks often coincide.

Figure 4.3: Scene boundaries (T6)

⇓ SceneNo	Utterance	form	syn	sem	prag	cont	strat
C5	**the hare$_{i}$** zoomed past	np	S	A	To	maintain	–
	the tortoise$_{i}$,	np	O	RO	Co	reestablish	–
6	and the tree lost it's leaves						
7	when **the hare$_{i}$** looked round	np	S	A	To	reestablish	–
	the snails$_{v}$ were moving faster	np	S	Th	To	introduce	–
	than **the tortoise$_{i}$**	np	S	Th	To	reestablish	–
D8	seconds later **the hare$_{i}$** had reached the girls school	np	S	Th	To	maintain	*chANT*⟩
9	and **ø$_{i}$** was singing, dancing, talking, and playing tennis and cricket on his own	zero	S	A	To	maintain	main/PC+/R+⟩

The scene boundary judgment attempts to capture a description of the structure of children's narratives which is not independent of content.[5] The judgment is based largely on the expectation that children's narratives would consist mainly of chains of events and orientation of the reader's attention to characters, time and place; see Wilkinson *et al.* (1980), Cowie (1984), Chafe (1985), Cameron *et. al* (1988) and Peterson (1990).

The definition of a scene was further influenced by the following ideas, which have previously been applied to adult texts:

- That speakers construct coherent narratives by orienting attention to characters, place and time; see Morgan & Sellner (1980), Peterson (1990), Labov & Waletzky (1967);
- That speakers orient listeners' attention to entities in scenes through the dimensions of time and space; see Croft (1990);
- Frederiksen's (1986) definition of a 'scene structure', taken from his formal methodology for mapping the propositional semantic base structure of a narrative to a higher level semantic structure called a narrative frame. A 'scene' is likened to a stage set, as "scenes correspond to contiguous locations at which series of events take place" (1986: 244).

[5]In contrast, story grammars apply syntactic rules to account for the generation and comprehension of possible stories; see Morgan & Sellner (1980), Black & Wilensky (1979) and Garnham *et. al* (1982) for criticism of story grammars.

4.6.2 Utterances

Narratives are divided into numbered **utterances**, indexed in the **No** column, and typeset in the **Utterance** column, as shown in Figure 4.4 below. In the text of this thesis, utterances are referred to by scene and number, *e.g.* C6, and C7, *etc.* in Figure 4.4 below.

Figure 4.4: Utterances (T1)

⇓ SceneNo	⇓ Utterance	form	syn	sem	prag	cont	strat
C6	**the hare$_i$** decided to go to sleep.	np	S	A	To	reestablish	–
7	**the hare$_i$** did not now	np	S	Ex	To	maintain	*chANT*⟩
	that **the tortoise$_{ii}$** sneeked	np	S	A	To	reestablish	–
	past **him$_i$**	pro	O	RO	Co	maintain	main/PC-/R-⟩
8	but **he$_i$** woke up	pro	S	Th	To	maintain	main/PC-/R+⟩
9	and **ø$_i$** saw	zero	S	Ex	To	maintain	main/PC+/R+⟩
	that **the tortoise$_{ii}$** was ahead	np	S	Th	To	reestablish	–
	of **him$_i$**	pro	O	RO	Co	maintain	main/PC-/R-⟩
10	so **he$_i$** zoomed right past	pro	S	A	To	maintain	main/PC-/R+⟩
	poor tortoise$_{ii}$.	np	O	RO	Co	maintain	–

Utterances were analyzed as being either *simple* or *complex* according to the following definitions:

Simple: A simple utterance consists of one *independent clause*, and does not contain an embedded subordinate clause; non-embedded coordinated clauses each constitute a *separate* simple utterance.[6] For example C8 and C10 in Figure 4.4 above.

Complex: A complex utterance consists of one main clause plus any *subordinate* clauses embedded within the main clause. For example, C6, C7, and C9 in Figure 4.4 above.

(Dialogue was not analyzed.)

[6]Syntactically embedded coordinated clauses are not treated as separate utterances; rather, they are included as part of the complex utterance in which they are embedded.

4.6.3 Character references

Figure 4.5: Character references (T1)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
A1	One day a race was with **the hare$_i$**	np	O	Sr	Co	introduce	*chANT*⟩
	and **the tortoise$_{ii}$**.	np	O	Sr	Co	introduce	*chANT*⟩
2	**the man$_{iii}$** said	np	S	A	To	introduce	–
	redy get set GO						
3	and **they$_{i+\ ii}$** were off	pro	S	A	To	reestablish	re/PC-/R-⟩
B4	**the hare$_i$** was in the lead	np	S	Th	To	reestablish	–
5	**the tortoise$_{ii}$** was trying hard	np	S	A	To	reestablish	–
	to keep up.						
C6	**the hare$_i$** decided	np	S	A	To	reestablish	–
	to go to sleep.						
7	**the hare$_i$** did not now	np	S	Ex	To	maintain	*chANT*⟩
	that **the tortoise$_{ii}$** sneeked	np	S	A	To	reestablish	–
	past **him$_i$**	pro	O	RO	Co	maintain	main/PC-/R-⟩
8	but **he$_i$** woke up	pro	S	Th	To	maintain	main/PC-/R+⟩
9	and **ø$_i$** saw	zero	S	Ex	To	maintain	main/PC+/R+⟩
	that **the tortoise$_{ii}$** was ahead	np	S	Th	To	reestablish	–
	of **him$_i$**	pro	O	RO	Co	maintain	main/PC-/R-⟩
10	so **he$_i$** zoomed right past	pro	S	A	To	maintain	main/PC-/R+⟩
	poor tortoise$_{ii}$.	np	O	RO	Co	maintain	–
D11	**he$_i$** made	pro	S	A	To	maintain	main/PC+/R-⟩
	4 bunys$_{iv}$ jump.	np	O	P	Co	introduce	⟨*chANT*
12	**they$_{iv}$** called	pro	S	A	To	maintain	⟨main/PC-/R+
	him$_i$ back	pro	O	P	Co	maintain	main/PC-/R-⟩

Any reference to an entity which is a character is called a 'character reference', regardless of whether the character is a human or an animal. (Or, in the case of 'the wooden duck' in the Duck narratives, an inanimate object.) Two exceptions were made when references to 'body parts' were counted as character references in the T narratives. These references were counted because there was no explicit antecedent in the same scene, and the 'body part' reference explicitly referred to a character which was pronominalized in the following utterance, (*e.g.*, **the tortoises feet** in D20 of T11). One other exception was made in the T set when a reference to **the girls school** was counted as a 'character reference' in T21. This reference was followed by a pronoun (pro), and no other reference to **the girls** occurred in the scene.

Each character reference is typeset in **boldface**, and contains a subscript which uniquely indexes the character as follows:

- A reference to a singular character having the form np or pro (see the next section below for a definition of these categories) is subscripted with a lower case roman numeral, *e.g.* **the hare**$_i$, **him**$_i$, **he**$_i$ in C7 and C8 of Figure 4.5 above.

- A reference to a group of characters having the form np or pro is subscripted with a lower case numeral, *e.g.* , in D11 and D12 of Figure 4.5 above, **4 bunys**$_{iv}$ and **they**$_{iv}$. Note that each 'superset', 'set' or 'subset' of Sneetches is counted as one character.

- A reference to a 'compound entity', which has the form pro is subscripted with the lower case roman numerals which are indexed to include the characters which comprise the compound entity. For example, **they**$_{i+ii}$ in A3 in Figure 4.5 above is a *compound entity* referring to **the hare**$_i$ *and* **the tortoise**$_{ii}$.

- When a 'missing' reference which is a zero anaphora occurs, a 'ø' has been inserted, and the reference has been indexed. *E.g.* ø in C9 of Figure 4.5 refer to **the hare**$_i$.

The following have not been included in the analysis of character references:

- References which are 'deleted' by the rules of transformational grammar, *e.g.* PRO in gerundival clauses,[7] PRO in adjunct clauses.[8]

- Relative pronouns which are produced in 'non-restrictive' relative clauses.[9]

- Reflexive pronouns.

- Subject complements.

- First person pronouns which refer to the writer (*i.e.* , 'I').

- Third person pronouns which refer to the producers of the cartoon video (*i.e.* , 'they').

- References to characters in dialogue.

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[7]See Haegeman (1991: 254-255).

[8]See Haegeman (1991: 262).

[9]Restrictive relative clauses are analyzed as part of the 'np' whch they post-modify. See Perera (1984: 77-79) or Huddleston (1984: 393-398) or for a discussion about relative clauses.

4.6.4 form column: np, pro, ø

The form column contains a notation to indicate the form of each character reference as follows.

A reference to a character involves a noun phrase (**NP**). For the purposes of this investigation, a noun phrase is described as having any one of the following forms:

- np: a single noun, a common noun, a proper noun, a 'noun substitute' or an 'np-group' (defined as a group of words that has a noun as its head which may include a clause which post-modifies the head noun), that can function as subject, object or complement.[10] For example: *the hare*, *Mummy duck*, *the ugly duckling*, *a man*, *the sneetches that have no star on their bellies*, *the sneetches without stars*, *one*, *some.*

- pro: a personal pronoun, *he*, *she*, *it*, *they*, *him*, *her*, or *them.*

- zero (ø): a zero anaphor which is a lexically empty specification of reference, marking the location where a character reference has been elided in a coordinated construction, or where a reference has been elided due to a probably physical writing error.[11] For example, ø in "he woke up and ø saw ..."

[10]See Perera (1984: 36-37) for a summary of the use of the term 'noun phrase'.

[11]In practice, there were judged to be two elisions due to a probable physical writing error, coded as ø in C19 of T11 and G16 of T18; ideally, these would have been analyzed separately. In addition, the word 'and' which would indicate a coordinated construction before the use of ø, appears to have been elided in C16 of T11.

4.6.5 syn column: syntactic role

The first of three role judgments for each character reference is a judgment made about its syntactic function within the clause in which it is produced; the type of *clause element* which the character reference is judged to express is noted in the syn column as S (Subject) or O (Object) according to the following definitions:

- S (subject): Subject is distinguished from other clause elements, in particular, from a 'predicate' insofar as it is an 'argument' of the predicative constituent (Li & Thompson, 1976), and determines concord with the predicate.[12]
- O: (object):
  - **direct object**: the direct object "typically refers to some person or thing directly affected by the action expressed by the verb" (Crystal, 1988: 38);
  - **indirect object**: the indirect object "typically refers to an animate being that is the recipient of the action ..." (Crystal, 1988: 38).
  - **object in a prepositional construction**: A noun phrase which is the 'object' of a preposition.

Examples of each form can be seen in Figure 4.6, below in which the following are highlighted: **the hare**$_{ii}$ in B6: object in a prepositional phrase [O]; **the hare**$_{ii}$ in D11: subject [S]; **four rabbit girls**$_{iv}$ in D12: direct object [O]; **the rabbits**$_{iv}$ in D12: indirect object [O].

Figure 4.6: Syntactic roles: **syn** column (T14)

SceneNo	Utterance	form	⇓ syn	sem	prag	cont	strat
B5	**The hare**$_{ii}$ went for a rest	np	S	A	To	maintain	–
6	**the tortoise**$_{i}$ catched up	np	S	A	To	reestablish	–
	with **the hare**$_{ii}$.	np	O	RO	Co	maintain	–
7	**The tortoise**$_{i}$ tipptoed	np	S	A	To	maintain	–
8	**the hare**$_{ii}$ woke up	np	S	Th	To	reestablish	–
C9	**hare**$_{ii}$ ran	np	S	A	To	maintain	*chANT*⟩
10	**he**$_{ii}$ got passed	pro	S	A	To	maintain	main/PC+/R+⟩
	the tortoise$_{i}$.	np	O	RO	Co	reestablish	–
D11	**The hare**$_{ii}$ stopped	np	S	A	To	maintain	*chANT*⟩
12	and ø$_{ii}$ saw	zero	S	Ex	To	maintain	main/PC+/R+⟩
	four rabbit girls$_{iv}$.	np	O	Pe	Co	introduce	–
13	**The hare**$_{ii}$ showed	np	S	A	To	maintain	–
	the rabbits$_{iv}$ some tricks.	np	O	B	Co	maintain	–

[12]There are many other criteria which may "combine to identify the subject of a clause" (Crystal, 1988: 36). For example, the subject usually appears before the verb in statements, and after the first verb in questions.

4.6.6 sem column: semantic role

Within each clause, a judgment about the semantic ('thematic') role of each character reference was made and noted in the **sem** column. This judgment is based on a definition of thematic role given by Ladusaw and Dowty (1988). Thematic role is determined by 'information' about the character and the role of the character referred to in the event or description encoded in the clause in which the reference occurs. In other words, thematic role was determined by the set of entailments concerning the character which the lexical meaning of the verb in the clause enforces, or the semantic relation between the character referred to and the verb phrase (predicate) which expresses the clause element 'verb' in the same clause.

Ladusaw and Dowty demonstrate this view of thematic roles using the following sentences as examples (1988: 63):

(1)a. *Fido chased Felix.*

b. *Felix was chased by Fido.*

> What makes Fido an Agent in the event described by (1a) and (1b) is information about Fido and his role in the event, not about the grammatical category or function of anything in the sentence. The lexical meaning of the verb *chase* is such that in order for a situation to be described by it, certain things must be true of Fido. That is, the meaning of the verb *chase* is such that certain things are entailed or presupposed about Fido qua dog. For an event to count as an event of Fido chasing Felix, Fido must be moving with an intention of catching Felix and Felix must be moving away from Fido. If one wishes to associate the term AGENT with one of the two participants, it is reasonable that it be with Fido rather than Felix, because it is Fido's intentions that are crucial to the event's being a chase ....

For the purpose of this investigation, the taxonomy of semantic roles has been compiled from the following sources: Jackendoff (1987), Jackendoff (1990) and Haegeman (1991),[13] and are listed and described in alphabetical order in Table 4.7 below.[14]

[13]Noting that unlike Ladusaw and Dowty, Jackendoff and Haegeman describe thematic roles as not having independent status, as they correspond to 'open arguments' of particular semantic functions which are realized syntactically in lexical conceptual structures.

[14]One of the roles listed in this table, 'Associate' was created to account for several references in the Duck narratives. In addition, the role 'Instrument' is used only in the Duck narratives when the wooden duck is referred to; the role 'Locative' is used when an exception has been made to include a 'body part' as a character reference; and, the role 'Reference Object' is used for character references, although Jackendoff identifies Reference Objects as inanimate objects, such as 'mountain' in the sentence: 'The train climbed the mountain' (1990: 259).

Figure 4.7: Semantic roles

A(Agent)	An entity which intentionally initiates action.
As(Associate)	An entity associated with another entity.
B(Beneficiary)	An entity which benefits from an action, or an entity described as being endowed by nature with a particular characteristic.
Ex(Experiencer)	An entity which experiences some psychological or mental state or which perceives an event or entity.
G(Goal)	An entity towards which an activity is directed.
In(Instrument)	An entity which is the means by which something occurs.
Lo(Locative)	An entity which is the place where something is.
P(Patient)	An entity which undergoes an action.
Pe(Percept)	An entity which is felt or perceived.
Re(Recipient)	An entity which receives something.
RO(Reference Object)	An entity which serves as a reference point or 'landmark' in relation to another entity.
Sr(Source)	An entity from which something is moved or derived.
Th(Theme)	An entity moved by an action or physically affected by an emotion, or an entity which 'exists'.

Appendices A, B and C contain footnotes which mark particularly difficult semantic role judgments, mainly due to judgments of *overlapping* roles.[15] Figure 4.8 below shows two scenes in which seven different semantic roles were judged to occur: A (Agent), Ex (Experiencer), Pe (Percept), B (Beneficiary), Th (Theme), RO (Reference Object).

Figure 4.8: Semantic roles: sem column (T14)

SceneNo	Utterance	form	syn	⇓ sem	prag	cont	strat
D11	**The hare$_{i_i}$** stopped	np	S	A	To	maintain	*chANT*⟩
12	and **ø$_{i_i}$** saw	zero	S	Ex	To	maintain	main/PC+/R+⟩
	four rabbit girls$_{i_v}$.	np	O	Pe	Co	introduce	–
13	**The hare$_{i_i}$** showed	np	S	A	To	maintain	–
	the rabbits$_{i_v}$ some tricks.	np	O	B	Co	maintain	–
E14	**The tortoise$_i$** went past	np	S	Th	To	reestablish	–
	the hare$_{i_i}$	np	O	RO	Co	maintain	–
15	**the hare$_{i_i}$** ran	np	S	A	To	maintain	–

[15] Jackendoff discusses overlapping as a problem of 'thematic hierarchy' in (Jackendoff, 1990).

4.6.7 prag column: pragmatic role

A pragmatic role judgment of To (*topic*) vs Co (*comment*) is made for each character reference and noted in the prag column.

The judgments of *topic* and *comment* are made for character references only, within the clauses in which references are produced. The definitions of these judgments are:

> *TOPIC*: The character who the clause is mainly about.
>
> *COMMENT*: The character who is referred to in the same clause as the *topic*, but who the clause is not mainly about. (*I.e.* a character who is referred to in the Comment of a clause.)

The definitions of *topic* and *comment* stated above are almost entirely based on the notion that the main idea of topic and comment stems "from the intuitive idea that we can distinguish between what we are talking about (the topic) and what we are saying about it (the comment)" (Palmer, 1981: 851). Because the topic-comment judgment is made for character references only, (*i.e.*, which character is the clause *about*, and what is being said about that character), in practice, the *topic* judgment is made for character references which express the clause element subject (S) in a clause, and the comment judgment is made for character references which express the clause element object (O).[16]

[16]The circularity of definition between syntactic and pragmatic roles is noted, with the caveat that Tomlin (1991) circumvents the problem of circularity by using the term *locus of attention* to have a similar meaning to the term 'topic', and claiming to have found evidence that "there is a rule within the grammar of English which maps the locus of [the speaker's and therefore the listener's] attention onto syntactic subject at the moment of utterance formulation" (1991: 6).

The definitions of *topic* and *comment* are set out with the knowledge that there are strong theoretical objections to the use of these categories, because they are difficult to apply in all but the simplest cases, (Morgan & Sellner, 1980), (Schlobinski & Schutze-Coburn, 1992), and that a wide variety of unsatisfactory definitions for these categories have been given in the literature. A comparative analysis of definitions can be found in Bates & MacWhinney (1982) or Schlobinski & Schutze-Coburn (1992). Lyons (1977), Engelkamp & Zimmer (1983), Tomlin (1991) and Danes (1974) contain further definitions.[17]

Examples of To and Co judgments can be seen in Figure 4.9 below:

Figure 4.9: Pragmatic roles: prag column (T13)

SceneNo	Utterance	form	syn	sem	⇓ prag	cont	strat
F18	and **the hare**$_i$ went past	np	S	Th	To	reestablish	*chANT*⟩
	some little girl rabbits$_v$	np	O	RO	Co	introduce	⟨*chANT*
19	and **they**$_v$ started to cheer	pro	S	A	To	maintain	⟨main/PC-/R+
	for **him**$_i$	pro	O	B	Co	maintain	main/PC-/R-⟩

[17]Furthermore, because it is made at clause level, the *topic-comment* judgment in this thesis does not to take into account that more than one topic-comment relationship may be established within an utterance; if the "point making function" is viewed as being recursive it "can be applied within a given utterance an indefinite number of times" (Bates & MacWhinney, 1982: 201). For example, some element which serves as a comment at one level can serve as a topic at another level.

4.6.8 Role convergence and clause position

In Chapter 5, Section 5.3.6 syntactic, semantic and pragmatic roles are further analyzed to show how these three roles converged when references to characters were produced: the term *role convergence* is used to describe the convergence of syntactic, semantic and pragmatic roles for each character reference. The correlation between role convergences and clause position is analyzed; a character reference is judged to occur in clause initial position (*cip*) when it occurs *before* the verb in a clause, regardless of whether the reference is preceded by a time adverbial, an exclamation, *etc.* And, it is judged to occur in clause non-initial position (*cnip*) when it occurs *after* the verb in a clause *and* after reference to another character. For example, in utterances (1) and (2) below, the reference indicated in bold face type is judged to occur in *cip*:

(1) **The Dad** was wacking up and Down (from D1)
(2) And then **one big egg** lade (from D5)

And, in utterances (3) and (4) the reference indicated in bold face type is judged to occur in *cnip*:

(3) so then mumma hut **dade** on the hed (from D11)
(4) He met **a wooden duck** (from D14)

The following exceptions were made to the above rules:

- In an 'existential sentence' when 'there' is followed by an inversion of subject and verb as in the utterance: "Ones a pone a time There wos a ugly duckling" (from D15), the character reference which follows the verb is analyzed as occurring in *cip*; these types of utterances occur only in the S and D set, because children in the T set followed general instructions issued by their teacher never to begin a story with "Once upon a time ...".

- In a clause in which the subject and verb have been inverted, *e.g.* : "and out came **five little ducklings**" (from D12), the subject is analyzed as occurring in *cip*, and, when there is an object, it is analyzed as occurring in *cnip*. In total, there is one clause in the S set which is an 'inversion', two in the D set and one in the T set. Only one of these utterances contains a subject *and* an object (B5 of D13). One utterance in D18 contains a repeated verb: "then came another egg came" (A4 of D18).

4.6.9 cont column: continuity function

The continuity function judgment noted in the cont column for each character reference captures information about the current 'information status' (Brown & Yule, 1983) of the character with respect to the continuity of the text: whether a character reference is used to *introduce* a character into the text, to *maintain* reference to a character or *reestablish* reference to a character which has been previously referred to in the text.

Definitions of the continuity functions are as follows:

- introduce: The judgment introduce is made when a character reference is used to refer to a character in the narrative for the first time, *e.g.* **The hare**$_i$ in A1 of Figure 4.10 on the following page.

- maintain: The judgment *maintain* is made when reference is made to a character (or a group of characters) which was previously referred to in either:

  - a previous clause of the same *complex* utterance; or
  - any clause of the immediately preceding utterance *e.g.* **he**$_i$ in B5 of Figure 4.10 on the following page.

  If a character reference is a (plural) compound entity, (such as **they**$_{i+ii}$), then a maintain judgment is made when any character in the set of characters referred to was previously referred to in either:

  - a previous clause of the same *complex* utterance; or
  - any clause of the immediately preceding utterance.

Figure 4.10: Continuity functions: **introduce**, **maintain**, **reestablish** (T3)

SceneNo	Utterance	form	syn	sem	prag	⇓ cont	strat
A1	**The hare$_i$**	np	S	Th	To	introduce	–
	and the tortoise$_{ii}$ had a race.	np	S	Th	To	introduce	–
2	**The moul$_{iii}$** fired the gun	np	S	A	To	introduce	–
3	and the race began						
B4	at first **the hare$_i$** was wining	np	S	Th	To	reestablish	*chANT*⟩
5	**he$_i$** rushed past	pro	S	A	To	maintain	main/PC+/R+⟩
	an ostich$_{iii}$	np	O	RO	Co	introduce	–
6	and all its beutiful feathers fell of.						

- **reestablish**: The judgment *reestablish* is made when reference is made to a character (or a group of characters) which was not previously referred to in either:
  - a previous clause of the same *complex* utterance; or
  - any clause of the immediately preceding utterance *e.g.* **the hare$_i$** in B4 of Figure 4.10 above.

  If a character reference is a (plural) compound entity, (such as **they$_{i+ii}$**). then a **reestablish** judgment is made when none of the members of the set of characters was previously referred to in either:
  - a previous clause of the same *complex* utterance; or
  - any clause of the immediately preceding utterance.

The definitions of continuity function judgments used in this investigation were strongly influenced by Prince's system for describing how texts can be viewed as 'sets of instructions' for constructing discourse models, which includes categories for textually evoked entities, (entities which have been introduced in the discourse). The continuity function judgments are also influenced by Brown and Yule's refinements to Prince's system, specifically, the division of textually evoked entities into current vs. displaced entities (Brown & Yule, 1983: 183):

> ...the current evoked entity is the one which was introduced as 'new' immediately before the current new entity was introduced. Displaced entities were introduced prior to that.

In summary, the continuity function provides a method for describing the linear 'structure' or 'continuity' of reference to characters across sets of *written* utterances. However, it is noted that while such linear descriptions provide a simple system for determining information status, or how a writer presents 'given' vs. 'new' information,[18] these judgments do not directly address the issue of how a writer directs the reader's attention to entities in the text in order to enable the reader to construct a mental model of the text. For example, the continuity function does not provide a description of how the writer uses 'minor propositional acts' to bring the reader's attention to how entities are situated in physical and mental space in a scene, as described in (Croft, 1990).

[18]'Given' vs. 'new' information is defined by Halliday (1967) as follows: new information can be either information which has not previously been introduced in the discourse, or information which the speaker chooses to present as new through intonational emphasis. In contrast, *given* means (1967: 211):

> ...'what you were talking about' (or 'what I was talking about before') ...

4.6.10 strat column: pronominalization strategies

In all narratives, a total of eight different pronominalization *production* strategies ('strategies') were identified as being implemented when character references had the form pro or ø, *i.e.* , for 'pronominalized' character references. A full analysis of strategies in narratives elicited for this study is given in Section 5.4 of Chapter 5. Following is an outline of how judgments in this category were coded.

A strategy has three components, each describing one aspect of how the pronominalized character reference was produced *relative to the previous reference to the same character in the narrative.* The three components are: continuity function, clause position and recency. Each component takes one value, as described below:

- **Continuity function**: The continuity function describes the relative location of a pronominalized character reference, and takes the value of one of the three continuity functions, introduce (intro), maintain (main), or reestablish (re) (defined in the preceding section of this Chapter):
  - when the continuity function component has a value of intro, a pro *introduces the character in the narrative*; (The form ø was not used to 'introduce' a character.)
  - when the continuity function component has a value of main previous reference to the pronominalized character occurred in the same or previous utterance; and
  - when the continuity function component has a value of re previous reference to the pronominalized character occurred in the text *before* the previous utterance.

- **Position conservation**: Position conservation (PC), the second component of a strategy, indicates whether a pronominalized reference in a chain has been produced in the same clause position as the previous reference to the same character. The position conservation component can take one of the following values:

  - If a pronominalized reference was produced in the same clause position as the previous reference to the same character, the position conservation component has the value PC+;
  - If a pronominalized reference was not produced in the same clause position as the previous reference to the same character, the position conservation component has the value PC-.

  Note that position conservation could not be judged when the first component of a strategy was the continuity function intro. This is because a comparison could not be made between the current reference and previous reference to the same character. In the case of a pronominalized reference which introduces a character, the position conservation component indicates that there is no previous reference, and the notation ChAnt- is used.

- **Recency**: Recency is the third component of a strategy. This component indicates whether a pronominalized reference is *the most recently referred to character in the narrative.* In other words, whether or not an intermediary character reference has occurred 'between' the pronominalized reference and the previous reference to the same character. If the pronominalized reference refers to the same character as the character most recently referred to in the narrative, the value of the recency component is R+, and if it does not refer to the most recently referred to character in the narrative, then the value is R-. (NB: The judgment of R+ was made if there was no intermediary reference to another character, but an intermediary reference to an entity which was not a character occurred.)

Figure 4.11 below gives a summary of all possible notations in the **strat** column, consisting of all pronominalization strategies implemented — all combinations of continuity function, position conservation and recency values.

Figure 4.11: Pronominalization strategies implemented

strategy	continuity function	position conservation	recency
intro/chANT-	introduce	n/a	n/a
main/PC+/R+	maintain	position conservation+	recency+
main/PC+/R-	maintain	position conservation+	recency-
main/PC-/R+	maintain	position conservation-	recency+
main/PC-/R-	maintain	position conservation-	recency-
re/PC+/R+	reestablish	position conservation+	recency+
re/PC+/R-	reestablish	position conservation+	recency-
re/PC-/R+	reestablish	position conservation-	recency+
re/PC-/R-	reestablish	position conservation-	recency-

Examples of how two pronominalization strategies are implemented are shown in Figure 4.12 below. The **pro they**$_{iii}$ in utterance C5, implements the strategy intro/chANT-, because **they**$_{iii}$ is used to refer to *all of the Sneetches*, even though *all of the Sneetches* has not been previously introduced in the narrative. In C6 **they**$_{iv}$ implements the strategy main/PC+/R+, in which each variable has the following meaning:

main/PC+/R+

continuity function: maintain$^{\uparrow}$

position conservation: yes$^{\uparrow}$

recency: yes$^{\uparrow}$

In other words, **they**$_{iv}$ maintains reference, because **the wans with the Stars**$_{iv}$ was previously referred to in the same utterance; a judgment of PC+ is made because **they**$_{iv}$ and **the wans...** both occur in clause initial position; and, a judgment of R+ is made because **the wans...** is the character most recently referred to.

Figure 4.12: Pronominalization strategies (S19)

SceneNo	Utterance	form	syn	sem	prag	cont	⇓ strat
C5	and **they**$_{iii}$ came enemys agen	pro	S	Th	To	introduce	intro/chANT-⟩
6	and **the wans with the Stars**$_{iv}$ think	np	S	Ex	To	introduce	⟨*chANT*
	they$_{iv}$ whar the best	pro	S	Th	To	maintain	⟨main/PC+/R+

Chains

Pronominalized character references (*pcrs*) were found to occur in series or 'chains', called *pronominalization chains* (chains). A diagram of each chain produced is listed in Tables A.3, B.3 and C.3 of Appendices A, B, and C, and a full analysis of chains is given in Section 5.5.2 of Chapter 5. Following is the definition of a chain and a description of how chains are coded.

A *pronominalization chain* is defined as:

> A series of character references which begins with an antecedent having the form **np**, called a 'character antecedent' (*chANT*), (if one has been produced), *followed by* one or more *pcrs*. The *last pcr* in a chain is the *pcr* which precedes *the next* reference to the same character having the form **np**; or, if the character is not referred to again with an **np**, the last *pcr* in the narrative which refers to that character.

For example, it can be seen in Figure 4.13, D narrative 11, that there are three chains referring to **the dadde duck$_i$**, one in Scene A, and two in scene B.

Figure 4.13: Pronominalization chains (D11)

SceneNo	Utterance	form	syn	sem	prag	cont	⇓ strat
A1	**The dadde duck$_i$** was wettin for	np	S	A	To	introduce	*chANT*⟩⇐
	the mumma baby$_{ii}$ to cum	np	O	G	Co	introduce	–
2	but **mumma duck baby$_{ii}$** did not cum	np	S	Th	To	maintain	–
3	so **he$_i$** watid.	pro	S	A	To	reestablish	re/PC+/R-⟩⇐
B4	then **mumma baby$_{ii}$** came	np	S	P	To	reestablish	–
5	so **dadde$_i$** was happy.	np	S	Ex	To	reestablish	–
6	Then **the ugle duckling$_{iii}$** cract from the egg	np	S	P	To	introduce	–
7	and **dadde duck$_i$** was not happy.	np	S	Ex	To	reestablish	*chANT*⟩⇐
8	So **he$_i$** was kros	pro	S	Ex	To	maintain	main/PC+/R+⟩⇐
	with **his mumma duck$_{iv}$**.	np	O	Pe	Co	introduce	–
9	so then **mumma$_{iv}$** hut	np	S	A	To	maintain	–
	dade$_i$	np	O	P	Co	maintain	*chANT*⟩⇐
	on the hed						
10	**he$_i$** saw stars.	pro	S	Ex	To	maintain	main/PC-/R+⟩⇐
C11	**mumma duck$_{iv}$** went away	np	S	A	To	reestablish	–
	with **the baby$_{ii}$**	np	O	As	Co	reestablish	–
12	**the ugle duckling$_{iii}$** fold	np	S	A	To	reestablish	–
	the mumme duck$_{iv}$	np	O	G	Co	maintain	–

As illustrated in Figure 4.13 above, chains are coded as follows:

- The *chANT*, the first reference in a chain having the form **np**, is indicated with the notation *chANT* in the **strat** column, as shown in A1, B7 and B9 in the figure above. (Note that there is no *chANT* if a **pro** implements the strategy **intro/chANT-** as shown in C5 of Figure 4.12 above.)
- The strategy implemented for each *pcr* is indicated in the **strat** column.
- References in the same chain are grouped by the same type of left or right-angled brackets. *Eg*, in Figure 4.13 above, references in each chain are marked with right-angled brackets '⟩' in the **strat** column.

4.7 Data analysis procedures

As explained throughout this chapter, the narratives were transcribed. Scenes and utterance boundaries were hand-coded, as were all judgments recorded for each reference to a character.

Much of the statistical analysis of hand-coded narratives was performed separately for each narrative set by an object-oriented program written in the Eiffel language by Russell (1991). The program reads in the coded narratives from a source file in the LaTeX format (the same as that used to typeset the narratives in this thesis), builds an internal representation of each narrative in the narrative set, computes various statistics from the internal representation, and finally prints out the statistics in tables in LaTeX format. These tables, included in Appendices A, B and C, Sections A.2, B.2 and C.2 are listed under the headings: 'Narrative feature summary', 'Character references: continuity function, form, location', 'Role convergence summary', 'Scene information' and 'Pronominalization strategy summary'. For further specifications of this program, and a cross-referenced list of all tables output by these programs, see Appendix E.

Pronominalization chains could be identified in 'character table lists' produced by the analysis programs (as described in Appendix E). A complete set of chain diagrams for each narrative set is listed in Sections A.2.7, B.2.7 and C.2.7 of Appendices A, B and C, respectively. These were produced by hand from the character table lists and a visual inspection of narrative listings. In addition, a table summarizing all pronominalization chains produced called 'Pronominalization chain summary' was produced manually for each set, and any further analysis of chains reported in Chapter 5 was performed by hand from the chain diagram listings. One other table was produced by hand for each narrative set: 'Types of utterances', presented in Appendices A, B and C.

4.8 Summary of coding

Table 4.4 below contains a summary of how narratives were coded. The first column, **Judgment**, lists all of the categories of judgments made; the second column, **Notation**, enumerates the notation used for each category of judgment; and the third column, **Section**, lists the section number in this chapter in which each category of judgment and its notation was described.

Table 4.4: Summary of narrative coding

Judgment	Notation	Section
Scenes	*alphabetized*: **A**, **B** etc.	S 4.6.1
Utterances	*numbered*: 1, 2, etc.	S 4.6.2
Character references	*indexed*: $_i$, $_{ii}$, etc.	S 4.6.3
form	np, pro, or ø	S 4.6.4
syn	*syntactic role*: S(Subject); O(Object)	S 4.6.5
sem	*semantic role*: A(Agent); As(Associate);	S 4.6.6
	B(Beneficiary); Ex(Experiencer); G(Goal);	
	In(Instrument); Lo(Location); P(Patient);	
	Pe(Percept); Re(Recipient); RO(Reference Object);	
	Sr(Source); Th(Theme)	
prag	*pragmatic role*: To(Topic); Co(Comment)	S 4.6.7
cont	*continuity function*: introduce; maintain; reestablish	S 4.6.9
strat	*pronominalization strategy* having three components	S 4.6.10
	continuity function (intro, main, re);	
	position conservation (PC+, PC-);	
	recency (R+, R-):	
	intro/chANT-(two components), main/PC+/R+, main/PC+/R-,	
	main/PC-/R+, main/PC-/R-, re/PC+/R+,	
	re/PC+/R-, re/PC-/R-	
	a *pronominalization chain* consists of:	
	a series of pronominalized character references	
	beginning with an antecedent (*chANT*),	
	and grouped by '⟩' or '⟨'	

4.9 In the next chapter

The next chapter contains the results of the analysis of children's narratives.

Chapter 5

Results: pronoun production experiments

In this Chapter, the results of the three writing experiments, described in Chapter 4, the Sneetch experiment (S), the Ugly Duckling experiment (D), and the Tortoise and the Hare experiment (T) are reported. All results are extracted or calculated from narrative listings and tables given in Appendices A, B and C, as noted at the bottom of each table in this chapter.

The contents of this Chapter is as follows:

- Section 5.1 gives a general overview of the features of narratives produced in all three experiments.
- Section 5.2 gives further detail concerning types of utterances.
- Section 5.3 is concerned with character references, first giving a general view of how character references were produced, and then focusing on form, syntactic, semantic and pragmatic roles and continuity function judgments, and finally, how character references were produced at the level of the scene.
- Section 5.4 analyzes 1) pronominalization strategies (which describe how pro's and zero's are produced relative to the previous reference to the same character) and 2) pronominalization chains.
- Section 5.5 presents a summary of all strategies and chains implemented, as well as examining further characteristics of chains.

5.1 General overview of narratives

5.1.1 Content

It was not expected that the children taking part in this study would write narratives which contained nearly as much detail as the videos that were viewed as stimulus material. Furthermore, subjects were not expected to produce narratives which contained *evaluation* of events (explanation of the point or purpose of the story). Rather, it was expected that children would write narratives which typically consisted of chains of events which included some explicit orientation or background information about characters, place and time, as explained in Section 4.6.1 of Chapter 4. Despite the fact that these expectations were largely based on previous studies of *spoken* rather than *written* narratives, in general, the narratives produced in this study met these expectations.

5.1.2 Completion

Each narrative was judged as to whether it was 'complete'. A narrative was judged to be complete if *all* of the following criteria were met:

- The narrative *began* with the same event or background information as the video of the story;
- The narrative contained an intermediary series of events or other information which made it possible for the story to end with the same event as the video;
- The narrative ended at the same event as the video.

In total, it was found that only 21%(S), 11%(D) and 40%(T) of narratives fulfilled all of these criteria.[1]

[1]Note all percentages in this chapter have been calculated by rounding up to the nearest two decimal places when the third decimal place was greater than .005, and rounding down when it was less than .005.

5.1.3 Scenes, utterances, characters

Table 5.1 below gives an overview of narratives in each set, showing the average number of scenes, utterances, characters and character references (references to characters) per narrative. The full description of each category appearing in this table given in Chapter 4 is referenced below, together with a short definition of each category:

scene : A unit of text which begins with the orientation of a reader's attention through an implicit or explicit change in spatial location, an implicit or explicit temporal break, or a discontinuity in the narrative. *(Chapter 4, Section 4.6.1)*

utterance : A simple or complex utterance consisting of one or more clauses. *(Chapter 4, Section 4.6.2)*

character : A human or an animal, a group of humans or animals, or one or more conjoined individual or groups of humans or animals participating in the narrative. *(Chapter 4, Section 4.6.3)*

character reference : Any reference to a 'character' in a narrative. *(Chapter 4, Section 4.6.3)*

Table 5.1: Narrative overview

feature	*avg no per narr*		
	Sneetch	**Duck**	**Tortoise**
Scenes	2.94	2.17	5.30
Utterances	5.58	6.39	17.27
Characters	3.50	4.05	4.47
Character references	8.00	9.72	23.33

Data extracted from Tables A.1, B.1 and C.1.

From Table 5.1, it can be seen that the T narratives are, on average, the longest, containing the highest average number of scenes and utterances. Furthermore, the T narratives contain the highest number of characters and character references per narrative. Further detail concerning each of the categories shown in Figure 5.1 is given in the sections which follow.

5.2 Types of utterances

Table 5.2, below, shows the number and proportion of *simple* and *complex* utterances produced in each set of narratives. A short definition of each type follows (Full definitions appear in Chapter 4, Section 4.6.2):

simple A *simple utterance* consists of one *independent clause.*

complex A *complex utterance* consists of one main clause plus any number of embedded *subordinate* clauses.

Table 5.2: Types of utterances produced

	no of utts (% of utts)		
utterance type	**Sneetch**	**Duck**	**Tortoise**
Simple	86 (64)	90 (78)	395 (76)
Complex	48 (36)	25 (22)	123 (24)
TOTAL	134(100)	115(100)	518 (100)

Data is extracted from Tables A.2, B.2 and C.2.

It can be seen from Table 5.2 that the percentage of complex utterances is highest in the S set; this is mainly due to the large number which contain an embedded 'content' clause such as:

"And the ones that had stars thot *that thay wher the best sneetches in the beatch.*"

5.3 Character references

This section deals with character references, first giving a general view of how character references were produced per narrative, and then focussing on an analysis of the following judgments about character references noted in the tables appended to the narratives which are listed in Appendices A, B and C: form, syntactic role, semantic role, pragmatic role and continuity function. The last part of this section is about how character references were produced at the level of the scene.

5.3.1 Number of characters

Table 5.3, below, shows for each narrative set, the number and percentage of narratives in which 1–7 characters are referred to per narrative, regardless of the form of reference (np, pro or ø). From Table 5.3 it can be seen that there

Table 5.3: Number of characters: all forms

no of chars	*no of narrs (% of narrs)* Sneetch	Duck	Tortoise
1	0 (0)	0 (0)	0 (0)
2	3 (13)	2 (11)	1 (3)
3	11 (46)	6 (33)	6 (20)
4	7 (29)	4 (22)	6 (20)
5	1 (4)	2 (11)	12 (40)
6	2 (8)	3 (17)	5 (17)
7	0 (0)	1 (6)	0 (0)
TOTAL	24 (100)	18(100)	30 (100)

Data extracted from Tables A.1, B.1 and C.1.

are no narratives produced in any narrative set in which only one character has been referred to, and that the majority of narratives in each set contain reference to three or more characters. These figures can be compared to the number of potential characters in each narrative based on stimulus materials, reported in Section 4.5 of Chapter 4:

- Sneetch: 4 characters (however, there were potentially many more characters than this, as many cycles of star application and removal occurred).
- Duck: 7 characters
- Tortoise: 5 characters. (When extra characters were referred to in the T narratives they were invented.)

5.3.2 Forms

There were a total of 192(S), 175(D) and 700(T) references to characters produced in all narratives, as reported in Tables A.1, B.1 and C.1. Table 5.4, below, gives a summary of the different forms used for these references, **np**, **pro**, or ø. Each form is defined with examples in Section 4.6.4 of Chapter 4; following are short definitions:

np : A common noun, a proper noun, or an 'np-group';

pro : An anaphoric (personal) pronoun;

ø : A zero anaphor which is a lexically empty specification of reference.

Table 5.4: Character references: forms

form	*no of refs (% of refs)*		
	Sneetch	**Duck**	**Tortoise**
np	116 (60)	100 (57)	455 (65)
pro	64 (33)	70 (40)	191 (27)
ø	12 (6)	5 (3)	54 (8)
TOTAL	192(100)	175(100)	700 (100)

Calculated from Tables A.3, B.3 and C.3

From Table 5.4 it can be seen that the percentage of character references produced having each form, **np**, **pro** or ø, is roughly similar in each narrative set, although the highest percentage of references having the form ø occurs in the T set. And, it can be calculated that the number of references produced in each set having the form ø represents 16%(S), 7%(D) and 22%(T) of all *pronominalized character references.* (The term *pronominalized character references* refers to all references having the form **pro** *or* ø.)

Pronominalized, not pronominalized per narrative

It can be calculated from Tables A.1, B.1 and C.1 that an average of 1.60(S), 2.00(D) and 2.64(T) characters are *pronominalized* per narrative (referred to at least once in the narrative with the form **pro** or ø). And, an average of 1.92(S), 2.06(D) and 1.83(T) characters are *not pronominalized* per narrative (only referred to with an **np**). In comparison, it was reported in Table 5.1 earlier in this Chapter, that on average there are 3.5(S), 4.05(D) and 4.47(T) characters referred to per narrative.

Pronominalized per narrative

Table 5.5 below shows, for each narrative set, the number and percentage of narratives in which 0–5 characters are pronominalized (referred to at least once with the form **pro** or ø) per narrative. For example, it can be seen that there are 11 Sneetch narratives (46%) in which only one character has been pronominalized.

It can be calculated from Table 5.5 that the largest percentage of narratives in which *more than one character is pronominalized* occurs in the T set: 87%(T) vs. 46%(S) and 56%(D). Furthermore, it can be seen that the S set contains the highest percentage of narratives (8%) in which 0 characters are pronominalized.

Table 5.5: Number of characters pronominalized per narrative

no of pronominalized chars	*no of narrs(% of narrs)*					
	Sneetch		**Duck**		**Tortoise**	
0	2	(8)	1	(6)	0	(0)
1	11	(46)	7	(39)	4	(13)
2	7	(29)	5	(28)	10	(33)
3	3	(13)	2	(11)	9	(30)
4	1	(4)	2	(11)	6	(20)
5	0	(0)	1	(6)	1	(3)
TOTAL	24	(100)	18	(100)	30	(100)

Data extracted from Tables A.1, B.1 and C.1.

5.3.3 Syntactic roles

For each character reference, three categories of clause-level role judgments were made and recorded in the table appended to each listed narrative. First, results concerning the notation in the **syn** column, the syntactic role judgment, are reported. Following is a short definition of this judgment, which is defined fully with examples in Section 4.6.5 of Chapter 4:

syn A judgment as to the syntactic function of the character reference in the clause. For each character reference, one of two judgments was recorded: S (Subject) and O (Object) (direct, indirect, and prepositional).

Table 5.6 below shows the numbers and percentages of character references which were found to implement the syntactic role S (Subject) vs. O (Object). It can be seen from this Table that in each set of narratives the majority of character references implemented the role S rather than O.

Table 5.6: Character references: syntactic roles

	no of refs(% of refs)		
syn role	**Sneetch**	**Duck**	**Tortoise**
S	168 (88)	130 (74)	553 (79)
O	24 (13)	45 (26)	147 (21)
TOTAL:	192(100)	175(100)	700 (100)

Data calculated from Tables A.4, B.4 and C.4.

5.3.4 Semantic roles

Following is a short definition of the semantic role judgment, recorded in the sem column of the table appended to each listed narrative. A full definition of each semantic role is given with examples in Section 4.6.6 of Chapter 4; following is a short definition and a summary of roles:

sem A judgment about the *semantic role* implemented, determined by the semantic relation between the character referred to and the verb phrase which expresses the clause element 'verb' in the same clause. The following roles were found to occur (in alphabetical order): A (Agent); As (Associate); B (Beneficiary); Ex (Experiencer); G (Goal); In (Instrument); Lo (Location); P (Patient); Pe (Percept); R (Recipient); RO (Reference Object); Sr (Source); Th (Theme).

Table 5.7 below shows the numbers and percentages of character references which were found to implement each semantic role listed above. It can be seen from this table that among the three narrative sets there is a variation in semantic roles. For example, 21% of character references implemented the role B (Beneficiary) in the Sneetch set, mostly in utterances in which the Sneetches were described as having stars on their bellies, or not having stars on their bellies — in comparison to 4%(D) and 3%(T). Furthermore, it can be seen that not all roles listed in Table 5.7 were implemented in each set, *e.g.* , 'G', 'In', 'Lo' and 'RO' were not implemented in the S set. The largest percentage of references in each set implemented the role A (Agent), although almost as large a percentage implemented the roles Th (Theme) and B (Beneficiary) in the S set.

Table 5.7: Character references: semantic roles

	no of refs(% of refs)		
sem role	Sneetch	Duck	Tortoise
A	47 (24)	47 (27)	349 (50)
As	1 (1)	4 (2)	5 (1)
B	41 (21)	7 (4)	20 (3)
Ex	32 (17)	25 (14)	42 (6)
G	0 (0)	12 (7)	6 (1)
In	0 (0)	2 (1)	0 (0)
Lo	0 (0)	1 (1)	1 (0)
P	15 (8)	30 (17)	8 (1)
Pe	4 (2)	13 (7)	26 (4)
R	4 (2)	5 (3)	14 (2)
RO	0 (0)	0 (0)	55 (8)
Sr	3 (2)	4 (2)	18 (3)
Th	45 (23)	25 (14)	156 (22)
TOTAL	192(100)	175(100)	700 (100)

Data calculated from Tables A.4, B.4 and C.4.

5.3.5 Pragmatic roles

Following is a short definition of the pragmatic role judgment, recorded in the prag column of the table appended to each listed narrative. Full definitions and discussion of the two possible roles, To and Co, including examples, can be found in Section 4.6.7 of Chapter 4; following is a short summary:

prag (pragmatic): a judgment as to whether a character reference is the *Topic* (To) or contained in the *Comment* (Co) of the clause in which it is produced according to the following definitions:

To : A character who the clause is mainly about;

Co : A character who the clause is not mainly about.

Table 5.8 below shows the numbers and percentages of character references which were found to implement the pragmatic role To vs. Co:

Table 5.8: Character references: pragmatic roles

	no of refs(% of refs)		
prag role	**Sneetch**	**Duck**	**Tortoise**
To	168 (88)	130 (74)	553 (79)
Co	24 (13)	46 (26)	147 (21)
TOTAL:	192(100)	175(100)	700 (100)

Data calculated from Tables A.4, B.4 and C.4.

It can be seen from Table 5.8 that in each narrative set the majority of character references were 'Topics' rather than 'Comments'. And, comparing Table 5.8 with Table 5.6 above, it can be seen that in each set there are an equal number of 'Subjects' and 'Topics' and an equal number of 'Objects' and 'Comments'. This finding is a consequence of the circular definitions of Topic and Comment; it was explained in Section 4.6.7 of Chapter 4 that "in practice the *topic* judgment is circular because it is made for character references which express the clause element subject (S) in a clause, and the comment judgment is made for character references which express the clause element object (O)". Thus, *each* reference that implemented the role of Subject also implemented the role of Topic, and each reference that implemented the role of Object also implemented the role of Comment.

5.3.6 Role convergences

For all character references, an analysis was made of the *convergence* of syn, sem, and prag roles, and recorded in Tables A.4, B.4 and C.4. These results are summarized in this section.

The term *role convergence* (*rolecon*) is used to describe the convergence of syntactic, semantic and pragmatic roles for each character reference. For example in Figure 5.1 below, the *rolecon* S/Th/To is associated with **sneetches**$_i$ in A1; S/B/To with **some**$_{ii}$ in A2, and S/A/To with **a man**$_{iv}$ in B4.

Figure 5.1: Role convergences: examples (S3)

SceneNo	Utterance	form	syn	sem	prag
A1	Once apon a time there lived **sneetches**$_i$	np	S	Th	To
2	**some**$_{ii}$ had a star	np	S	B	To
3	and **some**$_{iii}$ never had any stars.	np	S	B	To
B4	One day **a man**$_{iv}$ came to the beatch.	np	S	A	To
5	And **he**$_{iv}$ stoped	pro	S	A	To
6	and **ø**$_{iv}$ said	zero	S	A	To
	I know what you want.				
	I just know what you need.				

As explained on the previous page, in each set, the syntactic role S always converged with the pragmatic role To and the syntactic role O always converged with the pragmatic role Co.

Converging with semantic roles

Figure 5.2: Sneetch: Semantic roles converging with $S/\cdots/To$ and/or $O/\cdots/Co$

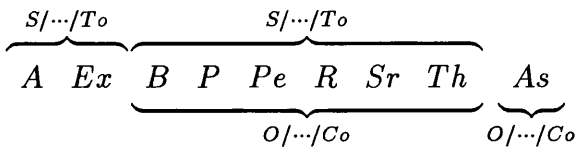


Figure 5.3: Duck: Semantic roles converging with $S/\cdots/To$ and/or $O/\cdots/Co$

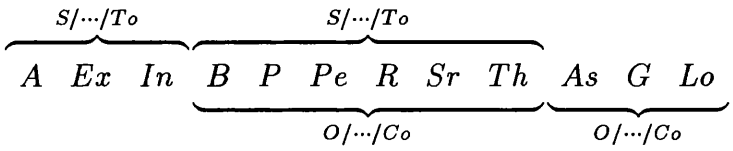
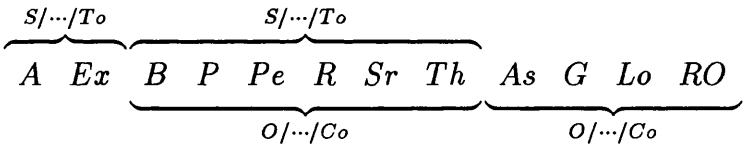


Figure 5.4: Tortoise: Semantic roles converging with $S/\cdots/To$ and/or $O/\cdots/Co$



Figures 5.2, 5.3 and 5.4 above show, for each narrative set, how semantic roles converged with syntactic and pragmatic roles. Each set of semantic roles is delimited by one curly bracket or a set of curly brackets. The curly brackets group sets of semantic roles according to whether they converged with S and To ($S/\cdots/To$) and/or O and Co ($O/\cdots/Co$). These figures show that:

1. The semantic roles which converged exclusively with S and To in each set varied, but included A (Agent) and Ex (Experiencer) in each set.

2. The semantic roles which converged exclusively with O and Co also varied, but included As (Associate) in each set.

3. Six semantic roles, B (Beneficiary), P (Patient), Pe (Percept), R (Recipient), Sr (Source) and Th (Theme) converged with either S and To or O and Co in each set.

Role convergences and clause position

An analysis was made of the relationship between the role convergence and *clause position* of each character reference. It was found that in each set a reference having a role convergence which included the roles S (Subject) and To (Topic) always occurred in *clause initial position* (*cip*), regardless of the semantic role implemented (*i.e.* , semantic roles shown in Figures 5.2, 5.3 and 5.4 above). In general, a character reference which occurs in *cip* occurs before the verb, and a character reference which occurs in *cnip* occurs after the verb. (See Section 4.6.8 of Chapter 4 for definitions of *cip* and *cnip*, and an explanation of how difficult cases were analyzed.) And, a reference having a role convergence which included the roles O (Object) and Co (Comment) always occurred in *clause non-initial position* (*cnip*), regardless of the semantic role implemented, (*i.e.* , semantic roles shown in Figures 5.2, 5.3 and 5.4 above).[2]

The correlation between role convergence and clause position is demonstrated in Figure 5.5 below. For example, for **the hare**$_i$ in C6, the converging roles are S/A/To and this reference occurs in *cip*, while for **poor tortoise**$_{ii}$ in C10 the converging roles are O/RO/Co and this reference occurs in *cnip*.

Figure 5.5: Role convergences and clause position (T1)

SceneNo	Utterance	form	syn	sem	prag
C6	**the hare**$_i$ decided	np	S	A	To
	to go to sleep.				
7	**the hare**$_i$ did not now	np	S	Ex	To
	that **the tortoise**$_{ii}$ sneeked	np	S	A	To
	past **him**$_i$	pro	O	RO	Co
8	but **he**$_i$ woke up	pro	S	Th	To
9	and ø$_i$ saw	zero	S	Ex	To
	that **the tortoise**$_{ii}$ was ahead	np	S	Th	To
	of **him**$_i$	pro	O	RO	Co
10	so **he**$_i$ zoomed right past	pro	S	A	To
	poor tortoise$_{ii}$.	np	O	RO	Co

[2]See Section 4.6.8 for a description of exceptions made in the case of subject verb inversions.

5.3.7 Continuity functions

Table 5.9: Continuity functions

continuity function	*no of char refs (% of char refs)*		
	Sneetch	**Duck**	**Tortoise**
introduce	81 (42)	73 (42)	123 (18)
maintain	83 (43)	83 (47)	347 (50)
reestablish	28 (15)	19 (11)	230 (33)
TOTAL	192(100)	175(100)	700 (100)

Table 5.9 above shows, for each narrative set, a summary of the number and percentage of character references for each continuity function judged: **introduce**, **maintain** or **reestablish**. A description of this category of judgment is given in Chapter 4, Section 4.6.9 with definitions of each continuity function and examples. Abridged definitions follow:

introduce Judged when a reference is used to refer to a character in the narrative for the first time.

maintain Judged when a reference refers to a character which was previously referred to in the same or previous utterance.

reestablish Judged when a reference refers to a character which was previously referred to in the narrative, but not in the same or previous utterance.

From Table 5.9 above it can be seen that in the S and D sets the percentages of character references which implement corresponding continuity functions are similar. In contrast, the T set contains a higher percentage of references which implement **reestablish** than either the D or S set, and a lower percentage of references which implement **introduce**. This result reflects the finding that T narratives are, on average, the longest narratives and contain on average, the highest number of character references — raising the probability that reference to characters would have to be 'maintained' or 'reestablished'.[3]

[3]In other words, the proportion of 'introduce' references is fixed for a given mean number of references per character.

5.3.8 Character references at scene level

This section presents the results of an analysis of the production of character references at the level of the narrative unit, 'scene'. As reported in Table 5.1 earlier in this Chapter, there were an average of 2.04(S), 2.17(D), and 5.30(T) scenes per narrative. It can also be calculated that there were an average of 2.85 (S) 2.95 (D) 3.25 (T) utterances per scene.

Table 5.10 below shows, for each set, the number and percentage of scenes within which 1–6 characters were referred to. It can be seen from this table that the majority of scenes in each set contain references to 1, 2 or 3 characters, and that in the T set, a greater percentage of scenes contain reference to three characters than one character. Only one narrative (in the T set) contains a scene in which there are no references to characters: Scene B of T narrative 25. Table 5.11 below

Table 5.10: Characters referred to at scene level

no chars	no of scenes (% of scenes) Sneetch	Duck	Tortoise
0	0 (0)	0 (0)	1 (1)
1	11 (22)	7 (18)	30 (19)
2	20 (41)	18 (46)	78 (48)
3	16 (33)	10 (26)	38 (24)
4	2 (4)	2 (5)	8 (5)
5	0 (0)	1 (3)	4 (3)
6	0 (0)	1 (3)	0 (0)
TOTAL	49 (100)	39(100)	150 (100)

Data extracted from Tables A.5, B.5 and C.5.

shows, for each narrative set, the number and percentage of scenes in which 0–4 characters are pronominalized (referred to at least once with a pro or ø.) It can be seen from this table that in each set, the greatest percentage of scenes contain pronominalization of 1 character, (in other words, it is most likely that a scene will contain pronominalization of exactly one character), although a large percentage of scenes also contain no pronominalization or pronominalization of two characters.

Table 5.11: Characters pronominalized at scene level

no chars	no of scenes (% of scenes) Sneetch	Duck	Tortoise
0	14 (29)	8 (21)	55 (35)
1	22 (45)	19 (49)	71 (45)
2	12 (24)	11 (28)	28 (18)
3	1 (2)	0 (0)	4 (3)
4	0 (0)	1 (3)	1 (1)
TOTAL	49 (100)	39(100)	159 (100)

Data extracted from Tables A.5, B.5 and C.5.

Table 5.12: Characters referred to/pronominalized at scene level

no chars	no of scenes(% of scenes) Sneetch	Duck	Tortoise
0-char/0-pron	0 (0)	0 (0)	1 (1)
subtotal	0 (0)	0 (0)	1 (1)
1-char/0-pron	3 (6)	2 (5)	9 (6)
1-char/1-pron	9 (18)	5 (13)	22 (14)
subtotal	12 (24)	7 (18)	31 (19)
2-char/0-pron	6 (12)	3 (8)	27 (17)
2-char/1-pron	7 (14)	10 (26)	30 (19)
2-char/2-pron	7 (14)	5 (13)	20 (13)
subtotal	20 (41)	18 (46)	77 (49)
3-char/0-pron	5 (10)	3 (8)	18 (11)
3-char/1-pron	5 (10)	2 (5)	10 (6)
3-char/2-pron	4 (8)	5 (13)	7 (4)
3-char/3-pron	1 (2)	0 (0)	3 (2)
subtotal	15 (31)	10 (26)	38 (24)
4-char/0-pron	0 (0)	0 (0)	0 (0)
4-char/1-pron	1 (2)	2 (5)	6 (4)
4-char/2-pron	1 (2)	0 (0)	1 (1)
4-char/3-pron	0 (0)	0 (0)	1 (1)
4-char/4-pron	0 (0)	0 (0)	0 (0)
subtotal	2 (4)	2 (5)	8 (5)
5-char/0-pron	0 (0)	0 (0)	0 (0)
5-char/1-pron	0 (0)	0 (0)	3 (2)
5-char/2-pron	0 (0)	1 (3)	0 (0)
5-char/3-pron	0 (0)	0 (0)	0 (0)
5-char/4-pron	0 (0)	0 (0)	1 (1)
5-char/5-pron	0 (0)	0 (0)	0 (0)
subtotal	0 (0)	1 (3)	4 (3)
6-char/0-pron	0 (0)	0 (0)	0 (0)
6-char/1-pron	0 (0)	0 (0)	0 (0)
6-char/2-pron	0 (0)	0 (0)	0 (0)
6-char/3-pron	0 (0)	0 (0)	0 (0)
6-char/4-pron	0 (0)	1 (3)	0 (0)
6-char/5-pron	0 (0)	0 (0)	0 (0)
6-char/6-pron	0 (0)	0 (0)	0 (0)
subtotal	0 (0)	1 (3)	0 (0)
TOTAL:	49 (100)	39(100)	159 (100)

Data extracted from Tables A.5, B.5 and C.5.

Table 5.12 above shows, for each narrative set, the number and percentage of scenes in which 1–6 characters are referred to *and* 0–4 characters pronominalized. For example, in the first column, '2-char/1-pron' is a scene in which *two characters were referred to and one character was pronominalized*, for example, the scene shown in Figure 5.6 below.

Figure 5.6: Two characters referred to, one pronominalized (D10)

SceneNo	Utterance	form
B2	Then **the mum**$_{i,i}$ noo	np
	she$_{i,i}$ was Expecting	pro
	ducklings$_{i,i,i}$.	np

Probability of pronominalization

The average percentage of characters pronominalized per scene when one, two or three characters were referred to can be calculated from Table 5.12. These calculations, given below, show that in each narrative set, the more characters referred to per scene, the less likely it was that each character was pronominalized. (In other words, a calculation of the probability that a character referred to in a scene was pronominalized.)

- **1 character referred to**: 75%(S), 71%(D), 71%(T)
- **2 characters referred to**: 53%(S), 56%(D), 45%(T)
- **3 characters referred to**: 36%(S), 40%(D), 29%(T)

Character references: boundaries vs. bodies

Results are reported in two tables as follows:

1. Table 5.13 contains information about the form and scene location of character references;
2. Table 5.14 contains information about the the form, scene location and continuity function of character references.

Both tables summarize results reported in Tables A.3, B.3 and C.3, which show for each narrative set, the number and percentage of references produced having each possible combination of:

- *form*: np *vs.* pro *or* ø;
- *scene location*: *boundary vs. body* according to the following definitions:

  boundary A reference occurs on a scene boundary if it occurs in the first utterance of a scene.

  body A reference occurs within a scene body if it occurs in any utterance except the first utterance of a scene.

- *continuity function*: introduce, maintain or reestablish.

Boundaries, bodies and form

In total, it can be calculated from Tables A.3 B.3 and C.3 that there were 65(S); 56(D) and 222(T) character references produced *on scene boundaries* and 127(S), 119(D), and 476(T) character references produced *within scene bodies.*[4] Table 5.13 below shows the number and percentage of all character references produced on a scene **boundary** or **body** having the form np or pro *or* zero (*i.e.* on a **boundary** or within a **body** and *not pronominalized* vs. **boundary** or **body** and *pronominalized.*) For example, in the S set, out of a total of 65 references produced on a scene **boundary**, 85% *were not* pronominalized and 15% *were* pronominalized.

Table 5.13: Scene location+form

scene loc+form	*no of refs (% of refs)* **Sneetch**	**Duck**	**Tortoise**
ON SCENE BOUNDARIES			
boundary+np	55 (85)	46 (82)	192 (86)
boundary+pro/ø	10 (15)	10 (18)	44 (14)
TOTAL (*bound*)	65(100)	56(100)	222 (100)
WITHIN SCENE BODIES			
body+np	61 (48)	53 (45)	262 (55)
body+pro/ø	66 (52)	66 (55)	216 (45)
TOTAL (*body*)	127(100)	119(100)	478 (100)

Data extracted from Tables A.3, B.3 and C.3.

In general, Table 5.13 shows that for all three narrative sets:

1. There is a preference for the use of nps over pros/zeros on scene boundaries, *i.e.* :

   $P(np \mid boundary) > P(pro/zero \mid boundary)$[5]

   but not a very clear preference for the use of nps over pros/zeros within scene bodies, *i.e.* :

   $P(np \mid body) \simeq P(pro/zero \mid body)$

2. In each narrative set, the percentage of all references occurring on a scene boundary having the form np is greater than the percentage of all references occurring within the body of a scene having the form np, *i.e.* :

   $P(np \mid bound) > P(np \mid body)$

[4]Scene body calculations include pros or zeros which occurred in a scene boundary utterance and *repeated* reference to a character referred to with an np in the same utterance.

[5]The probability (P) of a reference having the form np given that it occurs within a scene body is greater than the probability of a reference having the form pro or zero given that it occurs on a scene boundary.

Table 5.14, below, shows the number and percentage of all character references produced on a scene **boundary** or within a scene **body** which have the form np *or* pro/zero and for which the *continuity function*: introduce, maintain or reestablish was implemented.

Table 5.14: Scene location+form+continuity function

scene loc+form+cont func	*no of refs(% of refs)* Sneetch	Duck	Tortoise
ON SCENE BOUNDARIES			
boundary+np+introduce	46 (71)	39 (70)	76 (34)
boundary+pro/ø+introduce	2 (3)	2 (4)	0 (0)
subtotal (introduce)	48 (74)	41 (73)	76 (34)
boundary+np+maintain	5 (8)	3 (5)	51 (23)
boundary+pro/ø+maintain	7 (11)	8 (14)	28 (13)
subtotal (maintain)	12 (18)	11 (20)	79 (36)
boundary+np+reestablish	4 (6)	4 (7)	65 (29)
boundary+pro/ø+reestablish	1 (2)	0 (0)	2 (1)
subtotal (reestablish)	5 (8)	4 (7)	67 (30)
TOTAL	65(100)	56(100)	222 (100)
WITHIN SCENE BODIES			
body+np+introduce	32 (25)	31 (26)	48 (10)
body+pro/ø+introduce	0 (0)	2 (2)	0 (0)
subtotal (introduce)	32 (25)	33 (28)	48 (10)
body+np+maintain	16 (13)	16 (14)	78 (16)
body +pro/ø+maintain	56 (44)	55 (46)	191 (40)
subtotal (maintain)	72 (57)	71 (60)	269 (57)
body+np+reestablish	13 (10)	7 (6)	136 (29)
body+pro/ø+reestablish	10 (8)	8 (7)	25 (5)
subtotal (reestablish)	23 (18)	15 (13)	160 (34)
TOTAL	127(100)	119(100)	478 (100)

Data extracted from Tables A.3, B.3 and C.3.

It can be seen from Table 5.14 that:

1. In each set, references produced on a scene **boundary** are more likely to introduce or reestablish reference than to maintain reference, *i.e.* :

   $P(maintain \mid bound) < P(introduce/reestablish \mid boundary)$

2. In each set, when a character reference is produced *within a scene body* it is more likely to *maintain* reference than when it is produced *on a scene boundary*:

   $P(maintain \mid body) > P(maintain \mid boundary)$

3. In the S and D sets, when reference is maintained on a scene **boundary**, it is more likely to be maintained with a pro than an np, *i.e.* :

   $P(pro/zero \mid maintain, boundary) > P(np \mid maintain, boundary)$

   However, in the T set, reference is more likely to be maintained with an np than a pro on a scene boundary.

5.4 Descriptive pronominalization strategies

In total, nine different pronominalization strategies ('strategies') were found to have been implemented in all three narrative sets. The term *pronominalization strategy* is used in this chapter to mean a description of how each pronominalized character reference (**pro** or $\emptyset$) was produced *relative to the previous reference to the same character in the narrative.* (*I.e.* , a pronominalization strategy is not meant to be understood as being a *heuristic* strategy. A discussion of the relationship between pronominalization strategies and heuristic strategies is presented in Chapter 6). A pronominalization strategy consists of three components: *continuity function*, *clause position* and *recency.*

5.4.1 Chains

Pronominalization strategies were found to be implemented by pronominalized character references (*pcrs*) occurring in 'chains'. A *pronominalization chain* ('chain') is defined as:

> A series of character references which begins with an antecedent having the form **np**, called a 'character antecedent' (*chANT*), (if one has been produced), *followed by* one or more *pcrs.* The *last pcr* in a chain is the *pcr* which precedes *the next* reference to the same character having the form **np**, or if the character is not referred to again with an **np**, the last *pcr* in the narrative which refers to that character.

Pronominalization chains can be divided into two types:

1. *Single-strategy chains*: Chains in which each *pcr* implements the same strategy.

2. *Multi-strategy chains*: Chains in which two or more strategies are implemented.

5.4.2 Strategy coding

The coding of strategies and chains in the narrative listings of Appendices A, B, and C was first described in Section 4.6.10 in Chapter 4. As pronominalization strategies and chains in narrative excerpts are frequently referred to in the rest of this chapter, a review of coding of the **strat** column is presented below.

- If one has been produced, a 'character antecedent' having the form **np**, is the first reference in a chain, indicated by the notation *chANT* in the **strat** column.

- The name of the strategy implemented for each *pcr* is indicated in the **strat** column. The name of each strategy is comprised of abbreviations for each 'component variable', for example:

  main/PC+/R+
  continuity function: maintain$^{\uparrow}$
  position conservation: yes$^{\uparrow}$
  recency: yes$^{\uparrow}$

- References in the same chain are grouped by the same type of left or right-angled brackets. *Eg*, *chANT*$\rangle$ *vs.* $\langle$*chANT*; main/PC+/R+$\rangle$ *vs.* $\langle$main/PC+/R+.

5.4.3 Strategy components

As explained above, strategies consist of three components, each describing a different aspect of how a reference was produced *relative to the previous reference to the same character.* Each component was described in Section 4.6.10 of Chapter 4, and is briefly reviewed in this section.

Continuity function

Continuity function describes the relative location of a pronominalized character reference, and takes the value of one of three continuity functions. The three continuity functions have been defined and described in detail in Chapter 5 (Section 4.6.9). The following are salient characteristics of continuity function variables in pronominalization strategies:

- When the value of the first component of a strategy is intro (introduce), then the pro or ø which implements the strategy *introduces the character in the narrative.*
- When the value of the first component of a strategy is main (maintain), then previous reference to the same character occurred in the same or previous utterance.
- When the value of the first component of a strategy is re (reestablish), then previous reference to the same character occurred *before* the previous utterance.

All three continuity functions implemented in strategies can be seen in Figure 5.7 below. For example, the pro $\mathbf{He}_{iv}$ in C3 'introduces' the 'Ugly Duckling' so the strategy implemented has the value intro as its first component; $\mathbf{He}_{iv}$ in C4 'maintains' reference, so the strategy implemented has the value main as its first component; and, $\mathbf{He}_{iv}$ in C6 'reestablishes' reference so a strategy having the value re as its first component.

Figure 5.7: Pronominalization strategies: continuity function (D11)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
C3	[$\mathbf{He}_{iv}$] was swimming	pro	S	A	To	introduce	[intro]/chANT−⟩
4	then [$\mathbf{He}_{iv}$] saw	pro	S	Ex	To	maintain	[main]/PC+/R+⟩
	sumthing strange$_v$.	np	O	Pe	Co	introduce	⟨*chANT*
5	**It**$_v$ was a big big big duck	pro	S	Th	To	maintain	⟨main/PC-/R+
6	[$\mathbf{He}_{iv}$] thote	pro	S	Ex	To	reestablish	[re]/PC+/R-⟩
	it$_v$ was his mum	pro	S	Th	To	maintain	⟨main/PC+/R-
7	and **he**$_{iv}$ got hit on the head	pro	S	P	To	maintain	main/PC+/R-⟩

Position conservation

Position conservation is the second component of a strategy. This component has a value of either 'PC+' or 'PC-', and is used to indicate whether or not a *pcr* in a chain has been produced in the same clause position as the previous reference to the same character. If a *pcr* has been produced in the same clause position, the notation is PC+. For example, in C4 of Figure 5.8 below, $\mathbf{He}_{iv}$ is produced in *clause initial position* (*cip*), following the reference $\mathbf{He}_{iv}$ in C3, also in *cip*. Similarly, if a reference in *clause non-initial position* (*cnip*) follows a reference to the same character which was also produced in *cnip*, then PC+ is implemented.

Figure 5.8: Pronominalization strategies: position conservation (D11)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
C3	**He$_{iv}$ was swimming**	pro	S	A	To	introduce	intro/chANT-⟩
4	**then He$_{iv}$ saw**	pro	S	Ex	To	maintain	main/[PC+]/R+⟩
	sumthing strange$_v$.	np	O	Pe	Co	introduce	⟨*chANT*
5	**It$_v$ was a big big big duck**	pro	S	Th	To	maintain	⟨main/[PC-]/R+
6	**He$_{iv}$ thote**	pro	S	Ex	To	reestablish	re/PC+/R-⟩
	it$_v$ was his mum	pro	S	Th	To	maintain	⟨main/PC+/R-
7	**and he$_{iv}$ got hit on the head**	pro	S	P	To	maintain	main/PC+/R-⟩

Conversely, position conservation does not occur when a pronominalized character reference is not produced in the same clause position as the previous reference to the same character, as in C5 of Figure 5.8 above. In this utterance, $\mathbf{It}_v$ occurs in *cip* and follows **sumthing strange**$_v$ which occurred in *cnip* in C4, so the value of the position conservation component is PC-. Similarly, the value PC- is encoded when a *pcr* produced in *cnip* follows reference to the same character in *cip*.

Note that position conservation cannot be judged when the value of the first component of a strategy is the continuity function intro since there is no previous reference; the second component of an intro strategy has the value ChAnt-, indicating that there has been no previous reference.

Recency

Recency is the third component of a strategy. This component has the value of either 'R+' or 'R-', and is used to indicate whether or not a *pcr* in a chain is *the most recently referred to character in the narrative*; in other words, whether or not an *intermediary character reference* has occurred 'between' the *pcr* and the previous reference to the same character. If a *pcr* refers to the same character as the character most recently referred to in the narrative, the value indicated for this component is R+, and if it does not, then the value indicated is R-.

For example, in Figure 5.9 below, the strategy for the *pcr* $\mathbf{He}_{iv}$ in C4 has the value R+ for the recency component. But, when an intermediary character reference *icr*, $\mathbf{it}_{v}$, occurs 'between' $\mathbf{He}_{iv}$ in C6 and $\mathbf{he}_{iv}$ in C7, the recency component in the strategy for $\mathbf{he}_{iv}$ in C7 is R-.

Figure 5.9: Pronominalization strategies: recency (D11)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
C3	**He**$_{iv}$ **was swimming**	pro	S	A	To	introduce	intro/chANT-⟩
4	**then He**$_{iv}$ **saw**	pro	S	Ex	To	maintain	main/PC+/R+⟩
	sumthing strange$_{v}$**.**	np	O	Pe	Co	introduce	⟨*chANT*
5	**It**$_{v}$ **was a big big big duck**	pro	S	Th	To	maintain	⟨main/PC-/R+
6	**He**$_{iv}$ **thote**	pro	S	Ex	To	reestablish	re/PC+/R-⟩
	it$_{v}$ **was his mum**	pro	S	Th	To	maintain	⟨main/PC+/R-
7	**and he**$_{iv}$ **got hit on the head**	pro	S	P	To	maintain	main/PC+/R-⟩

Note that there is no 'recency' component for a *pcr* which implements the continuity function **introduce**. This is because there is no previous reference to the same character has occurred.

5.4.4 Strategy overview

In Figure 5.10 is a summary of all strategies which were found to be implemented. The set of strategies implemented consists of all combinations of possible values for the three components described in the previous part of this section, and intro/chANT-.

Figure 5.10: Pronominalization strategies implemented

strategy	*continuity function*	*position conservation*	*recency*
intro/chANT-	introduce	n/a	n/a
main/PC+/R+	maintain	position conservation+	recency+
main/PC+/R-	maintain	position conservation+	recency-
main/PC-/R+	maintain	position conservation-	recency+
main/PC-/R-	maintain	position conservation-	recency-
re/PC+/R+	reestablish	position conservation+	recency+
re/PC+/R-	reestablish	position conservation+	recency-
re/PC-/R+	reestablish	position conservation-	recency+
re/PC-/R-	reestablish	position conservation-	recency-

Data extracted from Tables A.6, B.6 and C.7.

The next part of this section presents a closer look at each strategy as it was implemented in *single-strategy chains*, and this is followed by an analysis of *multi-strategy chains*. The purpose is to show how different strategies were found to operate in chains. As explained earlier, a discussion about the relationship between pronominalization strategies and heuristic strategies is presented in Chapter 6.

5.4.5 intro/chANT-: introduce: no character antecedent

This strategy is implemented by:

Sneetch	Duck	Tortoise
3%	5%	0%

of all *pronominalized character references*; and within:

Sneetch	Duck	Tortoise
5%	10%	0%

of *all* pronominalization chains produced.

Data compiled from Tables A.6, B.6, C.7, A.7, B.7 and C.8.

Pronominalized character references which implement intro/chANT- introduce a character in a narrative with a pro, and therefore no position conservation or recency judgment is included in this strategy. By definition, no *chANT* has been produced before this strategy is implemented.

Figure 5.11 below shows a *pcr*, **they**$_{iii}$ in utterance C5, which comprises a *single strategy* chain (*ss-chain*) consisting of only one character reference implementing the strategy intro/chANT-.[6] The reference **they**$_{iii}$ is used to refer to *all of the Sneetches*, even though *all of the Sneetches* have not been previously introduced in the narrative.

Figure 5.11: Single strategy chain: intro/chANT- (S19)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
C5	and **they**$_{iii}$ came enemys agen	pro	S	Th	To	introduce	intro/chANT-⟩
6	and **the wans with the Stars**$_{iv}$ think	np	S	Ex	To	introduce	⟨*chANT*
	they$_{iv}$ whar the best	pro	S	Th	To	maintain	⟨main/PC+/R+

[6] By definition, a *ss-chain* in which the strategy intro/chANT- is implemented can only consist of one character reference because any *pcr* which followed would have to implement a different strategy, forming a multi-strategy chain.

5.4.6 main/PC+/R+:maintain/position conservation+/recency

This strategy is implemented by:

Sneetch	Duck	Tortoise
66%	39%	52%

of all *pronominalized character references*; and within:

Sneetch	Duck	Tortoise
72%	63%	68%

of *all* pronominalization chains produced.

Data compiled from Tables A.6, B.6, C.7, A.7, B.7 and C.8.

Pronominalized character references which implement main/PC+/R+ *maintain* reference to a character *in the same clause position* as the previous reference to the same character, who is the *most recent character* to have been referred to in the narrative.

Figure 5.12 below shows a main/PC+/R+ *ss-chain* which consists of a total of two references, a *chANT*, **the hare**$_i$, in B4, and a pro, **he**$_i$ in B5; each reference occurs in the same clause position, *cip*, and **he**$_i$, which implements main/PC+/R+ refers to the character most recently referred to in the narrative.

Figure 5.12: Single strategy chain: main/PC+/R+ (T3)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
B4	at first [**the hare**$_i$] was wining	np	S	Th	To	reestablish	[*chANT*⟩
5	[**he**$_i$] rushed past	pro	S	A	To	maintain	[main/PC+/R+⟩
	an ostich$_{iii}$	np	O	RO	Co	introduce	–
6	and all its beutiful feathers fell of.						

Figure 5.13 below shows another *ss-chain* in which the only strategy implemented is main/PC+/R+. This *ss-chain* consists of five references; a *chANT*, **the hare**$_{ii}$ which occurs in C20, followed by four *pcrs*, three **pros** and one ø, which refer to **the hare**$_{ii}$ in C21 – C24: **he**$_{ii}$, ø$_{ii}$, **he**$_{ii}$ and **he**$_{ii}$; each of these *pcrs* occur in the same clause position, *cip*, and each refers to the character most recently referred to in the narrative.

Figure 5.13: Single strategy chain: main/PC+/R+ (T26)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
C20	meanwhile **the hare**$_{ii}$ was beside some trees	np	S	Th	To	reestablish	*chANT*⟩
21	**he**$_{ii}$ ran past them	pro	S	A	To	maintain	main/PC+/R+⟩
22	and ø$_{ii}$ made the roots come up	zero	S	Sr	To	maintain	main/PC+/R+⟩
23	**he**$_{ii}$ was feeling a bit tired	pro	S	Th	To	maintain	main/PC+/R+⟩
24	so **he**$_{ii}$ lay down to rest ...	pro	S	A	To	maintain	main/PC+/R+⟩

Figure 5.14 contains a *ss-chain* in which main/PC+/R+ is implemented by a plural *pcr*, **they**$_{i+ii}$, which refers to **a hare**$_{i}$ and **a tortoise**$_{ii}$; all references in this chain occur in *cip*, and the characters which comprise the compound entity, **they**$_{i+ii}$ were the characters most recently referred to in the narrative.

Figure 5.14: Single strategy chain: main/PC+/R+: plural (T12)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
A1	There was gowing to be a big race						
2	and **a hare**$_{i}$ and	np	S	Th	To	introduce	*chANT*⟩
	a tortoise$_{ii}$ were in the big race	np	S	Th	To	introduce	*chANT*⟩
3	**they**$_{i+ii}$ went to the beginning of the line	pro	S	A	To	maintain	main/PC+/R+⟩

5.4.7 main/PC+/R-: maintain/position conservation+/recency

This strategy is implemented by:

Sneetch	Duck	Tortoise
8%	20%	22%

of all *pronominalized character references*; and within:

Sneetch	Duck	Tortoise
16%	30%	28%

of *all* pronominalization chains produced.

Data compiled from Tables A.6, B.6, C.7, A.7, B.7 and C.8.

Pronominalized character references which implement main/PC+/R- *maintain* reference to a character *in the same clause position* as the previous reference to the same character, who is **not** the *most recent character* to have been referred to in the narrative.

Figure 5.15 below shows a main/PC+/R- *ss-chain* which consists of a total of two references, a *chANT*, **the Dad Duck**$_{ii}$ in A2, and a pro, **he**$_{ii}$ in A3; both occur in *cip*. The pro, **he**$_{ii}$ does not refer to the character most recently referred to in the narrative because an intermediary character reference (having the same number and gender as **the Dad Duck**$_{ii}$, singular, male) occurs in *cnip* between the two references in the main/PC+/R- chain: **the Duck**$_{i}$ in A2.

Figure 5.15: Single strategy chain: main/PC+/R- (D2)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
A1	**The ugle Duckling**$_{i}$ **was not the hen egg.**	np	S	Th	To	introduce	–
2	and **the Dad Duck**$_{ii}$ did not like	np	S	Ex	To	introduce	*chANT*⟩
	the Duck$_{i}$.	np	O	Pe	Co	maintain	–
3	**he**$_{ii}$ did not like	pro	S	Ex	To	maintain	main/PC+/R-⟩
	the Duck$_{i}$.	np	O	Pe	Co	maintain	–

Figure 5.16 below shows another main/PC+/R- *ss-chain*, which consists of three references in *cip* which refer to **the tortoise**$_i$ in B6 – B8. This chain encompasses two intermediary character references (*intcharefs*) in *cnip* (having the same number and gender as the **the tortoise**$_i$ singular, male): **the hare**$_{ii}$ in B6 and **the hare**$_{ii}$ in B7.

Figure 5.16: Single strategy chain: main/PC+/R- (T23)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
(B)6	then **the tortoise**$_i$ came	np	S	A	To	reestablish	*chANT*⟩
	upon **the hare**$_{ii}$	np	O	Pe	Co	maintain	–
7	**he**$_i$ tiptod past	pro	S	A	To	maintain	main/PC+/R-⟩
	the hare$_{ii}$	np	O	RO	Co	maintain	–
8	**he**$_i$ hadend gon far	pro	S	A	To	maintain	main/PC+/R-⟩
	when **the hare**$_{ii}$ awock	np	S	Th	To	maintain	–

The next Figure, 5.17, shows two *interleaved* main/PC+/R- *ss-chains*. One chain contains reference to **the hare**$_{ii}$ in *cip* and the other contains reference to **the girls**$_{iv}$ in *cnip*. Each of these chains contains the intermediary character references encompassed by the other, (referring to characters having a different number and gender, singular male, vs. plural female).

Figure 5.17: Single strategy chains: interleaved main/PC+/R- (T18)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
G15	then **the hare**$_{ii}$ saw	np	S	Ex	To	maintain	*chANT*⟩
	some girls$_{iv}$	np	O	Pe	Co	introduce	⟨*chANT*
16	then $\emptyset_{ii}$ was talking to	ø	S	Th	To	maintain	main/PC+/R-⟩
	them$_{iv}$ for a long time	pro	O	R	Co	maintain	⟨main/PC+/R-

5.4.8 main/PC-/R+: maintain/position conservation-/recency+

This strategy is implemented by:

Sneetch	Duck	Tortoise
5%	13%	5%

of all *pronominalized character references*; and within:

Sneetch	Duck	Tortoise
2%	23%	9%

of *all* pronominalization chains produced.

Data compiled from Tables A.6, B.6, C.7, A.7, B.7 and C.8.

Pronominalized character references which implement main/PC-/R+ *maintain* reference to a character, and do not occur in the same clause position as the previous reference to the same character, who is the *most recent character* to have been referred to in the narrative.

Figure 5.18 below shows a main/PC-/R+ *ss-chain* which consists of a total of two references, a *chANTin cnip*, **dade**$_i$ in B9, and a **pro he**$_i$ in B10, which occurs in *cip*, which is not the same clause position. There are no intermediary character references, so **he**$_i$ refers to the character most recently referred to in the narrative.

Figure 5.18: Single strategy chain: main/PC-/R+ (D11)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
(B)9	so then **mumma**$_{i,v}$ hut	np	S	A	To	maintain	–
	[**dade**$_i$]	np	O	P	Co	maintain	[*chANT*⟩]
	on the hed						
10	[**he**$_i$] saw stars.	pro	S	Ex	To	maintain	[main/PC-/R+⟩]

Figure 5.19 below shows another main/PC-/R+ *ss-chain.* This chain contains reference to **some little girl rabbits**$_v$ in utterances F18 and F19 and is encompassed by another (multi-strategy) chain which contains reference to **the hare**$_i$. In the single-strategy main/PC-/R+ chain the first reference to **some little girls**$_v$ occurs in *cnip* in F18, followed by **they**$_v$ in *cip* in F19; no intermediary references occur within this chain.

Figure 5.19: Single strategy chain: main/PC-/R+ (T13)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
F18	and **the hare**$_i$ went past	np	S	Th	To	reestablish	*chANT*⟩
	some little girl rabbits$_v$	np	O	RO	Co	introduce	⟨*chANT*
19	and **they**$_v$ started to cheer	pro	S	A	To	maintain	⟨main/PC-/R+
	for **him**$_i$	pro	O	B	Co	maintain	main/PC-/R-⟩
20	and then **he**$_i$ showed	pro	S	A	To	maintain	main/PC-/R+⟩
	the little rabbits$_v$ some tricks	np	O	B	Co	maintain	–
21	then **one of the rabbits**$_{v_i}$ said	np	S	A	To	introduce	–
	wy are you not carrieing on						
	with the race						
22	*because Iv got so much speed*						

5.4.9 main/PC-/R-: maintain/position conservation-/recency-

This strategy is implemented by:

Sneetch	Duck	Tortoise
7%	12%	9%

of all *pronominalized character references*; and within:

Sneetch	Duck	Tortoise
12%	18%	15%

of *all* pronominalization chains produced.

Data compiled from Tables A.6, B.6, C.7, A.7, B.7 and C.8.

Pronominalized character references which implement main/PC-/R- *maintain* reference to a character, but do not occur in the same clause position as the previous reference to the same character, who is *not* the *most recent character* to have been referred to in the narrative.

Figure 5.20 below shows a main/PC-/R- *ss-chain* which consists of a total of two references contained in one utterance, C9 as follows: a *chANT* in *cip*, **the tortoise**$_{iii}$, and a pro in *cnip*, **him**$_{iii}$. The pro, **him**$_{iii}$ does not occur in the same clause position as **the tortoise**$_{ii}$, and there is one *intcharef* occurring 'between' the references in this chain, (which has the same number and gender, singular male): **the hare**$_{ii}$ in C10.

Figure 5.20: Single strategy chain: main/PC-/R- (T22)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
C9	While **the tortoise**$_{iii}$	np	S	A	To	maintain	*chANT*⟩
	was jogging along						
	the hare$_{ii}$ saw	np	S	Ex	To	reestablish	–
	him$_{iii}$.	pro	O	Pe	Co	maintain	main/PC-/R-⟩

Figure 5.21 below shows another main/PC-/R- *ss-chain.* This chain, containing reference to **the tortoies**$_{ii}$ in utterances G14 and G15 is interleaved with another (multi-strategy) chain, beginning in G15, which contains reference to **the hare**$_i$; the *chANT* of the multi-strategy chain, **the hare**$_i$ in G15 is an intermediary character reference, occurring 'between' references which refer to **the tortoies**$_{ii}$ in the main/PC-/R- chain, (having the same number and gender as **the tortoies**$_{ii}$).

Figure 5.21: Single strategy chain: main/PC-/R-: interleaved (T13)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
G14	**the tortoies**$_{ii}$ was in the lead	np	S	Th	To	reestablish	*chANT*⟩
15	but **the hare**$_i$ let	np	S	A	To	reestablish	⟨*chANT*
	him$_{ii}$	pro	O	B	Co	maintain	main/PC-/R-⟩
	be in front						
	because **he**$_i$ cood run faster	pro	S	B	To	maintain	⟨main/PC+/R-
16	but wene **he**$_i$ heard	pro	S	Ex	To	maintain	⟨main/PC+/R+
	the fans$_v$ rore	np	O	Pe	Co	introduce	–
	he$_i$ saw	pro	S	Ex	To	maintain	⟨main/PC+/R-
	the tortoies$_{ii}$ was	np	S	Th	To	maintain	–
	going to win						
17	**he**$_i$ was away to run fast	pro	S	A	To	maintain	⟨main/PC+/R-

5.4.10 re/PC+/R+:reestablish/position conservation+/recency+

This strategy is implemented by:

Sneetch	Duck	Tortoise
0%	0%	2%

of all *pronominalized character references*; and within:

Sneetch	Duck	Tortoise
0%	0%	5%

of *all* pronominalization chains produced.

Data compiled from Tables A.6, B.6, C.7, A.7, B.7 and C.8.

Pronominalized character references which implement re/PC+/R+ *reestablish* reference to a character *in the same clause position* as the previous reference to the same character, who is the *most recent character* to have been referred to in the narrative.

There are no single strategy chains in which re/PC+/R+ is implemented; re/PC+/R+ is only implemented in multi-strategy chains. A typical example of how re/PC+/R+ is implemented in a multi-strategy chain is shown below in utterance C23 in Figure 5.22. In this utterance, **he**$_i$ refers to **the hare**$_i$; reference to the hare is *reestablished* in the same clause position in which it previously occurred in C20 (having the form ø). The intermediary utterances, C21 and C22 contain no character references (the missing reference in C22 is interpreted to mean 'an arrow', referred to as 'it' in C21).

Figure 5.22: re/PC+/R+ within a multi-strategy chain (T21)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
(C)19	so **he**$_i$ went and shot a bow	pro	S	A	To	reestablish	⟨re/PC+/R-
20	a [ø$_i$] poot an appale on his head	zero	S	A	To	maintain	[⟨main/PC+/R+]
21	and it sliced it open						
22	and hit the bullseye						
23	and [**he**$_i$] throw a ball	pro	S	A	To	reestablish	[⟨re/PC+/R+]

5.4.11 re/PC+/R-:reestablish/position conservation+/recency-

This strategy is implemented by:

Sneetch	Duck	Tortoise
11%	8%	4%

of all *pronominalized character references*; and within:

Sneetch	Duck	Tortoise
16%	15%	7%

of *all* pronominalization chains produced.

Data compiled from Tables A.6, B.6, C.7, A.7, B.7 and C.8.

Pronominalized character references which implement re/PC+/R- *reestablish* reference to a character *in the same clause position* as the previous reference to the same character, who is *not* the *most recent character* to have been referred to in the narrative.

Figure 5.23 below shows a narrative in which a re/PC+/R- *ss-chain* occurs. The *chANT* for this chain is **the ones without stars**$_{ii}$ in *cnip* in A2; **them**$_{ii}$, which completes the chain, also in *cnip*, occurs in B5, following four intermediary character references to **Sylvester**$_{iii}$, three having the form pro.

Figure 5.23: Single strategy chain: re/PC+/R- (S16)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
A1	**The Sneetches with Stars**$_i$ thout	np	S	Ex	To	introduce	*chANT*⟩
	they$_i$ were	pro	S	Th	To	maintain	main/PC+/R+⟩
	the best Sneetches on the beatch.						
2	**They**$_i$ would not let	pro	S	A	To	maintain	main/PC+/R+⟩
	the ones without stars$_{ii}$	np	O	P	Co	introduce	⟨*chANT*
	play in there games.						
B3	But one day **a man called Sylvester**$_{iii}$	np	S	A	To	introduce	*chANT*⟩
	he$_{iii}$ came with a machine	pro	S	A	To	maintain	main/PC+/R+⟩
4	and **he**$_{iii}$ wanted money	pro	S	Ex	To	maintain	main/PC+/R+⟩
5	**He**$_{iii}$ made	pro	S	A	To	maintain	main/PC+/R+⟩
	them$_{ii}$	pro	O	P	Co	reestablish	⟨re/PC+/R-
	pay to get Stars on there bellys.						

5.4.12 re/PC-/R+:reestablish/position conservation-/recency+

This strategy is implemented by:

Sneetch	Duck	Tortoise
0%	0%	1%

of all *pronominalized character references*; and within:

Sneetch	Duck	Tortoise
0%	0%	1%

of *all* pronominalization chains produced.

Data compiled from Tables A.6, B.6, C.7, A.7, B.7 and C.8.

Pronominalized character references which implement re/PC-/R+ *reestablish* reference and do not occur in the same clause position as the previous reference to the same character, who is the *most recent character* to have been referred to in the narrative.

Figure 5.24 below shows a narrative excerpt in which the only a re/PC-/R+ *ss-chain* occurs. The *chANT* for this chain is **the hare**$_{ii}$ in B10. The pro, **he**$_{ii}$ occurs in B12.[7]

Figure 5.24: Single strategy chain: re/PC-/R+ (T 26)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
10	**the hare**$_{ii}$ held out his hand	np	S	A	To	reestablish	*chANT*⟩
11	**the tortoise**$_{i}$ said	np	S	A	To	reestablish	–
	May the best man win						
12	**the tortoise**$_{i}$ was about	np	S	Th	To	maintain	–
	to shacke the hares hand						
	when **he**$_{ii}$ pulled it away	pro	S	A	To	reestablish	re/PC-/R+⟩

[7]However, another (possessive) reference to **the hare**$_{ii}$ occurs in B12.

5.4.13 re/PC-/R-:reestablish/position conservation-/recency-

This strategy is implemented by:

Sneetch	Duck	Tortoise
4%	3%	4%

of all *pronominalized character references*; and within:

Sneetch	Duck	Tortoise
7%	5%	8%

of *all* pronominalization chains produced.

Data compiled from Tables A.6, B.6, C.7, A.7, B.7 and C.8.

Pronominalized character references which implement re/PC-/R- *reestablish* reference and do not occur in the same clause position as the previous reference to the same character, who is *not* the *most recent character* to have been referred to in the narrative.

Figure 5.25 below shows a narrative excerpt in which a re/PC-/R- *ss-chain* occurs. The *chANT* for this chain is a compound entity: **the hare**$_i$ + **the tortoise**$_{ii}$, and each singular entity comprising this compound entity is referred to in *cnip* in A1. The pro, **they**$_i$**+ii** occurs in *cip* in A3, following intermediary reference to **the man**$_{iii}$ in A2.

Figure 5.25: Single strategy chain: re/PC-/R- (T 1)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
A1	One day a race was with **the hare**$_i$	np	O	Sr	Co	introduce	*chANT*⟩
	and **the tortoise**$_{ii}$.	np	O	Sr	Co	introduce	*chANT*⟩
2	**the man**$_{iii}$ said	np	S	A	To	introduce	–
	redy get set GO						
3	and **they**$_{i+\ ii}$ were off	pro	S	A	To	reestablish	re/PC-/R-⟩

5.4.14 Multi-strategy chains

A multi-strategy chain (*ms-chain*) is a chain in which more than one strategy is implemented. In this section, multi-strategy chains are examined by giving one example from each narrative set.

Sneetch multi-strategy chain

Figure 5.26 shows an excerpt form S narrative 4 in which there is one *ms-chain*, referring to **the Sneetches**$_{iii}$ (Sneetches 'without' stars). This chain begins with a *chANT*, **the Sneetches**$_{iii}$ in B3, and ends in B6 with the **pro they**$_{iii}$. First, an intermediary character reference occurs, **Sylvester**$_{ii}$ in B3, and then it is interleaved with another chain, a main/PC+/R- single-strategy chain, referring to **Sylvester**$_{ii}$ in utterances B4–B5.

Each set of character references which consecutively implement the same strategy in a multi-strategy chain is called a 'subchain'. The *chANT* is included in the first subchain. For the multi-strategy chain shown in Figure 5.26, there are a total of *three* subchains as follows:

subchain 1	B3	**the Sneetches**$_{iii}$	*chANT*
subchain 1	B3	**them**$_{iii}$	main/PC-/R-
subchain 2	B4	**them**$_{iii}$	main/PC+/R-
subchain 3	B6	**they**$_{iii}$	re/PC-/R-

Figure 5.26: Multi-strategy chain (S4)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
B2	but not untel **Sylvester the conman**$_{ii}$ came.	np	S	A	To	introduce	*chANT*⟩
3	**he**$_{ii}$ was very bad	pro	S	Th	To	maintain	main/PC+/R+⟩
	becos [**the Sneetches**$_{iii}$] thout	np	S	Ex	To	introduce	⟨*chANT*
	Sylvester$_{ii}$ was going	np	S	A	To	maintain	–
	to help [**them**$_{iii}$].	pro	O	B	Co	maintain	⟨main/PC-/R-
4	but **Sylvester**$_{ii}$ was just wanting	np	S	Ex	To	maintain	*chANT*⟩
	to cheet [**them**$_{iii}$]	pro	O	P	Co	maintain	⟨main/PC+/R-
5	and ø$_{ii}$ brout out a machine	zero	S	A	To	maintain	main/PC+/R-⟩
6	and [**they**$_{iii}$] pade three punds	pro	S	A	To	reestablish	⟨re/PC-/R-
	to get in and get there stars.						

Duck multi-strategy chain

The *ms-chain* referring to **the swon**$_i$ shown in the excerpt from D narrative 17 in Figure 5.27 is interleaved with two other chains: 1) another *ms-chain* referring to **them**$_{iii}$, beginning in A2, and 2) a main/PC+/R+ *ss-chain* referring to **a mummy swon**$_v$ beginning in C6. In addition, an *intcharef* occurs in B4 (**this big duck**$_{iv}$). The references in the chain referring to **the swon**$_i$ (who is the 'ugly duckling') are summarized as follows:

subchain 1	A2	**the swon**$_i$	$chANT$
subchain 1	A2	**him**$_i$	main/PC-/R-
subchain 2	B3	**he**$_i$	main/PC-/R+
subchain 3	B4	**he**$_i$	main/PC+/R+
subchain 4	B5	**he**$_i$	main/PC+/R-
subchain 5	C7	**him**$_i$	re/PC-/R-

Figure 5.27: Multi-strategy chain (D17)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
A1	Once apon a time there was a ugly **Swon**$_i$ who came from	np	S	Th	To	introduce	–
	a mother duck$_{ii}$.	np	O	Sr	Co	introduce	–
2	and because **the swon**$_i$	np	S	B	To	maintain	⟨$chANT$
	was not the same as **them**$_{iii}$	pro	S	Th	To	introduce	intro/chANT-⟩
	so **they**$_{iii}$ would not let	pro	S	A	To	maintain	main/PC+/R+⟩
	him$_i$ stay.	pro	O	P	Co	maintain	⟨main/PC-/R-
B3	so **he**$_i$ went away feeling sad	pro	S	A	To	maintain	⟨main/PC-/R+
4	and then **he**$_i$ saw	pro	S	Ex	To	maintain	⟨main/PC+/R+
	this big duck$_{iv}$	np	O	Pe	Co	introduce	–
5	and **he**$_i$ was nockt out.	pro	S	P	To	maintain	⟨main/PC+/R-
C6	Then **a mummy swon**$_v$ came along	np	S	A	To	introduce	$chANT$⟩
7	and **ø**$_v$ took	zero	S	A	To	maintain	main/PC+/R+⟩
	him$_i$	pro	O	P	Co	reestablish	⟨re/PC-/R-
	with **her swons**$_{vi}$.	np	O	As	Co	introduce	–

Tortoise multi-strategy chain

Figure 5.28 shows an excerpt from T narrative 7 containing a *ms-chain* referring to **the tortoise**$_{ii}$, which is interleaved with two *ms-chains* referring to **the hare**$_{i}$; the *chANT* of the former occurs in C6; the *chANT* for the first chain referring to **the hare**$_{i}$ occurs in C4 and for the second in D8. Following is a summary of the references in the chain which refers to **the tortoise**$_{ii}$:

subchain 1	C6	**the tortoise**$_{ii}$	*chANT*
subchain 1	C6	**he**$_{ii}$	main/PC+/R-
subchain 2	C7	**ø**$_{ii}$	main/PC+/R+
subchain 3	D10	**him**$_{ii}$	re/PC-/R-

Figure 5.28: Multi-strategy chain (T7)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
C4	and when **the hare**$_{i}$ was far away	np	S	Th	To	maintain	*chANT*⟩
	from **the tortoise**$_{ii}$	np	O	RO	Co	maintain	–
	so **he**$_{i}$ leaned on the tree	pro	S	A	To	maintain	main/PC+/R-⟩
5	and **ø**$_{i}$ fell fast a sleep	pro	S	Th	To	maintain	main/PC+/R+⟩
6	and when [**the tortoise**$_{ii}$] came	np	S	A	To	reestablish	[⟨*chANT*]
	nare **him**$_{i}$	pro	O	RO	Co	maintain	main/PC-/R-⟩
	[**he**$_{ii}$] went shsh	pro	S	A	To	maintain	[⟨main/PC+/R-]
7	and [**ø**$_{ii}$] creept quietly	zero	S	A	To	maintain	[⟨main/PC+/R+]
	past **him**$_{i}$	pro	O	RO	Co	maintain	main/PC+/R-⟩
D8	after that **the hare**$_{i}$ walk up	np	S	Th	To	maintain	*chANT*⟩
9	and **ø**$_{i}$ zoomed away	zero	S	A	To	maintain	main/PC+/R+⟩
10	and **ø**$_{i}$ went	zero	S	A	To	maintain	main/PC+/R+⟩
	past [**him**$_{ii}$]	pro	O	RO	Co	reestablish	[⟨re/PC-/R-]

5.5 Summary: strategies and chains

5.5.1 Component values

In total, eight different strategies, describing how **pros** and **zeros** were produced relative to previous reference to the same character, have been identified and examined in detail. Table 5.15 below shows the number and percentage of *pcrs* produced which were found to implement each strategy, with the first column indicating the section in this chapter in which each strategy is examined. It can be seen from this table that the highest percentage of *pcrs* in each set implemented main/PC+/R+, with the lowest percentage implementing this strategy occurring in the D set. Furthermore, intro/chANT- is not implemented at all in the T set, and in both the D and T sets, at least 20% of *pcrs* implement main/PC+/R-.

Table 5.15: Strategies implemented

section	*strategy*	*no of pcrs (% of pcrs)* Sneetch		Duck		Tortoise	
S5.4.5	intro/chANT-	2	(3)	4	(5)	0	(0)
S5.4.6	main/PC+/R+	50	(66)	29	(39)	129	(53)
S5.4.7	main/PC+/R-	6	(8)	15	(20)	53	(22)
S5.4.8	main/PC-/R+	2	(5)	10	(14)	13	(5)
S5.4.9	main/PC-/R-	5	(7)	9	(12)	23	(9)
S5.4.10	re/PC+/R+	0	(0)	0	(0)	6	(2)
S5.4.11	re/PC+/R-	8	(11)	6	(8)	9	(4)
S5.4.12	re/PC-/R+	0	(0)	0	(0)	2	(1)
S5.4.13	re/PC-/R-	3	(4)	2	(3)	11	(4)
	TOTAL	76	(100)	75	(100)	245	(100)

Data extracted from Tables A.6, B.6 and C.7.

The next Table, 5.16, shows the number and percentage of pronominalization strategies implementing each possible value of the three strategy components: continuity function, position conservation and recency. For example, it can be seen in this table that the value of the continuity function component was **maintain** for 63 (83%) of all strategies implemented in the Sneetch set. Overall, Table 5.16 shows that in each set: the continuity function component has the value **maintain** more frequently than **reestablish**; the position conservation component has the value PC+ more frequently than PC-, and the recency component has the value R+ more frequently than R-

Table 5.16: Variables implemented in pronominalization strategies

variable	*no of strats (% of strats)* Sneetch	Duck	Tortoise
continuity function			
introduce	2 (3)	4 (5)	0 (0)
maintain	63 (83)	63 (84)	217 (89)
reestablish	11 (14)	8 (11)	28 (11)
total (cont func):	76 (100)	75(100)	245 (100)
position conservation			
PC+	64 (84)	50 (67)	197 (80)
PC-	10 (13)	21 (28)	48 (20)
intro/chANT-: N/A[a]	2 (3)	4 (5)	0 (0)
total (position cons):	76 (100)	75(100)	245 (100)
recency			
R+	52 (68)	39 (52)	150 (61)
R-	22 (29)	32 (43)	95 (39)
intro/chANT-: N/A[b]	2 (3)	4 (5)	0 (0)
total (recency):	76 (100)	75(100)	245 (100)

[a] intro/chANT- strategy, no position conservation judgement.

[b] intro/chANT- strategy, no recency judgement.

Data extracted from Tables A.6, B.6 and C.7.

5.5.2 Types of chains

Table 5.17 shows the number and percentage of each type of chain produced, according to the number of strategies implemented in each. From this table it can be seen that the majority of chains in each set are single-strategy chains.

Table 5.17: Pronominalization chains: all types

chain type	*no of chains (% of chains)* Sneetch	Duck	Tortoise
Single-Strategy Chains			
1-strategy	36 (84)	26 (65)	90 (69)
subtotal (single)	36 (84)	26 (65)	90 (69)
Multi-Strategy Chains			
2-strategy	2 (5)	9 (23)	32 (25)
3-strategy	3 (7)	1 (3)	4 (3)
4-strategy	2 (5)	2 (5)	4 (3)
5-strategy	0 (0)	1 (3)	0 (0)
6-strategy	0 (0)	1 (3)	0 (0)
subtotal (multi)	7 (16)	14 (35)	40 (31)
TOTAL: *all chains*	43 (100)	40(100)	130 (100)

Data extracted from Tables A.7, B.7, and C.8.

Summary: types of single strategy chains

Table 5.18 which follows shows the number and percentage of each type of single-strategy chain produced. It can be seen from this table that in each narrative set, of all *ss-chains*, the highest number and percentage are main/PC+/R+ chains, with the lowest percentage occurring in the D set; furthermore, no intro/chANT-chains (which would consist of only one reference) occur in the T set, and very few occur in the S or D set.

Table 5.18: Summary: single-strategy chains

chain type (strategy)	*no of chains (% of chains)* Sneetch	Duck	Tortoise
intro/chANT-	2 (5)	1 (2)	0 (0)
main/PC+/R+	26 (60)	15 (38)	58 (46)
main/PC+/R-	2 (5)	2 (5)	14 (11)
main/PC-/R+	0 (0)	4 (10)	4 (4)
main/PC-/R-	2 (5)	2 (5)	3 (2)
re/PC+/R+	0 (0)	0 (0)	1 (1)
re/PC+/R-	4 (9)	2 (5)	2 (2)
re/PC-/R+	0 (0)	0 (0)	1 (1)
re/PC-/R-	0 (0)	0 (0)	7 (5)
subtotal: (single)	36 (84)	26 (65)	90 (69)
subtotal: (multi)	7 (16)	14 (35)	40 (31)
TOTAL: *(all chains)*	43 (100)	40(100)	130 (100)

Data extracted from Tables A.7, B.7 and C.8.

Summary: Types of multi-strategy chains

Multi-strategy chains (*ms-chains*) have been defined as chains in which more than one strategy is implemented, (*i.e.* , chains consisting of two or more subchains). It was shown in Table 5.17 above, that 16% (S), 35% (D) and 31% (T) of all chains produced were *ms-chains*. Figure 5.19 below shows the number and percentage of *ms-chains* in which each strategy was involved (the number and percentage of *ms-chains* containing subchains implementing each strategy). It can be seen from this table that:

- Strategy main/PC+/R+ is involved in a majority of *ms-chains* in each set;
- Strategy main/PC+/R- is involved in a majority of *ms-chains* in each set;
- Strategy main/PC-/R- is implemented in over a third of all *ms-chains* in each set;
- Two other strategies, main/PC-/R+ in the D set, and re/PC+/R- in the S set are involved in over a third of all *ms-chains*.

Furthermore, the D set contains the only *ms-chains* in which intro/chANT- is implemented (by definition, as the first strategy).

Table 5.19: Strategies involved in multi-strategy chains

strategy	*no of chains (% of chains)*					
	Sneetch 7 chains		**Duck** 14 chains		**Tortoise** 40 chains	
intro/chANT-	0	(0)	23	(15)	0	(0)
main/PC+/R+	5	(71)	10	(71)	30	(75)
main/PC+/R-	5	(71)	10	(71)	23	(58)
main/PC-/R+	1	(0)	5	(38)	8	(20)
main/PC-/R-	3	(43)	5	(38)	16	(40)
re/PC+/R+	0	(0)	0	(0)	5	(13)
re/PC+/R-	3	(43)	4	(31)	6	(15)
re/PC-/R+	0	(0)	0	(0)	0	(0)
re/PC-/R-	2	(29)	2	(15)	4	(31)

Data extracted from Tables A.7, B.7 and C.8.

Summary: Strategies involved in all types of chains

Figure 5.20 below shows the number and percentage of *all chains* (single and multi-strategy chains) in which each strategy is involved. It can be seen from this table that:

- The strategy main/PC+/R+ is involved in more chains than any other strategy in each set;
- The strategy main/PC+/R- is involved in almost a third of all chains produced in the D and T sets.

Table 5.20: Strategies involved in all chains

strategy	*no of chains (% of chains)*					
	Sneetch 43 chains		**Duck** 40 chains		**Tortoise** 130 chains	
intro/chANT-	2	(5)	4	(10)	0	(0)
main/PC+/R+	31	(72)	25	(60)	88	(68)
main/PC+/R-	7	(16)	14	(35)	37	(28)
main/PC-/R+	1	(2)	9	(23)	12	(9)
main/PC-/R-	5	(12)	7	(18)	19	(15)
re/PC+/R+	0	(0)	0	(0)	6	(5)
re/PC+/R-	7	(16)	0	(0)	9	(7)
re/PC-/R+	0	(0)	0	(0)	1	(1)
re/PC-/R-	2	(5)	0	(5)	11	(8)

Data extracted from Tables A.7, B.7 and C.8.

5.5.3 Further characteristics of pronouns in chains

Chain length

Table 5.21 below shows the average length of chains in the following categories: 1) main/PC+/R+ chains; 2) all other single-strategy chains; 3) 2-, 3-, 4-, 5- and 6- strategy (multi) chains. Two different 'measurements' of length are given:

1. Average number of references referring to the pronominalized character in a chain: *i.e.* $chANT$ + *pcrs.*

2. Average number of utterances *encompassed* by the chain, indicated in square brackets: *i.e.*, total number of utterances encompassed by the chain, from the utterance in which the $chANT$ occurs up to and including the utterance in which the last *pcr* in the chain occurs.

It can be seen from this table that in each set, as the average number of character references in a chain increased, the average number of utterances encompassed by a chain also increased. It can also be seen that, with the exception of 4-strategy chains in the D set, as the average number of character references and utterances involved in chains increased, so did the number of strategies implemented.

Table 5.21: Summary: chain length

	no of pcrs [no of utts]		
	Sneetch	**Duck**	**Tortoise**
chain type	*charefs* [*utts*]	*charefs* [*utts*]	*charefs* [*utts*]
Single-Strategy Chains			
main/PC+/R+	2.35[1.54]	2.00 [1.67]	2.38 [2.03]
other *ss-chains*	2.00[2.60]	2.11 [1.91]	2.32 [2.32]
Multi-Strategy Chains			
2-strategy	3.00[3.00]	2.90 [3.50]	3.87 [3.03]
3-strategy	5.33[7.33]	5.00 [6.00]	4.20 [4.40]
4-strategy	8.00[8.00]	5.00 [4.50]	8.75[10.00]
5-strategy	– –	6.00 [6.00]	– –
6-strategy	– –	12.00[13.00]	– –

Data extracted from chains listed in Tables A.3, B.3 and C.3.

Chain boundary crossings

In total, 7/43 (16%) (S), 6/40 (15%) (D) and 20/129 (15.5%)(T) chains cross at least one scene boundary; of these less than half in each set cross two or more scene boundaries. Table 5.22, Table 5.23 and Table 5.24 below contain summaries of the number and percentage of chains which cross at least one scene boundary. (*I.e,* which contain references occurring in two or more scenes.) Each table shows only the percentage of chains which cross a scene boundary in one of the following categories: 1) main/PC+/R+ chains; 2) all other single strategy chains; 3) all multi-strategy chains. For example, it can be seen in Table 5.22 that there were 26 main/PC+/R+ chains produced in the S set, and of these 0% crossed at least one scene boundary. Overall, these tables shows that a higher percentage of multi-strategy chains cross at least one scene boundary than either main/PC+/R+ or 'other' single strategy chains.

Table 5.22: Chain boundary crossings: main/PC+/R+

	prop of chains (% of chains)		
chain type	**Sneetch**	**Duck**	**Tortoise**
main/PC+/R+	0/26 (0)	0/15(0)	5/58 (9)

Data extracted from chains listed in Tables A.3, B.3 and C.3.

Table 5.23: Chain boundary crossings: all other *ss-chains*

	prop of chains (% of chains)		
chain type	**Sneetch**	**Duck**	**Tortoise**
all other *ss-chains*	4/10(40)	1/11(9)	5/32 (16)

Data extracted from chains listed in Tables A.3, B.3 and C.3.

Table 5.24: Chain boundary crossings: multi-strategy chains

	prop of chains (% of chains)		
chain type	**Sneetch**	**Duck**	**Tortoise**
all ms-chains	4/7 (57)	4/14(29)	17/40(43)

Data extracted from chains listed in Tables A.3, B.3 and C.3.

Forms in chains

In the analysis of chains so far, the term 'pronominalized character reference' (*pcr*) has been used to mean a reference having the form pro or ø. The following three tables, 5.25, 5.26 and 5.27 show the number and percentage of three categories of chains (main/PC+/R+, all other single strategy chains, and all multi-strategy chains) in which:

1. all *pcrs* have the form pro (*pro*);

2. all *pcrs* have the form ø (*zero*);

3. at least one *pcr* has the form pro *and* at least one has the form ø (*pro and zero*)

For example, Figure 5.25 shows that 23/26 (88%) of all S main/PC+/R+ chains contain *pcrs* which *all* have the form pro, while 4% contain *pcrs* which *all* have the form ø, and 8% contain at least one *pcr* which has the form pro and one *pcr* which has the form ø.

It can be seen from Table 5.25 that the T set contains the highest percentage of main/PC+/R+ chains in which all *pcrs* have the form ø, and the lowest percentage in which all *pcrs* have the form pro.

Table 5.25: Forms of *pcrs*: main/PC+/R+ chains

chain type	*prop of chains (% of chains)* Sneetch	Duck	Tortoise
main/PC+/R+			
pro	23/26 (88)	13/15 (87)	37/58 (64)
zero	1/26 (4)	2/15 (13)	14/58 (24)
pro and zero	2/26 (8)	0/15 (0)	3/58 (5)
total main/PC+/R+ *chains*	26(100)	15(100)	58(100)

Data extracted from chains listed in Tables A.3, B.3 and C.3.

Table 5.26: Forms of *pcrs*: all other single strategy chains

chain type	*prop of chains (% of chains)* Sneetch	Duck	Tortoise
other single strategy			
pro	9/10 (10)	11/11(100)	29/32 (91)
zero	1/10 (10)	0/11 (0)	2/32 (6)
pro and zero	0/10 (0)	0/11 (0)	0/32 (0)
total single strategy chains	10(100)	12(100)	32(100)

Data extracted from chains listed in Tables A.3, B.3 and C.3

Table 5.27: Forms of *pcrs*: multi-strategy chains

chain type	*prop of chains (% of chains)* Sneetch	Duck	Tortoise
multi-strategy chains			
pro	4/7 (57)	12/14 (86)	25/40 (63)
zero	0/7 (0)	0/14 (0)	0/40 (0)
pro and zero	3/7 (43)	2/14 (14)	15/40 (38)
total multi-strategy chains	7(100)	14(100)	40(100)

Data extracted from chains listed in Tables A.3, B.3 and C.3

From the three tables above it can be calculated that the percentage of *all* chains which contain at least one *pcr* having the form ø equals: 16% (S), 10% (D), 26% (T) — the highest percentage occurring in the T set.

Furthermore, the chain listings given in Sections A.3, B.3 and C.3 in Appendices A, B and C show that of all references having the form ø, 75%(S), 100%(D) and 89%(T) implement the strategy main/PC+/R+.[8]

[8]Zero anaphora is used in coordinated constructions, and therefore the only two possible strategies which zeros could have implemented were main/PC+/R+ and main/PC+/R-. Thus, the analysis shows that when they used zeros, children implemented 'pronominalization strategies' which they were constrained to use.

Clause position

Tables 5.28, 5.29 and 5.30 below show, for each of three categories of chains, (main/PC+/R+, all other single strategy chains, all multi-strategy chains), the proportion and percentage in which:

1. all references (*i.e. chANT and* all *pcrs* which refer to the *chANT*) occur in clause initial position; or

2. at least one reference (*chANT* or a *pcr*) occurs in clause non-initial position.

It can be seen from these tables that all main/PC+/R+ chains involve reference in *cip* only, so if a *chANT* or a *pcr* occurs in *cnip*, it occurs either in another type of *ss-chain* or in a *ms-chain*.

Table 5.28: Clause position of *chANT* and *pcrs*: main/PC+/R+ chains

	no of chains (% of chains)		
chain type	**Sneetch**	**Duck**	**Tortoise**
main/PC+/R+			
cip	26/26(100)	15/15(100)	58/58(100)
cnip	0/26 (0)	0/15 (0)	0/58 (0)
total chains	26(100)	15(100)	58(100)

Data extracted from chains listed in Tables A.3, B.3 and C.3.

Table 5.29: Clause position of *chANT* and *pcrs*: other single strategy chains

	no of chains (% of chains)		
chain type	**Sneetch**	**Duck**	**Tortoise**
other single strategy chains			
cip	7/10 (70)	5/11 (45)	15/32 (47)
cnip	3/10 (30)	7/11 (64)	17/32 (53)
total chains	10(100)	12(100)	32 (100)

Data extracted from chains listed in Tables A.3, B.3 and C.3.

Table 5.30: Clause position of *chANT* and *pcrs*: multi-strategy chains

	no of chains (% of chains)		
chain type	**Sneetch**	**Duck**	**Tortoise**
multi-strategy chains			
cip	3/7 (43)	5/14 (43)	23/40 (58)
cnip	4/7 (57)	8/14 (57)	17/40 (43)
total chains	7(100)	14(100)	40 (100)

Data extracted from chains listed in Tables A.3, B.3 and C.3.

Overall, it can be calculated that 16%(S), 33%(D) and 26%(T) of all chains contained at least one *pcr* in *cnip*.

Plurals involved in chains

Two types of plural reference were found to be involved in chains:

1. Reference to a group of entities which can be expressed as one **np**, and hence, one *chANT*, and pronominalized in the third person plural ('they' or 'them'). For example, from S narrative 1:

   the Sneetches without stars$_i$ ar sad
   beecos **they**$_i$ havint got stars.

2. Reference to a 'compound' entity for which the *chANT* is expressed as two or more **nps** (*chANT*) implicitly or explicitly conjoined by 'and', and pronominalized in the third person plural ('they' or 'them'). For example, from T narrative 1

   One day a race was with **the hare**$_i$ and **the tortoise**$_{ii}$ ...
   and **they**$_{i+}$**ii** were off.

Table 5.31 below shows the number and percentage of all chains which refer to plural 'group' or 'compound' entities. It can be seen from this table that the

Table 5.31: Plurals involved in chains

	no of chains (% of chains)		
entity type	**Sneetch**	**Duck**	**Tortoise**
group	28/43 (65)	8/40 (20)	11/130 (8)
compound	3/43 (7)	1/40 (3)	9/130 (7)
total plural chains	31/43 (72)	9/40 (23)	19/130 (15)
total singular chains	12/43 (28)	31/40 (78)	110/130 (85)
total chains	43(100)	40(100)	130(100)

highest percentage of all chains which refer to a plural entity refer to group entities in the S set; and, overall, more plural chains were produced in the S set than in the D or T set.

Number and gender

In all three narrative sets, all pronominalized references agreed in number and gender with the np which functioned as the *chANT* in the chain in which the *pcr* was produced. However, in 1/40 of the chains in the D set and 1/129 of the chains in the T set (2%) *pcrs* were subject to a *change in gender.* For example, in D narrative 18, the ugly duckling is referred to as 'it' in B6: "So **they**$_{iv}$ left **it**$_{iii}$ alone." But in the utterance which follows, C7, the ugly ducking is referred to as 'he': "but **he**$_{iii}$ thought **he**$_{iii}$ found **a frend**$_{v}$.

Chapter 6

Summary, Discussion and Model

This Chapter gives a summary of results reported in Chapter 6, and then presents a discussion of results, followed by a a psycholinguistic model of the production of anaphoric reference by seven-year-old children which summarizes the discussion.

6.1 Summary of Results

6.1.1 Overview

The Sneetch (S) and Ugly Duckling (D) narratives were produced in different experiments by children in the same lower-third (Primary 3) class of Our Lady's School, Dundee, Scotland. In a further experiment, the Tortoise (T) narratives were produced by children in an upper-third (Primary 3) class of Park Place School, Dundee, Scotland. Both the mean and median age of the children who participated in the T experiment were slightly higher than that of children who participated in the S or D experiment: S: 7;5 (mean), 7;6.5 (median); D: 7;5 (mean), 7;4 (median); T: 7;7 (mean), 7;8 (median). Overall completion rates for the narrative writing task were highest for the T stories, and, on average, these stories were the longest, with the highest number of scenes, utterances, characters referred to and character references.

In general, the analysis of narratives showed all three sets to mostly have similar features, although some differences were also reported. For example, T and D narratives contained similar percentages of simple *vs.* complex utterances, while the S narratives contained a higher percentage of complex utterances, mainly due to the large number of embedded content clauses in utterances which describe the superiority of the *Sneetches with stars on their bellies*, *e.g.*, "And the ones that had starts thot they were the best".

There were other differences found among sets which may be attributable to the difference in the length of narratives produced, such as the finding that the T

set contained the highest percentage of narratives in which four or more characters were referred to, the highest percentage of narratives containing dialogue or utterances which did not contain character references, and the highest percentage of narratives in which three or more characters were pronominalized. Further differences are noted in the appropriate summaries below.

6.1.2 Scenes

The structure of narratives was analyzed by identifying units of text which oriented a reader's attention through an implicit or explicit change in spatial location, an implicit or explicit temporal break, or a discontinuity. On average, there were 2.94(S), 2.17(D) and 5.30(T) scenes per narrative.

6.1.3 Syntactic, semantic and pragmatic roles

In all three narrative sets, the majority of character references implemented the syntactic role S (Subject) rather than O (Object). These roles always converged with the pragmatic roles To and Co, respectively.

Among all three sets, thirteen different semantic roles were found to be implemented. In total, nine roles were implemented at least once in all three sets, and the role most frequently implemented in each set was 'Agent'. The set of roles implemented in each set was different, and varied according to the data-driven demands of each story, *i.e.* , as children attempted to tell stories in which characters assumed different roles in the videos they had seen, they varied semantic roles accordingly. For example, the T set was the only set in which the role *Reference Object* (RO), defined as an *entity which serves as a reference point or landmark in relation to another entity*, is implemented; this role describes the relationship between the two racers, the tortoise and the hare, in utterances such as: "the tortoise sneeked past him", in which *him* is the hare in the role of Reference Object.

6.1.4 Role convergences, clause position

An analysis of role convergences (rcons), defined as convergences of syntactic, semantic and pragmatic roles showed that among all three narrative sets, the set of semantic roles which converged with the syntactic and pragmatic roles S and To contained ten members, as did the set of semantic roles which converged with O and Co. In total six roles were contained in the intersecting set, *i.e.* there were six roles which converged with either S *and* To or O *and* Co, while four roles converged exclusively with S and To, and four converged exclusively with O and Co.

Role convergences were found to be correlated with clause position as follows:

- S/[semantic role]/To was found to be correlated with *clause initial position* (*cip*); and
- O/[semantic role]/Co was found to be correlated with *clause non-initial position* (*cnip*).

In total, the percentage of character references produced in *cip vs. cnip* were: Sneetch: 88% *vs.* 13%[1]; Duck: 74% *vs.* 26%; Tortoise 79% *vs.* 21%. That the Sneetch narratives contained the *lowest* percentage of character references which implemented *role convergences* correlated with *clause non-initial position* seems to be attributable to the different content of stimulus materials. Children appear to have had particular difficulty manipulating the various groups of Sneetches which interacted in the video story. This problem is demonstrated in an excerpt from S narrative 2:

> Once a ponatime ther was Sneetches and some had stars and some didint. and the wons with the stars thot they wor the best. and the wons with the stars and the onse that had no stars they were enemys.

6.1.5 Continuity functions

An analysis of the continuity functions **introduce**, **maintain** and **reestablish** showed that a similar percentage of character references were used to maintain reference in each narrative set, but that a higher percentage of references were used to reestablish reference (and hence a lower percentage were used to introduce reference) in the T set than the S or D set; this result was most likely due to the length of T narratives.

6.1.6 Scene level references

An analysis of character references at scene level showed that the majority of scenes in each set contained reference to 1, 2 or 3 characters, and that the greatest number of scenes in each set contained pronominalization of only one character (45–49%); however, 18–24% of all scenes contained pronominalization of two characters. Furthermore, it was calculated that for scenes containing 1–3 characters, in all sets, the higher the number of characters referred to per scene, the less likely it was that each character was pronominalized.

It was further reported that there was a preference for the use of **nps** over **pros** or **zeros** for character references produced in utterances on scene boundaries, but no

[1]These total less than '100' because percentages were rounded to two decimal places.

clear preference for the use of nps over pros or zeros within scene bodies. Character references on scene boundaries were more likely to introduce or reestablish reference than to maintain reference. In addition, when a character reference was produced within a scene body it was more likely to maintain reference than when it was produced on a scene boundary. Another difference among sets was found in the analysis of character references at the scene level. In the T set, when reference was maintained on a scene boundary, the character reference was more likely to have the form np than pro, but in the S and D sets, the character reference was more likely to have the form pro.

6.1.7 Strategies and chains

The analysis of pronominalized character references (*pcrs*), focused on the strategies implemented and the types of pronominalization chains (*chains*) which pronominalized references comprised. Results of this analysis are summarized in this section.

Strategies

Pronominalization strategies were defined has having three components: continuity function, position conservation and recency, each taking one value when a *pcr* was not used to introduce reference to a character in a narrative:

continuity function : maintain (main), or reestablish (re);

position conservation : PC+ or PC-;

recency : R+ or R-.

When a *pcr* was used to introduce reference, the strategy contained two components, *i.e.* , intro/chANT-. In total, nine different strategies were found to be implemented in single or multi-strategy 'chains': intro/chANT-, main/PC+/R+, main/PC+/R-, main/PC-/R+, main/PC-/R-, re/PC+/R+, re/PC+/R-, re/PC-/R+, re/PC-/R-.

It was found that very few *pcrs*, occurring only in the S and D sets, implemented the strategy intro/chANT- (meaning that they *were not* preceded in the text by an antecedent having the form np (the *chANT*)). In total, there were only two instances in the S set (3%), and four instances in the D set (5%).

The most frequently implemented strategy *in each set* was main/PC+/R+; the lowest percentage occurring in the D set: 66%(S), 39%(D) and 53%(T). The next most frequently implemented strategy in the D and T sets was main/PC+/R- (20%(D), 22%(T)). Only 8% of *pcrs* implemented this strategy in the S set.

The next highest percentage of strategies implemented by *pcrs* in the S set was re/PC+/R- (11%).

An analysis of each of the components of pronominalization strategies showed that the most frequent values judged were the same in each set:

continuity function : maintain vs. introduce or reestablish: maintain = 83%(S), 84%(D), 89%(T)

position conservation : PC+ vs. PC-: PC+ = 84% (S), 67% (D), 80% (T)

recency : R+ vs. R-: R+ = 68% (S), 52%(D), 61% (T)

Chains

Pronominalization chains consisted of a *chANT* plus a series (of one or more) *pcrs* meaning the *chANT* (unless a chain began with a *pcr* which introduced reference to a character and implemented the strategy intro/chANT-). The majority of chains were found to be 'single-strategy' rather than 'multi-strategy' chains, with the highest percentage of single-strategy chains occurring in the S set.

Single-strategy chains

In each set, the highest percentage of chains contained *pcrs* which implemented only one strategy: main/PC+/R+; the highest percentage in the S set (60%), the lowest in the D set (38%), and 46% in the T set. The average number of character references involved in single-strategy main/PC+/R+ chains was 2.35(S), 2.00(D), 2.38(T), and the average number of utterances encompassed by these chains was 1.54(S), 1.67(D), 2.03(T).

The next most frequently implemented types of chain in the D and T sets, were: D: main/PC-/R+ (10%) and T: main/PC+/R- (11%) — in both less than the total percentage of multi-strategy chains in which two strategies were implemented. In contrast, the next most frequently implemented type of chain in the S set was re/PC+/R-: 9%.

Multi-strategy chains

Two strategies were implemented with almost equal frequency, and more frequently than any other strategies in all multi-strategy chains in the S and D sets: main/PC+/R+ and main/PC+/R-. In the T set, main/PC+/R+ was the most frequently implemented strategy.

In general, multi-strategy chains in all sets tended to involve a much higher number of character references and encompassed a much higher number of utter-

ances than single-strategy chains, and a much higher percentage of multi-strategy chains were found to cross scene boundaries than single-strategy chains in all sets.

Strategies involved in all chains

In each set, the strategy which was implemented in the highest proportion of all chains was main/PC+/R+: 72%(S), 63%(D), 68%(T). The next most frequently implemented strategy in all chains in the D and T sets was main/PC+/R-: 30%(D), 28%(T), and in the S set, main/PC+/R- and re/PC-/R+ were both implemented in 16% of all chains.

Forms in chains

Most pronominalized references in all set were produced having the from pro. Only 16%(S), 10%(D) and 26%(T) of all chains contained any references having the form zero. The highest percentage of single-strategy chains in which all *pcrs* had the form zero occurred in the T set, and 38% of all multi-strategy chains in the T set contained at least one *pcr* having the form zero, as did 43% (S) and 14% (D). A large majority of all references having the form zero implemented the strategy main/PC+/R+.

Clause position

Overall, it was calculated that 16%(S), 33%(D) and 26%(T) of all chains contained at least one *pcr* in clause non-initial position. In each set, there were no pronominalized references which occurred in *cnip* in main/PC+/R+ single-strategy chains.

6.1.8 Plurals, number and gender, left dislocation

Plurals

Two types of plural references were pronominalized (referred to with the pro 'they' or 'them'): 1) reference to a group of entities' and 2) reference to a compound entity, (which consisted of more than one character implicitly or explicitly conjoined). The highest percentage of chains which involved plural references occurred in the S set, in which 65% of chains referred to a 'group' of characters. This is not surprising in view of the fact that the stimulus material was mainly about groups of Sneetches. In contrast, 20%(D) and 8%(T) of all chains referred to groups of characters, and 7%(S), 3%(D) and 7%(T) of all chains referred to compound entities.

Number and gender agreement

There were no instances found of disagreement in number and gender between a *pcr* and the *chANT* in the chain in which the *pcr* was produced. However, in one chain in the D set and one in the T set, the *gender* of a character was changed when the character was pronominalized.

6.2 Discussion

This section discusses the results of the analysis of children's narratives. Unless otherwise specified, the discussion is about all three narrative sets. The terms 'pronoun', 'pronominal' and 'pronominalized character reference' (*pcr*) are used interchangeably in this chapter to mean a reference to a character having the form pro or zero (see Chapter 4, Section 4.6.4 for definitions.).

6.2.1 Pronominalization and narrative construction

Children's narratives consisted mainly of chains of events, but also included descriptions of characters' thoughts and beliefs, and their physical characteristics. A wide variety of semantic roles were implemented by character references, indicating a wide variety of types of events and descriptions. Only occasionally did narratives contain dialogue or utterances which did not contain any references to characters. Most of the events and descriptions, and the order in which they were related, were drawn directly from the cartoon videos used as stimulus materials, although many narratives were incomplete and lacked detail.

The analysis of narrative structure showed that children sequentially organized the content of their narratives through the dimensions of time and location, and provided a good description of how narratives were semantically organized into units of 'data-driven' sequences called 'scenes'. At the same time, there was almost no evidence which could support the hypothesis that children organized their narratives from the 'top-down', for example, by stating the moral of the story, giving an overview of the events in the narrative, or establishing a thematic subject. Typically, the first utterance in each narrative directed the reader's attention to what children saw at the beginning of each cartoon video. For example, they established two opposing groups of sneetches, or the 'daddy duck' was waiting for the ducklings to be born, or a race was going to start between a tortoise and a hare.

In only a few narratives (D7, D14, D15, T17) was there some evidence that the writer attempted to create a 'thematic subject', mainly by focussing on one character in the first utterance, and then involving that character in all of the events and/or descriptions in the narrative. In all of the 'D' narratives listed above, the selected character was the ugly duckling, and in the 'T' narrative, the hare, for example:

Figure 6.1: Possible thematic subject (D14)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
A1	Once apon a time there lived an uglea duckling$_i$.	np	S	Th	To	introduce	*chANT*⟩
2	**He$_i$** had	pro	S	B	To	maintain	main/PC+/R+⟩
	no freids$_{ii}$	np	O	Pe	Co	introduce	–
	Except for **his faimily$_{iii}$**.	np	O	As	Co	introduce	–
B3	**He$_i$** met	pro	S	Th	To	maintain	main/PC+/R-⟩
	a wooden duck$_{iv}$	np	O	Pe	Co	introduce	⟨*chANT*
4	and **he$_i$** thout	pro	S	Ex	To	maintain	main/PC+/R-⟩
	it$_{iv}$ was his mother duck	pro	S	Th	To	maintain	⟨main/PC-/R-
5	**It$_{iv}$** rocked	pro	S	Th	To	maintain	⟨main/PC+/R+
6	and **ø$_{iv}$** hut	zero	S	In	To	maintain	⟨main/PC+/R+
	him$_i$ on the head	pro	O	P	Co	maintain	main/PC-/R-⟩

In all but one narrative in which the writer attempted to create a thematic subject, more than one character was pronominalized in clause initial position. Therefore, overall, there was no evidence to show that "output is governed by the thematic subject constraint, which preempts pronominalization in 'utterance initial slot' for the thematic subject" as Karmiloff-Smith (1987: 188) describes for spoken narratives of 6–7 year old children. However, neither was there evidence to show that seven year old children in this study produced narratives similar to those of 8–9 year old subjects in Karmiloff-Smith's study, which are "characterized by a dynamic interaction between data-driven and top-down control processes" (Karmiloff-Smith, 1987: 189); children in this study did not create thematic subjects and then use pronouns as 'discourse organizers', "generating differential markers ([such as] ...pronouns versus full noun phrases) for reference to the different protagonists' status in the narrative" (1987: 191).

Since pronominalization was not found to be a function of global thematic subjecthood, the discussion continues by taking a closer look at pronominalization at the level of the scene.

Pronominalization at scene level

There is ample evidence to show that scene boundaries may have constrained pronominalization. For example, utterances on scene boundaries were more likely to be used to 'introduce' or 'reestablish' reference to characters than to 'maintain' reference; the forms of character references on scene boundaries were more likely to be **nps** than **pros** or **zeros**; and, most pronominalized character references occurred within the same scene as their 'antecedent'.

However, there is further evidence which indicates that not all characters were pronominalized. Within a scene there was no clear preference for the use of **nps** over **pros** or **zeros**, and it was found that almost half of all scenes contained pronominalization of only one character. Of the remaining scenes, less than a third contained pronominalization of two characters or more. If only one character was referred to in a scene, there was greater than a 70% probability that the character would be pronominalized, decreasing to approximately 50% for two characters, and 30-40% for three characters.

Thus, so far, it is possible to build up a general picture of pronominalization constrained by scene boundaries, *i.e.*, occurring within scenes, but, at the same time, questions are raised as to why all characters within a scene were not pronominalized. The discussion therefore continues, first, with an attempt to build up a more detailed picture of pronominalization within scenes.

The next section begins with a detailed look at pronominalization chains which were produced within scene boundaries and in which reference was 'maintained', comprising 70%(S), 58%(D) and 63%(T) of all chains produced. In particular, the relationship between descriptive pronominalization strategies which were coded in the analysis of narratives and heuristic 'cognitive' strategies is examined.

6.2.2 Writing about one character

The most frequently implemented pronominalization strategy was main/PC+/R+. This strategy was usually implemented in a single-strategy chain spanning one or more utterances contained within the boundaries of one scene. These chains comprise 60%(S), 38%(D) and 46%(T) of all chains produced; in each set, this is the highest percentage of any type of chain produced.

The values of the three converging components which comprise main/PC+/R+ indicate that a pronominalized character reference (*pcr*) maintains reference to a character in the same clause position as the previous reference to the same character, which is the most recent character to have been referred to in the narrative.

In main/PC+/R+ single-strategy chains, the antecedent was always produced in clause-initial position, having the form np, and the same character was then pronominalized in clause-initial-position; for example, the chain referring to **a moul**$_{iii}$ in Figure 6.2 below, spanning utterances A2 and A3, and the chain shown in Figure 6.3 which spans a complex utterance in E11 in which a series of pronominalized references refer to **the hare**$_{ii}$:

Figure 6.2: main/PC+/R+ single-strategy chain (T13)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
A1	**The hare**$_{i}$ and	np	S	Th	To	introduce	–
	the tortoise$_{ii}$ had a race	np	S	Th	To	introduce	–
⇒2	and **a moul**$_{iii}$ was on top of a tree	np	S	Th	To	introduce	*chANT*⟩
3	**he**$_{iii}$ fired the gun	pro	S	A	To	maintain	main/PC+/R+⟩
4	and the race begun						

Figure 6.3: main/PC+/R+ single-strategy chain (T25)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
⇒E11	The **hare**$_{ii}$ ran	np	S	A	To	maintain	*chANT*⟩
	and **ø**$_{ii}$ ran	zero	S	A	To	maintain	main/PC+/R+⟩
	until suddenly **he**$_{ii}$ decided	pro	S	A	To	maintain	main/PC+/R+⟩
	that **he**$_{ii}$ would take a little snore	pro	S	A	To	maintain	main/PC+/R+⟩
12	**the tortoise**$_{i}$ suddenly saw	np	S	Ex	To	reestablish	*chANT*⟩
	the hare$_{ii}$	np	O	Pe	Co	maintain	–
	snoring away						
13	**he**$_{i}$ quickly ran	pro	S	A	To	maintain	main/PC+/R-⟩

Descriptive *vs.* heuristic

It can be seen in the figures above that the convergence of the 'values' PC+ and R+ when reference is 'maintained' in a single-strategy chain occurs when a chain is about one character, and spans a local unit of text, below the level of the scene.

This character is the most salient in the local unit because there are no other characters referred to. Reference is successively produced in clause initial position, because all clauses are about that character; therefore, by default, all references refer to the character *most recently referred to.*

Thus, although both the position conservation and recency judgments (PC+ and R+) accurately describe the relationships between references in these chains, the *heuristic production strategy* which has been implemented may be indicated by the 'global' characteristics of the local unit of the text produced. *I.e.*, a heuristic strategy may be operating whereby, after first introducing or reintroducing a character with an **np**, the writer pronominalizes *when writing about only one character at a time*, forming a highly constrained local unit of text which contains a series of one or more descriptions or events concerning that character. Pronouns referring to that character are produced within a unit of text which functions as a 'referentially autonomous whole', because the local unit contains the whole pronominalization chain (*chANT* + *pcr*'s).

Because they are referentially autonomous, these local units resemble 'discrete event units' identified by J. B. N. Harris (1980) (cited in Perera (1984: 244)) in teenage writing. However, unlike teenagers', children's local units are not consistently delimited by time adverbials, nor do they necessarily signal a new action; rather they are identified as referentially autonomous local units because they encompass one or more utterances which contain an entire chain of pronominal references. Later in this chapter it will be shown that a 'referentially autonomous unit' can contain intermediary character references and more than one chain.

On average, each **main/PC+/R+** single-strategy chain contained approximately two references in each set (*i.e.* one antecedent and one *pcr*), and it can also be calculated that the median number of references involved in each chain was two in each set. Usually, when the chain spanned two or more simple utterances, the enclosing text consisted of two separate events and/or descriptions (as shown in Figure 6.2 above), and when the chain spanned a complex utterance (as shown in Figure 6.3 above), there were fewer events and/or descriptions than the total number of clauses produced. Furthermore, 'cohesive effects' between references in the chain are achieved more through "continuity of lexical meaning" (Halliday & Hasan, 1976: 320) than through the production of dynamically interacting cues, and pronominalized references are interpretable by default, as explained below.

Not enabling: default interpretation

An adult writer might have enabled pronouns in the single-strategy chains shown in Figures 6.2 and 6.3 to have been interpreted by virtual resolution, verification of one antecedent, or evaluation of a set of candidate antecedents. But it seems far more likely that children have produced pronouns which can be interpreted by 'default' rather than through enablement.

Pronouns may be interpretable by default because they are produced in a chain spanning a highly constrained linguistic environment, produced within a scene (which is a higher-level local unit of text). Default interpretation would operate as follows. The local unit is perceived to be 'separated' from the preceding text. The utterance containing the antecedent having the form np in clause-initial position (the *chANT*) is the first utterance in the local unit. Then one or more pronominalized character references (references having the form pro or ø) function as 'referential placeholders' in *clause initial position*, and each clause is an event or description 'about' the pronominalized character.

The only character repeatedly referred to is, by default, the only *foregrounded*, and hence, *most salient* character within the local unit of text. Since there is only one foregrounded character, the representation of that character would be made accessible in the mental model of the text which a reader might construct. All pronouns within the local unit 'match' the *chANT* in number and gender, so they can be easily interpreted. Furthermore, the reader would not be disturbed by the implausibility of the choice of antecedent, because children generally produced utterances which related plausible events or descriptions of the characters referred to.

6.2.3 Introducing a second character

Children do not, however, always produce pronouns in local units which are so highly constrained.

19%(S), 33%(D) and 14%(T) of all main/PC+/R+ single-strategy chains contain reference to a *second character* in *clause non-initial position* (*cnip*) in the last utterance of text spanned by the chain. For example, the chain in B7–B8 shown in Figure 6.4 below.[2]

Figure 6.4: main/PC+/R+ single-strategy chain: reference in *cnip* (D11)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
B4	then **mumma baby**$_{ii}$ came	np	S	P	To	reestablish	–
5	so **dadde**$_{i}$ was happy.	np	S	Ex	To	reestablish	–
6	Then **the ugle duckling**$_{iii}$ cract from the egg	np	S	P	To	introduce	–
⇒7	and **dadde duck**$_{i}$ was not happy.	np	S	Ex	To	reestablish	*chANT*⟩
8	So **he**$_{i}$ was kros	pro	S	Ex	To	maintain	main/PC+/R+⟩
	with **his mumma duck**$_{iv}$.	np	O	Pe	Co	introduce	–

As can be seen in the example above, when a second character is introduced in *cnip*, the local unit of text may be more accurately described as being *mainly about* the pronominalized character than being *only* about the pronominalized character. For example, B7–B8 can be described as being mainly about **dadde duck**$_{i}$, but also about **his mumma duck**$_{iv}$. Thus, placement of reference to a second character in clause non-initial position marks the disruption of the tightly constrained local unit which is only about one character. The chain still forms a referentially autonomous whole because the whole chain is enclosed by a series of utterances which determine the boundaries of a local unit and no pronominalized references within this local unit are cohesively tied to an antecedent outside of this local unit. In addition, since the reference in *cnip* has the form np,[3] only one 'set' of cohesive ties of 'lexical continuity' between pronouns and their antecedent are established within the local unit.

[2]In addition, the T set contained the greatest number of deviations from the patterns mentioned so far in main/PC+/R+ single-strategy chains. 7/58 (12%) contained references as follows: Three chains contained an intermediary reference to an entity which is not a character; the intermediary reference was contained within an embedded clause, or a main clause which follows an embedded clause in a complex utterance. In these cases the 'R+' judgment was unaffected for pronouns which occurred after the intermediary reference because the pronouns referred to characters most recently mentioned in the narrative. Furthermore, there were four chains which contained a reference in clause-initial position *before* the sequence of references in the chain began. For example, one contained reference to an entity which was not a character in initial position of an embedded clause which preceded the main clause in which the antecedent occurred, and another chain contained reference to a character (having the form np) in the same position. Of these four chains, only one was enclosed in a local unit of text which was clearly *mainly about* the pronominalized character.

[3]The reference in *cnip* has the form pro in one chain in the S set, two in the D set, and two in the T set. One of these T chains is looked at in Section 6.2.7 below.

Strategy clash

It has been explained that although pronouns are produced successively as referential placeholders in *cip*, just as they were when the local unit of text was about only one character, the addition of reference in non-initial position at the end of the local unit alters the nature of the local unit — it is now *mainly* rather than *solely* about one character. Therefore, the production of reference in *cnip* can be described as *clashing* with the implementation of a heuristic strategy which would operate to produce pronouns in units of text which are only about one character.

However, the introduction of reference to a second character at the end of the last utterance in the unit may signal the gradual simplification or 'neatening up' of this heuristic strategy, which, as will be shown later in this discussion, may be ultimately manifested as a 'position conservation' strategy.[4] In the meantime, the reference in *cnip* may be accommodated because it does not disrupt the production of a series of pronominalized references in clause-initial position; hence, by default, the writer pronominalizes the character the local unit is 'mainly' about.

Default interpretation

Despite the addition of reference to a second character, it is still possible to interpret pronouns by default because pronouns are still used as referential placeholders in clause initial position, matching the 'np' produced in the same clause position in number and gender. Furthermore, after having processed reference to the second character, the reader is given no cues which would influence him/her to reassign the antecedent of the pronouns to be the character referred to in *cnip*.

The following section examines the effect of the production of intermediary character references having the form np and pronominalization in both clause positions.

6.2.4 Intermediary references

The discussion now turns to the pronominalization strategy main/PC+/R- in single-strategy chains. This strategy was judged when a pronominalized character reference maintained reference to a character previously referred to in the same or previous utterance in the same clause position, and an intermediary character reference occurred between references. Single-strategy main/PC+/R- chains comprised only 5%(S), 5%(D) and 11%(T) of all chains produced.

[4]The notion of 'neatening up' or 'streamlining' is taken from a paper by Aitchison (1989) to describe the 'gradual simplification' of the tense-mood-aspect-system in Tok Pisin.

Only a very small proportion of single-strategy main/PC+/R- chains were enclosed in local units of text in which only one character was pronominalized: 0/2(S) 1/2(D), and 5/14(T), representing 0%(S), 3%(D), 4%(T) of all chains produced. Unlike local units in which reference to a second character is introduced in *cnip* at the end of the last utterance, one or more references to the second character occur in *cnip* between references in the chain, having the form np. (In addition, a reference to the same (second) character sometimes occurred in *cnip* in the last utterance enclosing the chain, or, as in the example below, in *cip* in the last, embedded, clause.)

For example, it can be seen in B6–B8 of Figure 6.5 that the first reference in the local unit is a *chANT* referring to **the tortoise**$_i$, and the unit is *mainly about* the actions of **the tortoise**$_i$ referred to in *cip*, but that it is also about **the hare**$_{ii}$, referred to in *cnip*, having the 'semantic roles' 'Percept' and 'Reference Object' in relation to the tortoise's actions, and then awakening as the less salient character (having the role 'Theme') in the embedded clause shown in B8.[5]

Figure 6.5: main/PC+/R-: intermediary reference (T23)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
B4	then **the hare**$_{ii}$ stoped at a tree	np	S	A	To	reestablish	*chANT*⟩
5	and ø$_{ii}$ lay down to rest	zero	S	A	To	maintain	main/PC+/R+⟩
⇒6	then **the tortoise**$_i$ came	np	S	A	To	reestablish	*chANT*⟩
	upon **the hare**$_{ii}$	np	O	Pe	Co	maintain	–
7	**he**$_i$ tiptod past	pro	S	A	To	maintain	main/PC+/R-⟩
	the hare$_{ii}$	np	O	RO	Co	maintain	–
8	**he**$_i$ hadend gon far	pro	S	A	To	maintain	main/PC+/R-⟩
	when **the hare**$_{ii}$ awock	np	S	Th	To	maintain	–

[5]The last reference (**the hare**$_{ii}$) in the local unit encompassed by the main/PC+/R- single-strategy chain (in B8), occurs in initial position in an embedded clause rather than in *cnip*. So, the writer produced an utterance in which *who the utterance is mainly about* is determined not by clause position, but by the 'recursive' relationship between the two Topics in C8. In other words, if the notion of 'topic' is viewed as being recursive (as explained in Bates and MacWhinney (1982)), the entity, **the hare**$_{ii}$ in B8, would serve as topic within the clause in which it is produced, and as comment within the utterance in which it is produced; so, the utterance can be interpreted as being more about the pronominalized tortoise than the hare. Analysis of recursive topics is not further pursued in this thesis, except to note that another similar instance of a recursive topic occurs in D narrative 3 which contains a *pcr* in A3 which implements the strategy main/PC+/R- in a local unit containing an embedded (and hence less salient) topic.

Stability of clause position

The stability of clause position of the pronominalized references despite the introduction of intermediary references may indicate a further 'neatening up' of children's heuristic production strategies. Now, the heuristic strategy implemented appears to be one whereby pronouns are incrementally produced to refer to the character who a local unit of text is mainly about, *i.e.* the character referred to in clause initial position. While this strategy strongly resembles a comprehension strategy of 'maximal stability', which would be implemented on the basis of clause position (Maratsos, 1973), a full-blown heuristic *production* position conservation strategy would be evidenced by pronominalization in *cnip* as well as in *cip* within the same local unit of text; pronominalization in both clause positions would indicate that the writer was not only pronominalizing the character the local unit was mainly about, *i.e.* s/he would be pronominalizing the more salient character as well as the less salient character.

In total, only *two* local units were produced (both in the T set) which showed evidence of a full-blown production position conservation strategy. Each unit enclosed two 'interwoven' chains containing pronominalization in both clause positions, *and* can be described as being referentially autonomous: *i.e.* , both whole chains (*chANT* and *pcr* in initial and non-initial position) were enclosed within the same utterances. For example, in the local unit of text shown in Figure 6.6, there are two interwoven chains. One refers to **the hare**$_{ii}$ in *cip*, and the other to **some girls**$_{v}$ in *cnip*. Both chains are contained within the same utterances, forming one local unit.

Figure 6.6: Position conservation: *cip* and *cnip* (T18)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
G15	then **the hare**$_{ii}$ saw	np	S	Ex	To	maintain	*chANT*⟩
	some girls$_{iv}$	np	O	Pe	Co	introduce	⟨*chANT*
16	then **ø**$_{ii}$ was talking to	zero	S	Th	To	maintain	main/PC+/R-⟩
	them$_{iv}$ for a long time	pro	O	R	Co	maintain	⟨main/PC+/R-

The remainder of main/PC+/R- chains (two in the S set, one in the D set, and twelve in the T set) contained successive pronominalization of a character in the same clause position, but were not enclosed by a referentially autonomous local unit. This is because the main/PC+/R- single-strategy chain was typically interwoven with a subchain of a multi-strategy pronominalization chain, and the whole multi-strategy chain was not wholly contained within the same utterance (or utterances) which enclosed the main/PC+/R+ single-strategy chain. Alternatively, main/PC+/R- was implemented in multi-strategy chains, as shown in Figure 6.10 in Section 6.2.7 later in the discussion.

In the next section

The next section discusses local units of text formed by multi-strategy chains in which heuristic strategies appear to have been implemented in referentially autonomous units. After that, a summary is presented of all local units in which it has been hypothesized that heuristic strategies were implemented (Section 6.2.6). Then the discussion continues with an examination of pronominalized references in multi-strategy chains which are unlikely to have been produced according to any of these strategies.

6.2.5 Multi-strategy local units

When pronouns were produced within multi-strategy chains, the strategies they were judged to implement consisted of the same three components of strategies judged in single-strategy chains. However, a major difference is that multi-strategy chains span units of text containing two or more 'subchains', and therefore, these textual units have characteristics which reflect the combination of pronominalization strategies implemented. The first 'type' of multi-strategy chain to be discussed demonstrates how a multi-strategy chain can form a local unit which is mainly about one character.

The example given in Figure 6.7 below shows a multi-strategy chain which comprises a whole scene mainly about one character, **the father duckllingᵢ**. The first pronominalized reference referring to this character is **heᵢ** in A2. This reference follows the antecedent after an intermediary character reference, and is itself followed by another pronominalized reference to **the father duckllingᵢ**, **heᵢ**.

Figure 6.7: Subchain local unit (D2)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
A1	**The father duckllingᵢ was waitting**	np	S	A	To	introduce	*chANT*⟩
	for the babby duckllingsᵢᵢ	np	O	G	Co	introduce	–
2	**heᵢ wated so long**	pro	S	A	To	maintain	main/PC+/R-⟩
	heᵢ made a hole in the ground	pro	S	A	To	maintain	main/PC+/R+⟩

At first glance it appears that this unit of text may contain pronouns produced according to different heuristic strategies. For instance, the first pronoun, **he**$_i$ in A2, might implement a strategy whereby pronouns are produced to refer to the character the narrative is mainly about, while the second is produced incrementally, while the narrative is only about one character. It is more plausible, however, to propose that both pronouns were produced according to the same strategy because they were produced in the same chain, and within a local unit of text which is referentially autonomous. The strategy which could account for the production of both pronominal references is one whereby pronouns were produced to refer to the character the local unit is mainly about, because, overall, the unit of text is mainly about one character.

The text shown above is the only example of such a local unit formed in the D set. In addition, one similar unit occurs in the S set (in S24). However, it should be noted that each of these two units is produced within incomplete narratives comprised of only one local unit. In the T set, there were a total of thirteen multi-strategy chains which were enclosed in a referentially autonomous unit, and in which the pronominalized character is the one the unit is mainly about (representing 10% of all chains produced in this set).[6]

6.2.6 Summary: heuristic strategies in local units

The discussion has shown how pronouns are produced within local units of text which are highly constrained and referentially autonomous, having the following similar properties, regardless of which descriptive 'pronominalization strategies' were judged to have been implemented:

- Each local unit comprises a referentially autonomous whole, containing an antecedent having the form np in the first utterance, and all pronouns which refer to the same character as the antecedent in a chain of references, each occurring in the same utterance or the one which follows the previous reference.

[6]In the T set, these include eleven chains in which main/PC+/R+ and main/PC+/R- were implemented, and two chains in which main/PC+/R+ and re/PC+/R+ were implemented. In the latter, an intermediary *utterance* occurred in which there were no references to a character, hence the 'reestablish' judgment rather than 'maintain' when reference to the same character is pronominalized in initial position in the last utterance in the chain.

- All pronouns in the local unit are successively produced in the same clause position as the antecedent.
- Within the local unit, cohesive ties of 'lexical continuity' are established between pronominalized references and their antecedents.

A range of possible heuristic strategies have been identified as operating within local units. In total, these strategies account for the production of all pronouns within 62%(S), 43%(D) and 59%(T) of all chains produced as follows:

1. Pronominalization in initial position of the only character the local unit *is about*:[7]
   - 49%(S), 25%(D), 36%(T) of all chains.
2. Pronominalization in initial position of the character the local unit *is mainly about*:[8]
   - 14%(S), 18%(D), 20%(T) of all chains.
3. Pronominalization of the character previously referred to in the local unit *in the same clause position* (position conservation):[9]
   - 0%(S), 0%(D), 3%(T) of all chains.

It has further been proposed that if these strategies emerged in the order which is shown, then they would represent a gradual simplification of behavior. This point is further discussed in the model of pronominalization which is outlined in Section 6.3. The percentages listed above show that a majority of chains in the Sneetch and Tortoise set are accounted for by heuristic strategies, but this is not the case in the D set. The low percentage in the D set is most likely accounted for by the higher level of interaction between characters in the stimulus materials, as will be explained in the next section and in the model set out in Section 6.3.

[7]The total of all main/PC+/R+ single strategy chains *minus* those which contain reference to a second character in non-initial position at the end of the local unit; or, in initial position before the chain begins (T set only) when it is difficult to judge who the unit is mainly about.

[8]The total of all main/PC+/R+ single strategy chains which contain reference to a second character in non-initial position at the end of the local unit *plus* all main/PC+/R- chains which contain intermediary references to a second character having the form np, *plus* all multi-strategy chains implementing main/PC+/R+ *and* main/PC+/R-, or main/PC+/R+ *and* re/PC+/R+ which are enclosed in a referentially autonomous unit.

[9]The total of all units containing interwoven main/PC+/R- chains contained within the same utterances, and hence, the same local unit.

6.2.7 Pronominal confusion

In total, multi-strategy chains comprised 16%(S), 35%(D) and 31%(T) of all chains produced. Those which form referentially autonomous units have already been discussed. This section looks more closely at what appears to be pronominal confusion, created in multi-strategy chains when children pronominalized interacting characters without implementing heuristic strategies.

Multi-strategy chains were often produced when narratives related events involving interacting characters. The majority were interwoven with one or more chains. In each, different characters were pronominalized and, typically, strategies having either the value 'PC+' or 'PC-' were judged, as well as the values 'maintain' or 'reestablish'.[10]

For example, in Figure 6.8, below, there are two scenes containing two multi-strategy chains and one single-strategy chain. All three chains refer to two characters having the same number and gender, **the hare**$_i$ and **the tortoise**$_{ii}$. Of the two multi-strategy chains, one refers to **the hare**$_i$ spanning all of the utterances within Scene C (C4–C7), and implements three strategies: main/PC+/R-, main/PC+/R+, and main/PC-/R- (marked with a '•'). The other multi-strategy chain refers to **the tortoise**$_{ii}$, extending across the boundary between Scenes C and D (C6–D10, marked with a 'o'), and implements three strategies, main/PC+/R-, main/PC+/R+and re/PC-/R-. This chain is interwoven with a single strategy chain, implementing only main/PC+/R+, referring to **the hare**$_i$ in D8–D10 (which is marked with a '⋆').

Figure 6.8: Multi-strategy chain: pronominal confusion (T7)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
C4	and when **the hare**$_i$ was far away	np	S	Th	To	maintain	*chANT*⟩•
	from **the tortoise**$_{ii}$	np	O	RO	Co	maintain	–
	so **he**$_i$ leaned on the tree	pro	S	A	To	maintain	main/PC+/R-⟩•
5	and **ø**$_i$ fell fast a sleep	pro	S	Th	To	maintain	main/PC+/R+⟩•
6	and when **the tortoise**$_{ii}$ came	np	S	A	To	reestablish	o⟨*chANT*
	nare **him**$_i$	pro	O	RO	Co	maintain	main/PC-/R-⟩•
	he$_{ii}$ went shsh	pro	S	A	To	maintain	o⟨main/PC+/R-
7	and **ø**$_{ii}$ creept quietly	zero	S	A	To	maintain	o⟨main/PC+/R+
	past **him**$_i$	pro	O	RO	Co	maintain	main/PC+/R-⟩•
D8	after that **the hare**$_i$ walk up	np	S	Th	To	maintain	*chANT*⟩⋆
9	and **ø**$_i$ zoomed away	zero	S	A	To	maintain	main/PC+/R+⟩⋆
10	and **ø**$_i$ went	zero	S	A	To	maintain	main/PC+/R+⟩⋆
	past **him**$_{ii}$	pro	O	RO	Co	reestablish	o⟨re/PC-/R-

[10]The recency component is not considered to be important because it has been shown to be redundant when PC+ is judged, and, as will be seen below, is redundant when PC- is judged.

The text in this figure exemplifies the least constrained option which children took when they pronominalized in the narratives produced for this study. The writer tells a story in which both participating characters are pronominalized when they interact in a series of events which closely follow the cartoon video. This text can be compared with a segment from T narrative 12 in which each character is pronominalized, one at a time, and from T narrative 14, in which neither character is pronominalized, both shown in Figure 6.9 below:

Figure 6.9: Comparison of similar segments of text (T12, T14)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
E12	**the hare$_i$** ran	np	S	A	To	reestablish	*chANT*⟩
13	and then **he$_i$** stopted for a little nap	pro	S	A	To	maintain	main/PC+/R+⟩
14	later **the tortoise$_{ii}$** came along	np	S	A	To	reestablish	*chANT*⟩
15	and **ø$_{ii}$** saw	zero	S	Ex	To	maintain	main/PC+/R+⟩
	the hare$_i$	np	O	Pe	Co	reestablish	–
	sleeping						
16	**he$_{ii}$** said	pro	S	A	To	maintain	main/PC+/R-⟩
	shoow						
17	and **ø$_{ii}$** tiptowed quilay	zero	S	A	To	maintain	main/PC+/R+⟩
	past **the hare$_i$**	np	O	RO	Co	reestablish	–
B5	**The hare$_{ii}$** went for a rest	np	S	A	To	maintain	–
6	**the tortoise$_i$** catched up	np	S	A	To	reestablish	–
	with **the hare$_{ii}$**.	np	O	RO	Co	maintain	–
7	**The tortoise$_i$** tipptoed	np	S	A	To	maintain	–
8	**the hare$_{ii}$** woke up	np	S	Th	To	reestablish	–

Returning to Figure 6.8, three chains are produced so that each is interwoven with at least one other chain. One multi-strategy chain extends across a scene boundary and is cohesively linked from within the same unit of text spanned by the single-strategy main/PC+/R+ chain in D8–D10: the reference **him$_{ii}$** in D10 'reestablishes' reference and occurs in a different clause position than ø$_{ii}$ in C7, which was the previous reference to the same character in a previous scene. Thus, the introduction of a *pronoun* at the end of a single-strategy main/PC+/R+ chain breaks up the potentially autonomous local unit.

Most *pcrs* which implemented a strategy having the the value 'reestablish' as the first component were produced in multi-strategy chains. Like **him$_{ii}$** they referred to a character not mentioned in the same or previous utterance, and often, across a scene boundary. Another strategy more frequently implemented in multi-strategy chains than single-strategy chains is main/PC-/R-, also shown in Figure 6.8 (**him$_i$** in C6). It can be seen that this strategy is implemented when the clause position of a pronominalized referent is switched from initial to non-initial, as the writer simultaneously pronominalizes a character who the narrative is *not about* while switching who the narrative *is about* (*i.e.* , in C6, the narrative is mainly about **the tortoise$_{ii}$**).

Significantly, the writer shows no evidence of implementing heuristic strategies or enabling interpretation of pronouns by integrating pronoun production with the production of the text as an interpretable whole. Although characters interact, they do so within a series of concatenated events and descriptions which are lacking in detail and which are not organized from the top-down, and in text which is not divisible into local autonomous units below the level of the scene. In addition, there is no evidence that number and gender cues are manipulated; it is difficult to distinguish between interacting characters having the same number and gender which are pronominalized in both *cip* and *cnip*, when the clause positions of references are switched according to data-driven demands. For example, the hare is referred to in initial position in C5 ($\emptyset_i$), in which he falls asleep, and then pronominalized in non-initial position in C6 ($\mathbf{him}_i$), when the tortoise approaches. Overall, it is difficult to interpret pronouns in this text even though they their meaning is plausible within the utterances in which they occur.

The next example shown shows a similar pattern of production of pronominalized references in a Sneetch narrative:

Figure 6.10: Multi-strategy chain (S9)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
A1	**The sneetches$_i$** hud star on thar belly	np	S	B	To	introduce	*chANT*⟩
2	**sum$_{ii}$** dudin hud star on thar belly	np	S	B	To	introduce	–
3	**the sneetches $_{iii}$** wosin frens	np	S	Th	To	introduce	–
4	and **tha$_i$** wosin aloud to tok to	pro	S	P	To	reestablish	re/PC+/R-⟩
	the sneetches tha have no stars						
	on thar belly$_{ii}$	np	O	R	Co	reestablish	⟨*chANT*
5	and **$\emptyset_i$** put ther noseis up	zero	S	A	To	maintain	main/PC+/R-⟩
6	and **$\emptyset_i$** to not lit	zero	S	A	To	maintain	main/PC+/R+⟩
	them$_{ii}$ play in ther gam	pro	O	P	Co	reestablish	⟨re/PC+/R-
B7	**Sylvester$_{iv}$** cam	np	S	A	To	introduce	*chANT*⟩
8	**tha$_{ii}$** gav	pro	S	A	To	reestablish	⟨re/PC-/R-
	him$_{iv}$ mina	pro	O	B	Co	maintain	main/PC-/R-⟩
9	and **tha$_{ii}$** went into the machine	pro	S	A	To	maintain	⟨main/PC+/R-
10	wen **they$_{ii}$** came out	pro	S	A	To	maintain	⟨main/PC+/R+
	tha$_{ii}$ had star on thar belly.	pro	S	B	To	maintain	⟨main/PC+/R+

The last example of text shown in this section is a segment of a multi-strategy from the D narrative 18:

Figure 6.11: D set multi-strategy chain (D18)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
C7	but **he**$_{iii}$ thought	pro	S	Ex	To	maintain	main/PC-/R+⟩
	he$_{iii}$ found	pro	S	Th	To	maintain	main/PC+/R+⟩
	a frend$_{v}$	np	O	G	Co	introduce	⟨*chANT*
8	but **it**$_{v}$ was wooding.	pro	S	B	To	maintain	⟨main/PC-/R+
9	**He**$_{iii}$ sat on its tale	pro	S	A	To	reestablish	re/PC+/R-⟩
10	**He**$_{iii}$ jumpet on its beak	pro	S	A	To	maintain	main/PC+/R+⟩
11	and **ø**$_{iii}$ jumpet in the water.	zero	S	A	To	maintain	main/PC+/R+⟩
12	And **it**$_{v}$ hit	pro	S	In	To	reestablish	⟨re/PC+/R-
	him$_{iii}$ in the head	pro	O	P	Co	maintain	main/PC-/R-⟩
D13	**He**$_{iii}$ walked on to a pees of wood	pro	S	A	To	maintain	main/PC-/R+⟩
14	and **ø**$_{iii}$ started to cry	zero	S	Th	To	maintain	main/PC+/R+⟩
15	and then **more swans**$_{vi}$ came	np	S	A	To	introduce	⟨*chANT*
16	and **ø**$_{vi}$ welcommed	zero	S	A	To	maintain	⟨main/PC+/R+
	him$_{iii}$	pro	O	P	Co	reestablish	re/PC-/R-⟩
	to **its family**$_{viii}$.	np	O	As	Co	introduce	–

Several features of this narrative are important. First, it shows a multi-strategy chain which refers to the ugly duckling, which implements a variety of pronominalization strategies because the duckling is pronominalized whenever he is involved with another character (in this narrative, across two scene boundaries). Furthermore, while this is not a typical Duck narrative, because it is more complex and longer than most, Scenes C and D do typically show how a child fails to implement heuristic strategies when s/he attempts to pronominalize characters while representing characters interacting in events as they were depicted in the stimulus material.

For example, this figure shows judgments of the pronominalization strategies, main/PC-/R+ and re/PC+/R- (neither of which has been discussed so far). Together, these strategies were implemented in a total of 15% of all Duck single-strategy chains. The former strategy was typically implemented as in the above figure — when a referent was simultaneously pronominalized and switched from non-initial to initial position (**it**$_{v}$ in C8 and **He**$_{iii}$ in D13), *i.e.* , when the writer switched who the narrative is mainly about. The latter strategy, re/PC+/R- was typically implemented (in either clause initial or non-initial position) when an intermediary utterance was produced containing reference to another character between pronominalized references produced in the same clause position (*e.g.* **He**$_{iii}$ in C9).

Thus, it can be seen that the ugly duckling is successively pronominalized regardless of who he interacts with, or whether the narrative is mainly about him or not, as was the case in many Duck narratives. At the same time, referentially autonomous local units are not formed, and pronominalization occurs across scene boundaries. The fact that pronominalized references can be understood in this narrative (and others like it in the D set) is mainly due to the coincidental difference between the numbers and/or genders of characters, and not because the writer has implemented heuristic strategies or enabled interpretation.

6.2.8 Additional strategies

So far, all pronominalization strategies have been considered except intro/chANT- and re/PC-/R+. Both were implemented very infrequently, the first to introduce a character in a narrative with a pro, and the second to reestablish reference in a different clause position after an intermediary reference to an entity which was not a character.

Before a psycholinguistic model is proposed which summarizes the discussion, three further topics are considered briefly in the next section: 1) non-pronominalization within scenes; 2) the use of zero anaphors; and 3) plural references.

6.2.9 Non-pronominalization

It was found that 29%(S), 21%(D), 35%(T) of all scenes contained no pronominalized character references and, in scenes which did contain pronominalization, as the number of characters referred to per scene increased, the probability that each character was pronominalized decreased. This section looks at reasons why children may not have pronominalized.

Children do not always show the ability to pronominalize while they fulfill other data-driven goals, such as conveying a sequence of events or background material, structuring events into 'scenes' according to location or time, using other types of cohesive devices or producing dialogue. Most likely, children make a trade-off between competing goals, but there is also evidence that some children produce text which is not complex enough to include pronominalization.

Following are some examples of different types of scenes in which there are either no pronominalized characters, or not all characters have been pronominalized. In the first example, shown in Figure 6.12, there appears to be no opportunity to pronominalize because the scene is too short.

Figure 6.12: A short scene (T2)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
A1	one day **the hare**$_i$ and	np	S	Th	To	introduce	–
	the tortoise$_{ii}$ were going to have a race	np	S	Th	To	introduce	–

Similarly, in the scene shown in Figure 6.13 the writer does not find an opportunity to pronominalize in a short scene which describes the cause of the Sneetch dispute:

Figure 6.13: A short scene (S12)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
A1	One day **Sneetches**$_i$ were enemys.	np	S	Th	To	introduce	–
	Because **sum**$_{ii}$ had stars	np	S	B	To	introduce	$\langle chANT$
	and **sum**$_{iii}$ did not have stars.	np	S	B	To	introduce	$\langle chANT$

In Figure 6.14 an np rather than a pro is used for the second reference to **the mummy duck**$_{iv}$, possibly because the repeated reference occurs in clause non-initial position, which was only rarely used for pronominalization when the character in clause-initial position was not pronominalized:

Figure 6.14: Non-pronominalization *cnip* (D11

SceneNo	Utterance	form	syn	sem	prag	cont	strat
C11	**mumma duck**$_{iv}$ went away	np	S	A	To	reestablish	–
	with the baby$_{ii}$	np	O	As	Co	reestablish	–
12	**the ugle duckling**$_{iii}$ fold	np	S	A	To	reestablish	–
	the mummy duck$_{iv}$	np	O	G	Co	maintain	–

Finally, below is an example which shows that when detailed events within a scene are related to include dialogue, pronominalization may be sacrificed. Only one reference is pronominalized in this scene:

Figure 6.15: Detail, dialogue (T15)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
E16	Next **the rabbit**$_{ii}$ met	np	S	Ex	To	maintain	–
	4 little hares$_{v}$	np	O	Pe	Co	introduce	–
	sitting on the wall						
17	and then **the tortoise**$_{iv}$ went ahead of	np	S	A	To	reestablish	–
	the rabbit$_{ii}$	np	O	RO	Co	maintain	–
18	then **the little hares**$_{v}$ said to	np	S	A	To	reestablish	–
	the rabbit$_{ii}$	np	O	R	Co	maintain	–
	go on running ahead						
	the tortoise might win						
19	but **the rabbit**$_{ii}$ said	np	S	A	To	maintain	*chANT*⟩
	no						
20	and then **he**$_{ii}$ said	pro	S	A	To	maintain	main/PC+/R+⟩
	I've go plenty time						
21	so **the rabbit**$_{ii}$ told	np	S	A	To	maintain	–
	the little hare$_{v}$	np	O	R	Co	reestablish	–
	what is his name						
22	and his name was spedy.						
(23)	(Then he show)						

6.2.10 Zero anaphors

So far, in the discussion references have been treated in the same way, regardless of whether they were pro's or zero's. This section briefly considers the production of zero anaphors.

Pronominalized character references having the form zero usually implemented main/PC+/R+, either within single-strategy chains or in multi-strategy subchains. So, in general, zero's maintained reference, usually in the same clause-initial position as previous reference to the same character when no intermediary character references occurred, for example:

Figure 6.16: Zero anaphor (T2)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
(B)5	then **the hare**$_i$ woke up	np	S	Th	To	maintain	*chANT*⟩
6	and ø$_i$ went past	zero	S	A	To	maintain	main/PC+/R+⟩
	the tortoise$_{ii}$	np	O	RO	Co	reestablish	–

The tradeoff between pros and zeros is apparently made when children chain events in the form of a list. Taylor notes that the list is "an appealing organisational form for young writers" providing them with (1990: 60):

> ...a coherent way of celebrating what they know or organising their world before they have access to more sophisticated genre structures and means of internal textual cohesion (Barrs, 1987).

Possibly, omitting the subject allows textual cohesion to be achieved through the concatenation of a series of verb phrases, rather than a coordination of clauses; this would provide an economical way of constructing narratives which consist mainly of chains of events and descriptions.[11]

[11]See Hyams and Wexler (1993) for a 'principled grammatical approach' to the production of null subjects by children which includes a review of previous work. See Huddleston (1984: 386) for a discussion about the coordination of elliptical verb phrases *vs.* the coordination of clauses.

6.2.11 Plural pronouns

Two different types of plural entities were referred to, described as 'group' entities and 'compound entities'. The former consists of a group of characters, such as the Sneetches who had stars on their bellies, and the latter, two or more characters which were implicitly or explicitly conjoined, such as 'the tortoise and the hare.' The only narrative set which contained a higher percentage of chains referring to a plural entity than to a singular entity was the S set. All plural chains in the S set referred to a group of Sneetches.

It was mentioned in the summary of results, that the manipulation of groups of Sneetches appears to have made it more difficult for children to pronominalize. Possibly, this reflects the fact that children have not developed the ability to enable pronoun interpretation. When children found it necessary to differentiate between groups of Sneetches, they described each group using an **np**, *e.g.* , "the sneetches without stars" vs. "the sneetches with stars". In contrast, it was often difficult, to differentiate between pronominalized groups of Sneetches in the absence of enabling cues, as shown in the figure below: [12]

Figure 6.17: Pronominalized groups of Sneetches (S9)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
A1	One day **Sneetches**$_{i}$ were enemys.	np	S	Th	To	introduce	⟨*chANT*
	Because **sum**$_{ii}$ had stars	np	S	B	To	introduce	–
	and **sum**$_{iii}$ didnt have stars.	np	S	B	To	introduce	–
B2	All **Sylvester**$_{iv}$ wanted money	np	S	Ex	To	introduce	*chANT*⟩
	because **he**$_{iv}$ poot stars on	pro	S	A	To	maintain	main/PC+/R+⟩
	and **ø**$_{iv}$ took them of.	zero	S	A	To	maintain	main/PC+/R+⟩
3	**He**$_{iv}$ had big machine	pro	S	B	To	maintain	main/PC+/R+⟩
4	**he**$_{iv}$ Wantd to be ritch.	pro	S	Ex	To	maintain	main/PC+/R+⟩
C5	**Thay**$_{i}$ live on a bech.	pro	S	Th	To	reestablish	⟨re/PC+/R-
6	And **the ones with stars**$_{ii}$ thoght	np	S	Ex	To	reestablish	*chANT*⟩
	thay$_{ii}$ were the best.	pro	S	Th	To	maintain	main/PC+/R+⟩
7	**Thay**$_{i}$ becom friend again.	pro	S	Th	To	reestablish	⟨re/PC+/R-

[12]Pronouns could be interpreted by default when children created local units of text which were about only one group of Sneetches, and sometimes, when Sneetches interacted with Sylvester, a character having a different number and gender.

Children produced pronominalized reference to compound entities in similar ways in the D and T sets. For example, children in the class which produced the Tortoise narratives followed a general policy set by their teacher *never* to begin a story with 'Once upon a time there was ...'. One popular alternative for introducing the story was to explain that the race was 'between' the hare and tortoise (so character references occurred in *cnip*). Then they explained how the race was started, and described the beginning of the race as the tortoise and the hare leaving the starting line, referring to the tortoise and the hare as a pronominalized 'compound entity' 'they' in *cip*.

As a result, children in the T set often produced plural pronouns to refer to a compound entity in a local unit of text which encompassed at least one intermediary utterance between the *chANT* and the pro, containing reference to another character (usually the 'starter') in *cip*. It was almost always possible to interpret the pro 'they' in this context, because it was more plausible for the race to be between the tortoise and the hare than between any other combination of characters. For example:

Figure 6.18: re/PC-/R-: plural (T1)

SceneNo	Utterance	form	syn	sem	prag	cont	strat
A1	One day a race was with **the hare**$_{i}$	np	O	Sr	Co	introduce	*chANT*⟩
	and **the tortoise**$_{ii}$.	np	O	Sr	Co	introduce	*chANT*⟩
2	**the man**$_{iii}$ said	np	S	A	To	introduce	–
	redy get set GO						
3	and **they**$_{i+ ii}$ were off	pro	S	A	To	reestablish	re/PC-/R-⟩

6.3 A psycholinguistic model

This section summarizes the discussion presented in this chapter by proposing a model of the production of anaphoric pronouns in the written narratives of seven-year-old children.

6.3.1 Heuristic strategies in local units

Pronominalization in children's narratives was found to be predominantly a local phenomenon.

A range of possible heuristic production strategies have been identified as operating within 'referentially autonomous' local units, whereby pronouns are produced to refer to:

1. the only character being written about; or
2. the character mainly being written about; or
3. the character previously referred to *in the same clause position.*

It has been proposed that if these strategies emerged in the order in which they are shown, then they would represent a gradual simplification of behavior. The rationale for this is as follows. When the first strategy is implemented, all pronominalized references occur in clause initial position, and there are no references in non-initial position. The introduction of reference to a second character in clause non-initial position at the end of a series of utterances 'clashes' with the implementation of this strategy, but is accommodated because it does not disrupt the sequence of pronominalized references in initial position. However, when intermediary references to a second character having the form **np** are produced in non-initial position between pronominalized references, the strategy is simplified to be one whereby pronominalization only occurs in initial position, and the character the series of utterances is mainly about is pronominalized. Finally, a full-blown 'position conservation strategy', which resembles a comprehension strategy of 'maximal stability' proposed by Maratsos (1973), emerges to produce pronouns in both clause positions.

Pronouns produced according to these strategies were produced within highly constrained local units and were interpretable by default, especially when no intermediary character references occurred between pronouns, or when only one of two interacting characters was pronominalized. When position conservation was implemented, each pronoun could be understood to refer to the character previously referred to in the same clause position.

Position conservation may be difficult

It is significant that of the three heuristic strategies there was very little evidence of the use of a strategy to pronominalize the character a local unit was mainly about, and even less evidence for the use of a full-blown position conservation strategy. A reason for this may be that referentially autonomous local units of text which contain reference to characters in initial and non-initial position are difficult for seven-year-old children to produce, no matter how characters were portrayed in stimulus materials. For both strategies to be implemented, children have to write about two interacting characters who maintain the same relative salience throughout events which span at least two clauses. Furthermore, it is probably easier to pronominalize the character in initial position when an intermediary character reference having the form **np** is produced between pronominalized references than to establish an antecedent for each character, and then pronominalize each character in the same clause position.

Thus, although it is easy to test position conservation as a comprehension strategy when the utterances are produced by the investigator, it is not so easy to identify position conservation in children's connected discourse. This difficulty persists even though it is logical to propose that heuristic strategies evidenced in series of utterances forming local units solely (or mainly) about one character gradually simplify to position conservation. If position conservation were to be further investigated, it would be necessary to use stimulus materials which attempted to constrain children to write about two interacting characters, maintaining the same relative level of salience over a series of utterances.

6.3.2 Lack of control

That children had difficulty controlling pronominalization in both clause positions was evidenced by the production of pronouns which were not produced according to the heuristic strategies proposed. Multi-strategy chains exemplified the pronominal confusion which resulted when pronouns were not produced according to heuristic strategy constraints, and local, referentially autonomous units were not formed within scenes. Pronouns were produced in both clause positions, (although, zero anaphors were only produced in initial positions). Pronouns often referred to interacting characters having the same number and gender, even when it was difficult to distinguish between referents, were used to establish cohesive ties across scene boundaries, and were often produced within interwoven chains of pronominalized references.

Overall, this kind of confusion occurred in each narrative set, but was most prevalent in the Duck set. Only in the Duck narratives did a majority of chains

not contain pronouns implementing heuristic strategies. This appears to have resulted from children's use of pronouns while they reproduced the high level of interaction between characters portrayed in the stimulus material, such as:

- The mother duck sitting on her nest of eggs.
- Nobody liking the ugly duckling.
- The mother duck and the father duck arguing after the birth of the ugly duckling.
- The ugly duckling interacting with a series of characters: first, his family, then the wooden duck, then a family of swans.

The Sneetch narratives were produced by the same children, who pronominalized interacting groups of characters less often than individual characters. They appeared, as has already been suggested, to have been more concerned with using np's to distinguish between the many groups which emerged during the course of the story. This reflected the portrayal of the story in the cartoon. While groups of Sneetches interacted, individual actions and events were less distinguishable than in either the Ugly Duckling or the Tortoise and the Hare stories, and the cartoon was accompanied by narration which repeatedly distinguished between groups of Sneetches, explaining which group currently did nor did not have stars, and who liked or did not like whom. The cartoon of the Tortoise and the Hare story was more varied. The cartoon depicted a race in which characters alternately interacted with one or more other characters, but were also portrayed on their own.

Overall, because of the difference between stimulus materials, it not surprising that children produced different patterns of pronominalized references in each set. However, it is noted that the Tortoise set contained more varied environments in which pronouns were produced than the other two sets, *e.g.* , local units of text which contained a chain of pronominalized references to only one character, preceded by reference to another character in clause initial position, and chains of pronominalized references interrupted by references to entities which were not characters, or interrupted by dialogue.

Finally, children were also found to use zero anaphors to chain lists of events or descriptions, most frequently in the T set. In addition, children produced whole scenes which contained no pronominalization.

6.3.3 Strategy summary

Seven-year-old children were found to take a variety of preferred options or 'exit routes' when they produced pronouns in their written narratives. By analyzing chains of pronominal references in relation to narrative structure, it has been possible to tease out a variety of behavioral (heuristic) production strategies and to identify pronouns which were not produced by implementing these strategies.

It has been hypothesized that heuristic strategies may undergo a process of simplification from the production of pronouns in clause-initial position to the emergence of a position conservation strategy whereby pronouns are produced in both clause positions. However, there was very little evidence of a position conservation strategy, possibly because it would have been difficult to implement. In addition, pronominal confusion appears to be a function of the type of stimulus material used.

When this model of production is compared with previous studies, pronominalization still appears to be a highly variable situation, with children taking a variety of preferred options. However, children's pronominalization is not as 'messy' as it appears to be. It can be analyzed in terms of behavioral strategies which describe how pronouns are produced in local units of connected discourse[13] and gives a detailed picture of how children have used the conventionalized 'SVO' (subject-verb-object) word order (Bever, 1970; Bates & MacWhinney, 1982) when they pronominalize in written narratives. Furthermore, it has been shown that it is possible to analyze pronouns which were not produced in referentially autonomous (maximally stable) environments, in terms of how their production breaks the constraints associated with heuristic strategies.

6.3.4 Developing the ability to enable

Yuill and Oakhill (1991) hypothesized that for seven-year-old 'poor comprehenders' who took part in their comprehension and production experiments, inefficiency of working memory limited their "ability to plan cohesive narratives" (1991: 153). According to the adult model of production proposed in this thesis, the same limitations would preclude enabling pronoun interpretation, because enabling interpretation involves the production of cohesive narratives. However, it seems likely that the relative inefficiency of the working memories of *all* seven-year-old children would have limited their ability to enable pronoun interpretation. Most likely, the variety of preferred options taken which do not entail enabling reflects both of these factors.

At the age of seven, children in this study have shown that they are well on their

[13]This analysis renders the notion of recency redundant.

way to producing pronouns as adults would; pronouns consistently matched their antecedents in number and gender, were used in both clause initial and non-initial position, and when they were interpretable, were plausible within the utterances in which they were produced. However, it would not be possible for children to enable pronoun processing until they have developed the ability to create narratives in which they attain 'the wholeness of organization' achieved by adults through the establishment of many levels of coherence (van de Velde, 1992). Adults manipulate many levels of inferences to enable readers to dynamically construct mental models of their texts, including complex sets of varying converging cues to enable pronoun processing.

6.3.5 Further research

This study has concentrated on developing a coherent model of children's pronoun production based on an analysis of pronominalization chains in relation to narrative structure. One important area for further research concerning the production of anaphoric reference could involve the use of more variation and control in the use of stimulus materials to better understand the relationship between pronominalization and data-driven demands. In addition, there is a need to analyze how pronouns are produced within different types of utterances, possibly by undertaking an analysis of the relationship between heuristic strategies and syntactic restrictions on pronominalization. The study could also be extended by analyzing narratives of older children to obtain a better understanding of how adult strategies are developed.

One further topic of study could be to explore whether, as Bever proposes (1970), children's perceptual system influences linguistic behavior in adults, by exploring whether children's pronoun production strategies influence adult processes for enabling pronoun interpretation.

6.3.6 Psycholinguistic model — system model

In this chapter, a psycholinguistic model has been proposed as part of the development of PROTEUS. As a description of a part of the 'problem domain', the psycholinguistic model serves as input to the *computational system model.* Thus, so far the system model for PROTEUS is based on a problem domain which is described in terms of children's strategies for pronoun production; these strategies have been teased out in experimental work and proposed in relation to an adult model of pronominalization which children would eventually develop.

The next chapter (Chapter 7) extends the problem domain beyond the psycholinguistic model by outlining pedagogical goals for PROTEUS, and reviewing manual and computational techniques which have previously been used to fulfill similar goals. The set of pedagogical goals is stated in terms of how to teach seven-year-old children about language, and the review of language teaching techniques is used to choose a computational framework for teaching children about language in whole texts. Together with the psycholinguistic model, the set of pedagogical goals and computational framework comprise the 'problem domain' of PROTEUS.

Finally, in Chapter 8, the entire problem domain is synthesized as a system model with three components. The system model specficially addresses the problem of using computational techniques to teach about the production of anaphoric personal pronouns in children's narratives, and provides a basis for implementing PROTEUS as a computational prototype.

Chapter 7

Teaching linguistic knowledge

The analysis of requirements for a MTLTS continues with a presentation of pedagogical goals for a system called **PROTEUS**. Then follows a brief review of manual and computational teaching techniques which implement similar goals.

7.1 Linguistic knowledge

The term *acquired linguistic knowledge* is used to refer to knowledge about language which has not been formally taught to children. For example, by the age of five a child is likely to have acquired knowledge about and be able to use (encode or decode) a vocabulary of at least 2,000 words (and possibly up to 5,000 words (Aitchison, 1993)), hundreds of grammatical constructions (Perera, 1987), and a large body of pragmatic knowledge, such as knowledge about how intonation or facial expressions can be used to facilitate the hearer's task of inferring the speaker's intentions (Morgan & Green, 1980b). Acquired knowledge is also described as *implicit* knowledge (Perera, 1987), knowledge which has not been acquired through explicit sets of rules or technical terminology.

The term *explicit linguistic knowledge* is used to describe knowledge *about*, or an *awareness of* implicit knowledge (Perera, 1987). For example, explicit knowledge about language might take the form of technical terminology to describe the production and organization of speech sounds, the grammatical structure of the language, (Perera, 1987), or knowledge about the structure of texts (Wilkinson, 1986).

To describe knowledge about mental processes involved in language Yuill and Oakhill (1991) use the term *metacognitive awareness.* They cite cognitive processes in which skilled readers engage, such as clarifying the purpose of reading, identifying important aspects of the speech message, allocating attention to relevant information, reviewing, *etc.*; similar cognitive processes are described in Morgan and Green (1980a).

Pronoun production may involve cognitive processes related to those singled out by Yuill and Oakhill (1991) for readers, which are neither specific to language comprehension or production, as well as language specific knowledge. With reference to the pedagogical goals of PROTEUS, stated below, the term *metalinguistic awareness* (or knowledge) is used interchangeably with the term 'explicit' awareness (or knowledge) of acquired knowledge about how to use pronouns because knowledge about how to use pronouns is, ultimately, knowledge about how to use language.

7.1.1 Setting pedagogical goals

The pedagogical goals which PROTEUS aims to fulfill are:

- to teach children to develop both an implicit and metalinguistic awareness of acquired heuristic pronoun production strategies so that they can gain control over and maximize the use of their acquired strategies; and
- to provide support for the development of the adult ability to enable pronoun interpretation.

In the following section, manual techniques which have been implemented for the purpose of teaching children to gain explicit knowledge about, or an awareness of implicit knowledge about how to use language are reviewed.

7.2 Metalinguistic knowledge: manual techniques

7.2.1 Making knowledge visible

Making implicit knowledge visible in a text is a technique which can help to teach children to gain explicit knowledge about implicit linguistic knowledge. For example, a teacher can appeal to a child's implicit understanding of the function of full stops by pointing out that sentence boundaries are made visible by using full stops, and that this provides valuable guidance for the reader (Perera, 1987; Richmond, 1990). This knowledge can then be related to the child's own production strategies, so that the child becomes aware that if s/he uses full stops in his/her own writing, full stops will provide guidance for the reader.

Another technique makes implicit knowledge 'visible' through the use of illustrations. For example, Sealey explains how the use of an illustration shows a child that a pronoun means the character it refers to (Sealey, 1990: 52):

> With help, a child wrote a caption for her picture, which together formed part of a story she wanted to tell. The sentence was 'The hippo got stuck trying to get through the hedge and he started to laugh.' The teacher read the sentence out loud, but misconstrued the meaning because the pronoun 'he' was ambiguous. It was not the hippo, but the little boy watching who started to laugh, explained the writer. She decided, with the teacher to draw a line linking the word 'he' to the boy in her picture.

7.2.2 Using terminology

Terminology can be used as a 'descriptive convenience' for making implicit knowledge about linguistic functions explicit (Perera, 1987; The National Writing Project Consultative Group, 1990). For example, Richmond uses the term 'pronoun' as a descriptive convenience to make children aware that pronouns function as variables in written texts (Richmond, 1990: 36-37):

> Words like *she* are pronouns. They stand in for words or phrases like *my aunty* which they refer to.

7.2.3 Performing explicit operations

Another way of teaching children to become aware of implicit knowledge is to *perform explicit operations with texts* (The National Writing Project Consultative Group, 1990). One frequently used technique is to reconstruct a whole story from individual sentences which have been mixed up to form a jigsaw puzzle, drawing attention to features of cohesion or narrative sequence, features which contribute to the 'referential continuity' (Garnham *et al.*, 1982) of the story, and thus contribute to story comprehension (Stubbs, 1986).

7.2.4 Explicit knowledge of cognitive processes

Yuill and Oakhill (1991) describe a series of experiments in which the goal was to improve 'inferential and monitoring skills' of poor readers, aged 7–8. They encouraged children to become aware of and consciously implement 'cognitive processes' used in reading comprehension, such as inferencing from general knowledge (*i.e.*, they encouraged children to develop *metacognitive processes*). Some examples of methods used were:

Focusing on mental imagery, learning to think in pictures : Subjects were shown either one 'representational drawing', so-called because it illustrated the main point of a story; or one 'non-representational' cartoon-like sequence of four pictures, so-called because it depicted the *sequence* of events in the same story. Subjects were told to imagine the pictures were in their minds, and to use the image of the pictures to answer questions about the story. Then, when they were given a second story to read, they were told to form similar mental pictures as they read the story, and to answer questions with the aid of their mental pictures.

Using clue words to make inferences : Instructions were given to look for clue words that would help subjects to understand a text. For example, the setting of a story about a boy reading a book was *in the bath*, and the setting had to be inferred from clue words such as 'soap', 'towel', etc. The 'main consequence' of the story was the book falling into the bath. This event had to be inferred from words such as 'splash'.

Question generation to encourage inferencing : Children generated their own questions for other children in the same 'training group' using question words such as *who, where, why, when*, etc. For example, in a story about a girl named Lucy, the children produced questions such as 'Who was Lucy?' 'Where was she?'. The children who were asked the questions were encouraged to use their inference training (*e.g.* looking for clue words as described above) to find answers.

Macro-cloze inferencing : Subjects read story fragments in which some sentences were obscured by removable tape, and they had to guess what each hidden sentence was, based on clues from surrounding sentences. For example, in the following passage, the missing (hidden) sentence was revealed to be: *But there wasn't any left.* (Yuill & Oakhill, 1991: 189):

Kerry wanted cereal for her breakfast.
(hidden sentence)
So she had to have toast instead.

7.3 Computational systems: mother tongue

In this Section is a short review of computational systems used for teaching mother tongue language. These systems demonstrate a variety of computational techniques for making explicit children's implicit linguistic knowledge of comprehension and/or production strategies.

DEVELOPING TRAY

As a 'language awareness system', DEVELOPING TRAY is described (National Association for the Teaching of English, 1988; ILECC, 1991) as having the pedagogical goal of enhance[ing] language awareness through the reconstruction of language patterns and the discovery of underlying rules and conventions (National Association for the Teaching of English, 1988: 2.3). It is explained that DEVELOPING TRAY uses cloze and text ordering techniques allowing teachers to manipulate texts of their choice by deleting or jumbling various linguistic elements, *e.g.*, words, phrases and sentences. The goal is to make children aware of their own comprehension strategies.

For example, Nelson describes a case study of a group session in which her third year class reconstructed a text which was a passage from *The Last Unicorn.* She explains that, among other strategies, children used the comprehension strategy "inspired guesswork drawing on reservoirs of general knowledge" (National Association for the Teaching of English, 1988: 2.7) to reconstruct text when they filled in the words such as 'wings' in text about 'harpies' — because they reasoned that harpies are winged monsters that fly.

STORY MAKER

The STORY MAKER program is described as a 'toolkit' (Rubin, 1983). Its purpose is to enable children to become aware of and gain explicit control over 'high-level' narrative production strategies, such as maintaining the logical flow of a narrative, using examples in an explanation, and the communication of a character's plans. Children are freed from 'lower-level' aspects of production, such as punctuation, spelling and sentence structure when they create stories by choosing options from a set of already-written story segments in the form of branches of a structured tree.

STORYBASE

STORYBASE (Stopani, 1991) is a 'database' program which is used by a teacher to outline the *basic contents* of a story. The software provides a list of 'essential elements' of the story which have to be filled in and used by students writing the story, giving them an awareness of the basic contents of their own stories. For example, the list may consist of (Stopani, 1991: 16):

LOCATION:	a town/city in Scotland where the story had to begin
CHARACTERS:	people who had to appear in the story
ENVIRONMENTS:	places which had to be visited in the story
COMMENTS:	Scots phrases which had to be spoken in the story
INCIDENTS:	events which had to take place in the story
ITEMS:	'things' which had to be used in the story

7.4 Literary systems: techniques

The last section of the review in this chapter is concerned with software implemented in computational systems known as *literary systems.*

A variety of computer applications used in teaching and research in English for *literary subjects* provide the student with facilities to interact with the text which is being studied. Such applications enable the user to view the text as an *object* which can be viewed from a multiplicity of perspectives, for the purpose of leading the student to the discovery of a deeper understanding of the meaning of the text (Deegan & Lee, 1991).

Typically, textual and graphic sources are linked to a main text using a hypertext authoring tool, such as Guide, HyperCard Hyperdoc or Intermedia, (Deegan & Lee, 1992) to form an associative web. The benefits gained by representing text in this way have been described as overcoming "certain material constraints of linear text by allowing multiply-related computer-supported links to give visual proximity to conceptual connections" between textual features, external texts, and other non-textual information, such as illustrations (Deegan & Lee, 1991: 23).

Several examples of literary systems are described below, for the purpose of demonstrating techniques for using electronic texts to teach students, individually, or in groups, to develop a meta*cognitive* awareness of their own comprehension and/or production strategies. In each of these systems, the 'main text' is augmented by one or more of the following: sound, images, databases, and text analysis programs.

WULF

Wulf is a hypertext environment, developed at the University of Nottingham for learning Old English (Dillon & Jesch, 1991). Wulf encourages students to read Old English in the original, rather than to read popular translations. Students are encouraged to use *Wulf* to comprehend the original text by making computational connections between text, language, and critical issues relating to the text. The program is comprised of: a manuscript scan, written text, grammatical paradigms, a glossary, notes, a bibliography, a critical history of the poem, and several translated versions of the text which are linked in an associative web.

POETRY ANALYSIS

Another example of a hypertext literary system, developed at the University of East Anglia, is the Poetry Analysis Program implemented in HyperCard software on an Apple Macintosh (Allen, 1991). The first version of the system uses the idea of a central 'book card'. The poem to be studied is displayed on the left-hand-page of an open double-page book. Supporting material, such as word definitions and phrase interpretations linked in an associated web with the poem, is accessed by students for the purpose of 'discovering' the meaning of the text and displayed on the right-hand page of the book in direct juxtaposition to the poem.

The second version of the Poetry Analysis Program expands the program to allow users to view the poetic text with the poem's 'deep structure' made explicit by being made *visible.* With the additional facilities provided in the second version, the user is able to log patterns of figures of speech: metaphorical structure, repeating images, *etc.*, which can be highlighted within the poem itself. These patterns can be stored for future use and can be made available to other users of the program.

TELEBOOK

McLeod describes a system for teaching poetry to fourteen and fifteen year olds which she devised by adapting the application package *Telebook* to create fifteen pages of text and graphics using a number of teletext features, such as large-size characters, flashing letters and different colors of text and background (McLeod, 1991b). As in other systems categorized as 'literary systems', students' attention is drawn to comprehension strategies which lead them to discover a deeper understanding of the meaning of the text, such as understanding alliteration in the text by highlighting and discussing examples of alliteration. Further activities include having members of the class highlight the poem's imagery and find pictures in the library to illustrate the imagery.

HYPERPOEMS

McLeod (1992) also describes the use of words, images and sounds in writing poetry using an Apple Macintosh personal computer and HyperCard software. Students translated their own handwritten poems into 'HyperPoems', which meant that they were given the facility to create 'buttons' which activated images and sounds to amplify the text, thus learning to use techniques which are meant to make their poems more comprehensible to other students.

WORDCRUNCHING SHAKESPEARE

A 'text and retrieval' text analysis program, WordCruncher (1993), is used for teaching about Shakespeare's plays in conjunction with an electronic version of the text of Shakespeare's plays (Teaching Shakespeare on Computers, 1991). Using this software, students are asked to retrieve and analyze elements of the text in order to develop an awareness of and amplify their text comprehension strategies. For example, they are asked to:

- Look at the disease imagery in *Hamlet*, by using WordCruncher to search on the following words and all variants of words such as: corrupt, disease, envenom, infect, mildew, poison, ulcer, venom;
- Look at the list of frequencies for the disease imagery word list and discuss whether *Hamlet* is unusual among the tragedies in the number of such images, and account for the distribution of disease imagery (*e.g.* why do none occur in the early part of the play?).

In a different application of the same software, LoMonico (1992: 2–3) explains how she used WordCruncher in a Shakespeare seminar with a group of students working together:

> ...I designed a unit called "Owning a Word". ...The concept of "owning a word" is that each member of the class becomes an expert on a single word that occurs often in the particular play being studied. ...Throughout the study of the play, each of the most common words in the play was "owned" by someone in the class, and he was responsible for explaining how the word was being used in a particular passage.
>
> ...They had to trace and analyze the use of their word throughout the play, and show how their word was significant in understanding the meaning of the play.

THE SONNET WORKSTATION

The Sonnet Workstation supports a series of strategies developed by Rudolph P. Almasy, centered on the investigation of sixteenth-century sonnet writers' attitudes "towards the human form in the sonnets"; students using the Workstation have the goal of developing "a methodology for reading sonnets which focuses on the human form as a foundation for critical analyses ..." (Conner & Almasy, 1993: 42). The workstation provides a database of sonnets to allow students to identify subsets of sonnets sharing the chosen theme or image with the pedagogical goal of supporting the formation and testing of hypotheses about attitudes toward the human form.

7.5 Summary

The pedagogical goals which PROTEUS hopes to fulfill have been stated in the beginning of this chapter as:

- to teach children to develop both an implicit and metalinguistic awareness of acquired heuristic pronoun production strategies so that they can gain control over and maximize the use of their acquired strategies; and
- to provide support for the development of the adult ability to enable pronoun interpretation.

In this chapter it has been shown that it is possible to design and implement manual activities for developing metalinguistic awareness of implicit linguistic knowledge. Then, a variety of computational techniques already in use for teaching an explicit awareness of implicit linguistic knowledge about 'mother-tongue' language were reviewed. Like the more ambitious literary systems described, mother-tongue systems present an electronic text as an object which can be viewed from a 'multiplicity of perspectives', allowing the user to explore, reshape or reflect on a whole text or parts of a text. These techniques help to make implicit comprehension or production strategies explicit. However, literary systems often use more sophisticated computational techniques to achieve similar pedagogical goals.

At this point in the analysis, the main concern shifts to the interaction between the models of pronominalization by children and adults proposed earlier in this thesis, the design of technology and PROTEUS' pedagogical goals. Starting from the underlying assumption that PROTEUS will use whole texts to teach about pronominalization, the next chapter presents the final stage of analysis in which a 'system model' is proposed within the computational paradigm outlined in this chapter: the manipulation of 'electronic texts' to teach about language.

Chapter 8

The final stage of analysis

8.1 Introduction: the system model

The subject of this chapter is the final stage of the analysis of requirements, which synthesizes a 'system model' for PROTEUS. The system model is a model of 'the problem domain' of PROTEUS which could be mapped to a 'system implementation' in the design phase of PROTEUS' lifecycle which would follow the analysis of requirements.

The system model is partially written in natural language and partially expressed in computational terms taken from object-oriented systems development methodologies; see Booch (1986), Meyer (1988), Wirfs-Brock & Johnson (1990) and Henderson-Sellers & Edwards (1990). The purpose of using the object-oriented framework is to define the objects which are manipulated in the system as objects which 'exist' in the 'real-world'. Objects are defined to conform to a principle of modularity, so that the system model consists of "autonomous elements connected by a coherent simple structure" (Meyer, 1988: 19), increasing the probability that a simple change to the system during the design phase will affect just one module, or a small number of modules.

The PROTEUS system model consists of the following components:

1. A set of guidelines for producing the written portion of electronic 'whole' texts, written in natural language.

2. A description of an electronic text in object-oriented terms as a class of objects. At run-time an 'instance' of an electronic text contains instances of text objects and picture objects.

3. A set of tasks through which children and teachers would interact with one or more *electronic texts* and the objects contained within them. Tasks are specified in natural language, and specify which run-time text and picture objects they manipulate.

The remainder of this chapter consists of three major sections, each corresponding to the three components of the system model described above.

8.2 Pedagogical goals and guidelines

A primary pedagogical goal of PROTEUS is to make full use of children's current pronominalization strategies and to support the development of the adult ability to enable. These goals raise several problems. First, it is necessary to choose which strategies, or features of strategies, should be maximized, and to find a way of giving children an implicit or explicit awareness of these features. Since the limitation of children's working memories make children unlikely to be able to learn to enable, it is necessary to choose a way of supporting development that does not require full-blown implementation of adult production processes.

PROTEUS deals with these problems by designing two types of tasks which involve the manipulation of electronic texts. Firstly, comprehension-oriented tasks manipulate written texts which incorporate features of children's heuristic strategies, in which are encoded cues which adults may manipulate when they enable pronoun interpretation. These tasks are intended to develop an *implicit awareness* of the use of these strategies, simultaneously developing both an implicit and explicit awareness of how pronominalized references are produced in the text to be rendered interpretable. Secondly, production-oriented tasks give children the opportunity to create texts which maximize the use of heuristic strategies and adult cues by constraining the process of narrative construction, constraining the choice of characters which are referred to and constraining the actions and mental states which are expressed in the text. Both types of tasks are described in more detail later in this chapter in Section 8.5. Following is a set of guidelines for writing whole texts using children's strategies and adult cues, and selected features of children's narratives. After that, a sample narrative is presented which has been written in accordance with the guidelines set out below.

1. Structure narratives into scenes clearly demarcated by changes in location or time.

2. Pronominalize characters within scenes only (*i.e.* antecedents of all pronouns should occur in the same scene.)

3. Structure scenes into clearly demarcated local units of text. (See Section 8.3.4 below for a description of 'situations', which are used as the local unit of text in PROTEUS.

4. Allow pronominalization to occur either within situation boundaries or across situation boundaries.

5. Produce some scenes and situations in which there is no pronominalization.

6. Vary the number of characters referred to per scene, including some scenes which contain only one character which the scene is solely or mainly about.

7. Use a mixture of the following heuristic strategies when pronominalizing:

   (a) Create local units which are about only one character which is pronominalized;

   (b) Create local units which are about two characters, but in which only one character is pronominalized: the character the situation *is mainly about*, pronominalized in clause-initial position (*cip*).

   (c) Create local units which are about two characters, but mainly about one. Pronominalize both characters successively in the same clause position (*i.e.* one character in *cip*, and the other in clause non-initial position (*cnip*).

8. Produce local units in which the clause position of characters are switched and pronominalized, but do not produce any pronouns which would not be interpretable by an adult in 'real-time'.

9. Vary the number and gender of characters which interact; *e.g.* , two characters having the same number and gender, two characters having a different number and gender.

10. When two interacting characters are pronominalized, provide enough detail of characters' actions or states of mind to serve as cues which could contribute to the interpretation of the pronouns.

11. Pronominalize different 'types' of character, *i.e.* , individuals, groups, and compound entities.

12. Produce missing references (zero anaphora) in local units of text (situations) structured as 'lists'.

Figure 8.1: The Tortoise and the Hare

Scene	Sit	No	Utterance
A	a	1	One day there was going to be a big race between **a hare**$_i$ and **a tortoise**$_{ii}$.
		2	**Hundreds of animals**$_{iii}$ were waiting at the beach for the race to begin.
B	b	3	**The starter**$_{iv}$, whose name was Mr. Raccoon, was waiting at the starting line.
	c	4	**The hare**$_i$ and **the tortoise**$_{ii}$ took their places.
	d	5	**Mr. Raccoon**$_{iv}$ shot his gun into the air: BANG!
	e	6	Off **they**$_{i+ii}$ went.
		7	**The hare**$_i$ ran away so fast that **he**$_i$ knocked **the tortoise**$_{ii}$ over.
C	f	8	Soon **the hare**$_i$ was in the lead.
		9	So **he**$_i$ decided to take a little nap under a palm tree.
	g	10	**He**$_i$ lay down in the sand
		11	and ø$_i$ pulled his hat down
		12	and ø$_i$ fell fast asleep.
	h	13	While **he**$_i$ was sleeping, **the tortoise**$_{ii}$ caught up with **him**$_i$.
	i	14	**The tortoise**$_{ii}$ said shhhhh
		15	And quietly, ø$_{ii}$ tiptoed past **the sleeping hare**$_i$.
D	j	16	An hour later, **the hare**$_i$ awoke from his nap.
	k	17	**He**$_i$ realized that **the tortoise**$_{ii}$ was ahead of **him**$_i$ because **he**$_i$ saw the tortoise's footprints in the sand.
	l	18	So **he**$_i$ jumped up
		19	and **he**$_i$ ran as fast as **he**$_i$ could.
E	m	20	Meanwhile, **the tortoise**$_{ii}$ was still jogging along.
	n	21	**He**$_{ii}$ grew very hot and sweaty.
		22	So, **he**$_{ii}$ decided to cool off in the ocean.
	o	23	When **he**$_{ii}$ felt better **he**$_{ii}$ crawled out of the ocean.
		24	Then **he**$_{ii}$ dried himself off.
	p	25	And, while **he**$_{ii}$ was putting his sneakers on, **the hare**$_i$ zoomed past **him**$_{ii}$.
F	q	26	From the road, **the hare**$_i$ saw **three little female bunny rabbits**$_v$ sitting under a big umbrella.
	r	27	**They**$_v$ gave **him**$_i$ a big cheer.
G	s	28	**The hare**$_i$ ran over to the **three bunny rabbits**$_v$ because **he**$_i$ wanted to impress **them**$_v$.
	t	29	**He**$_i$ pulled a stereo system out of his knapsack
		30	and ø$_i$ put on some music.
		31	Then **they**$_{i+v}$ started to dance.
H	u	32	An hour later, when **the hare**$_i$ and **the three rabbits**$_v$ were relaxing under the umbrella, **the tortoise**$_{ii}$ jogged by.
	v	33	**Charlotte**$_{vi}$, who was one of the little rabbits, saw **him**$_{ii}$ out of the corner of her eye.
	w	34	**She**$_{vi}$ shouted: "There goes **the tortoise**$_{ii}$!"
	x	35	But **the hare**$_i$ was very confident.
		36	**He**$_i$ smiled at **her**
		37	and ø$_i$ said: "No sweat. Let's have a drink in the pub."
I	y	38	So **the hare**$_i$ and **the three bunnies**$_v$ went to the pub.
	z	39	At the pub **they**$_{i+v}$ drank orange juice.
		40	And ø$_{i+v}$ played pinball.
	aa	41	Finally, **the hare**$_i$ grew bored.
		42	So, **he**$_i$ said goodbye.
J	bb	43	Meanwhile, **the tortoise**$_{ii}$ was very close to the finish line.
		44	**He**$_{ii}$was feeling very strong.
	cc	45	And **he**$_{ii}$ grew faster with every step.
		46	And his legs grew longer.
K	dd	47	At last, **the tortoise**$_{ii}$ could see the crowd of animals$_{iii}$waving at **him**$_{ii}$.
		48	And **he**$_{ii}$ waved back to the crowd.
	ee	49	**The animals**$_{iii}$ couldn't believe their eyes.
		50	**They**$_{iii}$ ran onto the road.
		51	And ø$_{iii}$ surrounded **the tortoise**$_{ii}$ as **he**$_{ii}$ crossed the finish line.
	ff	52	**They**$_{iii}$ lifted **him**$_{ii}$ up
		53	and shouted "Hip, hip, hooray!"
	gg	54	Nobody noticed **the hare**$_i$ coming down the road.

8.2.1 Narrative overview

The story begins at the start of the race between the tortoise and the hare, and progresses until the race is finished. The race takes place along a road which circles a small tropical island, so the race begins and ends at the same location where a crowd has assembled. The whole narrative consists of eleven scenes (marked 'A-K') which progress linearly in time and space from the beginning to the end of the race, Referentially continuous 'situations' (local units, marked 'a-gg') comprise local units of text within scenes. There are two main protagonists, **the tortoise** and **the hare** who have the same number and gender, singular and male. (Notations used in Figure 8.1 are explained in detail in the sections which follow.)

8.3 The electronic text class

An 'electronic text' is specified as an *object-oriented class.* When PROTEUS is implemented as a working system, an 'instance' of an electronic text (*e.g.* , one entitled 'The Tortoise and the Hare') would contain 'run-time' instances of two types, or 'classes' of objects: picture objects and text objects. These would be the 'objects' which children mainipulate when they performed PROTEUS' tasks.

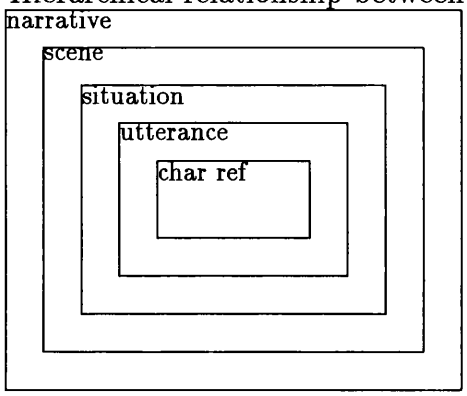
Text and picture objects are specified in the system model in terms of 'classes'. A class is characterized by a set of attributes (which correspond to the state of information content of the object at run-time) and operations which set and manipulate its state. A class may be thought of as a template from which objects belonging to the class are constructed (*i.e.* instantiated) at run-time.

Class specifications are explained in this section together with examples of objects belonging to each class which could be manipulated when PROTEUS was implemented as a working system. Instances of text and picture objects are drawn from the story of the Tortoise and the Hare in Figure 8.1 on the preceding page.

8.3.1 Classes of text objects

The classes of text objects (henceforth called 'text classes') represent the hierarchically ordered textual elements of written narratives. Figure 8.2 below shows the hierarchical relationship[1] between the following text classes: narrative, scene, situation, utterance and character reference.

Figure 8.2: Hierarchical relationship between text classes



[1]In object-oriented terms, this would be callsed a 'client-supplier' relationship.

8.3.2 Text Class: Narrative

The text class 'narrative' contains two attributes, the narrative's title and a list of all of the scenes which comprise the narrative.

8.3.3 Text Class: Scene

The text class 'scene' represents a narrative unit which is defined as:

> A unit of text which begins with reorientation of the reader's attention through the use of an implicit or explicit change in spatial location or temporal break.

The sample narrative shown in Figure 8.1 is divided into eleven 'instances' of scenes ('scene objects'), marked **A–K**. Scene boundaries are determined in varying ways according to the above definition, (which is similar to the determination of scene boundaries in children's narratives described in Section 4.6.1 of Chapter 4. For example, change in spatial location may be realized as a change in *perspective*, *e.g.* from a panoramic view of the starting line, which includes the crowd watching the race (Scene A), to a closer view of the raccoon, the hare and the tortoise at the starting line which begins Scene B. Change in spatial location may also be realized by an explicit change of location, *e.g.* Scene C takes place further along the road than Scene B, near a palm tree on the beach. An example of a temporal break is the transition from Scene C to Scene D, in the former the hare decides to take a nap, and in the latter he wakes up an hour later.

Scenes typically end when action at a specific location or in a specific time span ends, for example, with a description of a character's exit from a specific location. *E.g.* , the hare jumps up at the end of scene D and runs away. Other scene endings are not explicitly marked, and the following scene begins at a different location.

8.3.4 Text Class: Situation

The text class 'situation' is based on Morrow and Greenspan's use of the term for adult narratives, although they do not provide a precise definition.[2]

In PROTEUS, the text class situation represents:

> A group of one or more utterances which describe the actions, location or states of mind of one or more characters at a particular 'here and now' point in the narrative.

[2]Morrow and Greenspan (1989) describe a 'situation' as a semantic notion playing a role in the writer's 'presentation plan'. In their view, narratives "consist of a sequence of situations that develops the situation [mental] model in space and time", and each situation can be described from "the perspective of a particular *Here/Now* point" (1989: 64).

A shift of the 'here and now' point occurs when there is a shift in space within a location, and progression in time, or a change of mental space *within a scene.* These are difficult notions to pinpoint, and it is easier to think of divisions between situations as analogous to the way a camera filming the narrative might shift the visual image which is *in focus* within a scene. It should also be realized that situation boundaries are not 'fixed' since there may be more than one interpretation of situation boundaries within any given scene.

Divisions between 'instances' of situations are indicated in the sample text shown in Figure 8.1 by lower-case letters 'a', 'b', 'c'...'aa', *etc.* For example, Scene 'B' is divided into four situations, 'b', 'c', 'd', and 'e'. As will be described later, in Section 8.3.8, each instance of the text class 'situation' is linked to a particular instance of a picture-class object.

8.3.5 Text Class: Utterance

The text class 'utterance' represents *simple* or *complex* utterances, according to the definitions given in Section 4.6.2 of Chapter 4. In general, a simple utterance consists of one *independent clause*, *e.g.* J43:

"**He**$_{ii}$ was feeling very strong."

A *complex utterance* consists of one main clause plus any number of *subordinate* clauses syntactically embedded within it, *e.g.* E23:

"When **he**$_{ii}$ felt better, **he**$_{ii}$ crawled out of the ocean."

The sample narrative is divided into fifty-three utterances, marked **1–54**.

8.3.6 Text Class: Character Reference

The text class 'character reference' represents explicit textual references to entities which are characters and missing references which are zero anaphors. In the sample text, each 'instance' of a character reference has been typeset in bold face, and is indexed with roman numeral subscripts.

There are three types of entities which are considered to be 'characters':

- *individual characters*: *e.g.* : **the hare**$_{i}$; **the tortoise**$_{ii}$; **Mr. Raccoon**$_{iv}$; **Charlotte**$_{vi}$;
- *groups of characters*: *e.g.* : **the crowd**$_{iii}$, the **three bunny rabbits**$_{v}$; and
- *compound entities* which consist of entities implicitly or explicitly conjoined by 'and' in the text: *e.g.* the **pro they**$_{i+ii}$ referring to **the hare**$_{i}$ and **the tortoise**$_{ii}$. (Individual characters can comprise members of sets of compound entities.)

The number of a character reference is either singular or plural, and its gender is either male, female, or 'unspecified'.

Character references have one of the three following forms: **np**, **pro**, or **zero**, (see Section 4.6.4 of Chapter 4 for definitions), and are described as being produced in either *clause initial position* or *clause non-initial position.*

8.3.7 Text classes and their attributes

In the terminology of object-oriented analysis, an attribute of a class of objects is a feature of a class that would be manifested as a field in each instantiation of the class realized at run-time. In PROTEUS, an attribute of a class is a specific feature which would be instantiated when an instance of the object was realized during run-time. Figure 8.3 below presents a specification of each text class in informal object-oriented format which includes a listing of the class' attributes, summarizing features which were described in the Sections 8.3.3–8.3.6 above. In the design phase, these specifications would be expanded as necessary. Each attribute is typeset in boldface, with the type of variable (strictly speaking, 'object') which would be instantiated for each attribute shown in parentheses. (Choices of variable types are separated with a comma. For example, a scene boundary could be determined either by *location* or *time*). The adjacent Figure, 8.4, shows an example of how the variable for each attribute could be instantiated for a typical instance of each class, drawn from the narrative shown in Figure 8.1 above.

Figure 8.3: Text classes

class NARRATIVE
attributes:
key:
(identifier)
scene-list:
(cross-reference)

class SCENE
attributes:
key:
(cross reference)
situation-list:
(cross reference)
boundary determiner:
(location,time)

class SITUATION
attributes:
key:
(identifier)
utterance-list
(cross-reference)
illustration
(cross-reference)

class UTTERANCE
attributes:
key:
(identifier)
character-reference list:
(cross-reference)
utterance type:
(simple, complex)

class CHARACTER REFERENCE
attributes:
key:
(identifier)
type:
(individual, individual conjoined, group, compound)
utterance:
(cross-reference)
form:
(np, pro, zero)
number:
(singular, plural (group, compound))
gender:
(male, female, unspecified)
clause position:
(initial, non-initial)

Figure 8.4: Text classes: examples

class NARRATIVE
attributes:
key:
(tortoise/hare)
scene-list:
(A ... K)

class SCENE
attributes:
key:
(B)
situation-list:
(b-e)
boundary determiner:
(explicit location: starting line)

class SITUATION
attributes:
key:
(c)
utterance-list
(3)
illustration
(situation-illustration Ill-c)

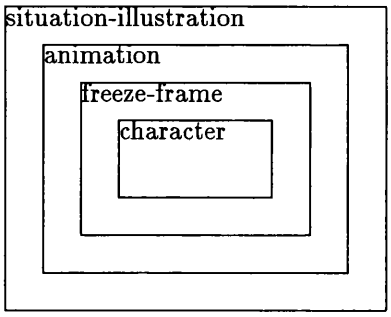
class UTTERANCE
attributes:
key:
(4)
character-reference list:
(i,ii)
utterance type:
(simple)

class CHARACTER REFERENCE
attributes:
key:
the hare$_i$
type:
(individual conjoined)
utterance:
(4)
form:
(np)
number:
(singular)
gender:
(male)
clause position
(initial)

8.3.8 Classes of picture objects

The classes of picture objects (henceforth called 'picture classes') represent hierarchically ordered pictorial elements of a narrative, and include 'situation-illustration', 'animation', 'freeze-frame' and 'character', as shown in Figure 8.5 below:

Figure 8.5: Hierarchical relationship between picture classes



Picture classes are used in electronic texts to provide 'a different access route' to the written text of narratives, as described in Section 8.5 later in this chapter. Before that, a definition, specification and example of each picture class are given.

8.3.9 Picture class: Situation-illustration

The class 'situation-illustration' represents illustrations which depict a summary of the contents of a 'situation' text object. Figures 8.6 and 8.7 respectively show the specification for the 'situation-illustration' class and an instantiated example of a 'situation-illustration'.

Figure 8.6: class SITUATION-ILLUSTRATION

class SITUATION-ILLUSTRATION
attributes:
key
(identifier)
situation-link
(cross-reference)
illustration content:
(description)

The following instantiation of a SCENE-ILLUSTRATION specification refers to situation 'g' in Figure 8.1, which is about only one character, the hare:

He lay down in the sand
and pulled his hat down
and fell asleep.

Figure 8.7: class SITUATION-ILLUSTRATION: example

class SITUATION-ILLUSTRATION
attributes:
key:
(Ill-g)
situation-link:
(g)
illustration content:
(The hare is sleeping under a palm tree
with his hat pulled down
over his eyes.)

8.3.10 Picture class: Animation

The class 'animation' represents an animated sequence of each action and/or mental state which comprise a situation. Figures 8.8 and 8.9, respectively, show the specification for the class 'animation' and an instantiated example.

Figure 8.8: class ANIMATION

class ANIMATION
attributes:
key
(identifier)
situation-link
(cross-reference)
situation-illustration link
(cross-reference)
action-state sequence:
(list)

An instantiated example of the class ANIMATION is given for situation 'g':

He lay down in the sand
and pulled his hat down
and fell asleep.

Figure 8.9: class ANIMATION: example

class ANIMATION
attributes:
key
(An:Ill-g)
situation-link
(g)
situation-illustration link
(Ill-g)
action-state sequence:
((1) The hare lays down under a palm tree.
(2) The hare pulls his hat down over his eyes.
(3) The hare falls asleep.)

8.3.11 Picture Class: Freeze Frame

The class 'freeze-frame' represents one of a sequence of animated actions or mental states which comprise an 'animation'. For example, the animation of situation 'g' above would be comprised of three freeze-frames, each depicting one action or state:

1. The hare lays down under the palm tree.
2. The hare pulls his hat down over his eyes.
3. The hare falls asleep.

The specification of the class freeze-frame is shown in Figure 8.10:

Figure 8.10: class FREEZE-FRAME

class FREEZE-FRAME
attributes:
key
(reference)
animation link
(cross-reference)
action or state:
(list of events/states)

An example of an instantiated freeze-frame is given for action (1) in Figure 8.11 below:

Figure 8.11: class FREEZE-FRAME: example

class FREEZE-FRAME
attributes:
key
(FF An:Ill-g.1)
animation link
(An:Ill-g)
action or state:
(The hare lays down under the palm tree.)

8.3.12 Picture Class: Character

The class 'character' represents one image of one character within a freeze-frame. For example, the character depicted in the freeze-frame described in the previous section is **the hare.**

The specification of the class character is shown in Figure 8.12:

Figure 8.12: class CHARACTER

class CHARACTER
attributes:
key
(reference)
freeze-frame link
(cross-reference)

An example of an instantiated character specification is given for the hare in the freeze-frame shown in the previous section:

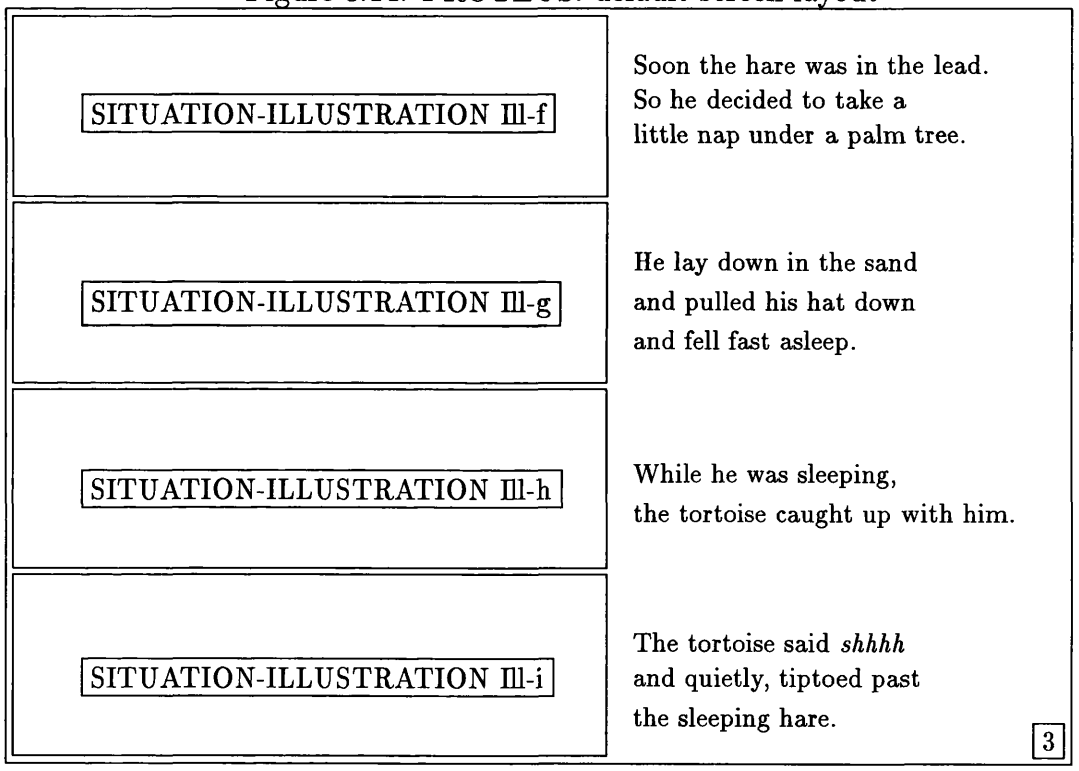
Figure 8.13: class CHARACTER: example

class CHARACTER
attributes:
key
(char:hare)
freeze-frame link
(FF-u.9)

8.4 Basic screen layout

Figure 8.14 shows PROTEUS' basic (or 'default') screen layout, using Scene C of the Tortoise/Hare story as an example. The unit of text which is displayed is a 'scene', containing text objects, *i.e.* , situations, utterances and character references, and picture objects, *i.e.* : situation-illustrations, animations, freeze-frames and characters. In the default layout the only objects which would be 'visible' are situation illustrations and text consisting of utterances grouped by situation. (In Figure 8.14, the 'key' for each situation-illustration is shown in place of a picture.) Each default screen layout is numbered as if it were a page in a book (in the example Scene C corresponds to page 3 of the text).

Figure 8.14: PROTEUS: default screen layout



The default screen layout is altered as users interact with electronic texts stored in PROTEUS and various text and picture objects are manipulated. The highest level of object which is manipulated is the scene which contains lower level text and linked picture objects. The following section describes tasks for interacting with electronic texts stored in PROTEUS.

8.5 Interacting with objects

In the rest of this chapter a set of tasks is proposed for manipulating run-time instances of electronic texts and the text and picture objects contained within them.

The tasks exploit the relationship between *comprehension* and *production* to teach seven-year-old children about the production of pronouns in written narratives. The tasks are presented in two groups: 'comprehension-oriented' and 'production-oriented'. For both, picture objects are used to provide a 'different access route' to the written text. In comprehension-oriented tasks, picture objects are used to help children to build up a mental model of the state of affairs expressed in the text, and hence to develop an implicit awareness of the strategies and cues which are incorporated in the text.[3] These tasks are also used to develop both an implicit and explicit awareness of how references to characters have been produced in the text. In production tasks, picture objects are used to guide children toward producing interpretable pronouns in interpretable texts by giving them the *opportunity* to use a variety of strategies. Ideally, they would be constrained to produce pronouns using targeted heuristic strategies, and to use cues which may be involved in enabling pronoun interpretation when adults produce pronouns.

The order in which tasks are presented does not constitute a recommendation for how PROTEUS should be used in the classroom. It is important to note that tasks are not specifically designed for particular configurations of users, *e.g.* individuals, groups or whole classes, nor are specific recommendations made at this stage about how a teacher would participate in the tasks proposed. Rather, it is envisioned that in the subsequent *design* phase (during which the prototype of PROTEUS would be implemented and iteratively evaluated and *redesigned*), teachers would be able to experiment with the order in which tasks were presented to students, the combinations of tasks presented, the configurations of users performing tasks, and the teacher's role in using PROTEUS.

[3]See Denis (1984) for a critical review of psychological research on the role of imagery in text processing, and Schallert (1980) for a discussion about the role of illustrations in reading comprehension and a review of experiments which used pictures to provide "a different access route to the text content" (1980: 510).

8.6 Comprehension-oriented tasks

8.6.1 Implicitly interpreting character references

First, a set of tasks is outlined which focus on the implicit use of scene-level, situation-level and utterance-level cues which can contribute to the interpretation of pronominalized character references. In all tasks, children are instructed to use picture objects to help them to understand the meaning of the written text, which includes, by default, understanding who the pronominalized character references refer to.

Task 1 *Children are instructed to sequentially activate the animations of all situation-illustrations in a scene.*

This task allows children to:

- understand that they can 'view' the contents of whole scenes;
- perceive that the text is divided into local units (situations) which correspond to situation-illustration picture objects; and
- perceive that each situation-illustration 'contains' an animated version of the text to which it corresponds.

Task 2 *Children are instructed to activate the animated version of each situation-illustration individually.*

This task gives children the opportunity to see that each animation shows characters acting out the actions or experiencing the mental states expressed in each situation.

Task 3 *Children are instructed to freeze each animation as it is viewed.*

This task gives children the opportunity to compare each frozen image with the text. As each freeze frame corresponds to one utterance, in effect, the 'meaning' of each utterance can be viewed.

8.6.2 Making character references explicit

This set of interaction tasks focuses on promoting an explicit awareness of how character references are produced and the meaning of character references in the *written* text.

Task 4 *Children are instructed to highlight character references which they can read in the text. Character references which can be highlighted are* nps *and* pros, *but not* zeros. *Character references can be highlighted at different 'levels', e.g. , within scenes, situations, or utterances, with the highest level at which references can be viewed being the 'scene'.*

This task explicitly shows children character references which occur in the text, and how character references have been produced within scenes, situations and utterances. Children can also be made aware of the difference between nps and pros, and 'chains' of pronominalized references.

Task 5 *Children are instructed to randomly select any number of character references in a selected utterance. When they do so, PROTEUS displays the freeze-frame picture object which depicts the selected utterance with the picture(s) of the selected character(s) highlighted.*

This task 'shows' children the meaning of any character reference, *i.e.* which character is referred to. This is accomplished by explicitly linking any character reference in the text with the corresponding picture of the character in a freeze-frame. Furthermore, the freeze-frame automatically selected by PROTEUS illustrates the meaning of the utterance in which the character reference occurs.

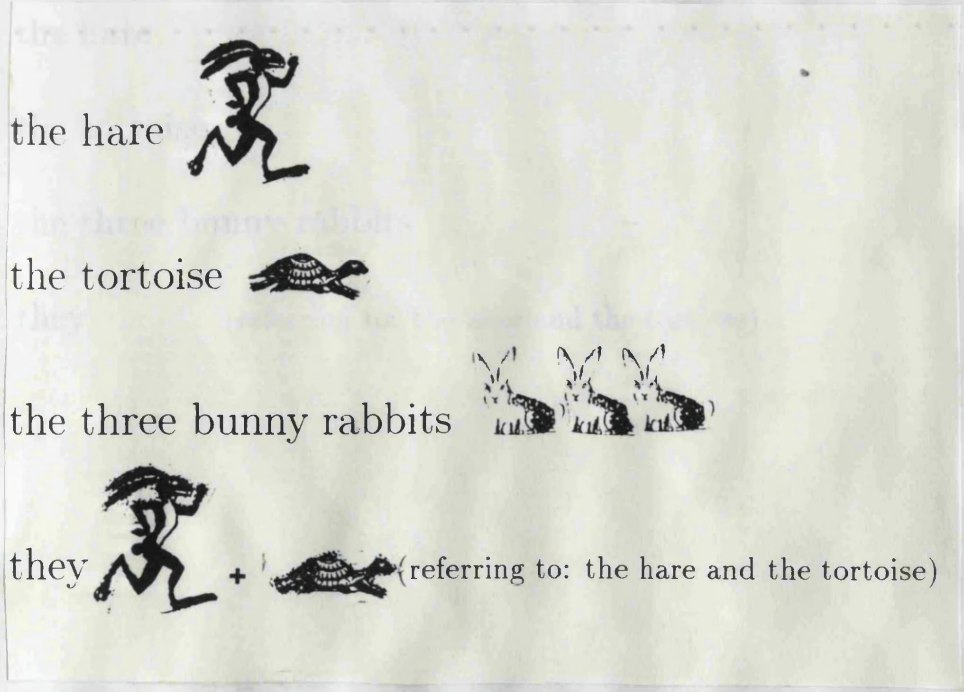
Task 6 *In this task children are instructed to select icons and index character references.*

This task could involve one or both of the following steps:

1. Selecting an icon for each character.
2. Indexing character references by manual placement of icons on the display of the text or by automatic indexing upon request.

The task of indexing characters could be altered by asking children to draw their own icons for each character, and to use these to index characters.

This task could require children to interpret all character references in a given unit of text. Furthermore, it could lead to an explicit awareness that references to characters can have different forms. This task could also develop an explicit awareness of the difference between single entities, group entities and compound entities because the icon for a single character (*e.g.* the tortoise) could depict one character, the icon for a group of characters, (*e.g.* the three bunny rabbits) could depict all members of the group, and icons for a compound entity (*e.g.* the tortoise and the hare) would depict members of the set comprising the compound entity, and be distinguished from group entities by the use of a '+' sign. For example:



Task 7 *This task involves altering the number and/or gender of character references which occur in the text.*

This task is intended to develop an explicit awareness of the number and gender of character references, and how these cues are encoded by pronouns (or in the case of 'they', an awareness that gender is not encoded). For example, one or both of the following steps could be taken when the gender of a referent is changed:

1. Instructing children to change the gender of a particular character, *e.g.* to change the gender of the tortoise from male to female by asking them to alter references manually or having PROTEUS automatically alter references.

2. Instructing children to redraw the character's indexing icon to match the new gender, and manually reindex character references, or activate a facility to have PROTEUS automatically reindex character references.

Similar steps could be taken for changing the 'number' of a character, *e.g.* , changing the story of the Tortoise and the Hare to be about two *teams of racers.*

Task 8 *This tasks involves highlighting missing character references in the text and asking children questions about utterances in which missing character references occur.*

This task is modelled on Richek's (1977) study in which she asked eight-year-old children to write one-word answers to questions about sentences in which the subject of the second clause of a sentence was missing. In PROTEUS, this task would involve highlighting missing references, making children explicitly aware that the text can be understood without the references and then asking them to answer questions such as, 'Who quietly tiptoed past the sleeping hare?' while highlighting utterance 15 of the Tortoise and the hare story: 'And quietly, $\emptyset_{ii}$ tiptoed past **the sleeping hare**$_i$.'

Children who had difficulty understanding clauses with missing subjects could view picture-objects to help them obtain correct answers.

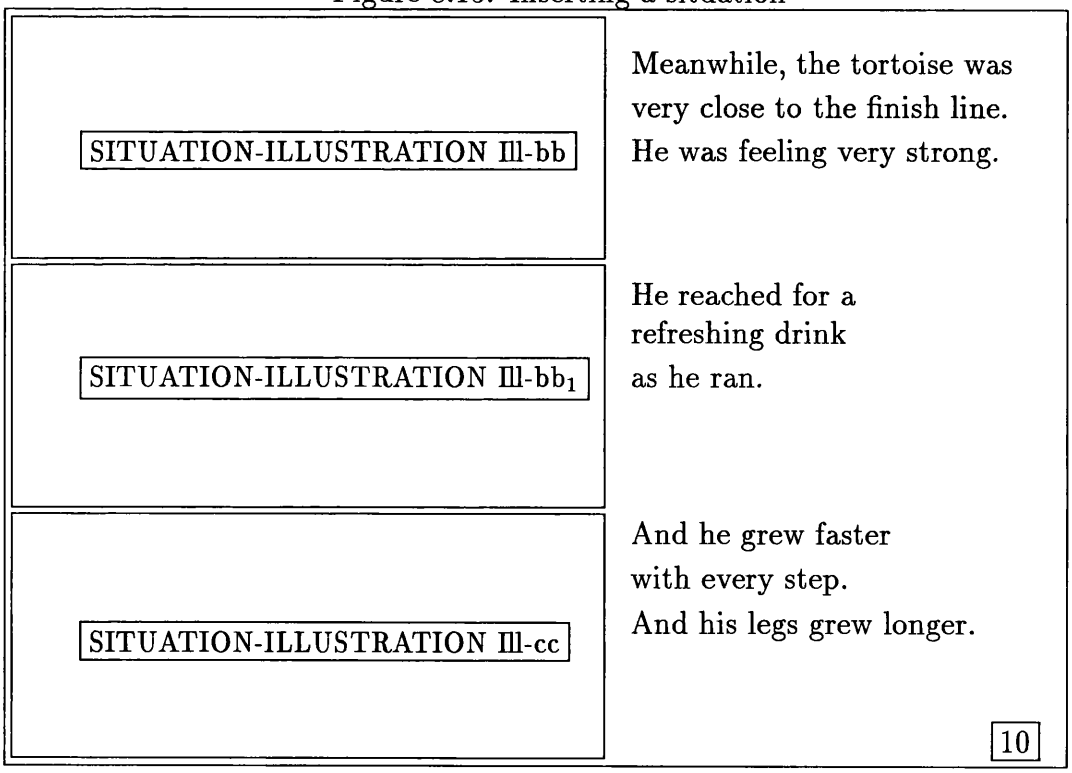
8.7 Production-oriented tasks

Production-oriented tasks in PROTEUS consist of different types of guided writing activities which are used to *constrain* one or more of the following: 1) narrative construction; 2) the choice of characters which are referred to; or 3) the actions and mental states which are expressed in the text. Examples of production-oriented tasks are given below.

Task 9 *Children are instructed to perform a guided writing task which involves insertion of written text for a missing situation.*

In this task, a scene would be displayed with a situation-illustration depicting a situation for which there is no accompanying text. For example, between situations 'bb' and 'cc' in Scene J of the Tortoise and the Hare story (in Figure 8.1), an inserted situation-illustration could depict the tortoise reaching for a drink as he ran, as shown in Figure 8.15 below:

Figure 8.15: Inserting a situation



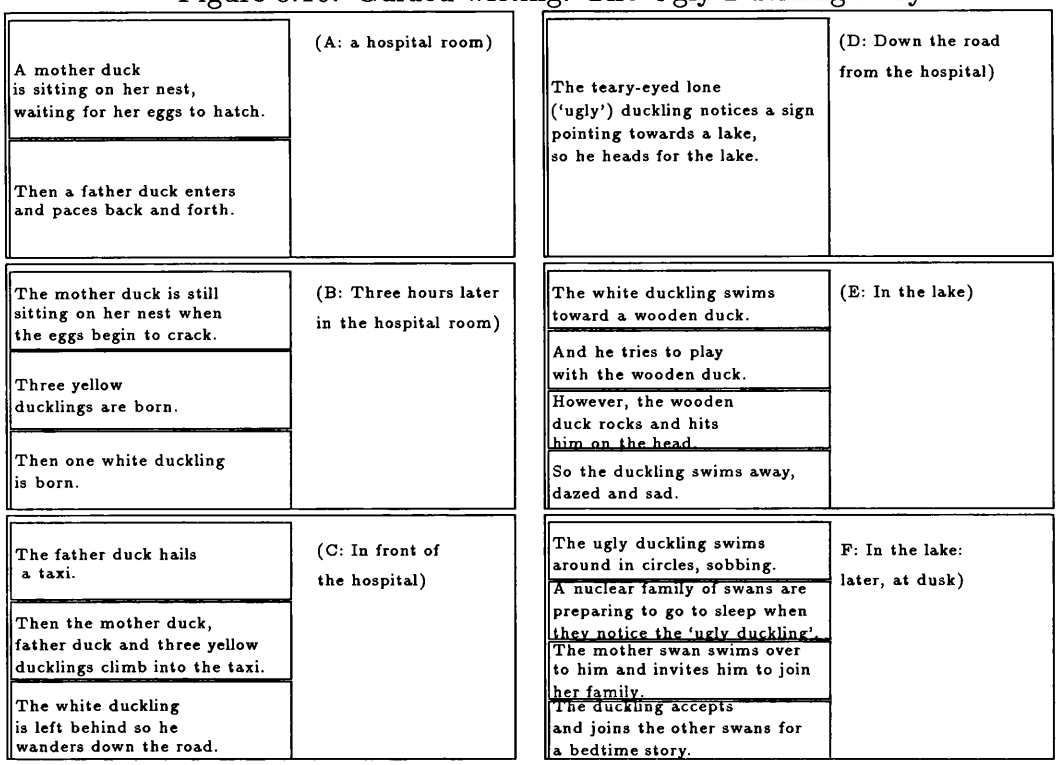
Children would be instructed to write and insert the missing text depicted in the situation-illustration. They would optionally be able to access an animation of the situation-illustration and freeze frames of the animation to constrain their writing task, and this task could be further constrained by instructing children to write one utterance per freeze frame image.

Task 10 *Children are instructed to perform a guided writing task which involves writing a whole story.*

Children would be instructed to 'write' stories which have been pre-structured into scenes and situations. They would be presented with screen displays showing situation-illustrations juxtaposed with blank 'situation' templates, and optionally with further picture objects, animations and/or freeze-frames, to guide and further constrain their writing.

When children write a guided story, scenes and situation 'objects' would be automatically generated, and children would be able to create objects which are utterances and character references as well as being given the facility to index character references. The purpose of generating text objects for guided writing is to provide children with the capability of discussing and manipulating text objects in their own narratives.

Figure 8.16: Guided writing: The Ugly Duckling story



Guided writing template

A sample template for guided story-writing has been created using the Ugly Duckling story, and is shown in Figure 8.16. The text which appears in the space allocated for each situation-illustration describes the content of the situation which would be depicted. Each scene (A-F) is marked, and the change in location or time which determines the scene boundary is indicated in parentheses. It can be seen from this example that children are guided to use a variety of strategies and create different types of linguistic environments, in which they can potentially pronominalize. For example:

- Scene A contains two 'situations' which are each about different characters;
- Scene D consists of only one situation which is about one character;
- In Scene E the ugly duckling and the wooden duck interact.

As in comprehension-oriented exercises, the numbers and/or genders of characters could be varied, and situations or scenes could be added.

8.8 Summary: the system model

This chapter has outlined a 'system model' for PROTEUS which synthesizes PROTEUS' pedagogical goals, the models of pronoun production for children and adults, and the necessary technology. Further issues regarding the implementation of PROTEUS are brought up in the next chapter, which is the final chapter of the main thesis.

Chapter 9

Summary and Conclusions

A major goal of this thesis was to bring together one aspect of language development — the production of anaphoric personal pronouns in the written narratives of seven-year-old children, with the design of technology appropriate for teaching using whole texts, and pedagogical goals involved in teaching mother-tongue language. First, a five-stage methodology was proposed for analyzing the requirements for designing a Mother Tongue Language Teaching System (MTLTS) and then the proposed methodology was used to generate an informal specification of requirements. This specification could be used in the design phase to build the prototype system called PROTEUS which teaches seven-year-old children about the production of anaphoric pronouns in written narratives, and it contains the output of the following stages:

Stage 1 (Chapter 2) This stage entailed the proposal of an adult model of pronoun production, taking into account previous comprehension and production studies. The model was given a 'process orientation', and was tuned to a model of the psychological operations involved in pronoun interpretation. It was proposed that adults enable virtual resolution, verification, and evaluation of candidate antecedents through the production of varying sets of converging cues involved in the production of the text as a whole.

Stage 2 (Chapters 3, 4, 5, and 6) A model of the production of anaphoric reference by seven-year-old children in their written narratives was developed. First, a critical review of studies concerning comprehension and production by children concluded that pronoun production may be a 'fairly messy situation'. Then, experiments were described which were designed to overcome the shortcomings identified in previous production studies: the failure to use a sufficient variety of stimulus material, the failure to analyze non-initial pronouns, an inadequate analysis of narrative structure, and a general failure to tease out strategies which accurately described the vari-

ability of pronoun production.

It was anticipated that the limited capacity of children's working memories would limit the ability to integrate pronoun production with the construction of their narratives as a whole, and that they would therefore use a variety of cognitive 'heuristic' strategies to produce pronouns, possibly resembling the comprehension strategy of 'maximal stability' of syntactic role, semantic role or clause position.

Three experiments were carried out in which three sets of written narratives were elicited by using cartoon videos as stimulus materials. Subjects were all drawn from Primary 3 classes in Scotland. Narratives were coded by dividing them into structural units called 'scenes' and utterances. Each reference to a character was indexed and judgments were made as to form, syntactic role, semantic role, pragmatic role, and continuity function. In addition, the 'pronominalization strategy' implemented by each pronoun ('pro' or 'ø') in the text was noted, and was comprised of the values of three components which represented judgments of continuity function, (clause) position conservation, and recency.

After experimental results were reported, the discussion focussed on teasing out preferred options for pronominalization. In a summary of the discussion, a model of children's pronominalization was presented.

A range of heuristic strategies for pronoun production were identified which represented a gradual simplification of behavior. These strategies were implemented within local units of text, usually within a scene, and ranged from pronominalization of the only character a local unit of text was about, (by default, pronominalization in clause-initial position), to the emergence of a full-blown position conservation strategy whereby referents in both clause positions are successively pronominalized in the same position. Children were also found to produce 'pronominal confusion' when they referred to interacting characters in less constrained environments; or, they avoided the use of pronominals altogether.

None of the strategies proposed involved the enabling of pronoun interpretation, although pronouns were often not difficult to interpret because they could be processed 'by default' in highly constrained local units of text.

It was concluded that, most likely, the variety of preferred options taken by children reflected both their varying abilities and the inefficiency of their working memories, and that children were unlikely to develop the adult ability to enable pronoun interpretation until they could produce narratives in which they manipulated many levels of inference.

Further research concerning the production of anaphoric reference was identified, including: the use of more varied and controlled stimulus materials, an analysis of the relationship between heuristic strategies and syntactic restrictions on pronominalization, and an exploration of whether children's strategies influence the adult process for enabling pronoun interpretation.

Stages 3 and 4 (Chapter 7) In this stage, PROTEUS' pedagogical goals were set out as follows:

- to teach children to develop both an implicit and metalinguistic awareness of acquired heuristic pronoun production strategies so that they can gain control over and maximize the use of their acquired strategies; and
- to provide support for the development of the adult ability to enable pronoun interpretation.

Then, after a review of manual and computational methods for teaching language, it was concluded that an electronic text would be used to teach pronominalization in PROTEUS.

Stage 5 (Chapter 8) This chapter describes the synthesis of a system model based on the previous stages of analysis. The system model proposed for PROTEUS consists of:

1. A set of guidelines for producing written electronic texts;
2. A description of an electronic text as a class of objects which at runtime contains instances of text and picture objects; and
3. A set of comprehension and production-oriented tasks for interacting with electronic texts.

9.1 Future work

Future research concerning the production of anaphoric reference has already been outlined. This section sets out further systems development issues.

One contribution to systems analysis made by the research presented in this thesis is to provide a case study of the application of an object-oriented methodology in the analysis phase. For PROTEUS, the choice of an object-oriented methodology was an obvious one, evidenced by the ease of defining linguistic objects in terms of computational classes of objects, and describing language teaching in terms of how these object could be manipulated in an electronic text. However,

while the case study establishes a basis for developing language teaching applications which are not 'content-free', it remains to be proven that the MTLTS requirements analysis methodology is effective in the development of real-world language teaching systems to be used in the classroom.

The system model proposed in Chapter 8 functions as a model of the problem domain for teaching the production of anaphoric reference to seven-year-old children. It is expected that this model could be mapped to a system implementation during an iterative design phase in which children would use PROTEUS in the classroom, and teachers and developers would collaborate to progressively update and formalize the system. Further issues would have to be faced during the design phase, such as: dialogue design, tailoring the interface for use by seven-year-old children, the development of teaching strategies and the production of training manuals for teachers. During the design process it should also be possible to monitor the use of PROTEUS from a psycholinguist's perspective. The purpose would be to provide further data for studying the production of anaphoric reference, and to develop a greater understanding of how to teach mother tongue language using computational systems based on the manipulation of, and interaction with, electronic texts. In particular, it will be important to monitor whether the use of PROTEUS supports development of adult processes, or whether it imposes constraints on pronoun production which suppress development.

Another systems development issue is the potential general use of the MTLTS methodology. It is not difficult to imagine that this methodology might be applied to the development of a computational system for teaching about another aspect of language. The requirements analysis would be undertaken by an 'expert' having enough psycholinguistic and computational knowledge to define the problem domain and a system model would be built as a prototype. Take, for example, Rubin's (1983) STORY MAKER program (described in Chapter 7), which is a toolkit for the creation of narratives, concentrating on higher-level processs, such as maintaining the logical flow of a narrative. A system which similarly dealt with higher-level processes in narrative construction, using the MTLTS methodology, would be built on the basis of a problem domain consisting of: a children's model based on psycholinguistic experimentation in relation to an adult model; appropriate pedagogical goals; and, a computational framework stated in terms of how text objects are to be manipulated. Then, a three-component system model would be synthesized, and finally, the system model would be used to build an experimental prototype. End users and programmers would become involved during the design phase, serving as input for the redefinition of the requirements established by the psycholinguist.

It is envisioned that the MTLTS methodology could further evolve into what

has been called a '*generic application*'.[1] Generic applications have been described by Wirfs-Brock and Johnson (1990) as being important to the future of systems development chiefly because: 1) they may be used to organize all aspects of an application in both the analysis and design phases (*e.g.* system model, documentation, *etc.*); and 2) because their components are reusable: they provide a software environment from which an application developer can generate specific applications "using the components in the generic application's information base" — by building a hierarchy of frames, "from generic to specific" (1990: 120).

An MTLTS generic application would be an *environment* to support the generation of specific applications for teaching different aspects of mother tongue language. Specifically, it would facilitate an analysis of requirements similar to that of PROTEUS. The requirements would include a psycholinguistic model coupled with a set of pedagogical goals. Then, if the 'expert' found that it would be appropriate to teach by manipulating linguistic objects in an electronic text, the MTLTS 'environment' would provide support for constructing whole electronic texts, text objects to be manipulated, and interaction tasks; *i.e.*, as in 'information base' it would support the synthesis and specification of the system model. In an MTLTS environment it would be possible to reuse 'generic' classes of objects and tasks, such as a class of electronic texts, a class of 'utterance' objects, *etc.*

In summary, the analysis of requirements for PROTEUS provides a case study which raises many further systems development issues which could be explored in the future. The methodology proposed is an example of an object-oriented methodology which might be used to develop further MTLTS applications. This is a methodology which has been tailored to a specific application domain, and it is envisioned that a generic application, or 'environment' could evolve from such a tailored methodology. In the analysis phase of the systems lifecycle, it may be possible for an 'environment' to be used as a requirements analysis tool, providing a computational framework for synthesizing a system model from a problem domain described by an 'expert' in natural language. It remains for further research to determine whether similar concepts and ideas could or should be implemented more widely for different types of applications, *i.e.*: the use of object-oriented methodologies, which are "rapidly evolving" but "by no means fully mature" (Fichman & Kemerer, 1992: 39), tailoring of methodologies to specific types of applications, and the evolution of generic environments which could be used as tools during the systems lifecycle.

[1]The term generic application has been defined by Wirfs-Brock and Johnson (1990) as being similar to a 'framework'. A framework is described as a "collection of abstract and concrete classes and the interfaces between them ... [which is] the design for a subsystem" (Wirfs-Brock & Johnson, 1990: 116). Frameworks have been typically used for implementing graphical user interfaces, such as Macintosh applications.

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Appendix A

Sneetch data

A.1 Sneetch narratives

A summary of coding for listed narratives is given on page 74 of the main thesis.

Sneetch Narrative 1

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**the Sneetches without stars**$_i$ ar sad	np	S	Ex	To	introduce	$chANT\rangle$
	beecos **they**$_i$ havint got stars.	pro	S	B	To	maintain	main/PC+/R+$\rangle$
2	**the Sneetches with stars**$_{ii}$ ar hapae.	np	S	Ex	To	introduce	–
B 3	**a man cald Sylvester**$_{iii}$ came along.	np	S	A	To	introduce	$\langle chANT$
4	**he**$_{iii}$ said	pro	S	A	To	maintain	$\langle$main/PC+/R+
	I no that the uther Sneetches ar anoyin yuo.						
	yuo shood get stars on yuo.						
5	So **the Sneetches**$_i$ went into the misheen	np	S	A	To	reestablish	$chANT\rangle$
6	**thae**$_i$ had stars.	pro	S	B[a]	To	maintain	main/PC+/R+$\rangle$

[a] Alternatively 'Agent', if the interpretation of utterances 5–6 is: 'They decided to have stars and went into the machine to get them' vs. 'Now they had stars (because they had gone into the machine to get them).'

Sneetch Narrative 2

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	Once a ponatime ther was **Sneetches**$_i$	np	S	Th[a]	To	introduce	–
2	and **some**$_{ii}$ had stars	np	S	B	To	introduce	–
3	and **some**$_{iii}$ didint.	np	S	B	To	introduce	–
4	and **the wons with the stars**$_{ii}$ thot	np	S	Ex	To	reestablish	$chANT\rangle$
	they$_{ii}$ wor the best.	pro	S	Th	To	maintain	main/PC+/R+$\rangle$
5	and **the wons with the stars**$_{ii}$	np	S	Th	To	maintain	$\langle chANT$
	and **the onse that had no stars**$_{iii}$	np	S	Th	To	reestablish	$\langle chANT$
	they$_{ii+\ iii}$ were enemys.	pro	S	Ex	To	maintain	$\langle$main/PC+/R+

[a] In an 'existential' utterance, the S is judged to have the semantic role 'Theme'.

Sneetch Narrative 3

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	Once apon a time there lived **sneetches**$_i$	np	S	Th	To	introduce	–
2	**some**$_{ii}$ had a star	np	S	B	To	introduce	–
3	and **some**$_{iii}$ never had any stars.	np	S	B	To	introduce	–
B 4	One day **a man**$_{iv}$ came to the beatch.	np	S	A	To	introduce	$chANT\rangle$
5	And **he**$_{iv}$ stoped	pro	S	A	To	maintain	main/PC+/R+$\rangle$
6	and **ø**$_{iv}$ said	zero	S	A	To	maintain	main/PC+/R+$\rangle$
	I know what you want.						
	I just know what you need.						

Sneetch Narrative 4

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**The Sneetches wiht the stars**$_i$ thout	np	S	Ex	To	introduce	⟨*chANT*
	they$_i$ wher the best.	pro	S	Th	To	maintain	⟨main/PC+/R+
B 2	but not untel **Sylvester the conman**$_{ii}$ came.	np	S	A	To	introduce	*chANT*⟩
3	**he**$_{ii}$ was very bad	pro	S	Th	To	maintain	main/PC+/R+⟩
	becos **the Sneetches**$_{iii}$ thout	np	S	Ex	To	introduce	⟨*chANT*
	Sylvester$_{ii}$ was going	np	S	A	To	maintain	–
	to help **them**$_{iii}$.	pro	O	B	Co	maintain	⟨main/PC-/R-
4	but **Sylvester**$_{ii}$ was just wanting	np	S	Ex	To	maintain	*chANT*⟩
	to cheet **them**$_{iii}$	pro	O	P	Co	maintain	⟨main/PC+/R-
5	and **ø**$_{ii}$ brout out a machine	zero	S	A	To	maintain	main/PC+/R-⟩
6	and **they**$_{iii}$ pade three punds	pro	S	A	To	reestablish	⟨re/PC-/R-
	to get in and get there stars.						
7	and **the other Sneetches**$_i$ still thout	np	S	Ex	To	reestablish	*chANT*⟩
	they$_i$ wher the best.	pro	S	Th	To	maintain	main/PC+/R+⟩

Sneetch Narrative 5

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**The sneetches**$_i$ hated	np	S	Ex	To	introduce	–
	eatch other$_i$.	np	O	Pe	Co	maintain	–
2	and **the ones that had stars**$_{ii}$ thot	np	S	Ex	To	introduce	*chANT*⟩
	that **thay**$_{ii}$ wher the best sneetches	pro	S	Th	To	maintain	main/PC+/R+⟩
	in the beatch.						

Sneetch Narrative 6

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	Once aponatime there lived **Sneetches**$_i$	np	S	Th	To	introduce	*chANT*⟩
2	and **some**$_{ii}$ had stars	np	S	B	To	introduce	–
3	and **some**$_{ii}$ didnet like	np	S	Ex	To	maintain	–
	the once without stars$_{iii}$	np	O	Pe	Co	introduce	–
B 4	and one day came						
	a man called Sylvester$_{iv}$	np	S	A	To	introduce	–
5	and **ø**$_i$[a] payed £10	zero	S	A	To	reestablish	re/PC-/R-⟩
C 6	and next day **ø**$_i$ payed £3	zero	S	A	To	maintain	main/PC+/R+⟩
D 7	and at the End **they**$_i$ had nothing atall	pro	S	B	To	maintain	main/PC+/R+⟩
8	and **ø**$_i$ payed all there money	zero	S	A	To	maintain	main/PC+/R+⟩
E 9	So next day **they**$_i$ became friends	pro	S	Th[b]	To	maintain	main/PC+/R+⟩
	even if **they**$_v$ had no stars	pro	S	B	To	introduce	⟨intro/chANT-
10	and **some**$_{vi}$ had two on there bum.	np	S	B	To	introduce	–
11	**They**$_i$ laughed	pro	S	A	To	reestablish	re/PC+/R-⟩
12	and **ø**$_i$ became friends.	zero	S	Th	To	maintain	main/PC+/R+⟩

[a] Interpreted as meaning the group of all Sneetches.

[b] 'They' is judged to have the semantic role 'Theme' (Sneetches are in a 'state' of friendship), although it is noted that it is also possible for a judgment of 'Agent' to have been made if the interpretation of this clause is 'The Sneetches created friendships with each other'. According to Jackendoff's taxonomy of roles (1990) another possible semantic role would be 'Reactor' if the utterance is interpreted to mean: 'The Sneetches reacted to each other by becoming friends'.

Sneetch Narrative 7

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day there were **Sneetches**$_i$	np	S	Th	To	introduce	*chANT*⟩
2	and **they**$_i$ were enemyes	pro	S	Th	To	maintain	main/PC+/R+⟩
3	**Some**$_{ii}$ of them Stars	np	S	B	To	introduce	–
4	and **Some**$_{iii}$ didin't.	np	S	B	To	introduce	–
5	**the Ones that had stars**$_{ii}$ thot	np	S	Ex	To	reestablish	⟨*chANT*
	that **they**$_{ii}$ wer the best.	pro	S	Th	To	maintain	⟨main/PC+/R+
6	**The Ones that stars**$_{ii}$ did not let	np	S	A	To	maintain	*chANT*⟩
	the ones that hadint stars$_{iii}$	np	O	P	Co	reestablish	–
	play with **them**$_{ii}$.	pro	O	As	Co	maintain	main/PC-/R-⟩

Sneetch Narrative 8

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day there was **Sneetches with Stars on there belly**$_i$.	np	S	Th	To	introduce	*chANT*⟩
	And **Some without Stars on there belly**$_{ii}$.	np	S	Th	To	introduce	*chANT*⟩
2	At firt **they**$_{i+ii}$ were enemys.	pro	S	Th	To	maintain	main/PC+/R+⟩
B 3	And there was a **man**$_{iii}$ cond	np	S	A	To	introduce	⟨*chANT*
	them$_{i+\ ii}$.	pro	O	P	Co	maintain	main/PC-/R-⟩
4	So **he**$_{iii}$ got	pro	S	A	To	maintain	⟨main/PC+/R-
	them$_{i+\ ii}$ to pay money.	pro	O	P	Co	maintain	main/PC+/R-⟩
5	And **they**$_{i+\ ii}$ had to pay it.	pro	S	P	To	maintain	main/PC-/R+⟩
6	Or **they**$_{i+\ ii}$ wouldn't get the stars on or off.	pro	S	B	To	maintain	main/PC+/R+⟩
7	So **they**$_{i+\ ii}$ Pade it.	pro	S	A	To	maintain	main/PC+/R+⟩
C 8	And at the end **they**$_{i+\ ii}$ laphed	pro	S	A	To	maintain	main/PC+/R+⟩
9	and ø$_{i+\ ii}$ became frends.	zero	S	Th	To	maintain	main/PC+/R+⟩

Sneetch Narrative 9

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**The sneetches**$_i$ hud star on thar belly	np	S	B	To	introduce	*chANT*⟩
2	**sum**$_{ii}$ dudin hud star on thar belly	np	S	B	To	introduce	–
3	**the sneetches** $_{iii}$ wosin frens	np	S	Th	To	introduce[a]	–
4	and **tha**$_i$ wosin aloud to tok to	pro	S	P	To	reestablish	re/PC+/R-⟩
	the sneetches tha have no stars on thar belly$_{ii}$	np	O	R	Co	reestablish	⟨*chANT*
5	and ø$_i$ put ther noseis up	zero	S	A	To	maintain	main/PC+/R-⟩
6	and ø$_i$ to not lit	zero	S	A	To	maintain	main/PC+/R+⟩
	them$_{ii}$ play in ther gam[b]	pro	O	P	Co	reestablish	⟨re/PC+/R-
B 7	**Sylvester**$_{iv}$ cam	np	S	A	To	introduce	*chANT*⟩
8	**tha**$_{ii}$ gav	pro	S	A	To	reestablish	⟨re/PC-/R-
	him$_{iv}$ mina	pro	O	B	Co	maintain	main/PC-/R-⟩
9	and **tha**$_{ii}$ went into the machine	pro	S	A	To	maintain	⟨main/PC+/R-
10	wen **they**$_{ii}$ came out	pro	S	A	To	maintain	⟨main/PC+/R+
	tha$_{ii}$ had star on thar belly.	pro	S	B	To	maintain	⟨main/PC+/R+

[a] Introduction of the 'superset' of all Sneetches.

[b] Incomplete utterance omitted: 'when tha was playin tha'

Sneetch Narrative 10

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**Sylvester**$_i$ was	np	S	Th	To	introduce	–
	a man who wanted mony						
	from **the Sneetches**$_{ii}$.	np	O	Sr	Co	introduce	–
B 2	**The wuns with the stars**$_{iii}$ thot	np	S	Ex	To	introduce	*chANT*⟩
	thay$_{iii}$ were the best.	pro	S	Th	To	maintain	main/PC+/R+⟩
C 3	But **Sylvester**$_i$ came along with his big machine.	np	S	A	To	reestablish	–
4	**Sylvester**$_i$ tock the stars of and on of and on of on.	np	S	A	To	maintain	–

Sneetch Narrative 11

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	It isnt fair						
	because **some Sneetches**$_i$ have Stars	np	S	B	To	introduce	–
	and **others**$_{ii}$ don't	np	S	B	To	introduce	*chANT*⟩
	and **some**$_i$ do.	np	S	B	To	maintain	*chANT*⟩
2	**Sylvester**$_{iii}$ cheaed	np	S	A	To	introduce	–
	them$_{i+ii}$.	pro	O	P	Co	maintain	main/PC-/R-⟩
B 3	at the end **they**$_{i+\ ii}$ all got muddald up.	pro	S	Th	To	maintain	main/PC-/R+⟩
4	**Some of them**$_{iv}$ have two stars.	np	S	B	To	introduce	–
5	**Some**$_v$ had Stars on ther back.	np	S	B	To	introduce	–

Sneetch Narrative 12

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day **Sneetches**$_i$ were enemys.	np	S	Th	To	introduce	⟨*chANT*
	Because **sum**$_{ii}$ had stars	np	S	B	To	introduce	–
	and **sum**$_{iii}$ did not have stars.	np	S	B	To	introduce	–
B 2	All **Sylvester**$_{iv}$ wanted money	np	S	Ex	To	introduce	*chANT*⟩
	because **he**$_{iv}$ poot stars on	pro	S	A	To	maintain	main/PC+/R+⟩
	and $\emptyset_{iv}$ took them of.	zero	S	A	To	maintain	main/PC+/R+⟩
3	**He**$_{iv}$ had big machine	pro	S	B	To	maintain	main/PC+/R+⟩
4	**he**$_{iv}$ Wantd to be ritch.	pro	S	Ex	To	maintain	main/PC+/R+⟩
C 5	**Thay**$_i$[a] live on a bech.	pro	S	Th	To	reestablish	⟨re/PC+/R-
6	And **the ones with stars**$_{ii}$ thogh	np	S	Ex	To	reestablish	*chANT*⟩
	thay$_{ii}$ were the best.	pro	S	Th	To	maintain	main/PC+/R+⟩
7	**Thay**$_i$[b] becom freind again.	pro	S	Th	To	reestablish	⟨re/PC+/R-

[a] This 'pro' is judged to mean the 'superset' of all Sneetches (**Sneetches**$_i$ in A1.) rather than a compound entity consisting of Sneetches with stars + Sneetches without stars.

[b] As in C5, this 'pro' is judged to mean the 'superset' of all Sneetches (**Sneetches**$_i$ in A1.)

Sneetch Narrative 13

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	At the start **some Sneetches**$_i$ had stars on thair bellys.	np	S	B	To	introduce	–
2	And **the Other Sneetches**$_i$ were jellis	np	S	Ex	To	maintain	–
	of **the Other Sneetches that didint have Stars on thair bellys**$_{ii}$	np	O	Sr[a]	Co	introduce	–
B 3	And then **Mr. Sylvester**$_{iii}$ came along with a big Machine.	np	S	A	To	introduce	*chANT*⟩
4	**he**$_{iii}$ wanted all thair mony to get all thair Stars on and all thair stars of.	pro	S	Ex	To	maintain	main/PC+/R+⟩
5	It was 3 pounds for the first lote.						

[a] Overlaps with 'Percept'.

Sneetch Narrative 14

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	Once apon a time there where **creechers caled the Sneetches$_i$**.	np	S	Th	To	introduce	–
2	And **the Sneetches With Stars on there belly$_{ii}$** thought	np	S	Ex	To	introduce	*chANT*⟩
	that **they$_{ii}$** whor the best.	pro	S	Th	To	maintain	main/PC+/R+⟩
3	And **they$_{ii}$** Whor geles	pro	S	Ex	To	maintain	main/PC+/R+⟩
	of the Sneetches Without Stars on there belly$_{iii}$.	np	O	Sr	Co	introduce	–
B 4	And When **the Sneetches With Stars$_{ii}$** had a Piknik	np	S	A	To	maintain	*chANT*⟩
	they$_{ii}$ wouldent let	pro	S	A	To	maintain	main/PC+/R+⟩
	the other Sneetches$_{iii}$	np	O	P	Co	reestablish	–
	Join in the Piknik.						
C 5	One day When **the Sneetches$_{iv}$** wehre on the beech	np	S	Th	To	introduce	–
	a man named Sylvester$_v$ came along in a funny Van.	np	S	A	To	introduce	–
D 6	**The Sneetches With Stars on there belly$_{ii}$** had to turn up there Snoote At	np	S	P	To	reestablish	–
	the Sneetches without stars on there belly$_{iii}$.	np	O	R	Co	reestablish	–

Sneetch Narrative 15

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	Once apon a time there lived **some Sneetches$_i$**	np	S	Th	To	introduce	–
2	**Some$_{ii}$** had a star	np	S	B	To	introduce	–
3	and **some$_{iii}$** didend have any stars.	np	S	B	To	introduce	–
B 4	**A man cald sylvester$_{iv}$** came with a car	np	S	A	To	introduce	*chANT*⟩
5	and **ø$_{iv}$** took some stars of and some stars on.	zero	S	A	To	maintain	main/PC+/R+⟩

Sneetch Narrative 16

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**The Sneetches with Stars$_i$** thout	np	S	Ex	To	introduce	*chANT*⟩
	they$_i$ were the best Sneetches on the beatch.	pro	S	Th	To	maintain	main/PC+/R+⟩
2	**They$_i$** would not let	pro	S	A	To	maintain	main/PC+/R+⟩
	the ones without stars$_{ii}$ play in there games.	np	O	P	Co	introduce	⟨*chANT*
B 3	But one day **a man called Sylvester$_{iii}$**	np	S	A	To	introduce	*chANT*⟩
	he$_{iii}$ came with a machine	pro	S	A	To	maintain	main/PC+/R+⟩
4	and **he$_{iii}$** wanted money	pro	S	Ex	To	maintain	main/PC+/R+⟩
5	**He$_{iii}$** made	pro	S	A	To	maintain	main/PC+/R+⟩
	them$_{ii}$ pay to get Stars on there bellys.	pro	O	P	Co	reestablish	⟨re/PC+/R-

Sneetch Narrative 17

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	tare was **Sneetches wis stars**$_i$	np	S	B	To	introduce	–
	and **Sneetches bithuwt Stars**$_{ii}$	np	S	B	To	introduce	–
2	and **the sneetches with stars**$_i$	np	S	Ex	To	maintain	–
	did not liyk **the sneetches bithuwt Stars**$_{ii}$	np	O	Pe	Co	maintain	–
3	but **the Sneetches bithuwt stars**$_{ii}$ lykt	np	S	Ex	To	maintain	–
	the Sneetches with stars$_i$.	np	O	Pe	Co	maintain	–

Sneetch Narrative 18

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**the ones with the stars**$_i$ fot	np	S	Ex	To	introduce	$chANT\rangle$
	thay$_i$ wer the smartst	pro	S	Th	To	maintain	main/PC+/R+⟩
2	and **the ones**$_{ii}$ fot	np	S	Ex	To	introduce	⟨$chANT$
	they$_{ii}$ where smart to	pro	S	Th	To	maintain	⟨main/PC+/R+
3	**some**$_{iii}$ had six stars	np	S	B	To	introduce	–

Sneetch Narrative 19

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	it wasint far be cose **the other Sneetches**$_i$ didin have stars.	np	S	B	To	introduce	$chANT\rangle$
B 2	and **the Sylvester**$_{ii}$ wanted money.	np	S	Ex	To	introduce	⟨$chANT$
3	and **they**$_i$ paed to get into the machine.	pro	S	A	To	reestablish	re/PC+/R-⟩
4	and **he**$_{ii}$ cheatid	pro	S	A	To	reestablish	⟨re/PC+/R-
C 5	and **they**$_{iii}$ came enemys agen	pro	S	Th	To	introduce	intro/chANT-⟩
6	and **the wans with the Stars**$_{iv}$ think	np	S	Ex	To	introduce[a]	⟨$chANT$
	they$_{iv}$ whar the best	pro	S	Th	To	maintain	⟨main/PC+/R+

[a] Neither the set of characters which includes 'All of the Sneetches' nor the set of Sneetches with stars has been established in the narrative before this reference occurs.

Sneetch Narrative 20

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**Some of the Sneetches**$_i$ hade Stars	np	S	B	To	introduce	–
2	and **Some**$_{ii}$ dint have eny Stars atoel	np	S	B	To	introduce	–
3	and **Some**$_{ii}$ thot	np	S	Ex	To	maintain	$chANT\rangle$
	they$_{ii}$ wear the best Sneetches	pro	S	Th	To	maintain	main/PC+/R+⟩
4	and **Some**$_i$ had two stars	np	S	B	To	reestablish	–
5	and **Some**$_{ii}$ had none Stars atoel	np	S	B	To	reestablish	–
6	**Some**$_{ii}$ did not let	np	S	A	To	maintain	–
	the wone with the Star$_i$ Play.	np	O	P	Co	reestablish	–
B 7	**Sylvester**$_{iii}$ had a machine	np	S	B	To	introduce	–
8	and it was a big machine						

Sneetch Narrative 21

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day there was **sneetches**$_{i}$	np	S	Th	To	introduce	–
2	**Some**$_{ii}$ had Stars on there bellys	np	S	B	To	introduce	–
3	and **others**$_{iii}$ had none	np	S	B	To	introduce	–
4	and **the Ones that had stars**$_{ii}$ ignored	np	S	A	To	reestablish	–
	The Ones that hadint got them$_{iii}$	np	O	R[a]	Co	maintain	–

[a]For consistency, the role is judged to be 'Recipient', but overlaps with 'Patient'.

Sneetch Narrative 22

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	Once there were **some sneetches**$_{i}$.	np	S	Th	To	introduce	–
2	**Some**$_{ii}$ had stars on their tummies	np	S	B	To	introduce	–
3	but **some**$_{iii}$ did not.	np	S	B	To	introduce	–
4	**The star tummied sneetches**$_{ii}$	np	S	Ex	To	reestablish	$chANT\rangle$
	thought that **they**$_{ii}$ were the best.	pro	S	Th	To	maintain	main/PC+/R+$\rangle$
B 5	When **the star tummied sneeches**$_{ii}$	np	S	A	To	maintain	–
	had a party the **others**$_{iii}$ did not	np	S	P	To	reestablish	–
	get to join in.						

Sneetch Narrative 23

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day **the Sneetcher**$_{i}$ had an argument	np	S	A[a]	To	introduce	–
	becoss **the other sneetcher**$_{ii}$	np	S	B	To	introduce	–
	dident haf enay stars.						
2	And **the Ones with stars**$_{iii}$ thot	np	S	Ex	To	introduce	$chANT\rangle$
	they$_{iii}$ were the best	pro	S	Th	To	maintain	main/PC+/R+$\rangle$

[a]This judgment is based on the interpretation that the Sneetches were intentionally engaged in an argument with each other.

Sneetch Narrative 24

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**Sylvester**$_{i}$ was a conman	np	S	Th	To	introduce	$chANT\rangle$
2	**He**$_{i}$ coned .	pro	S	A	To	maintain	main/PC+/R+$\rangle$
	the Sneetches$_{ii}$	np	O	P	Co	introduce	–
3	**He**$_{i}$ got mony	pro	S	R	To	maintain	main/PC+/R-$\rangle$
	be cose **the Sneetches**$_{ii}$ wanted	np	S	Ex	To	maintain	–
	to go in the machines						
	to get stars on thear belly						

A.2 Sneetch analysis tables

This section contains a series of tables output from the analysis of Sneetch narratives listed in the previous section of this Appendix.

A.2.1 Narrative features

Table A.1 below shows, for each of the twenty-four narratives in the Sneetch set: total number of Scenes ('No of Scenes'); total number of utterances ('No of Utts'); total number of characters referred to ('No of Chars'), total number of references to characters ('No of Refs'); total number of characters pronominalized ('No of Chars Pro'); and the total number of each continuity function judgment ('No of Cont Func': **introduce** ('Intro'), **maintain** ('Mntn'), **reestablish** ('Reest')).

Table A.1: Sneetch: Summary of narrative features

Narr No	No of Scenes	No of Utts	No of Chars	No of Refs	No of Chars Pro	No of Cont Func		
						Intro	Mntn	Reest
1	2	6	3	7	2	3	3	1
2	1	5	4	8	2	3	3	2
3	2	6	4	6	1	4	2	0
4	2	7	3	13	3	3	8	2
5	1	2	2	4	1	2	2	0
6	5	12	6	14	2	6	6	2
7	1	6	3	9	2	3	4	2
8	3	9	4	12	2	3	9	0
9	2	10	4	14	3	4	6	4
10	3	4	3	6	1	3	2	1
11	2	5	6	8	1	5	3	0
12	3	7	4	12	3	4	5	3
13	2	5	3	5	1	3	2	0
14	4	6	5	12	1	5	5	2
15	2	5	4	5	1	4	1	0
16	2	5	3	9	3	3	5	1
17	1	3	2	6	0	2	4	0
18	1	3	3	5	2	3	2	0
19	3	6	4	7	4	4	1	2
20	2	8	3	9	1	3	3	3
21	1	4	3	5	0	3	1	1
22	2	5	3	7	1	3	2	2
23	1	2	3	4	1	3	1	0
24	1	3	2	5	1	2	3	0
total:	49	134	84	192	38	81	83	28

A.2.2 Types of utterances

Table A.2 below shows, for each of the twenty-four narratives in the Sneetch set: the total number of each type of utterance, 'simple' *vs.* 'complex'.

Table A.2: Sneetch: Types of utterances

	Utterance type:	
Narr	Simple	Complex
1	4	2
2	3	2
3	5	1
4	2	5
5	1	1
6	10	2
7	4	2
8	8	1
9	7	3
10	2	2
11	4	1
12	4	3
13	4	1
14	1	5
15	5	0
16	1	4
17	0	3
18	1	2
19	4	2
20	6	2
21	4	0
22	3	2
23	1	1
24	2	1
total:	86	48

A.2.3 Character references

Table A.3 below shows, for each of the twenty-four narratives in the Sneetch set: the total number of character references ('Total Refs'):

- for which the continuity function judgment was: 'Introduce', 'Maintain', or 'Reestablish' and:
- which were *not pronominalized* or *pronominalized*, *i.e.* , having the form np ('np') or pro *or* zero ('pro/ø'); and:
- which were produced on a scene boundary ('bound') *vs.* within a scene body ('body').[1]

Table A.3: Sneetch: Character references: continuity function, form, location

Narr	Total	Introduce				Maintain				Reestablish			
		np		pro/ø		np		pro/ø		np		pro/ø	
No	Refs	bound	body	bound	body	bound	body	bound	body	bound	body	bound	body
1	7	2	1	0	0	0	0	1	2	0	1	0	0
2	8	1	2	0	0	0	1	0	2	0	2	0	0
3	6	2	2	0	0	0	0	0	2	0	0	0	0
4	13	2	1	0	0	0	2	1	5	0	1	0	1
5	4	1	1	0	0	1	0	0	1	0	0	0	0
6	14	2	3	1	0	0	1	4	1	0	0	0	2
7	9	1	2	0	0	0	1	0	3	0	2	0	0
8	12	3	0	0	0	0	0	2	7	0	0	0	0
9	14	2	2	0	0	0	0	0	6	0	1	0	3
10	6	3	0	0	0	0	1	1	0	1	0	0	0
11	8	2	3	0	0	1	0	1	1	0	0	0	0
12	12	4	0	0	0	0	0	2	3	0	1	1	1
13	5	2	1	0	0	0	1	0	1	0	0	0	0
14	12	3	2	0	0	2	0	1	2	2	0	0	0
15	5	2	2	0	0	0	0	0	1	0	0	0	0
16	9	2	1	0	0	0	0	2	3	0	0	0	1
17	6	2	0	0	0	0	4	0	0	0	0	0	0
18	5	1	2	0	0	0	0	1	1	0	0	0	0
19	7	2	1	1	0	0	0	0	1	0	0	0	2
20	9	2	1	0	0	0	2	0	1	0	3	0	0
21	5	1	2	0	0	0	1	0	0	0	1	0	0
22	7	1	2	0	0	1	0	0	1	1	1	0	0
23	4	2	1	0	0	0	0	0	1	0	0	0	0
24	5	1	1	0	0	0	1	0	2	0	0	0	0
total:	192	46	33	2	0	5	15	16	47	4	13	1	10

[1] A scene boundary judgment was made for a character reference if the reference occurred in the first utterance in a scene; however, if a pro or ø repeated reference to a character referred to in the first utterance of a scene, it was counted as occurring within a scene body.

A.2.4 Role convergences

Table A.4 below presents a 'role convergence summary', showing, for each of the twenty-four narratives in the Sneetch set: the total number of character references ('Tot Refs'):

- for which was judged a role convergence of syntactic role Subject (S) and pragmatic role Topic (T) ('S/.../To') *vs.* syntactic role Object (O) and pragmatic role Comment (Co) ('O/.../Co') and:
  - all semantic roles which converged with 'S/.../To' and 'O/.../Co'.

Table A.4: Sneetch: Role convergence summary

Narr No	Tot Refs	-Role Convergence- S/.../To						O/.../Co					
		A	Ex	Th	P	B	R	P	Pe	As	Sr	R	B
1	7	3	2	0	0	2	0	0	0	0	0	0	0
2	8	0	2	4	0	2	0	0	0	0	0	0	0
3	6	3	0	1	0	2	0	0	0	0	0	0	0
4	13	4	4	3	0	0	0	1	0	0	0	0	1
5	4	0	2	1	0	0	0	0	1	0	0	0	0
6	14	5	1	3	0	4	0	0	1	0	0	0	0
7	9	1	1	3	0	2	0	1	0	1	0	0	0
8	12	4	0	4	1	1	0	2	0	0	0	0	0
9	14	6	0	1	1	3	0	1	0	0	0	1	1
10	6	2	1	2	0	0	0	0	0	0	1	0	0
11	8	1	0	1	0	5	0	1	0	0	0	0	0
12	12	2	3	4	0	3	0	0	0	0	0	0	0
13	5	1	2	0	0	1	0	0	0	0	1	0	0
14	12	3	2	3	1	0	0	1	0	0	1	1	0
15	5	2	0	1	0	2	0	0	0	0	0	0	0
16	9	4	2	1	0	0	0	2	0	0	0	0	0
17	6	0	2	2	0	0	0	0	2	0	0	0	0
18	5	0	2	2	0	1	0	0	0	0	0	0	0
19	7	2	2	2	0	1	0	0	0	0	0	0	0
20	9	1	1	1	0	5	0	1	0	0	0	0	0
21	5	1	0	1	0	2	0	0	0	0	0	1	0
22	7	1	1	2	1	2	0	0	0	0	0	0	0
23	4	0	1	2	0	1	0	0	0	0	0	0	0
24	5	1	1	1	0	0	1	1	0	0	0	0	0
total:	192	47	32	45	4	39	1	11	4	1	3	3	2

A.2.5 Scenes

Table A.5 below contains the following information about each scene in all narratives of the Sneetch set ('Narr', 'Scene') as follows: 'Chars': number of characters referred to; 'Chars Pro': number of characters pronominalized (referred to with the form pro or ø); 'Pron Strategies': pronominalization strategies implemented at least once. (The notation '' in the last column, indicates that there were no pronominalization strategies implemented, and is used when there were no pronominalized character references in the scene.)

Table A.5: Sneetch: Scene information

Narr	Scene	Chars	Chars Pro	Pron Strategies
1	A	2	1	{main/PC+/R+}
1	B	2	2	{main/PC+/R+}
2	A	4	2	{main/PC+/R+}
3	A	3	0	{}
3	B	1	1	{main/PC+/R+}
4	A	1	1	{main/PC+/R+}
4	B	3	3	{main/PC+/R+;main/PC+/R-;main/PC-/R-;re/PC-/R-}
5	A	2	1	{main/PC+/R+}
6	A	3	0	{}
6	B	2	1	{main/PC+/R+;re/PC-/R-}
6	C	1	1	{main/PC+/R+}
6	D	1	1	{main/PC+/R+}
6	E	3	2	{main/PC+/R+;intro/chANT-;re/PC+/R-}
7	A	3	2	{main/PC+/R+;main/PC-/R-}
8	A	3	1	{main/PC+/R+}
8	B	2	2	{main/PC+/R+;main/PC+/R-;main/PC-/R+;main/PC-/R-}
8	C	1	1	{main/PC+/R+}
9	A	3	2	{main/PC+/R+;main/PC+/R-;re/PC+/R-}
9	B	2	2	{main/PC+/R+;main/PC+/R-;main/PC-/R-;re/PC-/R-}
10	A	2	0	{}
10	B	1	1	{main/PC+/R+}
10	C	1	0	{}
11	A	4	1	{main/PC-/R-}
11	B	3	1	{main/PC-/R+}
12	A	3	0	{}
12	B	1	1	{main/PC+/R+}
12	C	2	2	{main/PC+/R+;re/PC+/R-}
13	A	2	0	{}
13	B	1	1	{main/PC+/R+}
14	A	3	1	{main/PC+/R+}
14	B	2	1	{main/PC+/R+}
14	C	2	0	{}
14	D	2	0	{}
15	A	3	0	{}
15	B	1	1	{main/PC+/R+}
16	A	2	1	{main/PC+/R+}
16	B	2	2	{main/PC+/R+;re/PC+/R-}
17	A	2	0	{}
18	A	3	2	{main/PC+/R+}
19	A	1	0	{}
19	B	2	2	{re/PC+/R-}
19	C	2	2	{main/PC+/R+;intro/chANT-}
20	A	2	1	{main/PC+/R+}
20	B	1	0	{}
21	A	3	0	{}
22	A	3	1	{main/PC+/R+}
22	B	2	0	{}
23	A	3	1	{main/PC+/R+}
24	A	2	1	{main/PC+/R-}

A.2.6 Pronominalization strategies

Table A.6 below shows the number and percentage of pronominalized character references ('No Pro CharRefs') which implemented each pronominalization strategy in the Sneetch narrative set.

Table A.6: Sneetch: Pronominalization strategy summary

Pron Strategy	No Pro CharRefs (%)
intro/chANT-	2 (3)
main/PC+/R+	50 (66)
main/PC+/R-	6 (8)
main/PC-/R+	21 (5)
main/PC-/R-	5 (7)
re/PC+/R+	0 (0)
re/PC+/R-	8 (11)
re/PC-/R+	0 (0)
re/PC-/R-	3 (4)
total:	76(100)

A.2.7 Pronominalization chains

Table A.7 below shows the number and percentage of each type of pronominalization chain produced in the Sneetch set. Chains are grouped according to whether only one strategy was implemented (SINGLE-STRATEGY) or more than one strategy was implemented (MULTI-STRATEGY). MULTI-STRATEGY chains are further grouped according to the number of strategies implemented, and are listed according to the strategies which were implemented at least once in each chain.

Table A.7: Sneetch: Pronominalization chain summary

Pronominalization chain	No chains (%)
SINGLE-STRATEGY	
intro/chANT-	2 (5)
main/PC+/R+	26 (60)
main/PC+/R-	2 (5)
main/PC-/R+	0 (0)
main/PC-/R-	2 (5)
re/PC+/R+	0 (0)
re/PC+/R-	4 (9)
re/PC-/R+	0 (0)
re/PC-/R-	0 (0)
subtotal (single):	36 (84)
MULTI-STRATEGY	
2-strategy	
main/PC+/R+;main/PC+/R-	1 (2)
main/PC-/R-;main/PC-/R+	1 (2)
3-strategy	
main/PC-/R-;main/PC+/R-;re/PC-/R-	1 (2)
re/PC-/R-;main/PC+/R+;re/PC+/R-	1 (2)
re/PC+/R-;main/PC+/R-;main/PC+/R+	1 (2)
4-strategy	
main/PC+/R+;main/PC-/R-;main/PC+/R-;main/PC-/R+	1 (2)
re/PC+/R-;re/PC-/R-;main/PC+/R-;main/PC+/R+	1 (2)
subtotal (multi):	7 (16)
total:	43(100)

A.3 Sneetch: chain diagrams

This section contains diagrams depicting each pronominalization chain produced in the Sneetch narrative set. The heading for each diagram shows:

1. 'Narrative': The narrative in which the chain was produced.
2. 'Character': The character which each reference in the chain means and has been explicitly referred to in the text (the *chANT*).
3. 'Strategies': If the chain is a single-strategy chain, the strategy which was implemented; if the chain is a multi-strategy chain, a list of all strategies implemented at least once (*i.e.* , a list of all types of subchains).

The first two columns of the body of the diagram show the following notations, summarized in Table A.1 below:

1. 'ref' column: This column numbers all of the references encompassed by the chain, including intermediary character references with the following additional notations where appropriate:
   - Intermediary character references are marked with a '†' in the 'Ref' column. If more than one character was referred to as an intermediary character reference, then reference to the second character is marked with '††', the third '†††', *etc.*
   - References which occur in the first utterance encompassed by the chain (before the first reference in the chain), or which occur in the last utterance encompassed by the chain, (after the last reference in the chain) are marked with the symol '‡'.
   - When a compound entity consisting of two or more **nps** implicitly or explicitly conjoined is pronominalized, with the plural **pro** 'they' or 'them', the notation '+' is indicated in the 'Ref' column.
   - '-c' indicates that a clause does not contain reference to a character;
   - 'g' indicates that the the writer has explicitly changed the gender of a character between clauses or utterances.
2. 'scn-no' column: This column indicates the Scene and utterance number of the reference.

The rest of the body of the diagram shows whether the reference was produced in clause initial position or clause non-initial position ('cip' *vs.* 'cnip'), and, the form, number and gender of the reference ('form', 'num', 'gen') is indicated by a box around the appropriate notation (under the heading 'cip' or 'cnip'). The form is either **np**, **pro**, or ø; the number is either 's' (singular) or 'pl' (plural), and the gender is either 'm' (male), 'f' (female), or 'u' (unspecified). A scene boundary is indicated by a double underscore between references.

The following table summarizes which summarizes the notations used in this section:

Figure A.1: Notations used in chain diagrams

†	intermediary character reference
‡	reference occurs before or after last in chain in same utterance
+	compound entity explicitly or implicitly conjoined
c	no character reference occurs in the utterance
g	the gender of the character is changed
A double underscore between references indicates a scene boundary.	
The form, number and gender of each reference has been boxed.	

Sneetch Chain 1

Narrative: S1 **Character:** Sneetches without stars$_i$ **Strategies:** main/PC+/R+

		cip										cnip							
		form			*num*		*gen*			*form*			*num*		*gen*				
ref	*scn-no*																		
1	A1	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		
2	A1	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		

Sneetch Chain 2

Narrative: S1 **Character:** Sylvester$_{iii}$ **Strategies:** main/PC+/R+

		cip										cnip							
		form			*num*		*gen*			*form*			*num*		*gen*				
ref	*scn-no*																		
1	B3	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u		
2	B4	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u		

Sneetch Chain 3

Narrative: S2 **Character:** the wons with the stars$_i$ **Strategies:** main/PC+/R+

		cip										cnip							
		form			*num*		*gen*			*form*			*num*		*gen*				
ref	*scn-no*																		
1	A4	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		
2	A4	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		

Sneetch Chain 4

Narrative: S2 **Character:** the wons with the stars$_{ii}$
the wons with the stars stars$_{ii}$ **Strategies:** main/PC+/R+

			cip										cnip							
			form			*num*		*gen*			*form*			*num*		*gen*				
	ref	*scn-no*																		
	1	A5	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		
+	2	A5	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		
	3	A5	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		

Sneetch Chain 5

Narrative: S3 **Character:** a man$_{iv}$ **Strategies:** main/PC+/R+

		cip										cnip							
		form			*num*		*gen*			*form*			*num*		*gen*				
ref	*scn-no*																		
1	B4	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u		
2	B5	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u		
3	B6	np	pro	[ø]	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u		

Sneetch Chain 6

Narrative: S4 **Character:** the Sneetch with the stars$_i$ **Strategies:** main/PC+/R+

		cip										cnip							
		form			*num*		*gen*			*form*			*num*		*gen*				
ref	*scn-no*																		
1	A1	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		
2	A1	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		

Sneetch Chain 7

Narrative: S4 **Character:** Sylvester the conman$_{ii}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	B2	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	B3	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	3	B3	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
‡	4	B3	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	5	B3	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	s	**pl**	m	f	**u**

Sneetch Chain 8

Narrative: S4 **Character:** The Sneetches$_{iii}$ **Strategies:** main/PC-/R-;main/PC+/R-;re/PC-/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	B3	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	2	B3	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	3	B3	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	s	**pl**	m	f	**u**
†	4	B4	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	5	B4	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	s	**pl**	m	f	**u**
†	6	B5	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	7	B6	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	s	**pl**	m	f	**u**

Sneetch Chain 9

Narrative: S4 **Character:** Sylvester$_{ii}$ **Strategies:** main/PC+/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	B4	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	B4	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	s	**pl**	m	f	**u**
	3	B5	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Sneetch Chain 10

Narrative: S4 **Character:** the other Sneetches$_{i}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	B7	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	2	B7	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u

Sneetch Chain 11

Narrative: S5 **Character:** the ones that had stars$_{i}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	A2	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	2	A2	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u

Sneetch Chain 12

Narrative: S6 **Character:** Sneetches$_i$ **Strategies:** re/PC-/R-;main/PC+/R+;re/PC+/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	A1	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
†	2	A2	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
†	3	A3	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
††	4	A3	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	s	[pl]	m	f	[u]
†††	5	B4	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	6	B5	np	pro	[ø]	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
	7	C6	np	pro	[ø]	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
	8	D7	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
	9	D8	np	pro	[ø]	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
	10	E9	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
††††	11	E9	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	s	[pl]	m	f	[u]
†††††	12	E10	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
	13	E11	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
	14	E12	np	pro	[ø]	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u

Sneetch Chain 13

Narrative: S6 **Character:** they$_v$ **Strategies:** intro/chANT-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	E9	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u

Sneetch Chain 14

Narrative: S7 **Character:** Sneetches$_i$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	A1	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
	2	A2	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u

Sneetch Chain 15

Narrative: S7 **Character:** the ones that had stars$_{ii}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	A5	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
	2	A5	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u

Sneetch Chain 16

Narrative: S7 **Character:** the ones that had stars$_{ii}$ **Strategies:** main/PC-/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	A6	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
†	2	A6	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	s	[pl]	m	f	[u]
	3	A6	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	s	[pl]	m	f	[u]

Sneetch Chain 17

Narrative: S8 **Character:** Sneetches with stars on there belly$_i$+ Some without stars on there belly$_{ii}$
Strategies: main/PC+/R+;main/PC-/R-;main/PC+/R-;main/PC-/R+

			cip									cnip						
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	A1	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
+	2	A1	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	3	A2	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	4	B3	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	5	B3	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	s	**pl**	m	f	**u**
†	6	B4	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	7	B4	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	s	**pl**	m	f	**u**
	8	B5	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	9	B6	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	10	B7	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	11	C8	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	12	C9	np	pro	**ø**	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u

Sneetch Chain 18

Narrative: S8 **Character:** a man$_{iii}$ **Strategies:** main/PC+/R-

			cip									cnip						
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	B3	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	B3	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	s	**pl**	m	f	**u**
	3	B4	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	4	B4	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	s	**pl**	m	f	**u**

Sneetch Chain 19

Narrative: S9 **Character:** the Sneetches$_i$ re/PC+/R-;main/PC+/R-;main/PC+/R+

			cip									cnip						
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	A1	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	2	A2	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
††	3	A3	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	4	A4	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
††	5	A4	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	f	**u**
	6	A5	np	pro	**ø**	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	7	A6	np	pro	**ø**	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
‡	8	A6	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	s	**pl**	m	f	**u**

Sneetch Chain 20

Narrative: S9 **Character:** the Sneetches tha have no stars on thar belly$_{ii}$
Strategies: re/PC+/R-;re/PC-/R-;main/PC+/R-;main/PC+/R+

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
‡	1	A4	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	2	A4	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	f	**u**
†	3	A5	np	pro	**ø**	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	4	A6	np	pro	**ø**	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	5	A6	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	s	**pl**	m	f	**u**
††	6	B7	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	7	B8	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
††	8	B8	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
	9	B9	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	10	B10	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	11	B10	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u

Sneetch Chain 21

Narrative: S9 **Character:** Sylvester$_{iv}$ **Strategies:** main/PC-/R-

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
	1	B7	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	B8	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	3	B8	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u

Sneetch Chain 22

Narrative: S10 **Character:** the wuns with the stars$_{i}$ **Strategies:** main/PC+/R+

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
	1	B2	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	2	B2	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u

Sneetch Chain 23

Narrative: S11 **Character:** some Sneetches$_{i}$+ others$_{ii}$ **Strategies:** main/PC-/R-;main/PC-/R+

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
‡	1	A1	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	2	A1	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
+	3	A1	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	4	A2	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	5	A2	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	s	**pl**	m	f	**u**
	6	B3	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u

Sneetch Chain 24

Narrative: S12 **Character:** Sneetches$_i$ **Strategies:** re/PC+/R-

			cip								cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	A1	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	2	A1	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
††	3	A1	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
†††	4	B2	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	5	B2	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	6	B2	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	7	B3	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	8	B4	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	9	C5	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	10	C6	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	11	C6	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	12	C7	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u

Sneetch Chain 25

Narrative: S12 **Character:** Sylvester$_{iv}$ **Strategies:** main/PC+/R+

			cip								cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	B2	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	B2	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	3	B2	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	4	B3	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	5	B4	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Sneetch Chain 26

Narrative: S12 **Character:** the ones with stars$_{ii}$ **Strategies:** main/PC+/R+

			cip								cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	C6	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	2	C7	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u

Sneetch Chain 27

Narrative: S13 **Character:** Mr Sylvester$_{iii}$ **Strategies:** main/PC+/R+

			cip								cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	B3	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	B3	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Sneetch Chain 28

Narrative: S14 **Character:** the Sneetches with star on there belly$_{ii}$ **Strategies:** main/PC+/R+

			cip								cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	A2	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	2	A2	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	3	A3	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
‡	4	A3	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	f	**u**

Sneetch Chain 29

Narrative: S14 **Character:** the Sneetches with stars$_{ii}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	B4	**np**	pro	ø	s	**pl**	m	f	**u**		np	pro	ø	s	pl	m	f	u
	2	B4	np	**pro**	ø	s	**pl**	m	f	**u**		np	pro	ø	s	pl	m	f	u
‡	3	B4	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	s	**pl**	m	f	**u**

Sneetch Chain 30

Narrative: S15 **Character:** a man called Sylvester$_{iv}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	B4	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	2	B5	np	pro	**ø**	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u

Sneetch Chain 31

Narrative: S16 **Character:** the Sneetches with Stars$_{i}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	A1	**np**	pro	ø	s	**pl**	m	f	**u**		np	pro	ø	s	pl	m	f	u
	2	A1	np	**pro**	ø	s	**pl**	m	f	**u**		np	pro	ø	s	pl	m	f	u
	3	A2	np	**pro**	ø	s	**pl**	m	f	**u**		np	pro	ø	s	pl	m	f	u
‡	4	A2	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	s	**pl**	m	f	**u**

Sneetch Chain 32

Narrative: S16 **Character:** the ones without stars$_{ii}$ **Strategies:** re/PC+/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
‡	1	A2	np	**pro**	ø	s	**pl**	m	f	**u**		np	pro	ø	s	pl	m	f	u
	2	A2	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	s	**pl**	m	f	**u**
†	3	B3	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
†	4	B3	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
†	5	B4	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
†	6	B5	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	7	B6	np	pro	ø	s	pl	m	f	u		np	**pro**	ø	s	**pl**	m	f	**u**

Sneetch Chain 33

Narrative: S16 **Character:** a man called Sylvester$_{iii}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	B3	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	2	B3	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	3	B4	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	4	B5	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
‡	5	B5	np	pro	ø	s	pl	m	f	u		np	**pro**	ø	s	**pl**	m	f	**u**

Sneetch Chain 34

Narrative: S18 **Character:** the ones with Stars$_i$ **Strategies:** main/PC+/R+

		cip										cnip							
ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*				
1	A1	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		
2	A1	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		

Sneetch Chain 35

Narrative: S18 **Character:** the ones$_{ii}$ **Strategies:** main/PC+/R+

		cip										cnip							
ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*				
1	A2	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		
2	A2	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		

Sneetch Chain 36

Narrative: S19 **Character:** the other Sneetches$_i$ **Strategies:** re/PC+/R-

			cip										cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*				
	1	A1	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		
†	2	B2	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u		
	3	B3	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		

Sneetch Chain 37

Narrative: S19 **Character:** Sylvester$_{ii}$ **Strategies:** re/PC+/R-

			cip										cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*				
	1	B2	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u		
†	2	B3	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		
	3	B4	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u		

Sneetch Chain 38

Narrative: S19 **Character:** they$_{iii}$ **Strategies:** intro/chANT-

		cip										cnip							
ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*				
1	C5	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		

Sneetch Chain 39

Narrative: S19 **Character:** the wons with Stars$_{iii}$ **Strategies:** main/PC+/R+

		cip										cnip							
ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*				
1	C6	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		
2	C6	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u		

Sneetch Chain 40

Narrative: S20 **Character:** some$_{ii}$ **Strategies:** main/PC+/R+

		cip									cnip							
		form			*num*		*gen*				*form*			*num*		*gen*		
ref	*scn-no*																	
1	A3	**np**	pro	ø	s	**pl**	m	f	**u**		np	pro	ø	s	pl	m	f	u
2	A3	np	**pro**	ø	s	**pl**	m	f	**u**		np	pro	ø	s	pl	m	f	u

Sneetch Chain 41

Narrative: S22 **Character:** the star tummied sneetches$_{ii}$ **Strategies:** main/PC+/R+

		cip									cnip							
		form			*num*		*gen*				*form*			*num*		*gen*		
ref	*scn-no*																	
1	A4	**np**	pro	ø	s	**pl**	m	f	**u**		np	pro	ø	s	pl	m	f	u
2	A4	np	**pro**	ø	s	**pl**	m	f	**u**		np	pro	ø	s	pl	m	f	u

Sneetch Chain 42

Narrative: S23 **Character:** the ones with stars$_{iii}$ **Strategies:** main/PC+/R+

		cip									cnip							
		form			*num*		*gen*				*form*			*num*		*gen*		
ref	*scn-no*																	
1	A2	**np**	pro	ø	s	**pl**	m	f	**u**		np	pro	ø	s	pl	m	f	u
2	A2	np	**pro**	ø	s	**pl**	m	f	**u**		np	pro	ø	s	pl	m	f	u

Sneetch Chain 43

Narrative: S24 **Character:** Sylvester$_{i}$ **Strategies:** main/PC+/R+;main/PC+/R-

			cip									cnip							
			form			*num*		*gen*				*form*			*num*		*gen*		
	ref	*scn-no*																	
	1	A1	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	2	A2	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
†	3	A2	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	s	**pl**	m	f	**u**
	4	A3	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
‡	5	A3	**np**	pro	ø	s	**pl**	m	f	**u**		np	pro	ø	s	pl	m	f	u

Appendix B

Ugly Duckling data

B.1 Duck narratives

A summary of coding for listed narratives is given on page 74 of the main thesis.

Duck Narrative 1

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**The Dad$_i$** was wacking up and Down	np	S	A[a]	To	introduce	*chANT*⟩
2	and **he$_i$** made a hol in the grownd.	pro	S	A	To	maintain	main/PC+/R+⟩
B 3	Then **the eggs$_{ii}$** hacht	np	S	P[b]	To	introduce	–
4	but **one ege$_{iii}$** did not hacht.	np	S	P	To	introduce	*chANT*⟩
5	Then **it$_{iii}$** hatcht	pro	S	P	To	maintain	main/PC+/R+⟩

[a] Interpreted as 'The Dad was intentionally walking 'up and down'', waiting for his babies to be born.

[b] Overlaps with 'Theme'.

Duck Narrative 2

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**The father duckllingi** was waitting	np	S	A	To	introduce	*chANT*⟩
	for **the babby ducklingsii**	np	O	G	Co	introduce	–
2	**hei** wated so long	pro	S	A	To	maintain	main/PC+/R-⟩
	hei made a hole in the ground	pro	S	A	To	maintain	main/PC+/R+⟩

Duck Narrative 3

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**The Daddy duck$_i$** was waiting	np	S	A	To	introduce	–
	for **the babys$_{ii}$**.	np	O	G	Co	introduce	–
2	Suddenlae! **the Dad$_i$** was happy	np	S	Ex	To	maintain	*chANT*⟩
	becaus **the babys$_{ii}$** were born.	np	S	P	To	maintain	–
3	**He$_i$** was so happy.	pro	S	Ex	To	maintain	main/PC+/R-⟩
4	Then there was a **white one$_{iii}$**.	np	S	Th	To	introduce	⟨*chANT*
5	**It$_{iii}$** was a swan.	pro	S	Th	To	maintain	⟨main/PC+/R+
6	**He$_i$** did not like	pro	S	Ex	To	reestablish	re/PC+/R-⟩
	it$_{iii}$.	pro	O	Pe	Co	maintain	⟨main/PC-/R-

Duck Narrative 4

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**The father$_i$** was watring for	np	S	A	To	introduce	–
	the egg$_{ii}$ to hatch.	np	O	G	Co	introduce	–
2	and **one duck$_{iii}$** was	np	S	P	To	introduce	–
	whit duck hatch						

Duck Narrative 5

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	I[a] like the bit						
	when **the father duck$_i$** was	np	S	A	To	introduce	$chANT\rangle$
	walking back and forwerd.						
2	And **he$_i$** made a hole in the ground.	pro	S	A	To	maintain	main/PC+/R+⟩
B 3	**The mother$_{ii}$** lade four eggs	np	S	A	To	introduce	–
4	And then **one big egg$_{iii}$** lade	np	S	P	To	introduce	$chANT\rangle$
5	and **it$_{iii}$** was a swan.	pro	S	Th	To	maintain	main/PC+/R+⟩

[a] 'I' is not analysed.

Duck Narrative 6

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**The ugle Duckling$_i$** was	np	S	Th	To	introduce	–
	not the hen egg.						
2	and **the Dad Duck$_{ii}$** did not like	np	S	Ex	To	introduce	$chANT\rangle$
	the Duck$_i$.	np	O	Pe	Co	maintain	–
3	**he$_{ii}$** did not like	pro	S	Ex	To	maintain	main/PC+/R-⟩
	the Duck$_i$.	np	O	Pe	Co	maintain	–

Duck Narrative 7

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	I[a] felt sorry for **the ugle Duckling$_i$**	np	O	Pe[b]	Co	introduce	$chANT\rangle$
	becoes **all the Ducks$_{ii}$** turnd	np	S	A	To	introduce	⟨$chANT$
	thar backs on **him$_i$**	pro	O	R	Co	maintain	main/PC+/R-⟩
	becose **they$_{ii}$** Gave	pro	S	A	To	maintain	⟨main/PC+/R-
	him$_i$ the coold sholdere.	pro	O	R	Co	maintain	main/PC+/R-⟩
B 2	**he$_i$** thot	pro	S	Ex	To	maintain	main/PC-/R+⟩
	the woodin Duck$_{iii}$	np	S	Ex	To	introduce	⟨$chANT$
3	then **he$_i$** thot that	pro	S	Ex	To	maintain	main/PC+/R-⟩
4	**he$_i$** started to thingk	pro	S	Ex	To	maintain	main/PC+/R+⟩
	that **it$_{iii}$** hated	pro	S	Ex	To	reestablish	⟨re/PC+/R-
	him$_i$ too.	pro	O	Pe	Co	maintain	main/PC-/R-⟩

[a] 'I' is not analysed.

[b] Overlaps with 'Source' if interpretation of this utterance is 'The source of my sorrow was the Ugly Duckling.'

Duck Narrative 8

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**The Daddy duck**$_i$ was waiting	np	S	A	To	introduce	–
	for **the baby's**$_{ii}$.	np	O	G	Co	introduce	–
2	There was **a white duck!**$_{iii}$	np	S	Th	To	introduce	–
B 3	**They**$_{iv}$[a] went to the pond.	pro	S	A	To	introduce	intro/chANT-⟩

[a] It is unclear which characters **They**$_{iv}$ means.

Duck Narrative 9

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	At the beginning **the daddy duckling**$_i$	np	S	A	To	introduce	–
	Was Watting for **the babby's**$_{ii}$.	np	O	G	Co	introduce	–
B 2	Then **the eggs**$_{iii}$ hatchde	np	S	P	To	introduce	–
3	and **some little ducklings**$_{iv}$ came out.	np	S	P[a]	To	introduce	–
4	Then **an other egg**$_v$ hatched.	np	S	P	To	introduce	–
5	**That**$_v$ had a different Vois.	np	S	B	To	maintain	*chANT*⟩
6	**Nobidee**$_{vi}$ lickde	np	S	Ex	To	introduce	–
	him$_v$.	pro	O	Pe	Co	maintain	main/PC-/R-⟩
C 7	So **the uglee duckling**$_v$ went away.	np	S	A	To	maintain	–

[a] Overlaps with 'Theme'.

Duck Narrative 10

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**The dad**$_i$ was walking up and down	np	S	A	To	introduce	*chANT*⟩
	tile **he**$_i$ had made a big big big hole	pro	S	A	To	maintain	main/PC+/R+⟩
	in the grownd.						
B 2	Then **the mum**$_{ii}$ noo	np	S	Ex	To	introduce	*chANT*⟩
	she$_{ii}$ was Expecting	pro	S	Sr[a]	To	maintain	main/PC+/R+⟩
	ducklings$_{iii}$.	np	O	G	Co	introduce	–
C 3	**He**$_{iv}$ was swimming	pro	S	A	To	introduce	intro/chANT-⟩
4	then **He**$_{iv}$ saw	pro	S	Ex	To	maintain	main/PC+/R+⟩
	sumthing strange$_v$.	np	O	Pe	Co	introduce	⟨*chANT*
5	**It**$_v$ was a big big big duck	pro	S	Th	To	maintain	⟨main/PC-/R+
6	**He**$_{iv}$ thote	pro	S	Ex	To	reestablish	re/PC+/R-⟩
	it$_v$ was his mum	pro	S	Th	To	maintain	⟨main/PC+/R-
7	and **he**$_{iv}$ got hit on the head	pro	S	P	To	maintain	main/PC+/R-⟩
8	and they[b] had a sirckil around his head						

[a] Overlaps with 'Theme'

[b] 'they' is not analysed.

Duck Narrative 11

Scene	No	Utterance	form	syn	sem	prag	cont	strat
A	1	**The dadde duck$_i$** was wettin for	np	S	A	To	introduce	*chANT*⟩
		the mumma baby$_{ii}$ to cum	np	O	G	Co	introduce	–
	2	but **mumma duck baby$_{ii}$** did not cum	np	S	Th	To	maintain	–
	3	so **he$_i$** watid.	pro	S	A	To	reestablish	re/PC+/R-⟩
B	4	then **mumma baby$_{ii}$** came	np	S	P	To	reestablish	–
	5	so **dadde$_i$** was happy.	np	S	Ex	To	reestablish	–
	6	Then **the ugle ducklin$_{iii}$** cract from the egg	np	S	P^a	To	introduce	–
	7	and **dadde duck$_i$** was not happy.	np	S	Ex	To	reestablish	*chANT*⟩
	8	So **he$_i$** was kros	pro	S	Ex	To	maintain	main/PC+/R+⟩
		with **is mumma duck$_{iv}$**.	np	O	Pe^b	Co	introduce	–
	9	so then **mumma$_{iv}$** hut	np	S	A	To	maintain	–
		dade$_i$ on the hed	np	O	P	Co	maintain	*chANT*⟩
	10	**he$_i$** saw stars.	pro	S	Ex	To	maintain	main/PC-/R+⟩
C	11	**mumma duck$_{iv}$** wet away	np	S	A	To	reestablish	–
		with **the baby$_{ii}$**	np	O	As	Co	reestablish	–
	12	**the ugle duckling$_{iii}$** fold	np	S	A	To	reestablish	–
		the mumme duck$_{iv}$	np	O	G	Co	maintain	–

^{a}Overlaps with 'Theme'

^{b}Overlaps with 'Recipient'.

Duck Narrative 12

Scene	No	Utterance	form	syn	sem	prag	cont	strat
A	1	Once there was a **duck$_i$**	np	S	Th	To	introduce	–
		who was sitting on **her eggs$_{ii}$**.	np	O	Lo	Co	introduce	*chANT*⟩
	2	**They$_{ii}$** started to crack.	pro	S	P^a	To	maintain	main/PC-/R+⟩
	3	and out came **five little ducklings$_{iii}$**	np	S	P^b	To	introduce	*chANT*⟩
	4	and **they$_{iii}$** were all yellow	pro	S	B	To	maintain	main/PC+/R+⟩
	5	and then **mother duck$_i$** noticed	np	S	Ex	To	reestablish	–
		another egg$_{iv}$	np	O	Pe	Co	introduce	–
	6	and **that$_{iv}$** began to hatch	np	S	P	To	maintain	*chANT*⟩
	7	and **he$_{iv}$** was white.	pro	S	B	To	maintain	main/PC+/R+⟩
	8	What a surprise **mother duck$_i$** got	np	S	P	To	reestablish	–
	9	and **father duck$_v$** started to shout	np	S	A	To	introduce	*chANT*⟩
		at **mother duck$_i$**.	np	O	R	Co	maintain	*chANT*⟩
	10	then **they$_{i+v}$** started to argu	pro	S	A	To	maintain	main/PC-/R+⟩^{c}
		with **each other$_{i+v}$**.	np	O	R	Co	maintain	–

^{a}Overlaps with 'Theme'.

^{b}Overlaps with 'Theme'.

^{c}By definition this reference could not be judged to implement PC+ because only **the father duck$_v$** occurred in initial position in the previous utterance. However, R+ is judged because the two characters which **they$_i$+$_v$** means are the most recently mentioned characters in the narrative.

Duck Narrative 13

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	Once upon a time there was a **Mummy duck sitting on her nest**$_i$.	np	S	Th	To	introduce	*chANT*⟩
2	**She**$_i$ was waiting for	pro	S	A	To	maintain	main/PC+/R+⟩
	her eggs$_{ii}$ to hatch.	np	O	G	Co	introduce	⟨*chANT*
B 3	Then **they**$_{ii}$ hatched	pro	S	P	To	maintain	⟨main/PC-/R+
4	well **four of them**$_{iii}$[a] hatched.	np	S	P	To	introduce	–
5	Out of **the last egg**$_{iv}$ came	np	O	Sr	Co	introduce	–
	a white duckling$_v$.	np	S	P	To	introduce	–
6	**Mummy duck**$_i$ was furious	np	S	Ex	To	reestablish	*chANT*⟩
7	and **she**$_i$ sent	pro	S	A	To	maintain	main/PC+/R+⟩
	the white ducling$_v$ away.	np	O	P	Co	reestablish	–

[a] Analysed as an 'np'.

Duck Narrative 14

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	Once apon a time there lived an **uglea duckling**$_i$.	np	S	Th	To	introduce	*chANT*⟩
2	**He**$_i$ had	pro	S	B	To	maintain	main/PC+/R+⟩
	no freids$_{ii}$	np	O	Pe	Co	introduce	–
	Except for **his faimily**$_{iii}$.	np	O	As	Co	introduce	–
B 3	**He**$_i$ met	pro	S	Th	To	maintain	main/PC+/R-⟩
	a wooden duck$_{iv}$	np	O	Pe	Co	introduce	⟨*chANT*
4	and **he**$_i$ thout	pro	S	Ex	To	maintain	main/PC+/R-⟩
	it$_{iv}$ was his mother duck	pro	S	Th	To	maintain	⟨main/PC-/R-
5	**It**$_{iv}$ rocked	pro	S	Th	To	maintain	⟨main/PC+/R+
6	and **ø**$_{iv}$ hut	zero	S	In[a]	To	maintain	⟨main/PC+/R+
	him$_i$ on the head	pro	O	P	Co	maintain	main/PC-/R-⟩

[a] Although analyzed as a character, the wooden duck is an inanimate object, hence the judgment of 'Instrument'.

Duck Narrative 15

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	Ones a pone a time There wos a **ugly duckling**$_i$	np	S	Th	To	introduce	*chANT*⟩
2	and **all his Brufes**$_{ii}$ laft	np	S	A	To	introduce	–
	at **him**$_i$	pro	O	R	Co	maintain	main/PC-/R-⟩
B 3	**the uglea duckling**$_i$ ran away	np	S	A	To	maintain	–
	from **his famlea**$_{iii}$	np	O	Sr	Co	introduce	–
4	and **the ugly duckling**$_i$ started to ciud	np	S	Th	To	maintain	*chANT*⟩
	until **he**$_i$ sor	pro	S	Ex	To	maintain	main/PC+/R+⟩
	a woodn duck$_{iv}$	np	O	Pe	Co	introduce	–
5	**he**$_i$ went up	pro	S	A	To	maintain	main/PC+/R-⟩
	to **the woodn duck**$_{iv}$	np	O	G	Co	maintain	–

Duck Narrative 16

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	This story is called the ugly duckling[a].						
2	Once there was **four eggs**$_i$	np	S	Th	To	introduce	–
3	and **one**$_{ii}$ was a big egg	np	S	B[b]	To	introduce	–
B 4	**the dad**$_{ii}$ was walking	np	S	A	To	introduce	*chANT*⟩
5	and **he**$_{ii}$ made a big hole in the ground.	pro	S	A	To	maintain	main/PC+/R+⟩
C 6	**The last egg**$_{iii}$ hached.	np	S	P	To	introduce	–
D 7	**mumy duck**$_{ii}$	np	S	A	To	introduce	–
	and **dady duck**$_i$ started to fite	np	S	A	To	reestablish	–

[a] Not counted as a character reference.

[b] Physical description, therefore not judged to be 'Theme'.

Duck Narrative 17

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	Once apon a time there was **a ugly Swon**$_i$ who came from	np	S	Th	To	introduce	–
	a mother duck$_{ii}$.[a]	np	O	Sr	Co	introduce	–
2	and because **the swon**$_i$	np	S	B	To	maintain	⟨*chANT*
	was not the same as **them**$_{iii}$[b]	pro	S	A	To	maintain	intro/chANT-⟩
	so **they**$_{iii}$ would not let	pro	S	A	To	maintain	main/PC+/R+⟩
	him$_i$ stay.	pro	O	P	Co	maintain	⟨main/PC-/R-
B 3	so **he**$_i$ went away feeling sad	pro	S	A	To	maintain	⟨main/PC-/R+
4	and then **he**$_i$ saw	pro	S	Ex	To	maintain	⟨main/PC+/R+
	this big duck$_{iv}$	np	O	Pe	Co	introduce	–
5	and **he**$_i$ was nockt out.	pro	S	P	To	maintain	⟨main/PC+/R-
C 6	Then **a mummy swon**$_v$ came along	np	S	A	To	introduce	*chANT*⟩
7	and $\emptyset_v$ took	zero	S	A	To	maintain	main/PC+/R+⟩
	him$_i$	pro	O	P	Co	reestablish	⟨re/PC-/R-
	with **her swons**$_{vi}$.	np	O	As	Co	introduce	–

[a] Although 'a mother duck' is analyzed as a separate character reference.

[b] It is unclear which characters 'them' refers to; 'them' is analyzed as a 'subject'.

Duck Narrative 18

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	Once apon a time there was **a dad**$_i$	np	S	Th	To	introduce	*chANT*⟩
2	**He**$_i$ was waiting	pro	S	A	To	maintain	main/PC+/R+⟩
	for **his babys**$_{ii}$ to be born.	np	O	G	Co	introduce	–
B 3	**The babys**$_{ii}$ came	np	S	P	To	maintain	–
4	and then came **an other egg**$_{iii}$ came	np	S	P	To	introduce	–
	witch$_{iii}$ was the uglye duck	np	S	Th	To	maintain	*chANT*⟩
5	But **they**$_{iv}$ new	pro	S	Ex	To	introduce	⟨intro/chANT-
	it$_{iii}$ was not one of them.[a]	pro	S	Th[b]	To	maintain	main/PC+/R-⟩
6	So **they**$_{iv}$ left	pro	S	A	To	maintain	⟨main/PC+/R-
	it$_{iii}$ alone.	pro	O	P	Co	maintain	main/PC-/R-⟩
C 7	but **he**$_{iii}$ thought	pro	S	Ex	To	maintain	main/PC-/R+⟩
	he$_{iii}$ found	pro	S	Th	To	maintain	main/PC+/R+⟩
	a frend$_v$	np	O	G	Co	introduce	⟨*chANT*
8	but **it**$_v$ was wooding.	pro	S	B	To	maintain	⟨main/PC-/R+
9	**He**$_{iii}$ sat on its tale	pro	S	A	To	reestablish	re/PC+/R-⟩
10	**He**$_{iii}$ jumpet on its beak	pro	S	A	To	maintain	main/PC+/R+⟩
11	and **ø**$_{iii}$ jumpet in the water.	zero	S	A	To	maintain	main/PC+/R+⟩
12	And **it**$_v$ hit	pro	S	In	To	reestablish	⟨re/PC+/R-
	him$_{iii}$ in the head	pro	O	P	Co	maintain	main/PC-/R-⟩
D 13	**He**$_{iii}$ walked on to a pees of wood	pro	S	A	To	maintain	main/PC-/R+⟩
14	and **ø**$_{iii}$ started to cry	zero	S	Th	To	maintain	main/PC+/R+⟩
15	and then **more swans**$_{vi}$ came	np	S	A	To	introduce	⟨*chANT*
16	and **ø**$_{vi}$ welcommed	zero	S	A	To	maintain	⟨main/PC+/R+
	him$_{iii}$	pro	O	P	Co	reestablish	re/PC-/R-⟩
	to **its family**$_{vii}$.	np	O	As	Co	introduce	–

[a] The pro 'them' is not analyzed.

[b] Overlaps with 'Beneficiary'

B.2 Duck analysis tables

This section contains a series of tables output from the analysis of Duck narratives listed in the previous section of this Appendix.

B.2.1 Narrative features

Table B.1 below shows, for each of the twenty-four narratives in the Duck set: total number of Scenes ('No of Scenes'); total number of utterances ('No of Utts'); total number of characters referred to ('No of Chars'), total number of references to characters ('No of Refs'); total number of characters pronominalized ('No of Chars Pro'); and the total number of each continuity function judgment ('No of Cont Func': **introduce** ('Intro'), **maintain** ('Mntn'), **reestablish** ('Reest')).

Table B.1: Duck: Summary of narrative features

Narr No	No of Scenes	No of Utts	No of Chars	No of Refs	No of Chars Pro	No of Cont Func		
						Intro	Mntn	Reest
1	2	5	3	5	2	3	2	0
2	1	2	2	4	1	2	2	0
3	1	6	3	9	2	3	5	1
4	1	2	3	3	0	3	0	0
5	2	5	3	5	2	3	2	0
6	1	3	2	5	1	2	3	0
7	2	4	3	11	3	3	7	1
8	2	3	4	4	1	4	0	0
9	3	7	6	9	1	6	3	0
10	3	8	5	12	4	5	6	1
11	3	12	4	17	1	4	6	7
12	1	10	6	14	4	5	7	2
13	2	7	5	10	2	5	3	2
14	2	6	4	11	2	4	7	0
15	2	5	4	10	1	4	6	0
16	4	7	3	7	1	5	1	1
17	3	7	6	14	3	6	7	1
18	4	16	7	25	5	7	15	3
total:	39	115	73	175	36	74	82	19

B.2.2 Types of utterances

Table B.2 below shows, for each of the twenty-four narratives in the Duck set: the total number of each type of utterance, 'simple' *vs.* 'complex'.

Table B.2: Duck: Types of utterances

	Utterance type:	
Narr	Simple	Complex
1	5	0
2	1	1
3	5	1
4	0	2
5	4	1
6	3	0
7	1	3
8	3	0
9	6	1
10	5	3
11	11	1
12	9	1
13	5	2
14	4	2
15	4	1
16	7	0
17	5	2
18	12	4
total:	90	25

B.2.3 Character references

Table B.3 below shows, for each of the twenty-four narratives in the Duck set: the total number of character references ('Total Refs'):

- continuity function judgment was: 'Introduce', 'Maintain', or 'Reestablish' and:
- which were *not pronominalized* or *pronominalized*, *i.e.* , having the form np ('np') or pro *or* zero ('pro/ø'); and:
- which were produced on a scene boundary ('bound') *vs.* within a scene body ('body').[1]

Table B.3: Duck: Character references: continuity function, form, location

Narr	Total	Introduce				Maintain				Reestablish			
		np		pro/ø		np		pro/ø		np		pro/ø	
No	Refs	bound	body	bound	body	bound	body	bound	body	bound	body	bound	body
1	5	2	1	0	0	0	0	0	2	0	0	0	0
2	4	2	0	0	0	0	0	0	2	0	0	0	0
3	9	2	1	0	0	0	2	0	3	0	0	0	1
4	3	2	1	0	0	0	0	0	0	0	0	0	0
5	5	2	1	0	0	0	0	0	2	0	0	0	0
6	5	1	1	0	0	0	2	0	1	0	0	0	0
7	11	3	0	0	0	0	0	4	3	0	0	0	1
8	4	2	1	1	0	0	0	0	0	0	0	0	0
9	9	3	3	0	0	1	1	0	1	0	0	0	0
10	12	3	1	1	0	0	0	2	4	0	0	0	1
11	17	2	2	0	0	0	4	0	2	3	3	0	1
12	14	2	3	0	0	0	3	0	4	0	2	0	0
13	10	1	4	0	0	0	0	1	2	0	2	0	0
14	11	2	2	0	0	0	0	1	6	0	0	0	0
15	10	2	2	0	0	1	2	0	3	0	0	0	0
16	7	3	2	0	0	0	0	0	1	1	0	0	0
17	14	3	2	0	1	0	1	1	5	0	0	0	1
18	25	2	4	0	1	1	1	3	10	0	0	0	3
total:	175	39	31	2	2	3	16	12	51	4	7	0	8

[1] A scene boundary judgment was made for a character reference if the reference occurred in the first utterance in a scene; however, if a pro or ø repeated reference to a character referred to in the first utterance of a scene, it was counted as occurring within a scene body.

B.2.4 Role convergences

Table B.4 below presents a 'role convergence summary', showing, for each of the twenty-four narratives in the Duck set: the total number of character references ('Tot Refs'):

- for which was jduged a role convergence of syntactic role Subject (S) and pragmatic role Topic (T) ('S/.../To') *vs.* syntactic role Object (O) and pragmatic role Comment (Co) ('O/.../Co') and:
  - all semantic role which converged with 'S/.../To' and 'O/.../Co'.

Table B.4: Duck: Role convergence summary

Narr	Tot	-Role Convergence-													
		S/.../To							O/.../Co						
No	Refs	A	Ex	Th	P	B	Sr	In	P	Pe	As	Sr	R	Lo	G
1	5	2	0	0	3	0	0	0	0	0	0	0	0	0	0
2	4	3	0	0	0	0	0	0	0	0	0	0	0	0	1
3	9	1	3	2	1	0	0	0	0	1	0	0	0	0	1
4	3	1	0	0	1	0	0	0	0	0	0	0	0	0	1
5	5	3	0	1	1	0	0	0	0	0	0	0	0	0	0
6	5	0	2	1	0	0	0	0	0	2	0	0	0	0	0
7	11	2	5	0	0	0	0	0	0	2	0	0	2	0	0
8	4	2	0	0	1	0	0	0	0	0	0	0	0	0	1
9	9	2	1	1	2	1	0	0	0	1	0	0	0	0	1
10	12	3	3	2	1	0	1	0	0	1	0	0	0	0	1
11	17	5	4	1	2	0	0	0	1	1	1	0	0	0	2
12	14	2	1	1	4	2	0	0	0	1	0	0	2	1	0
13	10	2	1	1	3	0	0	0	1	0	0	1	0	0	1
14	11	0	1	4	0	1	0	1	1	2	1	0	0	0	0
15	10	3	1	2	0	0	0	0	0	1	0	1	1	0	1
16	7	4	0	1	1	1	0	0	0	0	0	0	0	0	0
17	14	4	1	2	1	1	0	0	2	1	1	1	0	0	0
18	25	8	2	5	2	1	0	1	3	0	1	0	0	0	2
total:	175	47	25	24	23	7	1	2	8	13	4	3	5	1	12

B.2.5 Scenes

Table B.5 below contains the following information about each scene in all narratives of the Duck set ('Narr', 'Scene') as follows: 'Chars': number of characters referred; 'Chars Pro': number of characters pronominalized (referred to with the forms pro or ø); 'Pron Strategies': pronominalization strategies implemented at least once. (The notation '' in the last column, indicates that there were no pronominalization strategies implemented, and is used when there were no pronominalized character references in the scene.)

Table B.5: Duck: Scene information

Narr	Scene	Chars	Chars Pro	Pron Strategies
1	A	1	1	{main/PC+/R+}
1	B	2	1	{main/PC+/R+}
2	A	2	1	{main/PC+/R+;main/PC+/R-}
3	A	3	2	{main/PC+/R-;main/PC-/R-;re/PC+/R-}
4	A	3	0	{}
5	A	1	1	{main/PC+/R+}
5	B	2	1	{main/PC+/R+}
6	A	2	1	{main/PC+/R-}
7	A	2	2	{main/PC+/R-}
7	B	2	2	{main/PC+/R+;main/PC+/R-;main/PC-/R+;main/PC-/R-;re/PC+/R-}
8	A	3	0	{}
8	B	1	1	{intro/chANT-}
9	A	2	0	{}
9	B	4	1	{main/PC-/R-}
9	C	1	0	{}
10	A	1	1	{main/PC+/R+}
10	B	2	1	{main/PC+/R+}
10	C	2	2	{main/PC+/R+;main/PC+/R-;main/PC-/R+;intro/chANT-}
11	A	2	1	{re/PC+/R-}
11	B	4	1	{main/PC+/R+;main/PC-/R+}
11	C	3	0	{}
12	A	6	4	{main/PC+/R+;main/PC-/R+}
13	A	2	1	{main/PC+/R+}
13	B	5	2	{main/PC+/R+;main/PC-/R+}
14	A	3	1	{main/PC+/R+}
14	B	2	2	{main/PC+/R+;main/PC+/R-;main/PC-/R-}
15	A	2	1	{main/PC-/R-}
15	B	3	1	{main/PC+/R+;main/PC+/R-}
16	A	2	0	{}
16	B	1	1	{main/PC+/R+}
16	C	1	0	{}
16	D	2	0	{}
17	A	3	2	{main/PC-/R-;intro/chANT-;main/PC+/R+}
17	B	2	1	{main/PC+/R+;main/PC+/R-;main/PC-/R+}
17	C	3	2	{main/PC+/R+;re/PC-/R-}
18	A	2	1	{main/PC+/R+}
18	B	3	2	{main/PC+/R-;main/PC-/R-;intro/chANT-}
18	C	2	2	{main/PC+/R+;main/PC-/R+;main/PC-/R-;re/PC+/R-}
18	D	3	2	{main/PC+/R+;main/PC-/R+;re/PC-/R-}

B.2.6 Pronominalization strategies

Table B.6 below shows the number and percentage of pronominalized character references ('No Pro CharRefs') which implemented each pronominalization strategy in the Duck set.

Table B.6: Duck: Pronominalization strategy summary

Pron Strategy	No Pro CharRefs (%)
intro/chANT-	4 (5)
main/PC+/R+	29 (39)
main/PC+/R-	15 (20)
main/PC-/R+	10 (13)
main/PC-/R-	9 (12)
re/PC+/R+	0 (0)
re/PC+/R-	6 (8)
re/PC-/R+	0 (0)
re/PC-/R-	2 (3)
total:	75(100)

B.2.7 Pronominalization chains

Table B.7 below shows the number and percentage of each type of chain produced in the Duck set. Chains are grouped according to whether only one strategy was implemented (SINGLE-STRATEGY) or more than one strategy was implemented (MULTI-STRATEGY). The latter are further grouped according to the number of strategies implemented, and listed according to the strategies implemented at least once in each chain.

Table B.7: Duck: Pronominalization chain summary

Pronominalization chain	No chains (%)
SINGLE-STRATEGY	
intro/chANT-	1 (2)
main/PC+/R+	15 (38)
main/PC+/R-	2 (5)
main/PC-/R+	4 (10)
main/PC-/R-	2 (5)
re/PC+/R+	0 (0)
re/PC+/R-	2 (5)
re/PC-/R+	0 (0)
re/PC-/R-	0 (0)
subtotal (single):	26 (65)
MULTI-STRATEGY	
2-strategy	
main/PC+/R+;main/PC+/R-	2 (5)
main/PC+/R+;main/PC-/R-	2 (5)
main/PC-/R+;main/PC+/R-	1 (3)
main/PC+/R-;re/PC+/R-	1 (3)
main/PC-/R+;re/PC+/R-	1 (3)
main/PC+/R-;intro/chANT-	2 (5)
3-strategy	
main/PC+/R+;main/PC+/R-;main/PC-/R-	1 (3)
4-strategy	
main/PC+/R-;main/PC-/R+;main/PC+/R+;main/PC-/R-	1 (3)
intro/chANT-;main/PC+/R+;re/PC+/R-;main/PC+/R-	1 (3)
5-strategy	
main/PC-/R-;main/PC-/R+;main/PC+/R+;main/PC+/R-;re/PC-/R-	1 (3)
6-strategy	
main/PC+/R-;main/PC-/R-;main/PC-/R+;main/PC+/R+;re/PC+/R-;re/PC-/R-	1 (3)
subtotal (multi):	14 (35)
total:	40(100)

B.3 Duck: chain diagrams

This section contains diagrams depicting each pronominalization chain produced in the Duck narrative set. A full explanation of how chains were coded is given in Section A.3 of Appendix A. Below is a key to the notations used:

Figure B.1: Notations used in chain diagrams

†	intermediary character reference
‡	reference occurs before or after last in chain in same utterance
+	compound entity explicitly or implicitly conjoined
c	no character reference occurs in the utterance
g	the gender of the character is changed

A double underscore between references indicates a scene boundary.
The form, number and gender of each reference has been boxed.

Duck Chain 1

Narrative: D1 **Character:** The Dad$_i$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	A1	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	A2	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Duck Chain 2

Narrative: D1 **Character:** one ege$_{iii}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	B4	**np**	pro	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
	2	B5	np	**pro**	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u

Duck Chain 3

Narrative: D2 **Character:** the father duckllingi **Strategies:** main/PC+/R-;main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	A1	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	A1	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	f	**u**
	3	A2	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	4	A3	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Duck Chain 4

Narrative: D3 **Character:** The Daddy duck$_i$ **Strategies:** main/PC+/R-;re/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	A2	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	A2	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	3	A3	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	4	A4	**np**	pro	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	5	A5	np	**pro**	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
	6	A6	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	7	A6	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	m	f	**u**

Duck Chain 5

Narrative: D3 **Character:** a white one$_{iii}$ **Strategies:** main/PC+/R+;main/PC-/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	A4	**np**	pro	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
	2	A5	np	**pro**	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	3	A6	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	4	A6	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	m	f	**u**

Duck Chain 6

Narrative: D5 **Character:** the father duck$_i$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	A1	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	A2	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Duck Chain 7

Narrative: D5 **Character:** one big egg$_{iii}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	B4	[np]	pro	ø	[s]	pl	m	f	[u]	np	pro	ø	s	pl	m	f	u
	2	B5	np	[pro]	ø	[s]	pl	m	f	[u]	np	pro	ø	s	pl	m	f	u

Duck Chain 8

Narrative: D6 **Character:** the Dad Duck$_{ii}$ **Strategies:** main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	A2	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	2	A2	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	[s]	pl	m	f	[u]
	3	A3	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
‡	4	A3	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	[s]	pl	m	f	[u]

Duck Chain 9

Narrative: D7 **Character:** the ugle Duckling$_{i}$
Strategies: main/PC+/R-;main/PC-/R+;main/PC+/R+;main/PC-/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	A1	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	[s]	pl	[m]	f	u
†	2	A1	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
	3	A1	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	[s]	pl	[m]	f	u
†	4	A1	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
	5	A1	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	[s]	pl	[m]	f	u
†	6	B2	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	7	B2	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	[s]	pl	m	f	[u]
	8	B3	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	9	B4	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	10	B4	np	[pro]	ø	[s]	pl	m	f	[u]	np	pro	ø	s	pl	m	f	u
	11	B4	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	[s]	pl	[m]	f	u

Duck Chain 10

Narrative: D7 **Character:** all the Ducks$_{ii}$ **Strategies:** main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
‡	1	A1	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	[s]	pl	[m]	f	u
	2	A1	[np]	pro	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
†	3	A1	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	[s]	pl	[m]	f	u
	4	A1	np	[pro]	ø	s	[pl]	m	f	[u]	np	pro	ø	s	pl	m	f	u
‡	5	A1	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	[s]	pl	[m]	f	u

Duck Chain 11

Narrative: D7 **Character:** the woodin Duck$_{iii}$ **Strategies:** re/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
‡	1	B2	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	B2	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	[s]	pl	m	f	[u]
†	3	B3	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	4	B4	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	5	B4	np	[pro]	ø	[s]	pl	m	f	[u]	np	pro	ø	s	pl	m	f	u
‡	6	B4	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	[s]	pl	[m]	f	u

Duck Chain 12

Narrative: D8 **Character:** They$_{iv}$ **Strategies:** intro/chANT-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	B3	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u

Duck Chain 13

Narrative: D9 **Character:** That$_{v}$[the ugly duckling] **Strategies:** main/PC-/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	B5	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	B6	**np**	pro	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
	3	B6	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u

Duck Chain 14

Narrative: D10 **Character:** the dad$_{i}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	A1	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	A1	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Duck Chain 15

Narrative: D10 **Character:** the mum$_{ii}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	B2	**np**	pro	ø	**s**	pl	m	**f**	u	np	pro	ø	s	pl	m	f	u
	2	B2	np	**pro**	ø	**s**	pl	m	**f**	u	np	pro	ø	s	pl	m	f	u
‡	3	B2	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	f	**u**

Duck Chain 16

Narrative: D10 **Character:** He$_{iv}$[the ugly duckling]
Strategies: intro/chANT-;main/PC+/R+;re/PC+/R-;main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	C3	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	C4	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	3	C4	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u
†	4	C5	np	**pro**	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
	5	C6	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	6	C6	np	**pro**	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
	7	C7	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Duck Chain 17

Narrative: D10 **Character:** sumthing strange$_{v}$ **Strategies:** main/PC-/R+;main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
‡	1	C4	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	C4	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	m	f	**u**
	3	C5	np	**pro**	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	4	C6	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	5	C6	np	**pro**	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u

Duck Chain 18

Narrative: D11 **Character:** The dadde duck$_i$ **Strategies:** re/PC+/R-

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
	1	A1	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	A1	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	f	**u**
†	3	A2	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	4	A3	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Duck Chain 19

Narrative: D11 **Character:** dadde duck$_i$ **Strategies:** main/PC+/R+

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
	1	B7	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	B8	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	3	B8	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	m	**f**	u

Duck Chain 20

Narrative: D11 **Character:** dadde duck$_i$ **Strategies:** main/PC-/R+

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
‡	1	B9	**np**	pro	ø	**s**	pl	m	**f**	u	np	pro	ø	s	pl	m	f	u
	2	B9	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u
	3	B10	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Duck Chain 21

Narrative: D12 **Character:** her eggs$_{ii}$ **Strategies:** main/PC-/R+

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
‡	1	A1	**np**	pro	ø	**s**	pl	m	**f**	u	np	pro	ø	s	pl	m	f	u
	2	A1	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	f	**u**
	3	A2	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u

Duck Chain 22

Narrative: D12 **Character:** five little ducklings$_{iii}$ **Strategies:** main/PC+/R+

ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
1	A3	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
2	A4	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u

Duck Chain 23

Narrative: D12 **Character:** that$_{iv}$[ugly duckling] **Strategies:** main/PC+/R+

ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
1	A6	**np**	pro	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
2	A7	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Duck Chain 24

Narrative: D12 **Character:** father duck$_v$+ mother duck$_i$ **Strategies:** main/PC-/R+

		cip									cnip							
		form			*num*		*gen*				*form*			*num*		*gen*		
ref	*scn-no*																	
1	A9	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
2	A9	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	**s**	pl	m	**f**	u
3	A10	np	**pro**	ø	s	**pl**	m	f	**u**		np	pro	ø	s	pl	m	f	u

Duck Chain 25

Narrative: D13 **Character:** A Mummy duck$_i$ **Strategies:** main/PC+/R+

		cip									cnip							
		form			*num*		*gen*				*form*			*num*		*gen*		
ref	*scn-no*																	
1	A1	**np**	pro	ø	**s**	pl	m	**f**	u		np	pro	ø	s	pl	m	f	u
2	A1	np	**pro**	ø	**s**	pl	m	**f**	u		np	pro	ø	s	pl	m	f	u

Duck Chain 26

Narrative: D13 **Character:** her eggs$_{ii}$ **Strategies:** main/PC-/R+

			cip									cnip							
			form			*num*		*gen*				*form*			*num*		*gen*		
	ref	*scn-no*																	
‡	1	A2	np	**pro**	ø	**s**	pl	m	**f**	u		np	pro	ø	s	pl	m	f	u
	2	A2	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	s	**pl**	m	f	**u**
	3	B3	np	**pro**	ø	s	**pl**	m	f	**u**		np	pro	ø	s	pl	m	f	u

Duck Chain 27

Narrative: D13 **Character:** Mummy duck$_i$ **Strategies:** main/PC+/R+

		cip									cnip							
		form			*num*		*gen*				*form*			*num*		*gen*		
ref	*scn-no*																	
1	B6	**np**	pro	ø	**s**	pl	m	**f**	u		np	pro	ø	s	pl	m	f	u
2	B7	np	**pro**	ø	**s**	pl	m	**f**	u		np	pro	ø	s	pl	m	f	u

Duck Chain 28

Narrative: D14 **Character:** an uglea duckling$_i$
Strategies: main/PC+/R+;main/PC+/R-;main/PC-/R-

		cip									cnip							
		form			*num*		*gen*				*form*			*num*		*gen*		
ref	*scn-no*																	
1	A1	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
2	A2	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
† 3	A2	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	s	**pl**	m	f	**u**
†† 4	A2	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	s	**pl**	m	f	**u**
5	B3	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
††† 6	B3	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	**s**	pl	m	f	**u**
7	B4	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
††† 8	B4	np	**pro**	ø	**s**	pl	m	f	**u**		np	pro	ø	s	pl	m	f	u
††† 9	B5	np	**pro**	ø	**s**	pl	m	f	**u**		np	pro	ø	s	pl	m	f	u
††† 10	B6	np	pro	**ø**	**s**	pl	m	f	**u**		np	pro	ø	s	pl	m	f	u
11	B6	np	pro	ø	s	pl	m	f	u		np	**pro**	ø	**s**	pl	**m**	f	u

Duck Chain 29

Narrative: D14 **Character:** a wooden duck$_{iv}$ **Strategies:** main/PC-/R-;main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
‡	1	B3	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	B3	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	m	f	**u**
†	3	B4	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	4	B4	np	**pro**	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
	5	B5	np	**pro**	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
	6	B6	np	pro	**ø**	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
‡	7	B6	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u

Duck Chain 30

Narrative: D15 **Character:** a ugly duckling$_{i}$ **Strategies:** main/PC-/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	A1	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	A2	**np**	pro	ø	s	**pl**	**m**	f	u	np	pro	ø	s	pl	m	f	u
	3	A2	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u

Duck Chain 31

Narrative: D15 **Character:** the ugly duckling$_{i}$ **Strategies:** main/PC+/R+;main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	B4	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	B4	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	3	B4	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	m	f	**u**
	4	B5	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	5	B5	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	m	f	**u**

Duck Chain 32

Narrative: D16 **Character:** the dad$_{ii}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	B4	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	B5	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Duck Chain 33

Narrative: D17 **Character:** the swon$_{i}$
Strategies: main/PC-/R-;main/PC-/R+;main/PC+/R+;re/PC-/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	A2	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	A2	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	3	A2	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
	4	B3	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	5	B4	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
††	6	B4	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	m	f	**u**
	7	B5	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†††	8	C6	**np**	pro	ø	**s**	pl	m	**f**	u	np	pro	ø	s	pl	m	f	u
†††	9	C7	np	pro	**ø**	**s**	pl	m	**f**	u	np	pro	ø	s	pl	m	f	u
	10	C7	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
‡	11	C7	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	f	**u**

Duck Chain 34

Narrative: D17 **Character:** they$_{iii}$ **Strategies:** intro/chANT-;main/PC+/R+

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
‡	1	A2	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	A2	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	3	A2	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	s	**pl**	m	f	**u**
‡	4	A2	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u

Duck Chain 35

Narrative: D17 **Character:** a mummy swon$_{v}$ **Strategies:** main/PC+/R+

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
	1	C6	**np**	pro	ø	**s**	pl	m	**f**	u	np	pro	ø	s	pl	m	f	u
	2	C6	np	pro	**ø**	**s**	pl	m	**f**	u	np	pro	ø	s	pl	m	f	u
‡	3	C6	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
‡	4	C6	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	f	**u**

Duck Chain 36

Narrative: D18 **Character:** a dad$_{i}$ **Strategies:** main/PC+/R+

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
	1	A1	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	A2	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	3	A2	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	f	**u**

Duck Chain 37

Narrative: D18 **Character:** witch$_{iii}$[the ugly duckling]
Strategies: main/PC+/R-;main/PC-/R-;main/PC-/R+;
main/PC+/R+;re/PC+/R-;re/PC-/R-

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
‡	1	B4	**np**	pro	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
	2	B4	**np**	pro	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	3	B5	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	4	B5	np	**pro**	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	5	B6	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	6	B6	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	m	f	**u**
g	7	C7	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	8	C7	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
††	9	C7	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	m	f	**u**
†	10	C8	np	**pro**	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
	11	C9	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	12	C10	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	13	C11	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
††	14	C12	np	**pro**	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
	15	C12	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
	16	D13	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	17	D14	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†††	18	D15	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
†††	19	D16	np	pro	**ø**	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	20	D16	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
‡	21	D16	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	f	**u**

Duck Chain 38

Narrative: D18 **Character:** they$_{iv}$ **Strategies:** intro/chANT-;main/PC+/R-

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
	1	B5	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	2	B5	np	**pro**	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
	3	B6	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
‡	4	B6	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	m	f	**u**

Duck Chain 39

Narrative: D18 **Character:** a frend$_{v}$ **Strategies:** main/PC-/R+;re/PC+/R-

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
‡	1	C7	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	2	C7	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	3	C7	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	m	f	**u**
	4	C8	np	**pro**	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	5	C9	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	6	C10	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	7	C11	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	8	C12	np	**pro**	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
‡	9	C12	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u

Duck Chain 40

Narrative: D18 **Character:** more swans$_{vi}$ **Strategies:** main/PC+/R+

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
	1	D15	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	2	D16	np	pro	**ø**	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
‡	3	D16	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	f	**u**

Appendix C

Tortoise/Hare data

C.1 Tortoise/Hare narratives

A summary of coding for listed narratives is given on page 74 of the main thesis.

Tortoise/Hare Narrative 1

Scene	No	Utterance	form	syn	sem	prag	cont	strat
A	1	One day a race was with **the hare**$_i$	np	O	Sr[a]	Co	introduce	*chANT*⟩
		and **the tortoise**$_{ii}$.	np	O	Sr	Co	introduce	*chANT*⟩
	2	**the man**$_{iii}$ said	np	S	A	To	introduce	–
		redy get set GO						
	3	and **they**$_{i+\ ii}$ were off	pro	S	A[b]	To	reestablish	re/PC-/R-⟩
B	4	**the hare**$_i$ was in the lead	np	S	Th	To	reestablish	–
	5	**the tortoise**$_{ii}$ was trying hard	np	S	A	To	reestablish	–
		to keep up.						
C	6	**the hare**$_i$ decided	np	S	A	To	reestablish	–
		to go to sleep.						
	7	**the hare**$_i$ did not now	np	S	Ex	To	maintain	*chANT*⟩
		that **the tortoise**$_{ii}$ sneeked	np	S	A	To	reestablish	–
		past **him**$_i$	pro	O	RO	Co	maintain	main/PC-/R-⟩
	8	but **he**$_i$ woke up	pro	S	Th	To	maintain	main/PC-/R+⟩
	9	and ø$_i$ saw	zero	S	Ex	To	maintain	main/PC+/R+⟩
		that **the tortoise**$_{ii}$ was ahead	np	S	Th	To	reestablish	–
		of **him**$_i$	pro	O	RO	Co	maintain	main/PC-/R-⟩
	10	so **he**$_i$ zoomed right past	pro	S	A	To	maintain	main/PC-/R+⟩
		poor tortoise$_{ii}$.	np	O	RO	Co	maintain	–
D	11	**he**$_i$ made	pro	S	A	To	maintain	main/PC+/R-⟩
		4 bunys$_{iv}$ jump.	np	O	P	Co	introduce	⟨*chANT*
	12	**they**$_{iv}$ called	pro	S	A	To	maintain	⟨main/PC-/R+
		him$_i$ back	pro	O	P	Co	maintain	main/PC-/R-⟩
	13	**he**$_i$ showed	pro	S	A	To	maintain	main/PC-/R+⟩
		them$_{iv}$ some tricks	pro	O	B	Co	maintain	⟨main/PC-/R-
	14	and then ø$_i$ went away	zero	S	A	To	maintain	main/PC+/R-⟩
E	15	**the tortoise**$_{ii}$ was near the finish line	np	S	Th	To	reestablish	–
	16	and **the tortoise**$_{ii}$ won	np	S	Th	To	maintain	–
	17	**crowdes**$_v$ were chearing.	np	S	A	To	introduce	–

[a] Overlaps with 'Associate'.

[b] Overlaps with 'Theme'

Tortoise/Hare Narrative 2

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	one day the hare$_i$ and	np	S	Th	To	introduce	–
	the tortoise$_{ii}$ were going to have a race	np	S	Th	To	introduce	–
B 2	and the hare$_i$ was going very fast	np	S	A[a]	To	maintain	–
C 3	then the hare$_i$ stoped to have a rest	np	S	A	To	maintain	–
4	and the Tortoise$_{ii}$ went past	np	S	A	To	reestablish	–
	the hare$_i$	np	O	RO	Co	maintain	–
5	then the hare$_i$ woke up	np	S	Th	To	maintain	$chANT\rangle$
6	and ø$_i$ went past	zero	S	A	To	maintain	main/PC+/R+$\rangle$
	the tortoise$_{ii}$	np	O	RO	Co	reestablish	–
D 7	then the hare$_i$ stoped	np	S	A	To	maintain	–
	to play with the rabits$_{iii}$	np	O	As	Co	introduce	–
8	and the tortoise$_{ii}$ went past	np	S	A	To	reestablish	–
	the hare$_i$	np	O	RO	Co	maintain	–
E 9	and the tortoise$_{ii}$ was near the finish line	np	S	Th	To	maintain	–
10	and the hare$_i$ was going fast	np	S	Th	To	reestablish	–
11	but the tortoise$_{ii}$ wun	np	S	Th	To	reestablish	–

[a] Overlaps with 'Theme'.

Tortoise/Hare Narrative 3

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	The hare$_i$	np	S	Th	To	introduce	–
	and the tortoise$_{ii}$ had a race.	np	S	Th	To	introduce	–
2	The moul$_{iii}$ fired the gun	np	S	A	To	introduce	–
3	and the race began						
B 4	at first the hare$_i$ was wining	np	S	Th	To	reestablish	$chANT\rangle$
5	he$_i$ rushed past	pro	S	A	To	maintain	main/PC+/R+$\rangle$
	an ostich$_{iii}$	np	O	RO	Co	introduce	–
6	and all its beutiful feathers fell of.						
C 7	the hare$_i$ ran on and on	np	S	A	To	reestablish	$chANT\rangle$
	until he$_i$ came to a tree.	pro	S	Th	To	maintain	main/PC+/R+$\rangle$
8	he$_i$ looked back	pro	S	A	To	maintain	main/PC+/R+$\rangle$
9	he$_i$ saw	pro	S	Ex	To	maintain	main/PC+/R+$\rangle$
	the tortoise$_{ii}$	np	O	Pe	Co	reestablish	–
	miles away with some snails$_{iv}$.	np	O	As	Co	introduce	–
10	he$_i$ lay down	pro	S	A	To	maintain	main/PC+/R-$\rangle$
11	and ø$_i$ had a rest	zero	S	A[a]	To	maintain	main/PC+/R+$\rangle$
12	the tortoise$_{ii}$ coat up	np	S	A	To	reestablish	$\langle chANT$
13	he$_{ii}$ crept slowly past	pro	S	A	To	maintain	$\langle$main/PC+/R+
	the hare$_i$	np	O	RO	Co	reestablish	–
14	and then ø$_{ii}$ ploded along	zero	S	A	To	maintain	$\langle$main/PC+/R-
D 15	the hare$_i$ woke up	np	S	Th	To	reestablish	$chANT\rangle$
16	he$_i$ ran	pro	S	A	To	maintain	main/PC+/R+$\rangle$
	as fast as he$_i$ could	pro	S	Sr	To	maintain	main/PC+/R+$\rangle$
17	he$_i$ had past	pro	S	Th	To	maintain	main/PC+/R+$\rangle$
	toby the tortoise$_{ii}$.	np	O	RO	Co	reestablish	–
E 18	the hare$_i$ stoped	np	S	A	To	maintain	$chANT\rangle$
19	and ø$_i$ played whith	zero	S	A	To	maintain	main/PC+/R+$\rangle$
	a couple of rabbits$_v$	np	O	As	Co	introduce	–
20	the tortoise$_{ii}$ ran past once again.	np	S	A	To	reestablish	–
21	the hare$_i$ twiriled his legs.	np	S	A	To	reestablish	–
F 22	the tortoise$_{ii}$ put his legs up as high as they could go	np	S	A	To	reestablish	$chANT\rangle$
23	he$_{ii}$ ran fast	pro	S	A	To	maintain	main/PC+/R+$\rangle$

[a] Overlaps with Theme.

Tortoise/Hare Narrative 4

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day **evrybody**$_i$ was getting ready	np	S	A	To	introduce	*chANT*⟩
	for **the tortoise**$_{ii}$	np	O	B	Co	introduce	–
	and **the hare**$_{iii}$	np	O	B	Co	introduce	–
	to have a race.						
B 2	when **they**$_i$ were finished	pro	S	Th	To	maintain	main/PC+/R-⟩
	the hare$_{iii}$ came out	np	S	A	To	reestablish	–
3	*hoory*						
	they$_i$ all cheered	pro	S	A	To	maintain	main/PC+/R-⟩
	wavin there hats						
	horry						
4	then slowly **the tortise**$_{ii}$ came out	np	S	A	To	reestablish	–
5	*Ha ha ha ha*						
	evrybody$_i$ shouted	np	S	A	To	reestablish	–
6	**the bager**$_{iv}$	np	S	A	To	introduce	*chANT*⟩
	ho$_{iv}$[a] blew wistle	pro	S	A	To	maintain	main/PC+/R+⟩
7	then $\emptyset_{iv}$ took a big big deep breath in	zero	S	A	To	maintain	main/PC+/R+⟩
8	and when **the bager**$_{iv}$ blew the wistle	np	S	A	To	maintain	–
	all his buttens popped of						
9	finaly **the hare**$_{iii}$	np	S	Th	To	reestablish	–
	and **the tortoise**$_{ii}$ were ready	np	S	Th	To	reestablish	–
	to go						
C 10	of zoomed **the hare**$_{iii}$	np	S	A	To	maintain	–
11	and very slowley went **the tortise**$_{ii}$	np	S	A	To	reestablish	–
12	went **the hare**$_{iii}$ went Past a tree and a tree	np	S	Th	To	reestablish	–
	house						
13	the tree lost all its leavs						
14	and the tree house fell down.						
D 15	slowly slowly **the tortois**$_{ii}$	np	S	A	To	reestablish	–
	still far back						
	came plunging along						

[a] Interpreted as 'he'.

Tortoise/Hare Narrative 5

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day **the hare**$_i$ and	np	S	Th	To	introduce	*chANT*⟩
	the tortoise$_{ii}$ had a race	np	S	Th	To	introduce	*chANT*⟩
2	and **the hare**$_i$ was very fast	np	S	Th	To	maintain	*chANT*⟩
3	and **thay**$_{i+ii}$ began	pro	S	Th	To	reestablish	re/PC+/R+⟩[a]
B 4	and **the hare**$_i$ was so fast	np	S	Th	To	reestablish	*chANT*⟩
	the trees had no leaves						
	when **he**$_i$ cam runing past	pro	S	Th	To	maintain	main/PC+/R+⟩
C 5	and then **he**$_i$ had a snooze	pro	S	A	To	maintain	main/PC+/R+⟩
6	and **the hare**$_i$ woock up	np	S	Th	To	maintain	–
	when **the tortoise**$_{ii}$ crept past	np	S	A	To	reestablish	–
D 7	and then **the hare**$_i$ toock of agen	np	S	A	To	maintain	*chANT*⟩
8	and on the waye **he**$_i$ met four	pro	S	Ex	To	maintain	main/PC+/R+⟩

[a] Judged to reestablish reference because the compound entity is established in A1.

Tortoise/Hare Narrative 6

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day there was going to be						
	a great race between **tortoise**$_i$	np	O	Sr	Co	introduce	*chANT*⟩
	and **hare**$_{ii}$	np	O	Sr	Co	introduce	*chANT*⟩
B 2	**the official starter**$_{iii}$ started the race	np	S	A	To	introduce	–
3	and **they**$_{i+\ ii}$ were off	pro	S	Th	To	reestablish	re/PC-/R-⟩
4	**the crowd**$_{iv}$ mainly cheered	np	S	A	To	introduce	–
	for **the hare**$_{ii}$.	np	O	B	Co	reestablish	–
C 5	**the hare**$_{ii}$ zoomed past	np	S	A	To	maintain	–
	the tortoise$_i$,	np	O	RO	Co	reestablish	–
6	and the tree lost it's leaves						
7	when **the hare**$_{ii}$ looked round	np	S	A	To	reestablish	–
	the snails$_v$ were moving faster	np	S	Th	To	introduce	–
	than **the tortoise**$_i$	np	S	Th	To	reestablish	–
D 8	seconds later **the hare**$_{ii}$ had reached the girls school	np	S	Th	To	maintain	*chANT*⟩
9	and **ø**$_{ii}$ was singing, dancing, talking, and playing tennis and cricket on his own	zero	S	A	To	maintain	main/PC+/R+⟩
E 10	when **the hare**$_{ii}$ was playing about	np	S	A	To	maintain	–
	the tortoise$_i$ slid by	np	S	A	To	reestablish	*chANT*⟩
11	and **ø**$_i$ just won the race by no more	zero	S	Th	To	maintain	main/PC+/R+⟩

Tortoise/Hare Narrative 7

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**The hare**$_i$ and	np	S	Th	To	introduce	–
	the tortoise$_{ii}$ where going	np	S	Th	To	introduce	–
	to have a race						
B 2	and wene the gun went						
	the hare$_i$ went very fast	np	S	A	To	maintain	*chANT*⟩
3	and **ø**$_i$ pushed	zero	S	A	To	maintain	main/PC+/R+⟩
	the tortoise$_{ii}$ down	np	O	P	Co	reestablish	–
C 4	and when **the hare**$_i$ was far away	np	S	Th	To	maintain	*chANT*⟩
	from **the tortoise**$_{ii}$	np	O	RO	Co	maintain	–
	so **he**$_i$ leaned on the tree	pro	S	A	To	maintain	main/PC+/R-⟩
5	and **ø**$_i$ fell fast a sleep	pro	S	Th	To	maintain	main/PC+/R+⟩
6	and when **the tortoise**$_{ii}$ came	np	S	A	To	reestablish	⟨*chANT*
	nere **him**$_i$	pro	O	RO	Co	maintain	main/PC-/R-⟩
	he$_{ii}$ went shsh	pro	S	A	To	maintain	⟨main/PC+/R-
7	and **ø**$_{ii}$ creepet quietly	zero	S	A	To	maintain	⟨main/PC+/R+
	past **him**$_i$	pro	O	RO	Co	maintain	main/PC+/R-⟩
D 8	after that **the hare**$_i$ wolk up	np	S	Th	To	maintain	*chANT*⟩
9	and **ø**$_i$ zoomed away	zero	S	A	To	maintain	main/PC+/R+⟩
10	and **ø**$_i$ went	zero	S	A	To	maintain	main/PC+/R+⟩
	past **him**$_{ii}$	pro	O	RO	Co	reestablish	⟨re/PC-/R-
E 11	and after that **he**$_i$ saw	pro	S	Ex	To	maintain	main/PC+/R-⟩
	four girls$_{iii}$	np	O	Pe	Co	introduce	–
12	and **oun**$_{iv}$ was blue	np	S	B	To	introduce	–
13	and **on**$_v$ had yellow	np	S	B	To	introduce	–
14	and **the tortoise**$_{ii}$ look	np	S	Ex	To	reestablish	–
	over **the hare**$_i$	np	O	Pe	Co	reestablish	–
15	but **the hare**$_i$ did not run	np	S	A	To	maintain	⟨*chANT*
16	and then **he**$_i$ don a trick whith	pro	S	A	To	maintain	⟨main/PC+/R+

Tortoise/Hare Narrative 8

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	one day **the hare**$_i$	np	S	Th	To	introduce	–
	and **the tortoise**$_{ii}$ had a races	np	S	Th[a]	To	introduce	–
2	and **the hare**$_i$ and	np	S	A	To	maintain	–
	the tortoise$_{ii}$ got rede for the races	np	S	A	To	maintain	*chANT*⟩
B 3	but **he**$_{ii}$ shake the hand	pro	S	A	To	maintain	main/PC+/R+⟩
4	but **the hare**$_i$ took his hand a way	np	S	A	To	reestablish	–
5	**the hare**$_i$ laughted	np	S	A	To	maintain	–
6	and **the hare**$_i$ dided a gane	np	S	A	To	maintain	–
7	**tortoise**$_{ii}$ laughted to	np	S	A	To	reestablish	–
8	**the tortoise**$_{ii}$ said *its a good joke*	np	S	A	To	maintain	–
(9)	(**the hare and the tortoise**)						

[a] Possibly, 'Agent.'

Tortoise/Hare Narrative 9

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day **evre one**$_i$ sat down	np	S	A	To	introduce	–
	to wath a race						
2	and it Was **the tortoise**$_{ii}$	np	O	Th	Co[a]	introduce	–
	and **A hare**$_{iii}$	np	O	Th	Co	introduce	–
3	**the rabbit**$_{iv}$ Whisled	np	S	A	To	introduce	*chANT*⟩
4	and $\emptyset_{iv}$ said	zero	S	A	To	maintain	main/PC+/R+⟩
	on your marks get set go						
5	**the rabbit**$_{iv}$ shot the gun	np	S	A	To	maintain	–
6	**the tow animles**$_{ii+iii}$[b] ran	np	S	A	To	reestablish	–
(7)	(**hare** Was)						

[a] This utterance is interpreted to mean "and it [the race] was with the tortoise and a hare.

[b] Interpreted as being synonymous with the compound entity the tortoise$_{ii}$+a hare$_{iii}$.

Tortoise/Hare Narrative 10

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	Wun day **the hare**$_i$ and	np	S	Th	To	introduce	–
	the tortoise$_{ii}$ had a race	np	S	Th[a]	To	introduce	–
B 2	of cors **the har**$_i$ wus a shof	np	S	Th	To	maintain	*chANT*⟩
3	and **he**$_i$ tot	pro	S	Ex	To	maintain	main/PC+/R+⟩
	he$_i$ was going to win	pro	S	Th	To	maintain	main/PC+/R+⟩
4	but **he**$_i$ wus ron	pro	S	Ex	To	maintain	main/PC+/R+⟩
5	**the tortoise**$_{ii}$ wun	np	S	Th	To	reestablish	–
	becos **he**$_i$ wus being lasa	pro	S	Th	To	maintain	main/PC+/R-⟩
C 6	wel **he**$_i$ wusnt being a lot lasy	pro	S	Th	To	maintain	main/PC+/R+⟩
7	but **he**$_i$ was talking to	pro	S	A[b]	To	maintain	main/PC+/R+⟩
	evvrawun$_{iii}$	np	O	R	Co	introduce	–
	mistrbare$_{iv}$ and	np	O	R	Co	introduce	–
	the we girls buna rabits$_v$[c]	np	O	R	Co	introduce	–
8	and ten **he**$_i$ shod	pro	S	A	To	maintain	main/PC+/R-⟩
	the bunas$_v$ sum tricts	np	O	B	Co	maintain	–
D 9	and ten $\emptyset_i$ trid	zero	S	A	To	maintain	main/PC+/R-⟩
	to cach up wit **the tortoise**$_{ii}$	np	O	G[d]	Co	reestablish	–
10	but $\emptyset_i$ bint win ...	zero	S	Th	To	maintain	main/PC+/R-⟩

[a] Possibly 'Agent'.

[b] Overlaps with 'Theme'.

[c] Ie, the hare was talking to everyone, including: Mr. Bear and the wee girl bunny rabbits.

[d] Overlaps with 'Reference Object.'

Tortoise/Hare Narrative 11

Scene	No	Utterance	form	syn	sem	prag	cont	strat
A	1	**A hare$_i$** and	np	S	Th	To	introduce	–
		a tortoise$_{ii}$ were going to have a race	np	S	Th[a]	To	introduce	–
	2	then **the racoon$_{iii}$** said	np	S	A	To	introduce	–
		go						
	3	and **the hare$_i$** ran fast	np	S	A	To	reestablish	*chANT*⟩
B	4	then **he$_i$** stoped	pro	S	A	To	maintain	main/PC+/R+⟩
		to have a rest						
	5	and **the tortoise$_{ii}$** tiped tode past	np	S	A	To	reestablish	⟨*chANT*
	6	but **the hare$_i$** herd	np	S	Ex	To	reestablish	*chANT*⟩
		him$_{ii}$	pro	O	Pe	Co	maintain	⟨main/PC-/R-
	7	so **he$_i$** ran fast	pro	S	A	To	maintain	main/PC+/R-⟩
		past **him$_{ii}$**	pro	O	RO	Co	maintain	⟨main/PC+/R-
C	8	then **he$_i$** saw	pro	S	Ex	To	maintain	main/PC+/R-⟩
		four girls$_{iv}$	np	O	Pe	Co	introduce	⟨*chANT*
		siting down on a wall						
	9	and **they$_{iv}$** said	pro	S	A	To	maintain	⟨main/PC-/R+
		come on hare						
	10	and **he$_i$** said	pro	S	A	To	reestablish	re/PC+/R-⟩
		watch him go past						
	11	and **the tortoise$_{ii}$** bumed write into and twig	np	S	Th	To	reestablish	–
	12	then **the hare$_i$** said	np	S	A	To	reestablish	*chANT*⟩
		watch me do borenarrow						
	13	so **he$_i$** pooled the arrow	pro	S	A	To	maintain	main/PC+/R+⟩
	14	and **ø$_i$** let it go	zero	S	A	To	maintain	main/PC+/R+⟩
	15	and **he$_i$** ran forword	pro	S	A	To	maintain	main/PC+/R+⟩
	16	**ø$_i$** got an apple	zero	S	A	To	maintain	main/PC+/R+⟩
	17	then the arrow went write throught it						
	18	then **he$_i$** played tenis	pro	S	A	To	reestablish	re/PC+/R+⟩
	19	then **ø$_i$** went on with his race	zero	S	A	To	maintain	main/PC+/R+⟩
D	20	and **the tortoises feet$_{ii}$**[b] went up	np	S	Th	To	reestablish	⟨*chANT*
	21	and **ø$_{ii}$** ran	zero	S	A	To	maintain	⟨main/PC+/R+
	22	then **ø$_{ii}$** went through the finesh line	zero	S	A	To	maintain	⟨main/PC+/R+
	23	and **ø$_{ii}$** was the winer	zero	S	Th	To	maintain	⟨main/PC+/R+

[a] Possibly, 'Agent.'

[b] Body part analyzed as a character reference due to explicit mention of character and no other reference to the character in the same scene.

Tortoise/Hare Narrative 12

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	There was gowing to be a big race						
B 2	and **a hare**$_i$ and	np	S	Th	To	introduce	*chANT*⟩
	a tortoise$_{ii}$ were in the big race	np	S	Th	To	introduce	*chANT*⟩
C 3	**they**$_{i+ii}$ went to the begining of the line	pro	S	A	To	maintain	main/PC+/R+⟩
4	and the gun went						
5	**the hare**$_i$ ran first	np	S	A	To	reestablish	–
6	and **the tortoise**$_{ii}$ swirld arownd on his shell	np	S	Th	To	reestablish	–
7	and the gun hit his shell						
8	**the tortoise**$_{ii}$ got up	np	S	A	To	reestablish	*chANT*⟩
9	and ø$_{ii}$ ran on to feet	zero	S	A	To	maintain	main/PC+/R+⟩
D 10	**the hare**$_i$ was runing so fast	np	S	Th	To	reestablish	*chANT*⟩
	that **he**$_i$ bloo everything away	pro	S	Sr	To	maintain	main/PC+/R+⟩
11	**the tortoise**$_{ii}$ was walking very sloly down the road	np	S	A	To	reestablish	–
E 12	**the hare**$_i$ ran	np	S	A	To	reestablish	*chANT*⟩
13	and then **he**$_i$ stopted for a little nap	pro	S	A	To	maintain	main/PC+/R+⟩
14	later **the tortoise**$_{ii}$ came along	np	S	A	To	reestablish	*chANT*⟩
15	and ø$_{ii}$ saw	zero	S	Ex	To	maintain	main/PC+/R+⟩
	the hare$_i$	np	O	Pe	Co	reestablish	–
	sleeping						
16	**he**$_{ii}$ said	pro	S	A	To	maintain	main/PC+/R-⟩
	shoow						
17	and ø$_{ii}$ tiptowed quilay	zero	S	A	To	maintain	main/PC+/R+⟩
	past **the hare**$_i$	np	O	RO	Co	reestablish	–
F 18	and then **he**$_{ii}$ walked on	pro	S	A	To	maintain	main/PC+/R-⟩
19	and there was branches in his ways						
20	so **he**$_{ii}$ put his head in his shell	pro	S	A	To	reestablish	re/PC+/R+⟩
21	**he**$_{ii}$ done that twice	pro	S	A	To	maintain	main/PC+/R+⟩
G 22	and **the hare**$_i$ woce up	np	S	Th	To	reestablish	⟨*chANT*
23	and ø$_i$ ran a head	zero	S	A	To	maintain	⟨main/PC+/R+
	of **him**$_{ii}$	pro	O	RO	Co	reestablish	re/PC-/R-⟩
H 24	and **the hare**$_i$ met	np	S	Ex	To	maintain	–
	six little rabits$_{iii}$	np	O	Pe	Co	introduce	–
25	and **the hare**$_i$ played tenes on his own	np	S	A	To	maintain	–
26	and then **the tortoise**$_{ii}$ went	np	S	A	To	reestablish	–
	a head of **the hare**$_i$	np	O	RO	Co	maintain	–
I 27	**the hare**$_i$ ran very fast	np	S	A	To	maintain	–
J 28	**the tortoise**$_{ii}$ ran and ran	np	S	A	To	reestablish	*chANT*⟩
29	and **he**$_{ii}$ went right throow the finish line	pro	S	A	To	maintain	main/PC+/R+⟩

Tortoise/Hare Narrative 13

Scene	No	Utterance	form	syn	sem	prag	cont	strat
A	1	**The hare$_i$** and	np	S	Th	To	introduce	–
		the tortoise$_{ii}$ had a race	np	S	Th	To	introduce	–
	2	and a **moul$_{iii}$** was on top of a tree	np	S	Th	To	introduce	*chANT*⟩
	3	**he$_{iii}$** fired the gun	pro	S	A	To	maintain	main/PC+/R+⟩
	4	and the race begun						
B	5	**the hare$_i$** kept on going	np	S	A	To	reestablish	–
	6	and **the tortoise$_{ii}$** was still at the begining	np	S	Th	To	–	⟨*chANT*
	7	and **the moul$_{iii}$** shot 3 bulits at the tortoises' shell	np	S	A	To	reestablish	–
	8	then **he$_{ii}$** started to run	pro	S	A	To	reestablish	⟨re/PC-/R+
C	9	and then **the hare$_i$** got tierd	np	S	Ex	To	reestablish	*chANT*⟩
	10	and **ø$_i$** went to sleep	zero	S	A	To	maintain	main/PC+/R+⟩
	11	and then **the tortoise$_{ii}$** kot up	np	S	A	To	reestablish	⟨*chANT*
		with **him$_i$**	pro	O	RO[a]	Co	maintain	main/PC-/R-⟩
	12	and **ø$_{ii}$** very quitley	zero	S	A	To	maintain	⟨main/PC+/R-
		went past **him$_i$**	pro	O	RO	Co	maintain	main/PC+/R-⟩
D	13	and then **the hare$_i$** awoke	np	S	Th	To	maintain	*chANT*⟩
	14	and **ø$_i$** saw	zero	S	Ex	To	maintain	main/PC+/R+⟩
		that **the tortoise$_{ii}$** was	np	S	Th	To	reestablish	–
		ahead of **him$_i$**	pro	O	RO	Co	maintain	main/PC-/R-⟩
	15	then **the hare$_i$** quiklay ran	np	S	A	To	maintain	–
E	16	**the hare$_i$** ran	np	S	A	To	maintain	–
		past a **swan$_{iv}$**	np	O	RO	Co	introduce	–
	17	and its butifal feathers fell off						
F	18	and **the hare$_i$** went past	np	S	Th	To	reestablish	*chANT*⟩
		some little girl rabbits$_v$	np	O	RO	Co	introduce	⟨*chANT*
	19	and **they$_v$** started to cheer	pro	S	A	To	maintain	⟨main/PC-/R+
		for **him$_i$**	pro	O	B	Co	maintain	main/PC-/R-⟩
G	20	and then **he$_i$** showed	pro	S	A	To	maintain	main/PC-/R+⟩
		the litttle rabbits$_v$ some tricks	np	O	B	Co	maintain	–
	21	then **one of the rabbits$_{vi}$** said *wy are you not carrieing on with the race?*	np	S	A	To	introduce	–
	22	*because Iv got so much speed*						
H	23	**the tortoise$_{ii}$** ran past	np	S	A	To	reestablish	–
		the hare$_i$	np	O	RO	Co	reestablish	–

[a] Overlaps with 'Goal'.

Tortoise/Hare Narrative 14

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	A race was going to begin						
	between a **tortoise**$_i$	np	O	Sr	Co	introduce	*chANT*⟩
	who was called Toby						
	and a **hare**$_{ii}$ called Tom.	np	O	Sr	Co	introduce	*chANT*⟩
2	**The man**$_{iii}$ blew the whistle	np	S	A	To	introduce	–
3	and off **they**$_{i+\ ii}$ went.	pro	S	A	To	reestablish	re/PC-/R-⟩
4	**The hare**$_{ii}$ ran faster	np	S	A	To	reestablish	–
	than **the tortoise**$_i$.	np	S	A	To	reestablish	–
B 5	**The hare**$_{ii}$ went for a rest	np	S	A	To	maintain	–
6	**the tortoise**$_i$ catched up	np	S	A	To	reestablish	–
	with **the hare**$_{ii}$.	np	O	RO	Co	maintain	–
7	**The tortoise**$_i$ tipptoed	np	S	A	To	maintain	–
8	**the hare**$_{ii}$ woke up	np	S	Th	To	reestablish	–
C 9	**hare**$_{ii}$ ran	np	S	A	To	maintain	*chANT*⟩
10	**he**$_{ii}$ got passed	pro	S	A	To	maintain	main/PC+/R+⟩
	the tortoise$_i$.	np	O	RO	Co	reestablish	–
D 11	**The hare**$_{ii}$ stopped	np	S	A	To	maintain	*chANT*⟩
12	and **ø**$_{ii}$ saw	zero	S	Ex	To	maintain	main/PC+/R+⟩
	four rabbit girls$_{iv}$.	np	O	Pe	Co	introduce	–
13	**The hare**$_{ii}$ showed	np	S	A	To	maintain	–
	the rabbits$_{iv}$ some tricks.	np	O	B	Co	maintain	–
E 14	**The tortoise**$_i$ went past	np	S	Th	To	reestablish	–
	the hare$_{ii}$	np	O	RO	Co	maintain	–
15	**the hare**$_{ii}$ ran	np	S	A	To	maintain	–
F 16	**the tortoise**$_i$ got high on his feet	np	S	A	To	reestablish	*chANT*⟩
17	**he**$_i$ walked	pro	S	A	To	maintain	main/PC+/R+⟩
18	**the tortoise**$_i$ one	np	S	Th	To	maintain	–
19	the race was over						

Tortoise/Hare Narrative 15

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	A race was going to start						
2	It was between a **Hare**$_i$	np	O	Sr	Co	introduce	*chANT*⟩
	and a **tortoise**$_{ii}$	np	O	Sr	Co	introduce	*chANT*⟩
3	**people**$_{iii}$ chatted among	np	S	A	To	introduce	–
	them selfs$_{iii}$	np	O	R	Co	maintain	–
B 4	then the gun came shooting out						
5	off **they**$_{i+ii}$ went	pro	S	A	To	reestablish	re/PC-/R-⟩
6	**the tortoise**$_{ii}$ was spinning round	np	S	Th[a]	To	reestablish	–
7	the hares legs was very fast						
C 8	then **the Hare**$_i$ saw a tree	np	S	Ex	To	maintain	*chANT*⟩
9	**it**$_i$ went down to sleep.	pro	S	A	To	maintain	main/PC+/R+⟩
10	**the tortoise**$_{ii}$ tiptoed	np	S	A	To	reestablish	–
	past **him**$_i$	pro	O	RO	Co	maintain	main/PC-/R-⟩
11	and **the tortoise**$_{ii}$ really started	np	S	A	To	maintain	⟨*chANT*
	to run						
D 12	then **the Hare**$_i$ saw	np	S	Ex	To	reestablish	*chANT*⟩
	him$_{ii}$	pro	O	Pe	Co	maintain	⟨main/PC-/R-
13	**it**$_i$ ran up	pro	S	A	To	maintain	main/PC+/R-⟩
14	and **it**$_i$ went right past	pro	S	A	To	maintain	main/PC+/R+⟩
	him$_{ii}$	pro	O	RO	Co	reestablish	⟨re/PC+/R-
E 15	there were **four baby hares**$_{iv}$	np	S	Th	To	introduce	–

[a] Overlaps with 'Patient'.

Tortoise/Hare Narrative 16

Scene	No	Utterance	form	syn	sem	prag	cont	strat
A	1	One day there was a race						
	2	and all **the odiens**$_i$ are ready to see the race.	np	S	Th	To	introduce	–
	3	First **the rabbit**$_{ii}$ came out of the shed.	np	S	A	To	introduce	–
	4	Then **the tortoise**$_{iii}$ came out of his shed.	np	S	A	To	introduce	–
	5	**The mole**$_{iv}$ fire the gun	np	S	A	To	introduce	–
	6	and the race had started.						
B	7	Then **the rabbit**$_{ii}$ came zooming around to win the race	np	S	A	To	reestablish	–
		while **the tortoise**$_{iii}$ walk sloly behind.	np	S	A	To	reestablish	–
C	8	First **the rabbit**$_{ii}$ past	np	S	A	To	reestablish	*chANT*⟩
		an ostrich$_v$	np	O	RO	Co	introduce	–
	9	and **he**$_{ii}$ was running so fast	pro	S	A[a]	To	maintain	main/PC+/R-⟩
		that **he**$_{ii}$ spoilt the ostrich feather	pro	S	Sr	To	maintain	main/PC+/R+⟩
D	10	then **the rabbit**$_{ii}$ came to a tree	np	S	A	To	maintain	*chANT*⟩
	11	Then **he**$_{ii}$ rest down on the tree	pro	S	A	To	maintain	main/PC+/R+⟩
	12	and **he**$_{ii}$ looked back	pro	S	A	To	maintain	main/PC+/R+⟩
		at **the tortoise**$_{iii}$	np	O	Pe	Co	reestablish	–
	13	then **he**$_{ii}$ laugh	pro	S	A	To	maintain	main/PC+/R-⟩
		at **the tortoise**$_{iii}$.	np	O	R	Co	maintain	–
	14	But then **the tortoise**$_{iii}$ the tree[b]	np	S	A	To	maintain	*chANT*⟩
	15	and **he**$_{iii}$ crept beside	pro	S	A	To	maintain	main/PC+/R+⟩
		the hare$_{ii}$ who was sleeping.	np	O	RO	Co	reestablish	–
	16	But just the moment when						
		the tortoise$_{iii}$ went	np	S	A	To	maintain	–
		to step on frount of **the rabbit**$_{ii}$.	np	O	RO	Co	maintain	–
		The rabbit$_{ii}$ went zooming	np	S	A	To	maintain	–
		ahead of **the tortoise**$_{iii}$.	np	O	RO	Co	maintain	–
E	17	Next **the rabbit**$_{ii}$ met	np	S	Ex	To	maintain	–
		4 little hares$_v$	np	O	Pe	Co	introduce	–
		sitting on the wall						
	18	and then **the tortoise**$_{iii}$ went ahead of	np	S	A	To	reestablish	–
		the rabbit$_{ii}$	np	O	RO	Co	maintain	–
	19	then **the little hares**$_v$ said to	np	S	A	To	reestablish	–
		the rabbit$_{ii}$	np	O	R	Co	maintain	–
		go on running ahead						
		the tortoise might win						
	20	but **the rabbit**$_{ii}$ said	np	S	A	To	maintain	*chANT*⟩
		no						
	21	and then **he**$_{ii}$ said	pro	S	A	To	maintain	main/PC+/R+⟩
		I've go plenty time						
	22	so **the rabbit**$_{ii}$ told	np	S	A	To	maintain	–
		the little hare$_v$	np	O	R	Co	reestablish	–
		what is his name						
	23	and his name was spedy.						

[a] Overlaps with 'Theme'.

[b] This utterance is interpreted to mean: 'The tortoise came upon the tree where the hare was sleeping.'

Tortoise/Hare Narrative 17

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	A race was goint to start						
2	and **hundreds of anamials**$_i$ were there.	np	S	Th	To	introduce	–
3	The race was between **a hare**$_{ii}$ and	np	O	Sr	Co	introduce	–
	a tortoise$_{iii}$.	np	O	Sr	Co	introduce	–
B 4	As **the hare**$_{ii}$ came out of his door	np	S	A	To	maintain	–
	evryone$_i$ was cheering and shouting	np	S	A	To	reestablish	–
C 5	**the racoon**$_{iv}$ said	np	S	A	To	introduce	*chANT*⟩
	on your marks get set go						
6	**he**$_{iv}$ fired the gun	pro	S	A	To	maintain	main/PC+/R+⟩
D 7	and again **the hare**$_{ii}$ was faster	np	S	Th	To	reestablish	–
	than **the tortoise**$_{iii}$	np	S	Th	To	reestablish	–
8	when **the hare**$_{ii}$ got to a tree	np	S	Th	To	maintain	*chANT*⟩
	he$_{ii}$ was sleeppy	pro	S	Th	To	maintain	main/PC+/R+⟩
9	so **he**$_{ii}$ went to sleep	pro	S	A	To	maintain	main/PC+/R+⟩
10	**the tortoise**$_{iii}$ cot up with	np	S	A	To	reestablish	–
	the hare$_{ii}$	np	O	RO	Co	maintain	–
11	*sho*						
	the tortoise$_{iii}$ creeped slowly and	np	S	A	To	maintain	–
	quietly past **the hare**$_{ii}$.	np	O	RO	Co	maintain	–
12	**the tortoise**$_{iii}$ cept cwit	np	S	A	To	maintain	*chANT*⟩
E 13	wons **he**$_{iii}$ was past	pro	S	Th	To	maintain	main/PC+/R+⟩
	the hare$_{ii}$	np	O	RO	Co	reestablish	–
	he$_{iii}$ started to run	pro	S	A	To	maintain	main/PC+/R-⟩
F 14	**the hare**$_{ii}$ woke up	np	S	Th	To	reestablish	*chANT*⟩
15	and **ø**$_{ii}$ wised past	zero	S	A	To	maintain	main/PC+/R+⟩
	the tortoise$_{iii}$	np	O	RO	Co	reestablish	–
G 16	**he**$_{ii}$ stoped	pro	S	A	To	maintain	main/PC+/R-⟩
17	and **ø**$_{ii}$ saw	zero	S	Ex	To	maintain	main/PC+/R+⟩
	5 lovely bunys$_v$	np	O	Pe	Co	introduce	–
18	**the tortoise**$_{iii}$ went past	np	S	A	To	reestablish	–
	the hare$_{ii}$	np	O	RO	Co	maintain	*chANT*⟩
19	**the 5 bunnys**$_v$ said together	np	S	A	To	reestablish	–
	Arent you go on						
	asked **the bunnys**$_v$	np	S	A	To	maintain	–
20	*No not with my speed*						
	he$_{ii}$ said	pro	S	A	To	reestablish	re/PC+/R-⟩
21	*I'll so you sum tricks*						
22	after that **he**$_{ii}$ hered	pro	S	Ex	To	reestablish	re/PC+/R+⟩
	pepole$_i$	np	O	Pe	Co	reestablish	–
	cheering onc more						
H 23	**he**$_{ii}$ was on his way	pro	S	Th	To	maintain	main/PC+/R-⟩
24	**he**$_{ii}$ ran past	pro	S	A	To	maintain	main/PC+/R+⟩
	the tortoise$_{iii}$	np	O	RO	Co	reestablish	–
25	**the tortoise**$_{iii}$ got hi on his feet	np	S	A	To	maintain	*chANT*⟩
26	and **ø**$_{iii}$ started to walk fast	zero	S	A	To	maintain	main/PC+/R+⟩
I 27	**the tortoise**$_{iii}$ ran	np	S	A	To	reestablish	*chANT*⟩
28	and **ø**$_{iii}$ wone the race.	zero	S	Th	To	maintain	main/PC+/R+⟩

Tortoise/Hare Narrative 18

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day **tortoise**$_i$ and	np	S	Th	To	introduce	–
	the hare$_{ii}$ were going to have a race	np	S	Th	To	introduce	–
	with **each other**$_{i+\ ii}$	np	O	Sr[a]	Co	maintain	–
B 2	then **the hare**$_{ii}$ came out of his house	np	S	A	To	maintain	–
3	and then **everbody**$_{iii}$ claped	np	S	A	To	introduce	–
4	and then **tortoise**$_i$ came out of his house	np	S	A	To	reestablish	–
5	but **everybody**$_{iii}$ lafed	np	S	A	To	reestablish	–
6	then **the hare**$_{ii}$ was being silly	np	S	A	To	reestablish	–
	to **the tortoise**$_i$	np	O	R	Co	reestablish	–
C 7	when the race began						
	the hare$_{ii}$ was the right way round	np	S	Th	To	reestablish	–
8	and **the tortoise**$_i$ was the wrong way round	np	S	Th	To	reestablish	*chANT*⟩
9	but then **he**$_i$ was the right way round	pro	S	Th	To	maintain	main/PC+/R+⟩
D 10	and then **he**$_i$ catch up with	pro	S	A	To	maintain	main/PC+/R+⟩
	the hare$_{ii}$	np	O	RO	Co	reestablish	–
11	but **the hare**$_{ii}$ played a trick	np	S	A	To	maintain	–
	on **the tortoise**$_i$	np	O	R	Co	maintain	–
	because **the hare**$_{ii}$ fell asleep	np	S	Th	To	maintain	–
E 12	then **the tortoise**$_i$ was in the leed	np	S	Th	To	maintain	–
F 13	but then **the hare**$_{ii}$ awoke	np	S	Th	To	reestablish	*chANT*⟩
14	and **ø**$_{ii}$ was in the leed again	zero	S	Th	To	maintain	main/PC+/R+⟩
G 15	then **the hare**$_{ii}$ saw	np	S	Ex	To	maintain	*chANT*⟩
	some girls$_{iv}$	np	O	Pe	Co	introduce	⟨*chANT*
16	then **ø**$_{ii}$ was talking to	zero	S	Th	To	maintain	main/PC+/R-⟩
	them$_{iv}$ for a long time	pro	O	R	Co	maintain	⟨main/PC+/R-
H 17	then **the tortoise**$_i$ past	np	S	A	To	reestablish	*chANT*⟩
	the girls$_{iv}$	np	O	RO	Co	maintain	–
18	and then **he**$_i$ was in the leed	pro	S	Th[b]	To	maintain	main/PC+/R-⟩
I 19	then **the hare**$_{ii}$ shode	np	S	A	To	reestablish	*chANT*⟩
	the girls$_{iv}$ some trick	np	O	B	Co	reestablish	–
20	but then **he**$_{ii}$ went away	pro	S	A	To	maintain	main/PC+/R-⟩
J 21	but **the tortoise**$_i$ was still in the leed	np	S	Th	To	reestablish	–
22	and **the hare**$_{ii}$ couldn't catch up with	np	S	A	To	reestablish	–
	the tortoise$_i$	np	O	RO	Co	maintain	–
K 22	and **the tortoise**$_i$ won the race	np	S	Th	To	maintain	*chANT*⟩
23	and **everybody**$_{iii}$ claped	np	S	A	To	reestablish	⟨*chANT*
24	and **ø**$_{iii}$ lifted	zero	S	A	To	maintain	⟨main/PC+/R+
	him$_i$ up.	pro	O	P	Co	reestablish	re/PC-/R-⟩

[a] Overlaps with 'Associate'.

[b] Overlaps with 'Reference Object'.

Tortoise/Hare Narrative 19

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day **tortoise**$_i$ and	np	S	Th	To	introduce	–
	Hare$_{ii}$ had a race	np	S	Th	To	introduce	–
B 2	**every budee**$_{iii}$ was shouting	np	S	A	To	introduce	–
	when **the to racers**$_{i+\ ii}$ came out	np	S	A	To	reestablish	–
3	**the hare**$_{ii}$ started playing joces	np	S	A	To	reestablish	*chANT*⟩
	on **the tortoise**$_i$	np	O	R	Co	reestablish	*chANT*⟩
4	and then **a scwirl**$_{iv}$ blowe a wisle	np	S	A	To	introduce	–
5	and off **they**$_{i+\ ii}$ went	pro	S	A	To	reestablish	re/PC-/R-⟩
C 6	**the hare**$_{ii}$ was so so fact	np	S	Th	To	reestablish	*chANT*⟩
	that **he**$_{ii}$ sa under a tree	pro	S	A	To	maintain	main/PC+/R+⟩
	biterding to be asleep						
7	then **the tortoise**$_i$	np	S	Ex	To	reestablish	*chANT*⟩
	he$_i$ thot	pro	S	Ex	To	maintain	main/PC+/R+⟩
	the hare$_{ii}$ was asleep	np	S	Th	To	maintain	–
8	and **he**$_i$ said	pro	S	A	To	maintain	main/PC+/R-⟩
	sh-sh						
9	and then **the hare**$_{ii}$ jumped up	np	S	A	To	reestablish	*chANT*⟩
10	and **ø**$_{ii}$ ran off	zero	S	A	To	maintain	main/PC+/R+⟩
D 11	**the hare**$_{ii}$ was away ahed	np	S	Th	To	maintain	–
E 12	then **the hare**$_{ii}$ wixd pased	np	S	A	To	maintain	*chANT*⟩
	four butfull girl rabbits$_v$	np	O	RO	Co	introduce	⟨*chANT*
F 13	and then **he**$_{ii}$ walked back to	pro	S	A	To	maintain	main/PC+/R-⟩
	them$_v$	pro	O	RO	Co	maintain	⟨main/PC+/R-
14	and **he**$_{ii}$ shode	pro	S	A	To	maintain	main/PC+/R-⟩
	them$_v$ sum trics	pro	O	B	Co	maintain	⟨main/PC+/R-
15	and then **the tortise**$_i$ pased	np	S	A	To	reestablish	–
16	but **the hare**$_{ii}$ just laft	np	S	A	To	reestablish	–
G 17	and by this time **the tortise**$_i$ was nere the finish line.	np	S	Th	To	reestablish	–
H 18	and then **the hare**$_{ii}$ trid to cach up	np	S	A	To	reestablish	*chANT*⟩
19	but **he**$_{ii}$ coodint	pro	S	A	To	maintain	main/PC+/R+⟩

Tortoise/Hare Narrative 20

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**The hare$_i$** was	np	S	Th	To	introduce	*chANT*⟩
	going to have a race						
	with **the tortoise$_{ii}$**	np	O	As	Co	introduce	*chANT*⟩
	to see ho wins						
2	**the rcone$_{iii}$** fired a gun	np	S	A	To	introduce	–
3	and off **they$_{i+ii}$** went	pro	S	A	To	reestablish	re/PC-/R-⟩
B 4	**the hare$_i$** knoked	np	S	A	To	reestablish	–
	the tortoise$_{ii}$ over	np	O	P	Co	reestablish	–
5	and **the hare$_i$** was in the front	np	S	Th	To	maintain	–
6	**the tortoise$_{ii}$** clomped behined	np	S	A	To	reestablish	–
C 7	**the hare$_i$** got tired	np	S	Th	To	reestablish	*chANT*⟩
8	so **he$_i$** went to sleep	pro	S	A	To	maintain	main/PC+/R+⟩
D 9	and **the tortoise$_{ii}$** was in front	np	S	Th	To	reestablish	–
E 10	but **the hare$_i$** woce up	np	S	Th	To	reestablish	*chANT*⟩
11	and **he$_i$** was in the lead	pro	S	Th	To	maintain	main/PC+/R+⟩
F 12	later **he$_i$** saw	pro	S	Ex	To	maintain	main/PC+/R+⟩
	4 bunny rabets$_{iv}$	np	O	Pe	Co	introduce	⟨*chANT*
13	**he$_i$** shoed tricks	pro	S	A	To	maintain	main/PC+/R-⟩
	to **them$_{iv}$**	pro	O	B	Co	maintain	⟨main/PC+/R-
G 14	**the tortoies$_{ii}$** was in the lead	np	S	Th	To	reestablish	*chANT*⟩
15	but **the hare$_i$** let	np	S	A	To	reestablish	⟨*chANT*
	him$_{ii}$ be in front	pro	O	B	Co	maintain	main/PC-/R-⟩
	because **he$_i$** cood run faster	pro	S	B	To	maintain	⟨main/PC+/R-
16	but wene **he$_i$** heard	pro	S	Ex	To	maintain	⟨main/PC+/R+
	the fans$_v$ rore	np	O	Pe	Co	introduce	–
	he$_i$ saw	pro	S	Ex	To	maintain	⟨main/PC+/R-
	the tortoies$_{ii}$ was	np	S	Th	To	maintain	–
	going to win						
17	**he$_i$** was away to run fast	pro	S	A	To	maintain	⟨main/PC+/R-
H 18	but **the tortoies$_{ii}$** got across the finish line	np	S	A	To	reestablish	*chANT*⟩
19	**he$_{ii}$** had wun	pro	S	Th	To	maintain	main/PC+/R+⟩
20	**the fans$_v$** lifted	np	S	A	To	reestablish	–
	him$_{ii}$ up in the air	pro	O	P	Co	maintain	main/PC-/R-⟩
21	**the hare$_i$** was cross	np	S	Ex	To	reestablish	–

Tortoise/Hare Narrative 21

Scene	No	Utterance	form	syn	sem	prag	cont	strat
A	1	**A Hare**$_i$ and	np	S	Th	To	introduce	–
		a tortoise$_{ii}$ had a race	np	S	Th	To	introduce	–
	2	and **the crowd**$_{iii}$ all cheered	np	S	A	To	introduce	*chANT*⟩
		for **the Hare**$_i$	np	O	B	Co	maintain	–
	3	and **they**$_{iii}$ laffed at	pro	S	A	To	maintain	main/PC+/R-⟩
		the tortoise$_{ii}$	np	O	R	Co	reestablish	–
	4	and **the man**$_{iv}$ tried	np	S	A	To	introduce	*chANT*⟩
		to blow the whistle						
	5	but **he**$_{iv}$ could not	pro	S	A	To	maintain	main/PC+/R+⟩
	6	so **he**$_{iv}$ took a deep breath	pro	S	A	To	maintain	main/PC+/R+⟩
	7	a his buttons fell of						
	8	then **he**$_{iv}$ fired the gun	pro	S	A	To	reestablish	re/PC+/R+⟩
	9	**the hare**$_i$ went speeding away	np	S	A	To	reestablish	–
	10	and **the tortoise**$_{ii}$ was still at the start	np	S	Th	To	reestablish	–
	11	and then **the starter**$_{iv}$ fired bullets	np	S	A	To	reestablish	–
		at **the tortoise**$_{ii}$	np	O	G[a]	Co	maintain	*chANT*⟩
	12	and **he**$_{ii}$ started todling off down the track	pro	S	A	To	maintain	main/PC-/R+⟩
B	13	and **the hare**$_i$ was speeding ahead	np	S	Th	To	reestablish	⟨*chANT*
		of **him**$_{ii}$	pro	O	RO	Co	maintain	main/PC-/R-⟩
	14	**he**$_i$ past	pro	S	A	To	maintain	⟨main/PC+/R-
		the girls school$_v$[b]	np	O	Lo	Co	introduce	*chANT*⟩
	15	and **they**$_v$ went	pro	S	A	To	maintain	main/PC-/R+⟩
		Hello						
C	16	and **he**$_i$ speeded back	pro	S	A	To	reestablish	⟨re/PC+/R-
		to **them**$_v$	pro	O	G	Co	maintain	main/PC-/R-⟩
	17	**he**$_i$ said	pro	S	A	To	maintain	⟨main/PC+/R-
		my name is speed						
	18	and **they**$_v$ said	pro	S	A	To	reestablish	re/PC-/R-⟩
		come and play with the[c]						
	19	so **he**$_i$ went and shot a bow	pro	S	A	To	reestablish	⟨re/PC+/R-
	20	a **ø**$_i$ poot an appale on his head	zero	S	A	To	maintain	⟨main/PC+/R+
	21	and it sliced it open[d]						
	22	and hit the bullseye						
	23	and **he**$_i$ throw a ball	pro	S	A	To	reestablish	⟨re/PC+/R+
	24	and **ø**$_i$ hit it with a bat	zero	S	A	To	maintain	⟨main/PC+/R+
	25	and **ø**$_i$ cot it	zero	S	A	To	maintain	⟨main/PC+/R+
	26	**he**$_i$ started playin tennis	pro	S	A	To	maintain	⟨main/PC+/R+
		in till **he**$_i$ herd	pro	S	Ex	To	maintain	⟨main/PC+/R+
		crowd$_{iii}$ cheering	np	O	Pe	Co	reestablish	–
	27	and **he**$_i$ went speeding	pro	S	A	To	maintain	⟨main/PC+/R-
D	28	and **the tortoise**$_{ii}$ ran	np	S	A	To	reestablish	*chANT*⟩
	29	and **ø**$_{ii}$ made his head longer	zero	S	A	To	maintain	main/PC+/R+⟩
	30	and **ø**$_{ii}$ one the race	zero	S	Th	To	maintain	main/PC+/R+⟩

[a] Overlaps with 'Patient' and 'Recipient'.

[b] Analyzed as a character reference.

[c] Incomplete utterance.

[d] Interpreted to mean 'an arrow sliced the apple open'.

Tortoise/Hare Narrative 22

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One fine sunny day **evrebody**$_{i}$ in the wood	np	S	A	To	introduce	–
	was getting ready for						
	a big race of **the hare**$_{ii}$	np	O	Sr	Co	introduce	–
	and **the tortoise**$_{iii}$	np	O	Sr	Co	introduce	–
B 2	When **the hare**$_{ii}$ came out	np	S	A	To	maintain	–
	every one$_{i}$ cheered.	np	S	A	To	maintain	–
3	but when **the tortoise**$_{iii}$ came	np	S	A	To	reestablish	–
	evreyone$_{i}$ laghed.	np	S	A	To	maintain	–
4	**the hare**$_{ii}$ and	np	S	A	To	reestablish	–
	the tortoise$_{iii}$ took thair places.	np	S	A	To	maintain	–
5	But **the tortoise**$_{iii}$ was faceing	np	S	Th	To	maintain	–
	the wrong way						
6	and when the gun went off						
	the hare$_{ii}$ was off.	np	S	A	To	reestablish	–
7	But **the tortoise**$_{iii}$ hid in his shell	np	S	A	To	reestablish	–
8	the gun went off a few more times						
	to get **the tortoise**$_{iii}$ going.	np	O	P	Co	maintain	–
C 9	While **the tortoise**$_{iii}$	np	S	A	To	maintain	*chANT*⟩
	was jogging along						
	the hare$_{ii}$ saw	np	S	Ex	To	reestablish	–
	him$_{iii}$.	pro	O	Pe	Co	maintain	main/PC-/R-⟩
10	**The hare**$_{ii}$ laghed	np	S	A	To	maintain	–
	as **the tortoise**$_{iii}$ jogged by	np	S	A	To	maintain	–
D 11	**the hare**$_{ii}$ ran in front	np	S	A	To	reestablish	*chANT*⟩
12	when **he**$_{ii}$ passed a girls school ...	pro	S	A	To	maintain	main/PC+/R+⟩

Tortoise/Hare Narrative 23

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day **a tortoise**$_{i}$ and	np	S	Th	To	introduce	–
	a hare$_{ii}$ had a race	np	S	Th	To	introduce	–
2	when the gun fierd						
	the hare$_{ii}$ ran so fast	np	S	A	To	maintain	*chANT*⟩
	that **he**$_{ii}$ knocked	pro	S	Sr	To	maintain	main/PC+/R+⟩
	the tortoise$_{i}$ over	np	O	P	Co	maintain	–
3	then **the tortoise**$_{i}$ started	np	S	A	To	maintain	–
	to run						
B 4	then **the hare**$_{ii}$ stoped at a tree	np	S	A	To	reestablish	*chANT*⟩
5	and **ø**$_{ii}$ lay down	zero	S	A	To	maintain	main/PC+/R+⟩
	to rest						
6	then **the tortoise**$_{i}$ came	np	S	A	To	reestablish	*chANT*⟩
	upon **the hare**$_{ii}$	np	O	Pe[a]	Co	maintain	–
7	**he**$_{i}$ tiptod past	pro	S	A	To	maintain	main/PC+/R-⟩
	the hare$_{ii}$	np	O	RO	Co	maintain	–
8	**he**$_{i}$ hadend gon far	pro	S	A	To	maintain	main/PC+/R-⟩
	when **the hare**$_{ii}$ awock	np	S	Th	To	maintain	–
C 9	then **the hare**$_{ii}$ went shoting	np	S	A	To	maintain	–
	past **the tortoise**$_{i}$ agin	np	O	RO	Co	maintain	–
D 10	then **the hare**$_{ii}$ stoped at	np	S	A	To	maintain	–
	4 little girls$_{iii}$	np	O	RO	Co	introduce	–
11	and **the tortoise**$_{i}$ went walking past	np	S	A	To	reestablish	–
	the hare$_{ii}$.	np	O	RO	Co	maintain	–
12	then **the little girls**$_{iii}$ said	np	S	A	To	reestablish	–
	you beter						

[a] Overlaps with 'Reference Object.'

Tortoise/Hare Narrative 24

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day **the hare**$_i$ and	np	S	Ex	To	introduce	*chANT*⟩
	the tortoise$_{ii}$ decided	np	S	Ex	To	introduce	*chANT*⟩
	that **they**$_{i+\ ii}$ were going	pro	S	Th	To	maintain	main/PC+/R+⟩
	to have a race						
B 2	**The hare**$_i$ was in his tent	np	S	Th	To	maintain	–
3	and **the tortoise**$_{ii}$ was in his.	np	S	Th	To	reestablish	–
C 4	At race time **the hare**$_i$ built up his hopes	np	S	Ex	To	reestablish	*chANT*⟩
	that **he**$_i$ was going to win.	pro	S	Th	To	maintain	main/PC+/R+⟩
5	Suddenly bang!						
6	a gun fired						
7	and the race started						
D 8	**Hare**$_i$ was in the lead	np	S	Th	To	reestablish	*chANT*⟩
9	soon **he**$_i$ saw	pro	S	Ex	To	maintain	main/PC+/R+⟩
	tortoise$_{ii}$	np	O	Pe	Co	reestablish	–
	far behind						
10	so **he**$_i$ lay down beside a tree to rest	pro	S	A	To	maintain	main/PC+/R-⟩
E 11	and later **he**$_i$ woke up	pro	S	Th	To	maintain	main/PC+/R+⟩

Tortoise/Hare Narrative 25

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day a **tortoise**$_i$ and a	np	S	A	To	introduce	–
	hare$_{ii}$ made a deal	np	S	A	To	introduce	–
2	the deal was to have a big race						
B 3	a few weeks later the big day came						
4	it had a sighn saying						
	big race tortoise vs hare						
C 5	**A badger**$_{iii}$ said	np	S	A	To	introduce	–
	on your marks get set go						
6	a big gun went BANG!!!						
7	**the hare**$_{ii}$ went	np	S	A	To	reestablish	–
	but not the **the tortoise**$_i$	np	S	A	To	reestablish	–
8	**the badger**$_{iii}$ went BANG!!! again	np	S	A	To	reestablish	–
9	and **the tortoise**$_i$ went	np	S	A	To	reestablish	–
D 10	**the hare**$_{ii}$ went down a hill	np	S	A	To	reestablish	–
E 11	The **hare**$_{ii}$ ran	np	S	A	To	maintain	*chANT*⟩
	and **ø**$_{ii}$ ran	zero	S	A	To	maintain	main/PC+/R+⟩
	untill suddenly **he**$_{ii}$ decided	pro	S	A	To	maintain	main/PC+/R+⟩
	that **he**$_{ii}$ would take a little snore	pro	S	A	To	maintain	main/PC+/R+⟩
12	**the tortoise**$_i$ suddenly saw	np	S	Ex	To	reestablish	*chANT*⟩
	the hare$_{ii}$	np	O	Pe	Co	maintain	–
	snoring away						
13	**he**$_i$ quickly ran	pro	S	A	To	maintain	main/PC+/R-⟩
F 14	**the hare**$_{ii}$ opened his eyes	np	S	Th	To	reestablish	*chANT*⟩
15	and **ø**$_{ii}$ saw	zero	S	Ex	To	maintain	main/PC+/R+⟩
	the tortoise$_i$	np	O	Pe	Co	reestablish	–

Tortoise/Hare Narrative 26

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day a race was going to be held						
2	a **tortoise**$_i$ was going to race	np	S	A	To	introduce	–
	a **hare**$_{ii}$.	np	O	As	Co	introduce	–
3	**Everybody**$_{iii}$ waited for	np	S	A	To	introduce	⟨*chANT*
	the hare$_{ii}$	np	O	G	Co	maintain	–
B 4	then a door opened						
5	and **a hare**$_{ii}$ came out	np	S	A	To	reestablish	–
6	**they**$_{iii}$ started to cheer	pro	S	A	To	reestablish	⟨re/PC+/R-
7	then **the tortoise**$_i$ came out of another door	np	S	A	To	reestablish	–
8	**the croud**$_{iii}$ laughed	np	S	A	To	reestablish	–
9	**the two animals**$_{i+ii}$ took there places	np	S	A	To	reestablish[a]	–
10	**the hare**$_{ii}$ held out his hand	np	S	A	To	reestablish	*chANT*⟩⟩
11	**the tortoise**$_i$ said	np	S	A	To	reestablish	–
	May the best man win						
12	**the tortoise**$_i$ was about	np	S	Th[b]	To	maintain	–
	to shacke the hares hand						
	when **he**$_{ii}$ pulled it away	pro	S	A	To	reestablish	re/PC-/R+⟩
13	*you got me on that one*						
	said **the tortoise**$_i$	np	S	A	To	maintain	–
14	then a voice came						
	on your marks get set go!						
15	**the hare**$_{ii}$ went zooming ahead	np	S	A	To	reestablish	–
	of **the tortoise**$_i$	np	O	RO	Co	reestablish	–
	because **the tortoise**$_i$ just stayed	np	S	A	To	maintain	*chANT*⟩
	where **he**$_i$ was	pro	S	Th	To	maintain	main/PC+/R+⟩
16	**the starter**$_v$ got angry	np	S	Ex	To	introduce	*chANT*⟩
17	so **he**$_v$ fired 3 bulots at his bottom	pro	S	A	To	maintain	main/PC+/R+⟩
18	**the tortoise**$_i$ moved	np	S	Th[c]	To	reestablish	*chANT*⟩
19	and ø$_i$ went away from his space	zero	S	A	To	maintain	main/PC+/R+⟩
C 20	meanwhile **the hare**$_{ii}$ was beside some trees	np	S	Th	To	reestablish	*chANT*⟩
21	**he**$_{ii}$ ran past them	pro	S	A	To	maintain	main/PC+/R+⟩
22	and ø$_{ii}$ made the roots come up	zero	S	Sr	To	maintain	main/PC+/R+⟩
23	**he**$_{ii}$ was feling a bit tired	pro	S	Th	To	maintain	main/PC+/R+⟩
24	so **he**$_{ii}$ lay down to rest ...	pro	S	A	To	maintain	main/PC+/R+⟩

[a] Synonomous with **the tortoise**$_{i+}$**the hare**$_{ii}$.

[b] Overlaps with 'Agent'.

[c] Presumably, involuntarily. Overlaps with 'Patient.'

Tortoise/Hare Narrative 27

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	**The hare**$_i$ and	np	S	Th	To	introduce	–
	the tortoise$_{ii}$ were having a race	np	S	Th	To	introduce	–
2	**the hare**$_i$ was sure to win.	np	S	Th	To	maintain	–
B 3	**the hare**$_i$ ran a way a hed of	np	S	A	To	maintain	–
	the tortoise$_{ii}$	np	O	RO	Co	reestablish	–
C 4	**the hare**$_i$ lay down to sleep	np	S	A	To	maintain	–
5	but **the tortoise**$_{ii}$ sneaked	np	S	A	To	reestablish	–
	past **hare**$_i$.	np	O	RO	Co	maintain	–
D 6	when **hare**$_i$ woke up	np	S	Th	To	maintain	*chANT*⟩
	he$_i$ started to run again.	pro	S	A	To	maintain	main/PC+/R+⟩
E 7	as **he**$_i$ was runing	pro	S	Th	To	maintain	main/PC+/R+⟩
	he$_i$ met	pro	S	Ex	To	maintain	main/PC+/R+⟩
	three prety girls$_{iii}$ sitting on a wall	np	O	Pe	Co	introduce	–
8	**the hare**$_i$ stoped	np	S	A	To	maintain	*chANT*⟩
9	and ø$_i$ showed	zero	S	A	To	maintain	main/PC+/R+⟩
	them$_{iii}$ him[a] playing tennis cricket and baseball really fast	pro	O	B	Co	reestablish	re/PC+/R-⟩
F 10	**he**$_i$ ran	pro	S	A	To	maintain	main/PC-/R+⟩
11	**he**$_i$ went past	pro	S	A	To	maintain	main/PC+/R+⟩
	tortoise$_{ii}$.	np	O	RO	Co	reestablish	–
G 12	I liked when **tortoise legs**$_{ii}$[b] grew longer	np	S	Th	To	maintain	*chANT*⟩
13	and **he**$_{ii}$ kept jumping a little bit more every time	pro	S	A	To	maintain	main/PC+/R+⟩
14	but **hare**$_i$ slowed down	np	S	Th	To	reestablish	–
15	and ø$_{ii}$ nearly got past.	zero	S	A	To	reestablish	re/PC+/R-⟩
16	**hare**$_i$ slowed down even more	np	S	Th	To	reestablish	–
17	and this time **tortoise**$_{ii}$ got past	np	S	A	To	reestablish	–
18	**tortoise**$_{ii}$ streched his neck out	np	S	A	To	maintain	–
19	his head just got throw before **hare**$_i$	np	O	Th	Co	reestablish	–
20	**the crowd**$_{iv}$ was chearing for	np	S	A	To	introduce	–
	the tortoise$_{ii}$	np	O	B	Co	reestablish	–

[a] Interpreted to mean 'his', hence not analyzed.

[b] Body parts analysed as a character reference.

Tortoise/Hare Narrative 28

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day **everyone**$_i$ was going	np	S	Th	To	introduce	–
	to see **the hare**$_{ii}$ and	np	O	Pe	Co	introduce	–
	the tortoise$_{iii}$ run a race	np	O	Pe	Co	introduce	–
2	**everybody**$_i$ was exsited	np	S	Ex	To	maintain	–
B 3	and then **the hare**$_{ii}$ came out of his hole	np	S	A	To	maintain	$chANT\rangle$
4	and **everyone**$_i$ was claping	np	S	A	To	reestablish	–
	for **him**$_{ii}$	pro	O	B	Co	maintain	main/PC-/R-$\rangle$
5	and **the tortoise**$_{iii}$ came out of his hole	np	S	A	To	reestablish	$chANT\rangle$
6	and **evryone**$_i$ was lafing at	np	S	A	To	reestablish	$\langle chANT$
	him$_{iii}$	pro	O	R	Co	maintain	main/PC-/R-$\rangle$
	because **thay**$_i$ didn't think	pro	S	Ex	To	maintain	$\langle$main/PC+/R-
	he$_{iii}$ woud win the race	pro	S	Th	To	maintain	main/PC-/R-$\rangle$
	because **he**$_{iii}$ was very slow at running	pro	S	Th	To	maintain	main/PC+/R+$\rangle$
C 7	then **the starter**$_{iv}$ said	np	S	A	To	introduce	–
	on your marks get set go						
8	and off went **the hare**$_{ii}$	np	S	A	To	reestablish	–
9	but **the tortoise**$_{iii}$ staed thair for a minite	np	S	A	To	reestablish	$chANT\rangle$
10	and **the starter**$_{iv}$ shot at	np	S	A	To	reestablish	–
	him$_{iii}$	pro	O	G[a]	Co	maintain	main/PC-/R-$\rangle$
11	and off **he**$_{iii}$ went	pro	S	A	To	maintain	main/PC-/R+$\rangle$
	jogging along the road						
D 12	**the hare**$_{ii}$ was wizzing down the road	np	S	A	To	reestablish	$chANT\rangle$
13	then **he**$_{ii}$ went for a prtend sleep	pro	S	A	To	maintain	main/PC+/R+$\rangle$
14	then **the tortoise**$_{iii}$ came by	np	S	A	To	reestablish	$chANT\rangle$
15	and **ø**$_{iii}$ stoped	zero	S	A	To	maintain	main/PC+/R+$\rangle$
16	and **ø**$_{iii}$ tiptoed past	zero	S	A	To	maintain	main/PC+/R+$\rangle$
17	and then **hare**$_{ii}$ woke up	np	S	Th	To	reestablish	$chANT\rangle$
18	and **ø**$_{ii}$ zoomed by	zero	S	A	To	maintain	main/PC+/R+$\rangle$

[a] Overlaps with 'Recipient'.

Tortoise/Hare Narrative 29

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day there was a big race of						
	the tortoise$_i$ and	np	O	Th	Co	introduce	*chANT*⟩
	the hare$_{ii}$	np	O	Th	Co	introduce	*chANT*⟩
2	There were **croweds of animals**$_{iii}$	np	S	Th	To	introduce	–
B 3	soon **they**$_{i+\ ii}$[a] were ready to start	pro	S	Th	To	reestablish	re/PC-/R-⟩
4	**the tortoise**$_i$ was facing the wrong way	np	S	Th	To	reestablish	–
5	then **the raccoon**$_{iv}$ said	np	S	A	To	introduce	–
	ready stdy go!						
6	and then **they**$_{i+\ ii}$ were off	pro	S	A	To	reestablish	re/PC+/R-⟩
7	then **the raccoon**$_{iv}$ realesed	np	S	Ex	To	reestablish	*chANT*⟩
	the tortoise$_i$ hadn't started	np	S	Th	To	reestablish	⟨*chANT*
8	so **he**$_{iv}$ banged his gun at	pro	S	A	To	maintain	main/PC+/R-⟩
	him$_i$	pro	O	R	Co	maintain	⟨main/PC-/R-
9	and **he**$_i$ was off	pro	S	A	To	maintain	⟨main/PC-/R+
C 10	as **the hare**$_{ii}$ went by	np	S	Th	To	reestablish	*chANT*⟩
	everything blew off						
	at the speed **he**$_{ii}$ was going,	pro	S	Th	To	maintain	main/PC+/R+⟩
D 11	soon **he**$_{ii}$ lay down beneth a tree	pro	S	A	To	maintain	main/PC+/R+⟩
	so that **the tortoise**$_i$ would think	np	S	Ex	To	reestablish	⟨*chANT*
	he$_{ii}$ was sleeping	pro	S	Th	To	maintain	main/PC+/R-⟩
12	so **he**$_i$ tiptoed past	pro	S	A	To	maintain	⟨main/PC+/R-
	the hare$_{ii}$	np	O	RO	Co	maintain	–

[a] Alternately, 'they' could mean 'tortoise$_i$+ hare$_{ii}$+ croweds of animals$_{iii}$', or 'croweds of animals$_{iii}$.'

Tortoise/Hare Narrative 30

Scene No	Utterance	form	syn	sem	prag	cont	strat
A 1	One day **the tortoise**$_i$ and	np	S	Th	To	introduce	–
	hare$_{ii}$ had a race	np	S	Th	To	introduce	–
2	**hare**$_{ii}$ got a big cheer	np	S	B	To	maintain	–
3	**tortoise**$_i$ was laughed at	np	S	R	To	reestablish	–
4	then the gun went						
	BANG						
5	**hare**$_{ii}$ ran	np	S	A	To	reestablish	*chANT*⟩
	as fast as **he**$_{ii}$ could	pro	S	A	To	maintain	main/PC+/R+⟩
6	**tortoise**$_i$ never went	np	S	A	To	reestablish	*chANT*⟩
7	**the animal**$_{iii}$ shot at	np	S	A	To	introduce	–
	him$_i$	pro	O	G	Co	maintain	main/PC-/R-⟩
8	then of **he**$_i$ went	pro	S	A	To	maintain	main/PC-/R+⟩
B 9	as **the hare**$_{ii}$ was in the leeg	np	S	Th	To	reestablish	*chANT*⟩
	he$_{ii}$ lay down on the bottom of the tree	pro	S	A	To	maintain	main/PC+/R+⟩
10	**the tortoise**$_i$ crept by very quitely	np	S	A	To	reestablish	–
C 11	then **hare**$_{ii}$ woke up	np	S	Th	To	reestablish	*chANT*⟩
12	and **ø**$_{ii}$ off again	zero	S	A	To	maintain	main/PC+/R+⟩
D 13	then **hare**$_{ii}$ saw	np	S	Ex	To	maintain	–
	four baby$_{iv}$[a] ...	np	O	Pe	Co	introduce	–

[a] Ie, four girl bunny rabbits.

C.2 Tortoise/Hare analysis tables

This section contains a series of tables output from the analysis of Tortoise/Hare narratives listed in the previous section of this Appendix.

C.2.1 Narrative features

Table C.1 below shows, for each of the twenty-four narratives in the Tortoise/Hare set: total number of Scenes ('No of Scenes'); total number of utterances ('No of Utts'); total number of characters referred to ('No of Chars'), total number of references to characters ('No of Refs'); total number of characters pronominalized ('No of Chars Pro'); and the total number of each continuity function judgment ('No of Cont Func': **introduce** ('Intro'), **maintain** ('Mntn'), **reestablish** ('Reest')).

Table C.1: Tortoise/Hare: Summary of narrative features

Narr No	No of Scenes	No of Utts	No of Chars	No of Refs	No of Chars Pro	No of Cont Func		
						Intro	Mntn	Reest
1	5	17	6	26	3	5	14	7
2	5	11	3	16	1	3	8	5
3	6	23	5	30	2	6	14	10
4	4	15	4	18	2	4	6	8
5	4	8	3	11	2	2	6	3
6	5	11	6	16	3	5	5	6
7	5	16	5	26	2	5	16	5
8	2	9	2	10	1	2	6	2
9	1	7	5	7	1	4	2	1
10	4	10	5	18	1	5	11	2
11	4	23	4	26	3	4	14	8
12	9	29	4	32	3	3	15	14
13	8	23	6	29	4	6	14	9
14	6	19	5	25	3	4	13	8
15	5	15	5	16	3	4	7	5
16	5	23	5	33	2	6	19	8
17	9	28	5	40	3	5	21	14
18	11	24	5	37	4	4	18	15
19	8	19	6	28	4	5	12	11
20	8	21	6	31	4	5	14	12
21	4	30	5	36	5	5	19	12
22	4	12	3	20	2	3	12	5
23	4	12	3	21	2	3	14	4
24	5	11	3	12	2	2	6	4
25	6	15	3	18	2	3	7	8
26	3	24	5	27	4	4	11	12
27	7	20	4	29	3	4	16	9
28	4	18	4	26	3	4	12	10
29	4	12	5	19	4	4	8	7
30	4	13	4	17	2	4	7	6
total:	159	518	134	700	80	123	347	230

C.2.2 Types of utterances

Table C.2 below shows, for each of the twenty-four narratives in the Tortoise/Hare set: the total number of each type of utterance, 'simple' *vs.* 'complex'.

Table C.2: Tortoise/Hare: Types of utterances

	Utterance type:	
Narr	Simple	Complex
1	11	6
2	10	1
3	19	4
4	8	7
5	6	2
6	8	3
7	12	4
8	9	0
9	5	2
10	7	3
11	17	6
12	26	3
13	21	2
14	17	2
15	14	1
16	13	10
17	20	8
18	21	3
19	14	5
20	7	3
21	25	5
22	7	5
23	8	4
24	7	4
25	11	4
26	18	6
27	13	7
28	14	4
29	7	5
30	9	4
total:	395	123

C.2.3 Character references

Table C.3 below shows, for each of the twenty-four narratives in the Tortoise/Hare set: the total number of character references ('Total Refs'):

- for which the continuity function judgment was: 'Introduce', 'Maintain', or 'Reestablish' and:
- which were *not pronominalized* or *pronominalized*, *i.e.* , having the form **np** ('np') or **pro** *or* **zero** ('pro/ø'); and:
- which were produced on a scene boundary ('bound') *vs.* within a scene body ('body').[1]

Table C.3: Tort/Hare: Character references: continuity function, form, location

Narr	Total	Introduce				Maintain				Reestablish			
		np		pro/ø		np		pro/ø		np		pro/ø	
No	Refs	bound	body	bound	body	bound	body	bound	body	bound	body	bound	body
1	26	3	2	0	0	0	3	1	10	3	3	0	1
2	16	3	0	0	0	4	3	0	1	0	5	0	0
3	30	2	4	0	0	1	0	1	12	4	6	0	0
4	18	3	1	0	0	1	1	1	3	2	6	0	0
5	11	2	0	0	0	1	2	2	1	1	1	0	1
6	16	3	2	0	0	3	0	0	2	2	3	0	1
7	26	3	2	0	0	4	1	2	9	0	4	0	1
8	10	2	0	0	0	0	5	1	0	0	2	0	0
9	7	1	3	0	0	0	1	0	1	0	1	0	0
10	18	2	3	0	0	1	1	2	7	1	1	0	0
11	26	3	1	0	0	0	0	2	12	1	5	0	2
12	32	3	0	0	0	2	2	2	9	4	8	0	2
13	29	4	2	0	0	3	0	1	10	5	3	0	1
14	25	2	2	0	0	4	6	0	3	2	5	0	1
15	16	1	3	0	0	1	1	1	4	1	2	0	2
16	32	3	4	0	0	2	10	0	7	2	5	0	0
17	40	1	5	0	0	1	8	4	8	6	6	0	2
18	37	3	1	0	0	6	4	1	7	7	7	0	1
19	28	4	1	0	0	2	1	3	6	4	6	0	1
20	31	3	2	0	0	0	2	1	11	7	4	0	1
21	36	2	3	0	0	0	2	2	15	2	5	1	4
22	20	3	0	0	0	4	6	1	1	1	4	0	0
23	21	3	0	0	0	3	7	0	4	1	3	0	0
24	12	2	0	0	0	1	0	3	2	2	2	0	0
25	18	3	0	0	0	1	1	3	2	2	6	0	0
26	27	0	4	0	0	1	3	1	7	0	10	0	2
27	28	3	1	0	0	3	5	3	4	1	7	0	1
28	26	4	0	0	0	1	1	0	11	1	8	0	0
29	19	2	2	0	0	0	1	3	4	2	3	1	1
30	17	3	1	0	0	1	1	1	4	1	5	0	0
total:	700	76	48	0	0	51	78	42	177	65	136	2	25

[1] A scene boundary judgment was made for a character reference if the reference occurred in the first utterance in a scene; however, if a **pro** or ø repeated reference to a character referred to in the first utterance of a scene, it was counted as occurring within a scene body.

C.2.4 Role convergences

Table C.4 on the following page presents a 'role convergence summary', showing, for each of the twenty-four narratives in the Tortoise/Hare set: the total number of character references ('Tot Refs'):

- for which was judged a role convergence of syntactic role Subject (S) and pragmatic role Topic (T) ('S/.../To') *vs.* syntactic role Object (O) and pragmatic role Comment (Co) ('O/.../Co') and:
  - all semantic roles which converged with 'S/.../To' and 'O/.../Co'.

Table C.4: Tortoise/Hare: Role convergence summary

Narr	Tot	S/.../To						O/.../Co									
No	Refs	A	Ex	Th	B	R	Sr	P	Pe	As	Sr	R	Lo	RO	Th	G	B
1	26	11	2	5	0	0	0	2	0	0	2	0	0	3	0	0	1
2	16	6	0	6	0	0	0	0	0	1	0	0	0	3	0	0	0
3	30	16	1	6	0	0	1	0	1	2	0	0	0	3	0	0	0
4	18	12	0	4	0	0	0	0	0	0	0	0	0	0	0	0	2
5	11	3	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0
6	16	7	0	5	0	0	0	0	0	0	2	0	0	1	0	0	1
7	26	10	2	5	2	0	0	1	2	0	0	0	0	4	0	0	0
8	10	8	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
9	7	5	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
10	18	3	2	8	0	0	0	0	0	0	0	3	0	0	0	1	1
11	26	16	2	5	0	0	0	0	2	0	0	0	0	1	0	0	0
12	32	19	2	5	0	0	1	0	2	0	0	0	0	3	0	0	0
13	29	13	2	6	0	0	0	0	0	0	0	0	0	6	0	0	2
14	25	14	1	3	0	0	0	0	1	0	2	0	0	3	0	0	1
15	16	7	2	2	0	0	0	0	1	0	2	0	0	2	0	0	0
16	32	20	1	1	0	0	1	0	2	0	0	3	0	5	1	0	0
17	40	19	2	9	0	0	0	0	2	0	2	0	0	6	0	0	0
18	37	13	1	13	0	0	0	1	1	0	1	3	0	3	0	0	1
19	28	16	2	6	0	0	0	0	0	0	0	1	0	2	0	0	1
20	31	10	4	9	1	0	0	2	2	1	0	0	0	0	0	0	2
21	36	23	1	5	0	0	0	0	1	0	0	1	1	1	0	2	1
22	20	14	1	1	0	0	0	1	1	0	2	0	0	0	0	0	0
23	21	11	0	3	0	0	1	1	1	0	0	0	0	4	0	0	0
24	12	1	4	6	0	0	0	0	1	0	0	0	0	0	0	0	0
25	18	13	2	1	0	0	0	0	2	0	0	0	0	0	0	0	0
26	27	17	1	5	0	0	0	1	0	1	0	0	0	1	0	1	0
27	28	12	1	8	0	0	0	0	1	0	0	0	0	3	1	0	2
28	26	15	2	4	0	0	0	0	2	0	0	1	0	0	0	1	1
29	19	6	2	7	0	0	0	0	0	0	0	1	0	1	2	0	0
30	17	8	1	4	1	1	0	0	1	0	0	0	0	0	0	1	0
total:	700	349	42	152	4	1	5	8	26	5	13	13	1	55	4	6	16

C.2.5 Scenes

Table C.5 and Table C.6 below contain the following information about each scene in all narratives in the Tortoise/Hare set ('Narr', 'Scene') as follows: 'Chars': number of characters referred; 'Chars Pro': number of characters pronominalized (referred to with the forms **pro** or ø); 'Pron Strategies': pronominalization strategies implemented at least once. (The notation '' in the last column, indicates that there were no pronominalization strategies implemented, and is used when there were no pronominalized character references in the scene.)

Table C.5: Tortoise/Hare: Scene information

Narr	Scene	Chars	Chars Pro	Pron Strategies
1	A	4	1	{re/PC-/R-}
1	B	2	0	{}
1	C	2	1	{main/PC+/R+;main/PC-/R+;main/PC-/R-}
1	D	2	2	{main/PC+/R-;main/PC-/R+;main/PC-/R-}
1	E	2	0	{}
2	A	2	0	{}
2	B	1	0	{}
2	C	2	1	{main/PC+/R+}
2	D	3	0	{}
2	E	2	0	{}
3	A	3	0	{}
3	B	2	1	{main/PC+/R+}
3	C	3	2	{main/PC+/R+;main/PC+/R-}
3	D	2	1	{main/PC+/R+}
3	E	3	1	{main/PC+/R+}
3	F	1	1	{main/PC+/R+}
4	A	3	0	{}
4	B	4	2	{main/PC+/R+;main/PC+/R-}
4	C	2	0	{}
4	D	1	0	{}
5	A	3	1	{main/PC+/R+;re/PC+/R+}
5	B	1	1	{main/PC+/R+}
5	C	2	1	{main/PC+/R+}
5	D	1	1	{main/PC+/R+}
6	A	2	0	{}
6	B	4	1	{re/PC-/R-}
6	C	3	0	{}
6	E	1	1	{main/PC+/R+}
6	E	2	1	{main/PC+/R+}
7	A	2	0	{}
7	B	2	1	{main/PC+/R+}
7	C	2	2	{main/PC+/R+;main/PC+/R-;main/PC-/R-}
7	D	2	2	{main/PC+/R+;re/PC-/R-}
7	E	5	1	{main/PC+/R+}
8	A	2	0	{}
8	B	2	1	{main/PC+/R+}
9	A	5	1	{main/PC+/R+}
10	A	2	0	{}
10	B	5	2	{main/PC+/R+;main/PC+/R-}
10	C	4	1	{main/PC+/R+}
10	D	2	1	{main/PC+/R+;main/PC+/R-}
11	A	3	0	{}
11	B	2	2	{main/PC+/R+;main/PC+/R-;main/PC-/R-}
11	C	3	2	{main/PC+/R+;main/PC+/R-;main/PC-/R+;re/PC+/R-}
11	D	1	1	{main/PC+/R+}
12	A	2	0	{}
12	C	2	1	{main/PC+/R+}
12	B	2	2	{main/PC+/R+}
12	D	2	2	{main/PC+/R+;main/PC+/R-}
12	E	1	1	{main/PC+/R+;main/PC+/R-;re/PC+/R-}
12	F	2	2	{main/PC+/R+;re/PC-/R-}
12	G	3	0	{}
12	H	1	0	{}
12	I	1	1	{main/PC+/R+}
13	A	3	1	{main/PC+/R+}
13	B	3	1	{re/PC-/R+}
13	C	2	2	{main/PC+/R+;main/PC+/R-;main/PC-/R-}
13	D	2	1	{main/PC+/R+;main/PC-/R-}
13	E	2	0	{}
13	F	2	2	{main/PC-/R+;main/PC-/R-}
13	G	3	1	{main/PC-/R+}
13	H	2	0	{}
14	A	4	1	{re/PC-/R-}
14	B	2	0	{}
14	C	2	1	{main/PC+/R+}
14	D	2	1	{main/PC+/R+}
14	E	2	0	{}
14	F	1	1	{main/PC+/R+}
15	A	3	0	{}
15	B	2	1	{re/PC-/R-}
15	C	2	1	{main/PC+/R+;main/PC-/R-}
15	D	2	2	{main/PC+/R+;main/PC+/R-;main/PC-/R-;re/PC+/R-}
15	E	1	0	{}

(Continued next page.)

Table C.6: Tortoise/Hare: Scene information (continued)

Narr	Scene	Chars	Chars Pro	Pron Strategies
16	A	4	0	{}
16	B	2	0	{}
16	C	2	1	{main/PC+/R+;main/PC+/R-}
16	D	2	2	{main/PC+/R+;main/PC+/R-}
16	E	3	1	{main/PC+/R+}
17	A	3	0	{}
17	B	2	0	{}
17	C	1	1	{main/PC+/R+}
17	D	2	1	{main/PC+/R+}
17	E	2	1	{main/PC+/R+,main/PC+/R-}
17	F	2	1	{main/PC+/R+}
17	G	4	1	{main/PC+/R+;main/PC+/R-;re/PC+/R-}
17	H	2	2	{main/PC+/R+;main/PC+/R-}
17	I	1	1	{main/PC+/R+}
18	A	3	0	{}
18	B	3	0	{}
18	C	2	1	{main/PC+/R+}
18	D	2	1	{main/PC+/R+}
18	E	1	0	{}
18	F	1	1	{main/PC+/R+}
18	G	2	2	{main/PC+/R-}
18	H	2	1	{main/PC+/R-}
18	I	2	1	{main/PC+/R-}
18	J	2	0	{}
18	K	2	2	{main/PC+/R+;re/PC-/R-}
19	A	2	0	{}
19	B	5	1	{re/PC-/R-}
19	C	2	2	{main/PC+/R+;main/PC+/R-}
19	D	1	0	{}
19	E	2	0	{}
19	F	3	2	{main/PC+/R-}
19	G	1	0	{}
19	H	1	1	{main/PC+/R+}
20	A	4	1	{re/PC-/R-}
20	B	2	0	{}
20	C	1	1	{main/PC+/R+}
20	D	1	0	{}
20	E	1	1	{main/PC+/R+}
20	F	2	2	{main/PC+/R+;main/PC+/R-}
20	G	3	2	{main/PC+/R+;main/PC+/R-;main/PC-/R-}
20	H	3	1	{main/PC+/R+;main/PC-/R-}
21	A	4	3	{main/PC+/R+;main/PC+/R-;main/PC-/R+}
21	B	3	3	{main/PC+/R-;main/PC-/R+;main/PC-/R-}
21	C	3	2	{main/PC+/R+;main/PC+/R-;main/PC-/R-;re/PC+/R+;re/PC+/R-;re/PC-/R-}
21	D	1	1	{main/PC+/R-}
22	A	3	0	{}
22	B	3	0	{}
22	C	2	1	{main/PC-/R-}
22	D	1	1	{main/PC+/R+}
23	A	2	1	{main/PC+/R+}
23	B	2	2	{main/PC+/R+;main/PC+/R-}
23	C	2	0	{}
23	D	3	0	{}
24	A	3	1	{main/PC+/R+}
24	B	2	0	{}
24	C	1	1	{main/PC+/R+}
24	D	2	1	{main/PC+/R+;main/PC+/R-}
24	E	1	1	{main/PC+/R+}
25	A	2	0	{}
25	B	0	0	{}
25	C	3	0	{}
25	D	1	0	{}
25	E	2	2	{main/PC+/R+;main/PC+/R-}
25	F	2	1	{main/PC+/R+}
26	A	3	0	{}
26	B	5	4	{main/PC+/R+;re/PC-/R+;re/PC+/R-}
26	C	1	1	{main/PC+/R+}
27	A	2	0	{}
27	B	2	0	{}
27	C	2	0	{}
27	D	1	1	{main/PC+/R+}
27	E	2	2	{main/PC+/R+;re/PC+/R-}
27	F	2	1	{main/PC+/R+;main/PC-/R+}
27	G	3	1	{main/PC+/R+;re/PC+/R-}
28	A	3	0	{}
28	B	3	3	{main/PC+/R+;main/PC+/R-;main/PC-/R-}
28	C	3	1	{main/PC-/R+;main/PC-/R-}
28	D	2	2	{main/PC+/R+}
29	A	3	0	{}
29	B	3	3	{main/PC-/R+;main/PC-/R-;re/PC+/R-;re/PC-/R-}
29	C	1	1	{main/PC+/R+}
29	D	2	2	{main/PC+/R+;main/PC+/R-;re/PC+/R-}
30	A	3	2	{main/PC+/R+;main/PC+/R-;main/PC-/R-}
30	B	2	1	{main/PC+/R+}
30	C	1	1	{main/PC+/R+}
30	D	2	0	{}

C.2.6 Pronominalization strategies

Table C.7 below shows the number and percentage of pronominalized character references ('No Pro CharRefs') which implemented each pronominalization strategy in the Tortoise/Hare narrative set.

Table C.7: Tortoise/Hare: Pronominalization strategy summary

Pron Strategy	No Pro CharRefs	(%)
intro/chANT-	0	(0)
main/PC+/R+	129	(53)
main/PC+/R-	53	(22)
main/PC-/R+	13	(5)
main/PC-/R-	23	(9)
re/PC+/R+	6	(2)
re/PC+/R-	9	(4)
re/PC-/R+	2	(1)
re/PC-/R-	11	(4)
total:	245	(100)

C.2.7 Pronominalization chains

Table C.8 below shows the number and percentage of each type of pronominalization chain produced in the Tortoise/Hare set. Chains are grouped according to whether only one strategy was implemented (SINGLE-STRATEGY) or more than one strategy was implemented (MULTI-STRATEGY). MULTI-STRATEGY chains are further grouped according to the number of strategies implemented, and are listed according to the strategies which were implemented at least once in each chain.

Table C.8: Tortoise/Hare: Pronominalization chain summary

Pronominalization chain	No chains (%)
SINGLE-STRATEGY	
intro/chANT-	0 (0)
main/PC+/R+	58 (46)
main/PC+/R-	14 (11)
main/PC-/R+	4 (4)
main/PC-/R-	3 (2)
re/PC+/R+	1 (1)
re/PC+/R-	2 (1)
re/PC-/R+	1 (1)
re/PC-/R-	7 (5)
subtotal (single):	90 (69)
MULTI-STRATEGY	
2-strategy	
main/PC+/R+;main/PC+/R-	15 (12)
main/PC+/R+;main/PC-/R-	4 (3)
main/PC+/R+;re/PC+/R+	2 (2)
main/PC+/R+;re/PC+/R-	1 (1)
main/PC+/R-;re/PC+/R-	1 (1)
main/PC-/R+;main/PC-/R-	5 (4)
main/PC-/R+;main/PC+/R+	1 (1)
main/PC-/R-;main/PC+/R-	1 (1)
main/PC-/R-;re/PC+/R-	1 (1)
re/PC-/R-;re/PC+/R-	1 (1)
3-strategy	
main/PC+/R+;main/PC+/R-;main/PC-/R-	2 (2)
main/PC+/R+;main/PC+/R-;re/PC-/R-	1 (2)
main/PC-/R+;main/PC-/R-;re/PC-/R-	1 (2)
4-strategy	
main/PC+/R+;main/PC+/R-;re/PC+/R+;re/PC-/R-	1 (2)
main/PC-/R-;main/PC-/R+;main/PC+/R-;main/PC+/R+	1 (2)
re/PC+/R-;re/PC+/R+;main/PC+/R-;main/PC+/R+	2 (2)
subtotal (multi):	40 (31)
total:	130(100)

C.3 Tortoise/Hare: chain diagrams

This section contains diagrams depicting each pronominalization chain produced in the Tortoise/Hare narrative set. A full explanation of how chains were coded is given in Section A.3 of Appendix A. Below is a key which summarizes the notations used:

Figure C.1: Notations used in chain diagrams

†	intermediary character reference
‡	reference occurs before or after last in chain in same utterance
+	compound entity explicitly or implicitly conjoined
c	no character reference occurs in the utterance
g	the gender of the character is changed

A double underscore between references indicates a scene boundary.
The form, number and gender of each reference has been boxed.

Tortoise/Hare Chain 1

Narrative: T1 **Character:** the hare$_{i}$+the tortoise$_{ii}$ **Strategies:** re/PC-/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	A1	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
+	2	A1	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
†	3	A2	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	4	A3	np	**pro**	ø	s	**pl**	**m**	f	u		np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 2

Narrative: T1 **Character:** the hare$_{i}$
Strategies: main/PC-/R-;main/PC-/R+;main/PC+/R-;main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	C7	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
†	2	C7	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	3	C7	np	pro	ø	s	pl	m	f	u		np	**pro**	ø	**s**	pl	**m**	f	u
	4	C8	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	5	C9	np	pro	**ø**	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
†	6	C9	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	7	C9	np	pro	ø	s	pl	m	f	u		np	**pro**	ø	**s**	pl	**m**	f	u
	8	C10	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
†	9	C10	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	**s**	pl	**m**	f	u
	10	D11	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
††	11	D11	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	s	**pl**	m	**f**	u
††	12	D12	np	**pro**	ø	s	**pl**	m	**f**	u		np	pro	ø	s	pl	m	f	u
	13	D12	np	pro	ø	s	pl	m	f	u		np	**pro**	ø	**s**	pl	**m**	f	u
	14	D13	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
††	15	D13	np	pro	ø	s	pl	m	f	u		np	**pro**	ø	s	**pl**	m	**f**	u
	16	D14	np	pro	**ø**	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 3

Narrative: T1 **Character:** 4 bunys$_{iv}$ **Strategies:** main/PC-/R+;main/PC-/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
‡	1	D11	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	2	D11	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	s	**pl**	m	**f**	u
	3	D12	np	**pro**	ø	s	**pl**	m	**f**	u		np	pro	ø	s	pl	m	f	u
†	4	D12	np	pro	ø	s	pl	m	f	u		np	**pro**	ø	**s**	pl	**m**	f	u
†	5	D13	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	6	D13	np	pro	ø	s	pl	m	f	u		np	**pro**	ø	s	**pl**	m	**f**	u

Tortoise/Hare Chain 4

Narrative: T2 **Character:** the hare$_{i}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	C5	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	2	C6	np	pro	**ø**	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	3	C6	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	**s**	pl	**m**	f	u

Tortoise/Hare Chain 5

Narrative: T3 **Character:** the hare$_i$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	B4	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	2	B5	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
+	3	B5	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	**s**	pl	m	f	**u**

Tortoise/Hare Chain 6

Narrative: T3 **Character:** the hare$_i$ **Strategies:** main/PC+/R+;main/PC+/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	C7	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	2	C7	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	3	C8	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	4	C9	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
†	5	C9	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	**s**	pl	**m**	f	u
††	6	C9	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	s	**pl**	m	f	**u**
	7	C10	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	8	C11	np	pro	**ø**	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 7

Narrative: T3 **Character:** the tortoise$_{ii}$ **Strategies:** main/PC+/R+;main/PC+/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	C12	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	2	C13	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
†	3	C13	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	**s**	pl	**m**	f	u
	4	C14	np	pro	**ø**	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 8

Narrative: T3 **Character:** the hare$_i$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	D15	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	2	D16	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	3	D16	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	4	D17	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
‡	5	D17	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	**s**	pl	**m**	f	u

Tortoise/Hare Chain 9

Narrative: T3 **Character:** the hare$_i$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	E18	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	2	E19	np	pro	**ø**	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 10

Narrative: T3 **Character:** the tortoise$_{ii}$ **Strategies:** main/PC+/R+

		cip									cnip								
ref	*scn-no*	*form*				*num*		*gen*			*form*				*num*		*gen*		
1	F22	[np]	pro	ø		[s]	pl	[m]	f	u	np	pro	ø		s	pl	m	f	u
2	F23	np	[pro]	ø		[s]	pl	[m]	f	u	np	pro	ø		s	pl	m	f	u

Tortoise/Hare Chain 11

Narrative: T4 **Character:** everybody$_{i}$ **Strategies:** main/PC+/R+;main/PC+/R-

			cip									cnip								
	ref	*scn-no*	*form*				*num*		*gen*			*form*				*num*		*gen*		
	1	A1	[np]	pro	ø		s	[pl]	m	f	[u]	np	pro	ø		s	pl	m	f	u
†	2	A1	np	pro	ø		s	pl	m	f	u	[np]	pro	ø		[s]	pl	[m]	f	u
††	3	A1	np	pro	ø		s	pl	m	f	u	[np]	pro	ø		[s]	pl	[m]	f	u
	4	B2	np	[pro]	ø		s	[pl]	m	f	[u]	np	pro	ø		s	pl	m	f	u
†	5	B2	[np]	pro	ø		[s]	pl	[m]	f	u	np	pro	ø		s	pl	m	f	u
	6	B3	np	[pro]	ø		s	[pl]	m	f	[u]	np	pro	ø		s	pl	m	f	u

Tortoise/Hare Chain 12

Narrative: T4 **Character:** the bager$_{iv}$ **Strategies:** main/PC+/R+

		cip									cnip								
ref	*scn-no*	*form*				*num*		*gen*			*form*				*num*		*gen*		
1	B6	[np]	pro	ø		[s]	pl	[m]	f	u	np	pro	ø		s	pl	m	f	u
2	B6	np	[pro]	ø		[s]	pl	[m]	f	u	np	pro	ø		s	pl	m	f	u
3	B7	np	pro	[ø]		[s]	pl	[m]	f	u	np	pro	ø		s	pl	m	f	u

Tortoise/Hare Chain 13

Narrative: T5 **Character:** the tortoise$_{ii}$+the hare$_{i}$ **Strategies:** re/PC+/R+

		cip									cnip								
ref	*scn-no*	*form*				*num*		*gen*			*form*				*num*		*gen*		
1	A1	[np]	pro	ø		[s]	pl	[m]	f	u	np	pro	ø		s	pl	m	f	u
+ 2	A1	[np]	pro	ø		[s]	pl	[m]	f	u	np	pro	ø		s	pl	m	f	u
† 3	A2	[np]	pro	ø		[s]	pl	[m]	f	u	np	pro	ø		s	pl	m	f	u
4	A3	np	[pro]	ø		s	[pl]	[m]	f	u	np	pro	ø		s	pl	m	f	u

Tortoise/Hare Chain 14

Narrative: T5 **Character:** the hare$_{i}$ **Strategies:** main/PC+/R+

		cip									cnip								
ref	*scn-no*	*form*				*num*		*gen*			*form*				*num*		*gen*		
1	B4	[np]	pro	ø		[s]	pl	[m]	f	u	np	pro	ø		s	pl	m	f	u
2	B4	np	[pro]	ø		[s]	pl	[m]	f	u	np	pro	ø		s	pl	m	f	u
3	C5	np	[pro]	ø		[s]	pl	[m]	f	u	np	pro	ø		s	pl	m	f	u

Tortoise/Hare Chain 15

Narrative: T5 **Character:** the hare$_{i}$ **Strategies:** main/PC+/R+

		cip									cnip								
ref	*scn-no*	*form*				*num*		*gen*			*form*				*num*		*gen*		
1	D7	[np]	pro	ø		[s]	pl	[m]	f	u	np	pro	ø		s	pl	m	f	u
2	D8	np	[pro]	ø		[s]	pl	[m]	f	u	np	pro	ø		s	pl	m	f	u

Tortoise/Hare Chain 16

Narrative: T6 **Character:** the tortoise$_i$+the hare$_{ii}$ **Strategies:** re/PC-/R-

			cip									cnip								
			form			*num*		*gen*				*form*			*num*		*gen*			
	ref	*scn-no*																		
	1	A1	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	**s**	pl	**m**	f	u	
+	2	A1	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	**s**	pl	**m**	f	u	
†	3	B2	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u	
	4	B3	np	**pro**	ø	s	**pl**	**m**	f	u		np	pro	ø	s	pl	m	f	u	

Tortoise/Hare Chain 17

Narrative: T6 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

			cip									cnip								
			form			*num*		*gen*				*form*			*num*		*gen*			
	ref	*scn-no*																		
	1	D8	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u	
	2	D9	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u	

Tortoise/Hare Chain 18

Narrative: T6 **Character:** the tortoise$_i$ **Strategies:** main/PC+/R+

			cip									cnip								
			form			*num*		*gen*				*form*			*num*		*gen*			
	ref	*scn-no*																		
‡	1	E10	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u	
	1	E10	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u	
	2	E11	np	pro	**ø**	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u	

Tortoise/Hare Chain 19

Narrative: T7 **Character:** the hare$_i$ **Strategies:** main/PC+/R+

			cip									cnip								
			form			*num*		*gen*				*form*			*num*		*gen*			
	ref	*scn-no*																		
c	1	B2	np	pro	ø	s	pl	m	f	u		np	pro	ø	s	pl	m	f	u	
	2	B2	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u	
	3	B3	np	pro	**ø**	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u	

Tortoise/Hare Chain 20

Narrative: T7 **Character:** the hare$_i$ **Strategies:** main/PC+/R+;main/PC+/R-;main/PC-/R-

			cip									cnip								
			form			*num*		*gen*				*form*			*num*		*gen*			
	ref	*scn-no*																		
	1	C4	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u	
†	2	C4	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	**s**	pl	**m**	f	u	
	3	C4	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u	
	4	C5	np	pro	**ø**	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u	
†	5	C6	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u	
	6	C6	np	pro	ø	s	pl	m	f	u		np	**pro**	ø	**s**	pl	**m**	f	u	
†	7	C6	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u	
†	8	C7	np	pro	**ø**	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u	
	9	C7	np	pro	ø	s	pl	m	f	u		np	**pro**	ø	**s**	pl	**m**	f	u	

Tortoise/Hare Chain 21

Narrative: T7 **Character:** the hare$_i$ **Strategies:** main/PC+/R+;main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	D8	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	D9	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	3	D10	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	4	D10	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
	5	E11	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	6	E11	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	**f**	u

Tortoise/Hare Chain 22

Narrative: T7 **Character:** the hare$_i$ **Strategies:** main/PC+/R+

ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
1	E15	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
2	E16	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 23

Narrative: T7 **Character:** the tortoise$_{ii}$ **Strategies:** main/PC+/R+;main/PC+/R-;re/PC-/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	C6	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	C6	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
	3	C6	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	4	C7	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	5	C7	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
†	6	D8	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	7	D9	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	8	D10	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	9	D10	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u

Tortoise/Hare Chain 24

Narrative: T8 **Character:** the tortoise$_{ii}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
‡	1	A2	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	A2	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	3	B3	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 25

Narrative: T9 **Character:** the rabbit$_{iv}$ **Strategies:** main/PC+/R+

ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
1	A3	**np**	pro	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
2	A4	np	pro	**ø**	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 26

Narrative: T10 **Character:** the hare/i **Strategies:** main/PC+/R+;main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	B2	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	B3	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	3	B3	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	4	B4	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	5	B5	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	6	B5	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	7	C6	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	8	C7	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	9	C7	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	f	**u**
††	10	C7	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u
†††	11	C7	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	**f**	u
	12	C8	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
††††	13	C8	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	**f**	u
	14	D9	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	15	D9	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u
	16	D10	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 27

Narrative: T11 **Character:** the hare$_i$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	A3	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	B4	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 28

Narrative: T11 **Character:** the hare$_i$ **Strategies:** main/PC+/R-;re/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	B6	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	B6	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
	3	B7	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	4	B7	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
	5	C8	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
††	6	C8	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	**f**	u
††	7	C9	np	**pro**	ø	s	**pl**	m	**f**	u	np	pro	ø	s	pl	m	f	u
	8	C10	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 29

Narrative: T11 **Character:** tortoise$_{ii}$ **Strategies:** main/PC-/R-;main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	B5	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	B6	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	3	B6	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
†	4	B7	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	5	B7	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u

Tortoise/Hare Chain 30

Narrative: T11 **Character:** four girls$_{iv}$ **Strategies:** main/PC-/R+

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
‡	1	C8	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	C8	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	m	**f**	u
	3	C9	np	**pro**	ø	**s**	pl	m	**f**	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 31

Narrative: T11 **Character:** hare$_i$ **Strategies:** main/PC+/R+;re/PC+/R+

ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
1	C12	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
2	C13	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
3	C14	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
4	C15	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
5	C16	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
6	C18	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
7	C19	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 32

Narrative: T11 **Character:** the tortoises feet$_{ii}$ **Strategies:** main/PC+/R+

ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
1	D20	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
2	D21	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
3	D22	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
4	D23	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 33

Narrative: T12 **Character:** a hare$_{i+}$a tortoise$_{ii}$ **Strategies:** main/PC+/R+

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
	1	B2	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
+	2	B2	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	3	B3	np	**pro**	ø	s	**pl**	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 34

Narrative: T12 **Character:** the tortoise$_{ii}$ **Strategies:** main/PC+/R+

ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
1	B8	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
2	B9	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 35

Narrative: T12

Character: the hare$_i$ **Strategies:** main/PC+/R+

ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
1	C10	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
2	C10	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 36

Narrative: T12 **Character:** the hare$_i$ **Strategies:** main/PC+/R+

		cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	D12	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	D13	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 37

Narrative: T12 **Character:** the tortoise$_{ii}$
Strategies: main/PC+/R+;main/PC+/R-;re/PC+/R+;re/PC-/R-

			cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	D14	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	D15	np	pro	[ø]	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	3	D15	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	[s]	pl	[m]	f	u
	4	D16	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	5	D17	np	pro	[ø]	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	6	D17	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	[s]	pl	[m]	f	u
	7	E18	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
c	8	E19	np	pro	ø	s	pl	m	f	u	np	pro	ø	s	pl	m	f	u
	9	E20	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	10	E21	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	11	F22	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	12	F23	np	pro	[ø]	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	13	F23	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	[s]	pl	[m]	f	u

Tortoise/Hare Chain 38

Narrative: T12 **Character:** the hare$_i$ **Strategies:** main/PC+/R+

		cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	F22	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	F23	np	pro	[ø]	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
‡	3	F23	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	[s]	pl	[m]	f	u

Tortoise/Hare Chain 39

Narrative: T12 **Character:** the tortoise$_{ii}$ **Strategies:** main/PC+/R+

		cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	I28	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	I29	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 40

Narrative: T13 **Character:** a moul$_{iii}$ **Strategies:** main/PC+/R+

		cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	A2	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	A3	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 41

Narrative: T13 **Character:** the tortoise$_{ii}$ **Strategies:** main/PC-/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	B6	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	B7	**np**	pro	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
	2	B8	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 42

Narrative: T13 **Character:** the hare$_{i}$
Strategies: main/PC+/R+;main/PC-/R-;main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	C9	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	C10	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	3	C11	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	4	C11	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
†	5	C12	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	6	C12	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u

Tortoise/Hare Chain 43

Narrative: T13 **Character:** the tortoise$_{ii}$ **Strategies:** main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	C11	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	C11	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
	3	C12	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	4	C12	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u

Tortoise/Hare Chain 44

Narrative: T13 **Character:** the hare$_{i}$ **Strategies:** main/PC+/R+;main/PC-/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	D13	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	D14	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	3	D14	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	4	D14	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u

Tortoise/Hare Chain 45

Narrative: T13 **Character:** the hare$_{i}$ **Strategies:** main/PC-/R-;main/PC-/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	F18	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	F18	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	**f**	u
†	3	F19	np	**pro**	ø	s	**pl**	m	**f**	u	np	pro	ø	s	pl	m	f	u
	4	F19	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
	5	G20	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	6	G20	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	**f**	u

Tortoise/Hare Chain 46

Narrative: T13 **Character:** some little girl rabbits$_v$ **Strategies:** main/PC-/R+

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
‡	1	F18	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	F18	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	**f**	u
	3	F19	np	**pro**	ø	s	**pl**	m	**f**	u	np	pro	ø	s	pl	m	f	u
‡	4	F19	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u

Tortoise/Hare Chain 47

Narrative: T14 **Character:** tortoise$_{i}$+hare$_{ii}$ **Strategies:** re/PC-/R-

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
	1	A1	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u
+	2	A1	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u
†	3	A2	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	4	A3	np	**pro**	ø	s	**pl**	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 48

Narrative: T14 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
	1	C9	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	C10	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	3	C10	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u

Tortoise/Hare Chain 49

Narrative: T14 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
	1	D11	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	D12	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	3	D12	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	**f**	u

Tortoise/Hare Chain 50

Narrative: T14 **Character:** the tortoise$_{i}$ **Strategies:** main/PC+/R+

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
	1	F16	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	F17	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 51

Narrative: T15 **Character:** a hare$_{i}$+a tortoise$_{ii}$ **Strategies:** re/PC-/R-

	ref	scn-no	cip form			cip num		cip gen			cnip form			cnip num		cnip gen		
	1	A2	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u
+	2	A2	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u
†	3	A3	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
c	5	B4	np	pro	ø	s	pl	m	f	u	np	pro	ø	s	pl	m	f	u
	6	B5	np	**pro**	ø	s	**pl**	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 52

Narrative: T15 **Character:** the Hare$_i$ **Strategies:** main/PC+/R+;main/PC-/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	C8	[np]	pro	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u
	2	C9	np	[pro]	ø	[s]	pl	m	f	[u]		np	pro	ø	s	pl	m	f	u
†	3	C10	[np]	pro	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u
	4	C10	np	pro	ø	s	pl	m	f	u		np	[pro]	ø	[s]	pl	[m]	f	u

Tortoise/Hare Chain 53

Narrative: T15 **Character:** the tortoise$_{ii}$ **Strategies:** main/PC-/R-;re/PC+/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	C11	[np]	pro	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u
†	2	D12	[np]	pro	ø	[s]	pl	m	f	[u]		np	pro	ø	s	pl	m	f	u
	3	D12	np	pro	ø	s	pl	m	f	u		np	[pro]	ø	[s]	pl	[m]	f	u
†	4	D13	np	[pro]	ø	[s]	pl	m	f	[u]		np	pro	ø	s	pl	m	f	u
†	5	D14	np	[pro]	ø	[s]	pl	m	f	[u]		np	pro	ø	s	pl	m	f	u
	6	D14	np	pro	ø	s	pl	m	f	u		np	[pro]	ø	[s]	pl	[m]	f	u

Tortoise/Hare Chain 54

Narrative: T15 **Character:** the Hare$_i$ **Strategies:** main/PC+/R-;main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	D12	[np]	pro	ø	[s]	pl	m	f	[u]		np	pro	ø	s	pl	m	f	u
†	2	D12	np	pro	ø	s	pl	m	f	u		np	[pro]	ø	[s]	pl	[m]	f	u
	3	D13	np	[pro]	ø	[s]	pl	m	f	[u]		np	pro	ø	s	pl	m	f	u
	4	D14	np	[pro]	ø	[s]	pl	m	f	[u]		np	pro	ø	s	pl	m	f	u
‡	5	D14	np	pro	ø	s	pl	m	f	u		np	[pro]	ø	[s]	pl	[m]	f	u

Tortoise/Hare Chain 55

Narrative: T16 **Character:** the rabbit$_{ii}$ **Strategies:** main/PC+/R-;main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	C8	[np]	pro	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u
†	2	C8	np	pro	ø	s	pl	m	f	u		[np]	pro	ø	[s]	pl	m	f	[u]
	3	C9	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u
	4	C9	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 56

Narrative: T16 **Character:** the rabbit$_{ii}$ **Strategies:** main/PC+/R+;main/PC+/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	D10	[np]	pro	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u
	2	D11	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u
	3	D12	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u
†	4	D12	np	pro	ø	s	pl	m	f	u		[np]	pro	ø	[s]	pl	[m]	f	u
	5	D13	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u
‡	6	D13	np	pro	ø	s	pl	m	f	u		[np]	pro	ø	[s]	pl	[m]	f	u

Tortoise/Hare Chain 57

Narrative: T16 **Character:** the tortoise$_{iv}$ **Strategies:** main/PC+/R+

			cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*			
	1	D14	[np]	pro	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
	2	D15	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
‡	3	D15	np	pro	ø	s	pl	m	f	u		[np]	pro	ø	[s]	pl	[m]	f	u	

Tortoise/Hare Chain 58

Narrative: T16 **Character:** the rabbit$_{ii}$ **Strategies:** main/PC+/R+

			cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*			
	1	E20	[np]	pro	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
	2	E21	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	

Tortoise/Hare Chain 59

Narrative: T17 **Character:** the racoon$_{iv}$ **Strategies:** main/PC+/R+

			cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*			
	1	C5	[np]	pro	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
	2	C6	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	

Tortoise/Hare Chain 60

Narrative: T17 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

			cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*			
	1	D8	[np]	pro	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
	2	D8	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
	3	D9	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	

Tortoise/Hare Chain 61

Narrative: T17 **Character:** tortoise$_{iii}$ **Strategies:** main/PC+/R+;main/PC+/R-

			cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*			
	1	D12	[np]	pro	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
	2	E13	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
†	3	E13	np	pro	ø	s	pl	m	f	u		[np]	pro	ø	[s]	pl	[m]	f	u	
	4	E13	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	

Tortoise/Hare Chain 62

Narrative: T17 **Character:** hare$_{ii}$ **Strategies:** main/PC+/R+;main/PC+/R-

			cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*			
	1	F14	[np]	pro	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
	2	F15	np	pro	[ø]	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
†	3	F15	np	pro	ø	s	pl	m	f	u		[np]	pro	ø	[s]	pl	[m]	f	u	
	4	G16	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
	5	G17	np	pro	[ø]	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
‡	6	G17	np	pro	ø	s	pl	m	f	u		[np]	pro	ø	s	[pl]	m	[f]	u	

Tortoise/Hare Chain 63

Narrative: T17 **Character:** the hare$_{ii}$
Strategies: re/PC+/R-;re/PC+/R+;main/PC+/R-;main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
‡	1	G18	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	G18	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u
†	3	G19	**np**	pro	ø	s	**pl**	m	**f**	u	np	pro	ø	s	pl	m	f	u
†	4	G19	**np**	pro	ø	s	**pl**	m	**f**	u	np	pro	ø	s	pl	m	f	u
	5	G20	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
c	6	G21	np	pro	ø	s	pl	m	f	u	np	pro	ø	s	pl	m	f	u
	7	G22	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	8	G22	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	f	**u**
	9	H23	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	10	H24	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	11	H24	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u

Tortoise/Hare Chain 64

Narrative: T17 **Character:** tortoise$_{ii}$ **Strategies:** main/PC+/R+

ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
1	H25	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
2	H26	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 65

Narrative: T17 **Character:** thetortoise$_{iii}$ **Strategies:** main/PC+/R+

ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
1	I27	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
2	I28	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 66

Narrative: T18 **Character:** the tortoise$_{i}$ **Strategies:** main/PC+/R+

ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
1	C8	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
2	C9	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
3	D10	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 67

Narrative: T18 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
1	F13	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
2	F14	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 68

Narrative: T18 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	G15	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	G15	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	**f**	u
	3	G16	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 69

Narrative: T18 **Character:** some girls$_{iv}$ **Strategies:** main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
‡	1	G15	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	G15	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	**f**	u
†	3	G16	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	4	G16	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	s	**pl**	m	**f**	u

Tortoise/Hare Chain 70

Narrative: T18 **Character:** the tortoise$_{i}$ **Strategies:** main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	H17	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	H17	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	**f**	u
	3	H18	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 71

Narrative: T18 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	I19	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	I19	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	**f**	u
	3	I20	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 72

Narrative: T18 **Character:** the tortoise$_{ii}$ **Strategies:** re/PC-/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	K22	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	K23	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	3	K24	np	pro	**ø**	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	4	K24	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u

Tortoise/Hare Chain 73

Narrative: T18 **Character:** everybody$_{ii}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	K23	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	2	K24	np	pro	**ø**	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
‡	3	K24	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u

Tortoise/Hare Chain 74

Narrative: T19 **Character:** the hare$_{ii}$+the tortoise$_{i}$ **Strategies:** re/PC-/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	B3	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
+	2	B3	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	[s]	pl	[m]	f	u
†	3	B4	[np]	pro	ø	[s]	pl	m	f	[u]	np	pro	ø	s	pl	m	f	u
	4	B5	np	[pro]	ø	s	[pl]	[m]	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 75

Narrative: T19 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	C6	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	C6	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 76

Narrative: T19 **Character:** the tortoise$_{i}$ **Strategies:** main/PC+/R+;main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	C7	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	C7	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	3	C7	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	4	C8	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 77

Narrative: T19 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	C9	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	C10	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 78

Narrative: T19 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	E12	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	2	E12	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	s	[pl]	m	[f]	u
	3	F13	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	4	F13	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	s	[pl]	m	[f]	u
	5	F14	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
‡	6	F14	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	s	[pl]	m	[f]	u

Tortoise/Hare Chain 79

Narrative: T19 **Character:** four butfull girl rabbits$_{v}$ **Strategies:** main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
‡	1	E12	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	E12	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	s	[pl]	m	[f]	u
†	3	F13	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	4	F13	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	s	[pl]	m	[f]	u
†	5	F14	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	6	F14	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	s	[pl]	m	[f]	u

Tortoise/Hare Chain 80

Narrative: T19 **Character:** hare$_{ii}$ **Strategies:** main/PC+/R+

		cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	H18	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	H19	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 81

Narrative: T20 **Character:** hare$_{i}$+tortoise$_{ii}$ **Strategies:** re/PC-/R-

			cip									cnip								
		ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
		1	A1	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
+		2	A1	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	[s]	pl	[m]	f	u
†		3	A2	[np]	pro	ø	[s]	pl	m	f	[u]	np	pro	ø	s	pl	m	f	u
		4	A3	np	[pro]	ø	s	[pl]	[m]	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 82

Narrative: T20 **Character:** the hare$_{i}$ **Strategies:** main/PC+/R+

		cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	C7	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	C8	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 83

Narrative: T20 **Character:** the hare$_{i}$ **Strategies:** main/PC+/R+;main/PC+/R-

		cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	E10	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	E11	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	3	F12	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	4	F12	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	s	[pl]	m	[f]	u
	5	F13	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
‡	6	F13	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	s	[pl]	m	[f]	u

Tortoise/Hare Chain 84

Narrative: T20 **Character:** 4 bunny rabets$_{iv}$ **Strategies:** main/PC+/R-

		cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
‡	1	F12	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	F12	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	s	[pl]	m	[f]	u
†	3	F13	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	4	F13	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	s	[pl]	m	[f]	u

Tortoise/Hare Chain 85

Narrative: T20 **Character:** the tortoies$_{ii}$ **Strategies:** main/PC-/R-

		cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	G14	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	2	G15	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	3	G15	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	[s]	pl	[m]	f	u
‡	4	GG15	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 86

Narrative: T20 **Character:** the hare$_i$ **Strategies:** main/PC+/R-;main/PC+/R+

			cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*			
	1	G15	[np]	pro	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
†	2	G15	np	pro	ø	s	pl	m	f	u		np	[pro]	ø	[s]	pl	[m]	f	u	
	3	G15	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
	4	G16	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
††	5	G16	np	pro	ø	s	pl	m	f	u		[np]	pro	ø	s	[pl]	m	f	[u]	
	6	G16	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
†	7	G16	[np]	pro	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
	8	G17	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	

Tortoise/Hare Chain 87

Narrative: T20 **Character:** the tortoies$_{ii}$ **Strategies:** main/PC+/R+;main/PC-/R-

			cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*			
	1	H18	[np]	pro	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
	2	H19	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
†	3	H20	[np]	pro	ø	s	[pl]	m	f	[u]		np	pro	ø	s	pl	m	f	u	
	4	H20	np	pro	ø	s	pl	m	f	u		np	[pro]	ø	[s]	pl	[m]	f	u	

Tortoise/Hare Chain 88

Narrative: T21 **Character:** the crowd$_{iii}$ **Strategies:** main/PC+/R-

			cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*			
	1	A2	[np]	pro	ø	s	[pl]	m	f	[u]		np	pro	ø	s	pl	m	f	u	
†	2	A2	np	pro	ø	s	pl	m	f	u		[np]	pro	ø	[s]	pl	[m]	f	u	
	3	A3	np	[pro]	ø	s	[pl]	m	f	[u]		np	pro	ø	s	pl	m	f	u	
‡	4	A3	np	pro	ø	s	pl	m	f	u		[np]	pro	ø	[s]	pl	[m]	f	u	

Tortoise/Hare Chain 89

Narrative: T21 **Character:** the man$_{iv}$ **Strategies:** main/PC+/R+;re/PC+/R+

			cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*			
	1	A4	[np]	pro	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
	2	A5	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
	3	A6	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
- ch	4	A7	np	pro	ø	s	pl	m	f	u		np	pro	ø	s	pl	m	f	u	
	5	A8	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	

Tortoise/Hare Chain 90

Narrative: T21 **Character:** the tortoise$_{ii}$ **Strategies:** main/PC-/R+

			cip									cnip								
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*			
‡	1	A11	[np]	pro	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	
	1	A11	np	pro	ø	s	pl	m	f	u		[np]	pro	ø	[s]	pl	[m]	f	u	
	2	A12	np	[pro]	ø	[s]	pl	[m]	f	u		np	pro	ø	s	pl	m	f	u	

Tortoise/Hare Chain 91

Narrative: T21 **Character:** hare$_i$
Strategies: main/PC+/R-;re/PC+/R-;re/PC+/R+
main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	B13	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
†	2	B13	np	pro	ø	s	pl	m	f	u		np	**pro**	ø	**s**	pl	**m**	f	u
	3	B14	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
††	4	B14	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	**s**	pl	m	f	**u**
††	5	B15	np	**pro**	ø	**s**	pl	m	**f**	u		np	pro	ø	s	pl	m	f	u
	6	C16	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
††	7	C16	np	pro	ø	s	pl	m	f	u		np	**pro**	ø	s	**pl**	m	**f**	u
	8	C17	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
††	9	C18	np	**pro**	ø	s	**pl**	m	**f**	u		np	pro	ø	s	pl	m	f	u
	10	C19	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	11	C20	np	pro	**ø**	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
c	12	C21	np	pro	ø	s	pl	m	f	u		np	pro	ø	s	pl	m	f	u
c	13	C22	np	pro	ø	s	pl	m	f	u		np	pro	ø	s	pl	m	f	u
	14	C23	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	15	C24	np	pro	**ø**	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	16	C25	np	pro	**ø**	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	17	C26	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	18	C26	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
†	19	C26	**np**	pro	ø	s	**pl**	m	f	**u**		np	pro	ø	s	pl	m	f	u
	20	C27	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 92

Narrative: T21 **Character:** the girls school$_v$ **Strategies:** main/PC-/R+;main/PC-/R-;re/PC-/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
‡	1	B14	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	2	B14	np	pro	ø	s	pl	m	f	u		**np**	pro	ø	s	**pl**	m	**f**	u
	3	B15	np	**pro**	ø	s	**pl**	m	**f**	u		np	pro	ø	s	pl	m	f	u
†	4	C16	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	5	C16	np	**pro**	ø	s	**pl**	m	**f**	u		np	pro	ø	s	pl	m	f	u
†	6	C17	np	**pro**	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	7	C18	np	**pro**	ø	s	**pl**	m	**f**	u		np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 93

Narrative: T21 **Character:** the tortoise$_{ii}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	D28	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	2	D29	np	pro	**ø**	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	3	D30	np	pro	**ø**	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 94

Narrative: T22 **Character:** the tortoise$_{iii}$ **Strategies:** main/PC-/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*				*form*			*num*		*gen*		
	1	C9	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
†	2	C9	**np**	pro	ø	**s**	pl	**m**	f	u		np	pro	ø	s	pl	m	f	u
	3	C9	np	pro	ø	s	pl	m	f	u		np	**pro**	ø	**s**	pl	**m**	f	u

Tortoise/Hare Chain 95

Narrative: T22 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	D11	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	D12	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 96

Narrative: T23 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	A2	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	A2	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	3	A2	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u

Tortoise/Hare Chain 97

Narrative: T23 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	B4	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	B5	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 98

Narrative: T23 **Character:** tortoise$_{i}$ **Strategies:** main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	B6	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	B6	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u
	3	B7	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	4	B7	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u
	5	B8	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	6	B8	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 99

Narrative: T24 **Character:** the hare$_{i}$+ the tortoise$_{ii}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	A1	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
+	2	A1	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	3	A1	np	**pro**	ø	s	**pl**	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 100

Narrative: T24 **Character:** the hare$_{i}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	C4	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	C4	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 101

Narrative: T24 **Character:** the hare$_i$ **Strategies:** main/PC+/R+;main/PC+/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*			
	1	D8	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u	
	2	D9	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u	
†	3	D9	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u	
	4	D10	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u	
	5	E11	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u	

Tortoise/Hare Chain 102

Narrative: T25 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*			
	1	E11	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u	
	2	E11	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u	
	3	E11	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u	
	4	E11	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u	

Tortoise/Hare Chain 103

Narrative: T25 **Character:** the tortoise$_i$ **Strategies:** main/PC+/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*			
	1	E12	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u	
†	2	E12	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u	
	3	E13	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u	

Tortoise/Hare Chain 104

Narrative: T25 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*			
	1	F14	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u	
	2	F15	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u	
	3	F15	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u	

Tortoise/Hare Chain 105

Narrative: T26 **Character:** Everybody$_{iii}$ **Strategies:** re/PC+/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*			
	1	A3	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u	
†	2	A3	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u	
- ch	3	B4	np	pro	ø	s	pl	m	f	u	np	pro	ø	s	pl	m	f	u	
†	4	B5	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u	
	5	B6	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u	

Tortoise/Hare Chain 106

Narrative: T26 **Character:** the hare$_{ii}$ **Strategies:** re/PC-/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	B10	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	B11	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	3	B12	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	4	B12	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 107

Narrative: T26 **Character:** the tortoise$_{i}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
‡	1	B15	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	2	B15	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	3	B15	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	4	B15	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 108

Narrative: T26 **Character:** the starter$_{v}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	B16	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	B17	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 109

Narrative: T 26 **Character:** the tortoise$_{i}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	B18	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	B19	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 110

Narrative: T26 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	C20	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	C21	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	3	C22	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	4	C23	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	5	C24	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 111

Narrative: T27 **Character:** the hare$_{i}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	D6	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	D6	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	3	E7	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	4	E7	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	5	E7	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	**f**	u

Tortoise/Hare Chain 112

Narrative: T27 **Character:** the hare$_i$ **Strategies:** main/PC+/R+;main/PC-/R+

			cip										cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	E8	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	E9	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	3	E9	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	s	**pl**	m	**f**	u
	4	F10	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	5	F11	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	6	F11	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u

Tortoise/Hare Chain 113

Narrative: T27 **Character:** three prety girls$_{iii}$ **Strategies:** re/PC-/R+

			cip										cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
‡	1	E7	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	2	E7	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	3	E7	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	s	**pl**	m	**f**	u
†	4	E8	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	5	E9	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	6	E9	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	s	**pl**	m	**f**	u

Tortoise/Hare Chain 114

Narrative: T27 **Character:** tortoise legs$_{ii}$ **Strategies:** main/PC+/R+;re/PC+/R-

			cip										cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	G12	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	2	G13	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	3	G14	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	4	G15	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 115

Narrative: T28 **Character:** the hare$_{ii}$ **Strategies:** main/PC-/R-

			cip										cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	B3	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	B4	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	3	B4	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u

Tortoise/Hare Chain 116

Narrative: T28 **Character:** the tortoise$_{iii}$ **Strategies:** main/PC-/R-;main/PC+/R+

			cip										cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	B5	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	B6	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	3	B6	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
	4	B6	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	5	B6	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	6	B6	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 117

Narrative: T28 **Character:** evryone$_i$ **Strategies:** main/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	B6	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
†	2	B6	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
	3	B6	np	**pro**	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
‡	4	B6	np	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
‡	4	B6	np	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 118

Narrative: T28 **Character:** the tortoise$_{iii}$ **Strategies:** main/PC-/R-;main/PC-/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	C9	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†	2	C10	**np**	pro	ø	**s**	pl	m	f	**u**	np	pro	ø	s	pl	m	f	u
	3	C10	np	pro	ø	s	pl	m	f	u	np	**pro**	ø	**s**	pl	**m**	f	u
	4	C11	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 119

Narrative: T28 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	D12	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	D13	np	**pro**	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 120

Narrative: T28 **Character:** tortoise$_{iii}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	D14	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	D15	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	3	D16	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 121

Narrative: T28 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	D17	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	2	D18	np	pro	**ø**	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 122

Narrative: T29 **Character:** the tortoise$_i$+the hare$_{ii}$ **Strategies:** re/PC-/R-;re/PC+/R-

	ref	*scn-no*	cip *form*			cip *num*		cip *gen*			cnip *form*			cnip *num*		cnip *gen*		
	1	A1	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u
+	2	A1	np	pro	ø	s	pl	m	f	u	**np**	pro	ø	**s**	pl	**m**	f	u
†	3	A2	**np**	pro	ø	s	**pl**	m	f	**u**	np	pro	ø	s	pl	m	f	u
	4	B3	np	**pro**	ø	s	**pl**	**m**	f	u	np	pro	ø	s	pl	m	f	u
††	5	B4	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
†††	6	B5	**np**	pro	ø	**s**	pl	**m**	f	u	np	pro	ø	s	pl	m	f	u
	7	B6	np	**pro**	ø	s	**pl**	**m**	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 123

Narrative: T29 **Character:** the raccoon$_{iv}$ **Strategies:** main/PC+/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	B7	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	2	B7	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	3	B8	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
‡	4	B8	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	[s]	pl	[m]	f	u

Tortoise/Hare Chain 124

Narrative: T29 **Character:** tortoise$_{i}$ **Strategies:** main/PC-/R-;main/PC-/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
‡	1	B7	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	B7	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	3	B8	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	4	B8	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	[s]	pl	[m]	f	u
	5	B9	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 125

Narrative: T29 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+;main/PC+/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	C10	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	C10	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	3	D11	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	4	D11	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	5	D11	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 126

Narrative: T29 **Character:** tortoise$_{i}$ **Strategies:** main/PC+/R-

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
‡	1	D11	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
‡	1	D11	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
†	2	D11	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	3	D12	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
‡	4	D12	np	pro	ø	s	pl	m	f	u	[np]	pro	ø	[s]	pl	[m]	f	u

Tortoise/Hare Chain 127

Narrative: T30 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

			cip									cnip							
	ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
	1	A5	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
	2	A5	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 128

Narrative: T30 **Character:** the tortoise$_i$ **Strategies:** main/PC-/R-;main/PC-/R+

			cip									cnip							
ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
1	A6	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
† 2	A7	[np]	pro	ø	[s]	pl	m	f	[u]	np	pro	ø	s	pl	m	f	u
3	A7	np	pro	ø	s	pl	m	f	u	np	[pro]	ø	[s]	pl	[m]	f	u
4	A8	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 129

Narrative: T30 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

			cip									cnip							
ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
1	B9	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
2	B9	np	[pro]	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u

Tortoise/Hare Chain 130

Narrative: T30 **Character:** the hare$_{ii}$ **Strategies:** main/PC+/R+

			cip									cnip							
ref	*scn-no*	*form*			*num*		*gen*			*form*			*num*		*gen*		
1	C11	[np]	pro	ø	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u
2	C12	np	pro	[ø]	[s]	pl	[m]	f	u	np	pro	ø	s	pl	m	f	u

Appendix D

Adult narratives

Narratives in this Appendix were produced by four adult subjects.

D.1 Adult Narrative 1

On the beaches, there lived the sneetches. There were 2 sorts: star bellied sneetches, and bare bellied sneetches.

The star bellied sneetches thought they were better than the sneetches without stars on their bellies. So they wouldn't interact with them — eg speak with them, play with them, sit with them.

The children of the star bellied sneetches were told explicitly not to have anything to do with the child sneetches who had no stars. So while the star bellied sneetches had feasts on the beaches, the sneetches without stars would mope around, and were miserable, at their exclusion from the star bellied sneetches activities.

One day while sitting around moping, they saw a strange car coming towards them along the road. The car stopped and the driver introduced himself. He was Mr. McBean, and said he could help them solve their problems. He told them that they were miserable because they had no stars on their bellies, and that he could fix it. His car went into an amazing transformation to become a 'star on' machine. For the price of 3 dollars the bare bellied sneetches could go through the machine and have stars placed on their bellies. All the bare bellied sneetches paid up, were processed and became star bellied sneetches.

Thus starred, they went over to the 'original' star bellied sneetches, showed their starred bellies and said that they could no longer be excluded from all the activities.

The 'original' star bellied sneetches were very perplexed. They could now no longer tell who were the real star bellies and therefore 'superior', sneetches, and who were the original bare bellied sneetches.

Along came Mr. McBean and said that in order to help them with their problems, he would remove their stars for the price of ten dollars. That way, the sneetches with their stars removed, would know that they were really the 'superior' sneetches.

Along came Mr. McBean and said that in order to help them with their problems, he would remove their stars for the price of ten dollar. That way, the sneetches with their stars removed, would now that they were really the 'superior' sneetches.

So his car performed another transformation to become a star-off machine, and the original star bellied sneetches paid up, were processed, and became bare bellied sneetches. Then they (i.e. the bare bellied sneetches — i.e. those who'd had theri stars removed) went off to the sneetches with stars on their bellies (care of Mr. McBean) and paraded singing how abominable were stars on bellies, and that they (now being bare bellied) were the proper superior type of sneetches.

The original bare bellied sneetches (now with stars) were furious, and went off to Mr. McBean paid 10 dollars and had their stars removed.

The original star bellied sneetches (now without stars) went off to Mr. McBean paid 3 dollars and had their stars put on.

As soon as one group changed, then the other group changed. Mr. McBean had a roaring trade, and when all the sneetches had used up all their money, he retransformed his 2 machines back, and drove off — saying that the sneetches would never learn.

On the beaches there were no longer 2 distinct groups of sneetches, but sneetches with 0, 1, 2, 3 or even more stars on their bellies and behinds!, and non one could tell who had belonged to the two former groups.

The sneetches learnt that it did not matter whether you were bare bellied or star bellied, but that any kind of sneetch was as good as any other.

D.2 Adult Narrative 2

This cartoon concerns a group of beings called sneetches, who live on beaches, and is a moral tale about prejudice. There are two types of sneetches, ones with stars on their abdomens and ones without. The cartoon shows how initially sneetches with stars consider themselves to be superior to those without stars. They condition their children into believing this also. Sneetches with stars ignore, exclude, and abuse sneetches without stars.

One day a man called Sylvester coerced the seneetches without stars to use his magical machine to have stars stuck on them at the cost of $10. However, when the sneetches with stars saw what was happening they called a meeting to discuss what to do. Sylvester was present at this meeting and offered to remove their stars using his machine, so that they could be distinguishable again.

Sylvester continued to remove stars and replace stars in order to make the sneetches the same or distinguishalbe until the sneetches had no more money. At this point Sylvester left, having become very rich. The sneetches were now very varied in the number of stars they had on them or off them. Finally they made up their differences and became friends realizing that underneath all sneetches were the same.

D.3 Adult Narrative 3

Once upon a time, a weird guy in an umbrella drifted ashore onto a beach populated by Sneetches, both the plain and star-bellied kind, and he was not heard from again. The sneetches, meanwhile, continued a long-running and very racist argument that the star-bellied sneetches were a superior strain to their plain-bellied relatives. The star-bellies took every opportunity to deride and humiliate the plain-bellies for being different, and wouldn't let them join in with their games and so on. So when a weird and wonderful chappie with a weird and wonderful name arrived with a huge, weird and wonderful machine which could add stars to their bellies, the sneetches without all jumped at the chance and jumped into the machine getting a nice star for $3. The original star-bellied sneetches fought back by deciding that stars were now out of fashion, and got Mr. Weird and Wonderful to remove their stars with another machine of his for $10. This then escalated to the point where the sneetches were running from machine to machine to stay a la mode. However, when they all ran out of bucks, and the guy with the machines left heading for a bank, the sneetches found that they couldn't tell who had been, or had not been, a star-bellied sneetch, and what's more, they didn't care. So, they all lived happily ever after, with their different number of stars, toasting marshmallows round the fire. Which only goes to show that if a smart capitalist can spot a good racist dispute, he can clean up in town.

D.4 Adult Narrative 4

Two groups of people (sneetches) lived on a beach and were in competition with each other. One group was considered better off than the other (by both groups) since they had stars on their stomachs. The second group (without stars) were excluded from the first group's activities and wanted desparately to join in. For this they assumed they needed stars on their bellies.

Along came a man with a special machine which could fix stars onto sneetches bellies. He set this machine up on the beach and offered "non starred" sneetches the chance to become "starred" sneetches for $5. All the "non starred' sneetches took up the chance to become "starred" sneetches and the salesman made a lot of money.

At this point the two groups became indistinguishable but do not live happily ever after (not yet anyway). The original group of "starred sneetches" are very unhappy that they are no longer better off. However, the salesman offers them the chance to become so by removing their stars for $10 a time in a star off machine.

The sneetches respond eagerly to this offer and soon the sneetches became two groups again — one with stars, one without. However this time the sneetches without stars are better off than the ones with stars (note it is stilll the same group as before).

The starred sneetches want to become non starred sneetches now and pay the salesman $10 for the privilege of being so. And so the process continues of the two groups alternating between starred and nonstarred as the original nonstarred group try to be like the original group.

Eventually the salesman makes enough money and drives away with his machines leaving the sneetches without any cash.

As in all good children's education cartoons (as opposed to proper cartoons like Tom & Jerry), the moral the story is trying to get across is realised as the two groups of sneetches realise how silly they have been and become good friends and equals (star or no stars).

Appendix E

The 'anal' program

Much of the statistical analysis of hand-coded narratives was performed separately for each narrative set by an object-oriented program written in the Eiffel language by Russell (1991). The program reads in the coded narratives from a source file in the LaTeX format (the same as that used to typeset the narratives in this thesis), builds an internal representation of each narrative in the narrative set, computes various statistics from the internal representation, and finally prints out the statistics in tables in LaTeX format.

In accordance with the object-oriented paradigm the internal representation is an object structure where the software objects correspond to linguistic objects: a narrative is represented by the class **narrative** which is a list of lines, where a line is represented by class **line**. Class **line** corresponds to one typeset line (which contains only one reference to a character). In addition, class **line** contains attributes corresponding to the scene index (A ... Z), the index of the utterance in the enclosing scene, the text of the typeset line, the character referent (class **referent**), and fields denoting the *syntactic role*, *semantic role*, *pragmatic role*, *continuity function* and *pronominalization strategy* (if one was recorded). For convenience, class **line** also has an attribute *parent* which is a cross reference to the narrative of which it is a member. It should be noted that the scene structure is represented implicitly (*i.e.* , there is no scene class) and is determined by inspecting the scene index attribute of class **line**.

Class **referent** is used to encapsulate information pertaining to a character reference, which includes the corresponding text of the reference, the character subscript (class **charSubscript**), the form (np, pro or zero).

As well as the attributes described above which model the source narratives in a direct linear fashion, class **narrative** contains attribute **Clist** of type **list of CharTable**, the character table list. Each item (of type class **CharTable**) in the list is itself a **list of CharEntry** and contains a list of all references to a particular character, where each character is identified by its subscript (type **CharSubscript**). There is one **CharTable** instance for each character. Each

CharEntry contains information pertaining to the character reference. This includes the place of reference (boundary vs body), and the previous reference (if any). The view of the narrative provided by a **CharTable** is particularly useful for analyzing chains of references.

Operation proceeds as follows. The root class creates various table objects used to store the statistics (frequencies) of interest, and then creates a **narrative** object, and reads in the next narrative from the source file, builds the character reference table list (**list of CharTable**), and then uses this internal representation to update the table objects using a routine *update* or *process* as defined by each **table** class with the **narrative** object passed as argument. Each narrative from the source list is processed in this way, and finally the following tables were output and printed out in LaTeX format: Tables A.1, B.1, C.1, A.3, B.3, C.3, A.4, B.4, C.4, A.5, B.5, C.5, A.6, B.6 and C.7.