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Classical narratology in the late sixties and seventies vitally relied on the benefits of structuralism – its graphic models, its crisp formalisms, its linguistics-inspired toolboxes – features that were generally appreciated by teachers and students alike. Unfortunately, the new-frontiers phase of classical narratology lasted only until deconstructionists and poststructuralists came along and radically pulled the rug out from under the common-sense axioms that narratology had so optimistically built on. In response, postclassical narratologists started a number of remedial and recuperative programs. Progressive trends in the late eighties and the early nineties produced a critical reassessment of narratological terms, a general broadening of scope, and an increasing interest in thematic aspects. Less spectacularly than before, narratology branched out into a feminist narratology, a historiographic narratology, a possible worlds narratology, a "natural" narratology, even a postmodern narratology, to name only a small number of important diversifications.

Another adjustment suggested at a very early stage was a more detailed consideration of the reader's role in the grammar of narrative, and a suitable exploration of this subject was first presented in Sternberg's ([1978] 1993) and Perry's (1979) investigations into the dynamics of reading. Pursuing these researchers' quest toward a "cognitive" narratology, the present essay takes a "process turn" paralleling that already taken in cognitive linguistics, discourse analysis, and linguistic stylistics. My point of departure is the notorious "garden path sentence" – a type of sentence that traps the reader in a processing failure and requires an act of reanalysis to recover its actual structure and meaning. As has been noted in the psycholinguistic literature, the garden path phenomenon can also be found in certain kinds of jokes, riddles, and stories, apparently involving very similar error-recovery and reanalysis routines. I shall argue that these texts draw the researcher's attention to a number [end of p. 167] of interesting cognitive mechanisms that have largely remained hidden below both the reader's and the narratologist's thresholds of awareness.

When Todorov coined the term "narratology" in 1969, French *analyse structurale du récit* (structural analysis of narrative, also the title of a seminal 1966 special issue of *Communications*) had already divested itself of the ballast of early 20C normative poetics (Lubbock 1921, Beach 1932) and, following Saussurean and Jakobsonian precepts, had begun to isolate new basic units of narrative analysis, probed into syntagmatic and paradigmatic relations, and stratified and taxonomized the phenomenology of its object. During the seventies, many narrative theorists took an additional cue from Chomskyan generative grammar and, thinking in terms of "deep" and "surface structures," set as their goal no less than the formulation of a universal grammar of "narrative competence" (Greimas 1971, Füger 1972, Culler 1975, Prince 1982). Classical narratology's chief success came from the work of Gérard Genette ([1972] 1980; [1983] 1988), however, a theorist who considered his own use of grammatical terms as merely metaphorical.

Unlike most of his colleagues, who were bent on distilling what was common to all narratives, and intentionally avoided detailed analyses of specific works (Culler 1975, 120), Genette combined his theoretical exposition with a compelling "Proustology," as he called it (Genette [1983] 1988, 12). In fact, so convincing was Genette's two-in-one enterprise that his *Narrative Discourse* soon became a pilot study in "applied" narratology, and his terms were widely accepted as the discipline's tools of trade.

The new-frontiers phase of classical narratology did not last long, however. When deconstructionists and poststructuralists entered the scene in the early seventies, few of the seemingly common-sense concepts and premises of structuralism were allowed to stand. On the poststructuralists' view, the very idea of coherent structure sealed the critic in a golden cage, and every sensible person's first duty was to escape by whatever means possible – by favoring decentering over centering (Foucault 1972), dis-closure over closure (Spanos 1977), heterogeneity over homogeneity, and plays of meanings over an impoverished "correct" interpretation (Derrida 1972). In comparison, narratological methods and objectives seemed naive and inadequate, and many began to consider the discipline a "paleostructuralist relic" (Chatman 1993, 59). Yet the momentum of narratology was not spent, and its potent conceptual toolbox – a poststructuralist anathema if ever there was one – formed the basis of a number of excellent studies (e.g., Nünning 1989 on George Eliot, Edmiston 1991 on the 18C French novel, Collier 1992 on Patrick White, and Stevenson 1992 on modernist fiction). The late eighties and the early nineties also saw a **[end of p. 168]** critical reassessment of terms and concepts (Chatman 1990), a general broadening of scope, especially as to the range of text types to be admitted (Pavel 1985, Cohn 1990, Bal 1990, Branigan 1992), and an increasing interest in combining technical and thematic aspects. Since then, the discipline has branched out into a feminist narratology (Bal 1986, Warhol 1989, Lanser 1992), a historiographic narratology (Cohn 1990), a narratology of historiographic fiction (Nünning 1995), a possible worlds narratology (Ryan 1991, Ronen 1994), a deliberately "natural" narratology (Fludernik 1996a), even a postmodern narratology (Hutcheon 1988, McHale [1987] 1994), to name only a small number of important diversifications. As to methodological advances, where classical narratology preferred an ahistorical/panchronic vantage, postclassical narratology today actively pursues historical/diachronic lines of inquiry; where many first-generation narratologists insisted on an elementarist (or analytic, or combinatorial, or "bottom-up") approach (Chatman 1975, 234; Lanser 1981, 35-6; Genette [1983] 1988, 129), postclassical narratology today welcomes the uses of synthetic and integrative views (Cohn 1981, Stanzel 1984); and, finally, where classical narratology assumed a holistic and retrospective stance, there is an increasing tendency today to pick up the thread of Sternberg's ([1978] 1993) and Perry's (1979) explorations into the cognitive dynamics of the reading process.

Following up this latter line of inquiry, the present paper deliberately takes a "process turn" paralleling that taken in cognitive linguistics (Bever 1970), discourse analysis (Brown and Yule [1983] 1989, ch. 1.3.3), and linguistic stylistics (Fludernik 1996b). The crucial linguistic test case elucidating "discourse-as-process" as opposed to "text-as-product" (Brown and Yule [1983] 1989, 24) is the "garden path sentence" – a type of sentence that traps the reader in a processing

failure and requires an act of reanalysis to recuperate its actual structure and meaning. Interestingly, the cognitive mechanisms that trigger the garden path effect are precisely those that allow effortless comprehension of ordinary sentences in the first place. The mechanisms involved are quite ubiquitous, and researchers like Hockett ([1973] 1977) noted from early on that garden path effects also occurred in jokes, riddles, and stories. The present paper will trace this widening circle of the garden path phenomenon, first by looking at the cognitive research into garden path sentences and introducing a set of basic concepts and models, then by discussing a garden path joke and a garden path riddle, and finally, by analyzing two garden path stories (James Thurber's "The Secret Life of Walter Mitty" and Ursula Le Guin's "Mazes"). The narratological conclusions that are drawn from this are almost entirely due to what is rapidly becoming a fruitful and promising interdisciplinary exchange between literary theory and Artificial Intelligence (Colomb and Turner 1989, Schank [1990] 1995, Ryan 1991, Cook 1994, Duchan et al. 1995, Herman 1997, Jahn 1997). [end of p. 169]

1. The linguistics of garden path sentences

Descriptive linguistics in the nineteen sixties set itself the aim of capturing the system of a native speaker's linguistic competence. The production side – how speakers go about constructing sentences – and the cognition side – how hearers manage to understand sentences – were deliberately set aside as less relevant aspects of "performance." Competence grammar was grounded on a powerful testing procedure – an idealized native speaker's ability to decide whether a given sentence was grammatical or ungrammatical. Although it was acknowledged that sentences also submitted to "degrees of acceptability," these were again considered a largely negligible matter of performance (Chomsky 1965, §2). When Bever (1970) finally initiated an investigation into "The Cognitive Basis For Linguistic Structures," however, he was able to present a number of sentences that elicited sharply contradictory grammaticality and acceptability judgments. Particularly striking was the following item, now usually cited as the classical "garden path":

- (1) The horse raced past the barn fell (Bever 1970, 316)

In cursory (i.e., *nota bene*, normal) reading, (1) appears ungrammatical, garbled and incomprehensible. If one treats (1) like a piece of polymorphous wallpaper pattern, however, and simply stares at it for a while, then there is a good chance that it will miraculously "change structure" and become readable as *The horse THAT WAS raced past the barn fell*, i.e., comply with the perfectly grammatical pattern of sentences like *The horse sent/ridden past the barn fell* (Bever 1970, 316). Of course, the very obvious cognitive difference is that (1) tricks the reader into a construction from which it is very difficult to recover.

Ever since Marcus (1980, ch. 9) used the term, garden path sentences have become a popular subject in the cognitive sciences, especially in parsing theory and psycholinguistics.¹ Parsing theorists invent garden path sentences to test their

¹ The popularity of the subject can be gauged from the fact that a search on "garden path" in the 1981-1997 MLA CD-ROM database produces 26 hits, 16 of which are indexed as dealing

parsing algorithms, psycholinguists use them to investigate strengths and limits of cognitive strategies, and empirical researchers analyze eye movement and reading time data. Across these different foci of interest, the general pattern of garden paths is considered to be basically identical. The main analytical concepts used to define the "problem space" (Minsky [1975] 1979, 22) of garden paths are best illustrated by comparing and contrasting (1) with the following item:

(2) They told the boy that the girl met the story (Fodor and Inoue 1994, 409) [**end of p. 170**]

(2) – like (1) – begins with an unproblematical *initial region* (*They told the boy*). The initial region borders on a *locally or temporarily ambiguous region* (*that the girl met the*) which opens the door to the garden path – most readers wrongly assume that the sentence will continue as indirect speech. By no means all ambiguities induce the effect, however, so the ambiguous region is only a necessary condition (if that, see section 2). In fact, the reader only gets *garden pathed* when he or she follows a *cognitive preference* for a specific reading of the ambiguous region which is later discarded in favor of the "correct" reading. In (2), it is the functional ambiguity of the word *that* (complementizer or relative pronoun) which is retrospectively identifiable as the *source or onset of error*. For the duration of the ambiguous region, however, there is no obvious indication that (2)'s syntax might be different from what it appears to be; in fact, the reader in all likelihood becomes increasingly *committed* to the incorrect indirect-speech reading chosen. Eventually, however, the realization comes that something has gone wrong: in (1), the word *fell* appears as a supernumerary and non-attributable constituent prohibiting syntactic and semantic closure; in (2), the reader is confronted with the semantic oddity of somebody "meeting a story." As (1) and (2) show, garden path *symptoms* come in a variety of forms, and what makes the matter complicated is that, as a general rule, there is no obvious link between a garden path's symptom and its source of error.

Even though linguists are usually interested in inventing garden paths that are "virtually unprocessable" (Pritchett 1988, 540), not all garden path sentences are in fact equally difficult. Empirical garden path indices such as slow reading times and regressive eye movements vary considerably with sentence-internal and contextual factors.² Garden pathing is usually felt to be more or less "severe" or "persistent," and recovery from it can be "easy" or "difficult" (Fodor and Inoue 1994, 411). For convenience, one might posit a rough and ready scale on which occasionally or potentially misleading sentences like (3a-b) fall on the low-difficulty end, mild garden paths like (4a-b) occupy a middle ground, and breakdown garden paths like (5a-b) congregate to the high-difficulty end. As is common practice in the psycholinguistic literature, I am using ellipses marks to indicate the symptom onset locations:

with garden path sentences. An influential early parsing theory is the "garden path theory of sentence processing" (Frazier 1979, [**end of p. 192**] Clifton and Ferreira 1989). Fodor and Inoue (1994, 408) report several monograph-sized garden path studies in press.

² See Altmann et al. (1992) and Rayner and Sereno (1994) for empirical evidence. As Marcus (1980, ch. 9.6) and Pritchett (1988, 543n5) note, many garden path sentences are less difficult, or even not at all difficult, when supplied with suitable punctuation marks or rendered in careful enunciation – consider, e.g., *The horse, raced past the barn, fell.*

- (3) a. They knew the girl at the bakeshop ... was hungry (Fodor and Inoue 1994, 417)
 - b. The old man's glasses were filled with ... sherry (Schank and Birnbaum 1984, 215)
- (4) a. After John had started the car ... pulled up to the curb (Hockett [1977] 1967, 238)
 - b. Without her contributions ... failed to come in (Pritchett 1988, 543) [**end of p. 171**]
- (5) a. The horse raced past the barn ... fell (Bever 1970, 316)
 - b. The daughter of Pharaoh's son is the ... son of Pharaoh's daughter (Fodor and Inoue 1994, 411)

Garden pathing may take place momentarily in (3a-b), but recovery is more or less routine; in (4a-b), recovery is difficult but not impossible, and (5)'s sentences are such "dramatic garden paths" (Fodor and Inoue 1994, 411) that it is safe to predict that no ordinary reader will be able to make satisfactory sense of them quickly.³ Despite the largely provisional and impressionistic nature of this scale, it appears that the difficult and "artificial" (Marcus 1980, 218) items normally singled out by linguists are just radical instances of a very common phenomenon. In fact, many naturally occurring garden path items can probably be found in waste-paper baskets and first-version manuscripts.

Whether natural or artificial, easy or difficult, the items discussed so far clearly suffice to identify ambiguity, preferences, and symptoms as major features of the garden path phenomenon as one encounters it in isolated sentences. I will now move on to the question of how these factors shape up in the cognitive models used in Artificial Intelligence research.

2. The Artificial Intelligence approach: Frames, Scripts, Preferences

AI research in natural language comprehension can be divided into an engineering section and a cognitive science section. AI's cog-sci researchers focus on designing cognitive models, and AI's engineers attempt to implement computer programs that mimic efficient human cognitive capabilities. In the sixties, design and implementation of a computational natural language processor (CNLP, for short) progressed well, raising very high hopes and collaring substantial grants. Early versions of CNLP were soon able to perform adequate syntactic parsing, and it was briefly believed that it needed only a bilingual dictionary and a set of suitable transfer rules to move on to more ambitious tasks like machine translation. As is well known, this proved to be illusory mainly because everybody had underestimated the problem of ambiguity in natural language. The problem was not that CNLP was unable to handle ambiguity at all, but that it handled it too well.

³ Note that the quality of *satisfactory sense* is symptomatically lacking in the garden path reading of (5b). Construing [*the daughter*] [*of Pharaoh's son*] will give the sentence a truth value of *false*. Construing [*the daughter of Pharaoh's*]'s [*son*] will yield a more satisfactory truth value of *true*, but this construction is inordinately difficult to obtain. For an enlightening discussion of this item, see Fodor and Inoue (1994, 411-14). I will return to the crucial issue of satisfactory sense or "cognitive payoff" in the next section.

For instance, given a textbook favorite like *Time flies like an arrow*, a sixties-seventies vintage CNLP would reliably derive no less than three parses (Brainerd 1971, 211; Winograd 1983, 92),⁴ a feat no ordinary human natural language processor (of sound mind) would ever dream of. Embarrassingly, AI operators had to be advised in all seriousness to take CNLP's multiple parses to "the person who entered the input and to let her or him indicate **[end of p. 172]** which [alternative] was intended" (Winograd 1983, 368). For anything approaching a practical purpose, this was counterproductive. It became clear at this point that ambiguity was no isolated phenomenon that would go away of its own accord; what was worse, the designers of CNLP had to admit that they had not the faintest idea how to implement formally and explicitly what ordinary humans do automatically and unconsciously, namely *resolve* ambiguity and settle for a most likely reading.

It does not take much insight or introspection to recognize that ambiguity is normally resolved on the basis of situational and contextual knowledge. For instance, encyclopedic "world knowledge" tells us who or what is flying where in *I saw the Azores flying the Atlantic* (Johnson-Laird 1983, 235), and context tells us which meaning of the word *seal* is relevant in (i) *John goes to the zoo often; he is very fond of one particular seal* vs. (ii) *The royal proclamation was finally completed, and the king sent for his seal* (Lehnert 1979, 80). Hermeneuticists have always claimed that while each part X of a discourse tells us something about the whole, the whole also tells us something about X; in fact, they propose that it is the mutual reinforcement or "hermeneutic circle" of these processes that eventually produces understanding. Unfortunately, what the AI programmer encounters as soon as s/he attempts to implement a context-sensitive ambiguity resolution routine is mainly the hermeneutic circle's vicious twin – the *hermeneutic dilemma* that one knows neither function nor meaning of part X unless one knows the context, but that one cannot know the context (made up of parts more or less like X) unless one already knows X. Moreover, it is all very well to say that context (or "the whole") disambiguates the word *seal* in *The royal proclamation was finally completed, and the king sent for his seal* – but what if the king has a pet seal (Lehnert 1979, 80), in other words, what if local context is overridden by global context or various stages of widening context (Fish 1980, 281-92)? In order to overcome this notorious paradox of context, AI theorists realized that the vague notion of "context" had to be replaced by a more tangible construct.

In the mid-seventies, Marvin Minsky at M.I.T. and Roger C. Schank collaborating with Robert P. Abelson in New Haven began to experiment with computational data structures aiming at capturing a person's knowledge and expectations about standard situations like walking through a room, going to a restaurant etc. Designing what they called "frames" (Minsky) and "scripts" (Schank and Abelson), these theorists soon hit on a number of cognitive intricacies that, owing to the seemingly obvious nature of things, had been ignored by previous researchers. For instance, given a standard "theater script," Schank and Abelson pointed out that "we need not ask why somebody wants to see our ticket when we enter a theater, or why one should be quiet, or how long **[end of p. 173]** it is appropriate to sit in one's seat. Knowledge of specific situations such as theaters allows us to interpret

⁴ (i) *Time* (N) *flies* (V) *like an arrow* (PP); (ii) *Time* (V, imperative) *flies* (N) *like an arrow* (PP); (iii) *Time flies* (N) *like* (V) *an arrow* (N).

the remarks that people make about theaters" (Schank and Abelson 1977, 37). Similarly, when processing a restaurant story, the restaurant script enables us (and, ideally, CNLP, too) to "assume that what was ordered was what was eaten" (Schank 1995, 8), even if this is nowhere explicitly stated in the text itself.

For a closer glimpse into the theory of frames and scripts, it is instructive to note that the original central definitions overlap and complement each other in a number of relevant aspects:

- (6) [A frame] is a remembered framework to be adapted to fit reality by changing details as necessary. We can think of a frame as a network of nodes and relations. The "top levels" of a frame are fixed, and represent things that are always true about the supposed situation. The lower levels have many terminals – "slots" that must be filled by specific instances or data. Each terminal can specify conditions its assignments must meet. (The assignments themselves are usually smaller "sub-frames.") . . . Much of the phenomenological power of the theory hinges on the inclusion of expectations and other kinds of presumptions. A frame's terminals are normally already filled with "default" assignments. (Minsky [1975] 1979, 1-2)
- (7) A script is a structure that describes appropriate sequences of events in a particular context. A script is made up of slots and requirements about what can fill these slots. The structure is an interconnected whole, and what is in one slot affects what can be in another. . . . [A] script is a predetermined, stereotyped sequence of actions that defines a well-known situation.

Understanding . . . is a process by which people match what they see and hear to pre-stored groupings of actions that they have already experienced. New information is understood in terms of old information. A human understander comes equipped with thousands of scripts. He uses these scripts almost without thinking. (Schank and Abelson 1977, 41, 67)

In order to be able to use both definitions, AI theorists often stipulate that the scope of frames is wider than that of scripts, and that scripts are types of "frames designed for the specific task of natural language processing" (Lehnert 1979, 85). (6) and (7) suggest that frames basically deal with *states and situations* (seeing a room, making a promise) while scripts cover *stereotypical action sequences* (playing a football game, going to a birthday party, eating in a restaurant (Minsky [1975] 1979, 7; Schank and Abelson 1977, 41). Since frames and scripts can occur at many different levels of complexity – hence the notion of subframes and subscripts – further conceptual integration allows frames to slot into scripts, and scripts to slot into frames. As I will argue in the following sections, the *frame of a narrative situation* (Jahn 1997) and the **[end of p. 174]** *genre-specific script of a narrative performance* will prove instrumental for a discussion of literary garden paths.

As detailed in (6) and (7), frames and scripts specify "defaults" to encode expectations, "nodes and relations" to capture categories and hierarchies, and "terminals" and "slots" to provide data integration points. The usual mode of frame or script structure visualization is the directed graph or tree diagram (Minsky [1975] 1979, 3; Schank and Abelson 1977, 43), a structure that is well manageable in computational terms. Frames and scripts are required to be

"flexible" and adapt to "new and unusual situations," to deal with variants or "tracks" (Schank and Abelson 1977, 40), and to allow exceptions, "excuses" (Minsky [1975] 1979, 18), "interferences and distractions" (Schank and Abelson 1977, ch. 3.4). For both frames and scripts, the actual integration of lower level data is regulated by "conditions" and "requirements." Some of these are necessary conditions representing "things that are always true about the supposed situation" (Minsky), others are of a more probabilistic or modal nature, specifying ideal types or defaults, but also marginal cases, permissible exceptions, and so on.

Because frames and scripts must be flexible and adaptable, most of their cognitive power lies in the non-necessary conditions encapsulated in them. In the following, I will take up a suggestion by Ray Jackendoff (1983; 1987) and treat a frame's or a script's non-necessary conditions as *preference rules* – a doubly convenient term because it establishes a direct link to the subject of garden paths. Preference rules usually come in pairs, groups, and oppositions, and accumulate in complex *preference rule systems* in which each rule is weighted and ranked according to a specific priority, confidence or stability rating. A preference rule system is a carefully calibrated operational model of a restricted area of cognitive decision-making (Jackendoff 1983, ch. 8; 1987, ch. 8.3). As Jackendoff (1983, 155) shows in more detail, preference rule systems can be used to formalize cognitive decisions in such varied fields as visual and musical grouping, prototype images, categorization judgments, taxonomies, word meanings, markedness conventions, parsing heuristics, and pragmatic strategies. In fact, Jackendoff convincingly claims that "the characteristics of preference rule systems are found everywhere in the psychological process, all the way from low-level perceptual mechanisms to problems so prominent in our conscious life as to be of social and political concern" (1983, 156).

Many comprehension strategies discussed in the literature can be recast as preference rules using the formula *Prefer to assume that p, else prefer to assume that q, else ...* (etc.). For instance, Bever (1970, 294) isolated a reading strategy to *prefer to assume that the first N ... V ... (N) clause is a main clause* – not quite coincidentally, this is the very low-level preference that opens the door **[end of p. 175]** to the garden path of (1), *The horse raced past the barn fell*. In similar manner, the context-sensitive "strict subcategorization" and "selection restriction" rules envisaged in Chomsky (1965) can be turned into preference rules in a cognitive context, and the same goes for the "theta grid" restrictions now assumed in more recent "government and binding" theory (Chomsky 1986). The perceived oddity of "the girl met the story" in garden path item (2), above, is a consequence of violating a restriction of the verb *meet* according to which human agents usually meet other human agents. Some dictionaries specify default restrictions of this type by citing standard context patterns like "said of a person" or prototype sentences like "an attractive sister I want you to *meet*" (thus *Webster's Third* under *meet*). On higher levels of analysis, the speaker/hearer assumptions and felicity conditions of speech acts (Searle [1969] 1974), the principles of politeness and face-saving (Leech 1983, Brown and Levinson 1987), and the maxims of conversational co-operation (Grice 1975) are easily converted into hearer/reader-oriented preference rules (cp. Jackendoff 1983, 155).

Frames/scripts and data enter into a mutual dependency-and-reinforcement relationship which constitutes an operationally practicable version of the hermeneutic circle. On the one hand, frames and scripts offer slots within which the data accumulate and "make sense," and on the other, the data continually test the adequacy of whichever frames and scripts are active. Put simply, frames and scripts tell us what the data are, and the data tell us whether our choice of frame or script is appropriate. Functionally, frames, scripts and preference rules disambiguate structural, lexical, referential and illocutionary ambiguities, supply the defaults to fill the gaps in the discourse, and provide the presuppositions that enable one to understand what the discourse is about. In the final analysis, it is the degree of compatibility or competition among preferences that decides "whether a sequence of data is perceived as standard, stereotypical, new, unusual, indeterminate or persistently ambiguous" (Jackendoff 1987, 252).

Although the psychological correlatives of frames, scripts, and preference rule systems are circumspect, efficient and time-tested inference engines, they are definitely not fail-safe devices. It is in the nature of things that humans occasionally misconstrue and misunderstand, and this fact is no more apparent than when one is led down a garden path. Put simply, a garden path triggers a preference rule system failure that causes processing to be impeded or break down. Since preference rules are general and ubiquitous it follows – extending the definition given in section 1 – that there are garden paths that do not depend on ambiguity at all. Consider the following enlightening item invented by Johnson-Laird: **[end of p. 176]**

(8) The book fills a much needed gap (Johnson-Laird 1981, 122)

As Johnson-Laird points out, without explicitly using the term "garden path," there is a strong likelihood that readers will misconstrue (8). In fact, one normally has to re-read (8) a couple of times before one realizes "that it is the gap, not the book, that is needed" and that the sentence is not as "laudatory" as one thought (1981, 122). Since (8) leads the reader into an interpretation which in view of later evidence cannot be upheld, it is a garden path like all the other garden paths treated so far. It *differs* from the previous garden paths firstly because it cannot be tied down to any known type of lexical, structural or referential ambiguity, and secondly because it does not show any obvious symptom. On the face of it, (8) says what it says, and it says it clearly, so it does not lead one astray by violating any known conversational maxims. What does lead one astray is one's anticipation of good sense, and this is itself a consequence of a human understander's unwillingness to consider nonsense, of a general horror of semantic emptiness, of a craving to make satisfactory sense of a discourse, in short, of preferring what makes more sense or even most sense (Lehnert 1979, 84-5). Evidently, the preference to read for maximum cognitive payoff ranks higher than the complementary preference to take an utterance to mean exactly and nothing but what it literally says. As (8) very clearly shows, the cognitive payoff preference initially dominates the text. It is only when the reader is forced to reprocess the sentence (repeatedly, if necessary) that the cognitive value of the first reading (a much-needed book filling some kind of a gap) degrades up to a point where the secondary preference gets the upper hand and recovers (8)'s other (textually more

accurate, but less sensible) reading (tolerating the notion of a much-needed gap).⁵ Luckily, the blinkeredness induced by (8) is not the rule. Notorious cases like *The postman bit the dog* (Marcus 1984, 259) or *Man Eats Lion* (an advert for a piece of confectionery) show that the cognitive payoff preference is not so dominant as to suppress all messages that run against normal sense and probability. Significantly, children around the age of 3, accessing smaller knowledge bases and differently organized preference rule systems, are prone to be garden pathed by these cases (Bever 1970, 306-7).

Consider also how the cognitive payoff preference affects processing of the following item:

(9) Police Say Detective Shot Man With Knife (Private Eye 1979, 29)

This is one of many examples of unintentional (or possibly intentional) headline humor and prepares the ground for material to be dealt with in the next [end of p. 177] section. (9) has only one probable reading, yet one also easily (almost eagerly) retains the improbable alternative suggested on low-level syntactic grounds. Considering that one is not at all tempted to do this sort of thing with a comparable case like the notorious *We saw the boy with the telescope*, it seems we are dealing with a type of material where it virtually pays not to disambiguate. Specifically, there seems to be a general impulse to deactivate ambiguity resolution if this helps to retain a reading that allows one to laugh at authority (in this case, the police), or speaking more generally, if this helps to instantiate a joke frame (see next section). In fact, items like (9) are collectibles, and the book from which it has been quoted also contains the similar "boob" *Police found drunk in shop window* (Private Eye 1979, 5). Aided by competing preferences and garden path conditions, the cognitive payoff preference can be seen to maintain or even generate polyvalent readings that hold their own against the odds of probability.

Frames, scripts and preference rules regulate the interfaces between data-driven ("bottom-up") and context or knowledge driven ("top-down") cognitive strategies. One of the main preferences is to read a text for maximum cognitive payoff. If this rule is not satisfied then no appropriate sense can be made of the input, and the data will exhibit the very oddity that psycholinguists identify as a garden path symptom. The garden path is confirmed if the symptom goes away on conscious or unconscious reanalysis, either by switching frames or scripts, or by reshuffling the preference rules. This is the standard scenario, but in view of the evidence of (8) and (9) one should also keep in mind that there are garden paths which are not

⁵ This is practically the same effect that occurs in the famous Necker cube experiment. First, one sees a cube (actually, an ambiguous wire-frame figure) from a preferred point of view, usually left-and-above. After a while, one subliminally asks, Is that all? Could there be a different interpretation? And bang, there is the cube seen from right-and-below. Jackendoff (1987, 116-7) discusses the Necker cube figure in the context of ambiguous sentences and garden path items, Wenzel (1994, 123-5) relates it to a garden path joke, and Jahn (1997) adapts it for a mental experiment illustrating the primacy-recency conflict. Jackendoff (1987, 117) further points out that subjects hearing the looped audio sequence *the see I sun the see I sun ...* after a while tend to construe this as *ice on the sea ice on the sea* Even more dramatic is the "repeating word" experiment reported by von Foerster ([1981] 1990, 42), in which the looped word *cogitate* induces hearers to construe a dramatic number of variant readings.

attended by a symptom, as well as recovery procedures which maintain polyvalent readings for ulterior cognitive payoffs.

3. The evidence of "simple" forms: jokes and riddles

In 1930, André Jolles published a pathbreaking investigation into the *Simple Forms* of legends, sagas, myths, riddles, proverbs, anecdotes, fairy-tales, and jokes. The word *simple* is best scarequoted because, as Jolles noted, theoretical exposition of these genres is far from simple (Jolles [1930] 1965, v; cp. also the more recent exposition in Koch 1994). In the present context, the word simple may be taken to indicate that the performance of simple forms is stereotypically scripted.

Specifically, a joke's communicative frame consists of a speaker/narrator N and an audience R (R1, R2, ...), and the text is expected to culminate in a punch line effecting a specific audience reaction, laughter. As was noted by Hockett, there is a class of jokes that turn on carefully crafted garden [end of p. 176] paths. In fact, Hockett distinguishes two types of garden path jokes, exemplified by (10a-b), below:

(10) a. If you hit me I'll wax wroth, and then Roth will be all slippery. (Hockett 1973] 1977, 266; qtd Yamaguchi 1988, 324)

b. Underneath that rugged exterior there beats a heart of ... stone. (269)

According to Hockett, (10a) is a "punning garden path," and (10b) is a "nonpunning garden path." Both items are clearly similar to the sentoids constructed by psycholinguists: (10a) turns on a locally ambiguous (sound) sequence, and (10b) – like (8) – is based on a preferred (but misguided) anticipation of a fixed expression ("heart of gold"). According to Hancher's (1980), Raskin's (1985) and Raskin and Attardo's (1994) pragmatic models, jokes usually evoke two "opposed" scripts and generally tend to mislead by deceptively violating the maxims of cooperation of bona-fide communication (mainly those of relation, quantity, and quality). Taking up Hockett's examples, Yamaguchi (1988) defines a garden path joke as

(11) [a] joke in which the context is potentially ambiguous in that it has potentially a first and a second reading, the former being replaced by the latter at the end of the joke. (Yamaguchi 1988, 325)

Clearly, however, (11) is too narrowly ambiguity oriented and overlooks the evidence of items such as (8) and, in fact, (10b). More importantly, although (11) presupposes that a garden path can be the central element or "pivot" (Hockett [1973] 1977, 267) of a joke, it does not address the question why some garden paths are funny and others are not. Consider, for instance:

(12) a. When Bill finally met John, he was wearing his gorilla costume. Gosh, I am impressed, John said.

b. The airship was about to leave the airport. The last person to go up the gangway was Miss Hemming. Slowly her huge nose turned into the wind. Then, like some enormous beast, she crawled along the grass. (Crystal 1995, 233)

Both (12a) and (12b) hinge on an ambiguous pronominal reference. On the usual preference of proximal binding, "he" in (12a) and "her/she" in (12b) will initially be associated with John and Miss Hemming, respectively. Wider context indicates that this is wrong in both cases, so one generates the appropriate alternatives, reenacting the recovery process predicted by Yamaguchi, in (11). Yet while (12a) remains unfunny to the point of being boring, (12b) is funny **[end of p. 179]** enough to be quotable by Crystal, himself quoting from another source. Evidently, one cannot hope to approach the elusive causes of humor (Navon 1988) without including a psychological component. Paradoxically, psychological research into humor (especially the humor of dirty jokes) has unanimously found that what a joke's audience is laughing about is rarely a laughing matter. Under psychoanalysis, jokes simply aren't very pleasant: their players are aggressors and victims (or "butts"), and often enough a joke treats a traumatic subject. As soon as one asks *who or what one laughs at* it becomes plain that a "joke frame" provides role slots for aggressors and victims, usually to be instantiated by characters in the joke's story. As Legman ([1968] 1973, 116) points out, the roles of aggressors and victims may also project to the outer levels of the joke frame. In garden path jokes, specifically, it is the teller who acts as the aggressor, and the listener who assumes the role of the butt.

Hockett also noted that riddles tend to invoke the same patterns and frames as jokes. One of his examples is a classic of folk literature:⁶

- (13) As I was going to St. Ives
 I met a man with seven wives,
 Each wife had seven bags;
 Each bag had seven cats;
 Each cat had seven kits.
 Kits, cats, bags, wives,
 How many were there going to St. Ives?
 Hockett ([1973] 1977, 273)

Employing the frame of a first-person (homodiegetic) narrative situation, (13) contains a minimal narrative, or perhaps it would be more adequate to say, following Chatman (1990, ch. 1-2), that both story and descriptive detail are put to "the service of" the riddle. The story is clearly fictional; no one is asked to believe that the speaker ever actually went to St. Ives, or really saw what s/he says s/he saw. To use Bal's (1981, 45) formula, there is a narrator-speaker (N) who tells an audience that X ("I," the narrator's experiencing Self) sees what Y ("a man with seven wives") does. Despite its brevity, the story's tellability (Labov 1972) is high, largely owing to the exotic nature of the man's seven wives. Otherwise, the story is abortive; there is no development, no plot, no denouement. From line 6, the speaker simply abandons the narrative and concludes by putting the riddle's poser. The standard riddle script now requires the interaction of a member of the audience, R (being a "nursery rhyme," R is most likely a child), who, as Hockett points out, "cannot normally guess the answer and is not really supposed to try" ([1973] 1977, 271). When R fulfills his/her part of the script by saying "Don't

⁶ Opie and Opie ([1951] 1977, 377) trace the earliest English version of (10) back to 1730. Hockett claims that a "prototype appears in the Rhind papyrus, from Egypt from about 1650 B.C." ([1973] 1977, 273).

know," the speaker reveals the correct **[end of p. 180]** answer, "One."⁷ Not surprisingly, the answer will strike R as symptomatically odd.

Again, like (8) and (10b), (13)'s garden path arises not from a linguistic ambiguity but from R's being artfully primed to expect a numerical calculation task of some sort or other. Even in the context of a riddle script, R will preferentially be inclined to assume that the speaker is speaking cooperatively and making his or her "contribution as informative as is required." Of course, it is the flouting of this maxim that eventually leads to R's misapprehension of the drift of the final question.

As Hockett further notes ([1973] 1977, 270-71), there is an obvious family resemblance between nursery rhyme riddles like (13) and genuine problems posed in a contest. The main points of difference are (a) that a *bona fide* competitive problem is not literary (Ryan 1991, 2), and (b) that the answer is expected to be within reach of the contestant's capability. But, as (14), below, shows, it is certainly legitimate for the problem to involve a garden path:

- (14) You are rowing a boat upstream. The river flows at three miles per hour; your speed against the current is four and one-quarter. You lose your hat on the water. Forty-five minutes later you realize it is missing . . . How long does it take to row back to your floating hat? (Gleick 1992, 33)

Although (14) poses as an algebraic problem, the difficulty is that it will take too long, under contest conditions, to do the necessary calculation. The feat actually required is to recognize that no calculation is needed at all. Here is how Richard P. Feynman, winner of the Physics Nobel Prize in 1965, reportedly solved (14) at age eighteen:

- (15) Given a few minutes, the algebra is routine. But a student whose head fills with 3s and 4 1/4s, adding them or subtracting them, has already lost. This is a problem about reference frames. The river's motion is irrelevant . . . In fact all the velocities are just so much foliage. Ignore them, place your point of reference at the floating hat — think of yourself floating like the hat, the water motionless about you, the banks an irrelevant blur — now watch the boat, and you see at once, as Feynman did, that it will return in the same forty-five minutes it spent rowing away. For all the best competitors, the goal was a mental flash, achieved somewhere below consciousness. In these ideal instants one did not strain toward the answer so much as to relax toward it. (Gleick 1992, 33)

Apparently, Feynman "simply" disabled the cooperative preference, correctly guessing that it was being flouted. Rather than becoming swamped by the discourse's **[end of p. 181]** "foliage," he imaginatively transposed to the story's scene of action where the answer was simply waiting to be picked up — interestingly enough, it is a strategy that would also crack (13), much, presumably, to the annoyance of everybody concerned. Feynman later realized that conducting

⁷ As Opie and Opie point out, "The solution is 'one' or 'none' according to how the question is read. If the question is as plainly put as it was by a writer 200 years ago, 'Qu: How many Wives, Sacs, Cats and Kittens went to St. Ives?' the answer is clearly 'none'" ([1951] 1977, 377).

innovative research was not much different from solving garden path puzzles. New physical laws, he pointed out, were discovered by deliberately going against the grain of one's expectations: "[R]easonable things are where the trouble always is . . . In general we look for a new law by the following process. First we guess it" (Feynman [1965] 1992, 156). The same creative problem solving techniques were later popularized by de Bono ([1971] 1983) under the label of "lateral thinking."⁸

What has, hopefully, become evident in this section is that the AI-enhanced conceptualizations introduced in sections 1 and 2 can be applied to good explicatory effect to the seemingly simple and minimally narrative forms of jokes and riddles. Let us widen the scope once more and consider two short stories which make particularly effective use of garden paths.

4. Two Garden Path Stories

James Thurber's famous "The Secret Life of Walter Mitty" juxtaposes an action line situated in the ordinary world of the Mittys (their shopping trip to Waterbury) with the wildly escapist daydreams of the hen-pecked husband. Although much energy has been expended on psychoanalyzing the protagonist of this unquestionable "masterpiece of associational psychology" (Hasley 1974, 506), very few critics discuss the narratological cruxes of its dream episodes or the story's challenging garden path beginning. Here are the story's first three paragraphs:

- (16) [a] 'We're going through!' The Commander's voice was like thin ice breaking. He wore his full-dress uniform, with the heavily braided white cap pulled down rakishly over one cold grey eye. 'We can't make it, sir. It's spoiling for a hurricane, if you ask me.' 'I'm not asking you, Lieutenant Berg,' said the Commander. 'Throw on the power lights! Rev her up to 8,500! We're going through!' The pounding of the cylinders increased: ta-pocketa-pocketa-pocketa-pocketa-pocketa. The Commander stared at the ice forming on the pilot window. He walked over and twisted a row of complicated dials. 'Switch on No. 8 auxiliary!' he shouted. 'Switch on No. 8 auxiliary!' repeated Lieutenant Berg. 'Full strength in No. 3 turret!' shouted the Commander. 'Full strength in No. 3 turret!' The crew, bending to their various tasks in the huge, hurtling eight-engined Navy hydroplane, looked at **[end of p. 182]** each other and grinned. 'The Old Man will get us through,' they said to one another. 'The Old Man ain't afraid of Hell!'
- [b] 'Not so fast! You're driving too fast!' said Mrs. Mitty. 'What are you driving so fast for?'
- [c] 'Hmm?' said Walter Mitty. He looked at his wife, in the seat beside him, with shocked astonishment. She seemed grossly unfamiliar, like a strange woman who had yelled at him in a crowd. 'You were up to fifty-five,' she said. 'You know I don't like to go more than forty. You were up to fifty-five.' Walter Mitty drove on toward Waterbury in silence, the roaring of the SN 202 through the worst storm in twenty years of Navy flying fading in the remote, intimate airways of his mind. (Thurber 69)

⁸ De Bono himself illustrates lateral thinking by quoting two garden path jokes (de Bono [1971] 1983, 39). The notion of lateral thinking also comes up in Fodor and Inoue's discussion of their "repair model" of garden path recovery (1994, 410).

Four more daydream episodes are interspersed in the further course of the story; all are presented in the easily recognizable style of (16a). In fact, the story not only begins but also ends with one of these episodes (when Mitty, now a prisoner of war, but "undefeated to the last," faces a firing squad). Despite this circular framing, ordinary world knowledge tells us that Mitty's dream existence (as Commander Mitty, Dr. Mitty, Captain Mitty etc.) ontologically presupposes his fictionally real existence (henpecked Mitty driving his car to Waterbury). Hence it is generally assumed that Mitty's daydreams are "embedded" in the story's representation of Mitty's real world. What is less clear is the exact narratological status of the embedded segments. According to Genette, dreams, daydreams, and recollections ("subjective analepses") are to be treated like "metadiegetic" narratives, in which intradiegetic narrators tell "second" (or third or fourth) narratives (Genette [1972] 1980, 231). In "Notes on Narrative Embedding," Bal (1981) has argued to use the prefix "hypo-" rather than "meta-" (a proposal that has been accepted by many narratologists); and she has also suggested that dreams should be treated as "hypofocalizations" rather than "hyponarrations" (a point on which most narratologists are notably reluctant to commit themselves). One may well ask which of these account captures the state of affairs presented in "Walter Mitty." Particularly relevant is the question whether the well-spoken narrator of the fictionally real sections (who can talk of the "intimate airways of [Mitty's] mind") is the same as the second-rate, bungling, cinematic narrator of the fantasy episodes (who lets his protagonist "twist a row of complicated dials"). Or is it Mitty himself who bungles the "complicated dials," becoming a metadiegetic narrator "by delegation," and turning (16a) into hyponarration as well as hypofocalization? Throwing these questions into sharp focus, Mitty's daydreams point up some troublesome narratological aporias (Jahn 1996, 248). **[end of p. 183]**

What is less problematic is the fact that "Walter Mitty" begins with an episode whose embeddedness (if one accepts it as such) is only recognizable when it is over, i.e., when the narrator passes his remark about "the remote, intimate airways" of Mitty's mind in (16b). Adapting Genette's terms, one might say that (16a) is a "local" alteration, a case of paralipsis, of giving too little information at one point. But "local paralipsis" does not adequately cover the case because when one begins to read the story there is no background norm on which (16a) could be recognized as an alteration, whereas, from (16b) onwards, the text is as informative as one could wish. Of course, no-one can postpone interpretation until everything has been said, so, by the time the reader comes to (16b), the (faulty) frames and scripts under which (16a) makes some sort of initial sense are already instantiated and working. Since it is easy, subsequently, to recover from (16a)'s garden path, and instantiate more suitable replacement frames and scripts, the question naturally is why Thurber uses a garden path at all.

As Ryan (1991, 180-81) has shown, the popular Chinese-boxes visualization of embeddings, while accurate as a final state model, is neither very specific about the local states at which transitions from or into embedded elements occur, nor does it particularly bother about the transitional "edgework" (Segal 1995, 74) that accomplishes the shifts from framing texts to embedded texts, and vice versa. As Ryan suggests, processual aspects such as these are better captured by a dynamic structure known as a "stack" in computer science. Stacks, like Chinese boxes, lend

themselves well to visualization, and the bit of AI jargon that goes with them is quickly established. The particular type of stack most relevant for embedding scenarios is one called a "LIFO" (last-in, first-out) stack. A stack is either empty or contains any number of elements. Only one element, the one on top of the stack, is "visible." State changes are achieved by two simple operations: a new element becomes accessible by "pushing" it onto the top of the stack, and an old element (an element *in* the stack) becomes accessible by "popping" elements off the stack until it is the current one. Applied to meta- or hypodiegetic narratives, the narratological analogy is that when a story begins, it pushes its first narrative onto an (as yet empty) stack. Any metadiegetic second or third narratives are additionally pushed onto the (growing) stack. As soon as a metadiegetic story ends, it pops off the (diminishing) stack, returning the narrative to whichever level happens to lie below.

Recently, a number of "deictic shift theorists" (Duchan et al. 1995) have suggested that if one focuses on the reader's task of negotiating first and second "ontological realms" (rather than first and second narratives) then one is dealing [end of p. 184] with an ontological stack where the most usual pushes are from the ground level of the fiction's real or actual world into a character's perception of it (in standard narratological terms, this amounts to a shift from "objective" narration to "reflector mode" narrative), and from thence to the imaginary worlds of a character's recollections, visions, or dreams (Galbraith 1995, 47). Conversely, ontological pops variously return the reader from a character's dreams, visions or recollections to the ground level of the story's actual world, or from thence to a narrator's commentary or description. Obviously, at the end of the story or novel, a final pop (or series of pops) clears off the fiction's ontological stack, returning the reader to his or her actual world. What is of particular interest in this account is that the life of a story's ontological stack becomes a scripted and preference-ruled process. Specifically, there is a default preference to assume that, at the beginning of a narrative, the story's ontological stack is loaded by pushing the narrative situation and the text's actual world. The reader will preferentially proceed on the assumption that any additional pushes and pops will be textually signaled. As a consequence, any text deviating from this pattern will present a garden path. For instance, at the beginning of *Alice in Wonderland* the text pushes from Alice's actual world into the world of her dream without letting the reader explicitly know (Ryan 1991, 188). A similar push occurs in another famous Thurber story, "The Lady on 142." Conversely, in *Crime and Punishment*, pops from Raskolnikov's dream world to the story's actual world are occasionally left un signaled (Lethcoe 1969, 211). In *Alice in Wonderland* and *Crime and Punishment*, these garden paths are mild and local infractions only, and the necessary pushes or pops are more or less effortlessly performed on recognizing the dream quality of Alice's Wonderland, or on encountering a description of something Raskolnikov cannot possibly have seen. Conceivably, garden pathing of this type can also be more radical, for instance, when an un signaled push into a dream is maintained for over 400 pages (as happens in Pelz von Felinau's *Tantalus*). Naturally, belatedly signaled pushes and pops can also serve the deliberate postmodernist strategy of "misleading the reader into regarding an embedded, secondary world as the primary, diegetic world" (McHale [1987] 1994, 115).

What happens at the beginning of "Walter Mitty" is that the story's ontological stack is already loaded beyond the default number of elements. Since first readers have no way of knowing this, they initially proceed on the preference to assume that (16a)'s action and setting, however unverisimilar it may appear, is situated in the ontological space of the story's real world. For a first reader, Thurber's story begins not as a daydream but as an action-packed military adventure.

Symptomatically, setting, characters, and storyline are immediately reminiscent of an old B movie, a mode of presentation not normally [end of p. 185] associated with an author like Thurber.⁹ Things are even subtly and hilariously wrong from the beginning – the characters are overly clichéd, the "Commander" incongruously wears his "full-dress uniform" on a mission, the narrator can't be bothered with detail; most ludicrously of all, the sound of the airplane's engines is rendered onomatopoeically (and it is not the sound one expects from an eight-engined airplane). Yet these are dead giveaways retrospectively only; for the duration of (16a), the reader has *no* plausible ground for assuming that s/he has entered the world of Mitty's visions.¹⁰ It is only when (16b) suddenly pops to an impossible second level of real action that the garden path's symptom manifests itself in full force. The reader now realizes, probably in "shocked astonishment" much like Mitty's (obviously, one of the garden path's fine functional effects), that the new storyline – husband and wife in a car – is the one that constitutes the fiction's real world, whereas the one that was just popped off represents a phenomenological state, i.e., Mitty's daydream. From here on, the "difference in flavour" (McHale [1987] 1994, 115) between the B movie style of the dream episodes and the modernist reflector mode style of Mitty's ordinary-life episodes are reliable indicators for all further pushes and pops.

Practically all of the foregoing points slip through the net of the holistic (final state) view preferred in classical narratological analysis. The problem is not so much that the holistic model is inadequate but that it forgets, even represses, the (garden) paths it had to traverse in order to arrive at its final synthesis. Paradoxically, the foregoing processual analysis suggests not only that a garden path can be functional but that it actually leads somewhere. Moreover, as Perry has plausibly argued (1979, 41), in a second reading a story only unfolds its full luster when the readings rejected in earlier readings are at least partially resurrected. The initial garden path in "Walter Mitty" is functional not only because it forces us, at one point, to accept Mitty's ridiculous dream world as ground level reality, but also because it makes us undertake the cognitive leap from seeing it as a bungling B movie narrative to reinterpreting it as the wish-

⁹ Although the B movie style of the daydream episodes is usually noted in passing, no one, to my knowledge, has done for "Walter Mitty" what Lowes ([1927] 1978) did for "Kubla Khan." Ellis's "The Allusions in 'The Secret Life of Walter Mitty'" (1965) is basically just another psychoanalyzing approach, disdaining to even mention the influence of *Dawn Patrol* on the story's latter episodes. An "intermedial approach" (Wolf 1996) accessing the story's actual filmic sources would certainly be of considerable narratological interest.

¹⁰ This lack of a dream quality distinguishes (16a) from the dream incipit of, for instance, Dickens's *Edwin Drood*. In retrospect, however, certain elements such as the sound of the car's engine, and "the ice forming on the . . . window" are recognizable as external stimuli reaching into Mitty's vision.

fulfilment "dreamwork" of a protagonist whose real life has become all but meaningless.

Let me turn to an even more effective garden path case, a science fiction short story by Ursula Le Guin. Very fittingly, it is entitled "Mazes."

Le Guin's story is told by a first-person (homodiegetic) narrator who is held captive by an alien who tortures and starves her.¹¹ The text appears in the form of a memo or personal briefing in which the narrator describes her present situation, recapitulates what she knows about the alien, tries to guess its motives, and to identify what has gone wrong. This may look like the beginning of a "problem solving" script, but unfortunately nothing of the kind **[end of p. 186]** materializes. The only decisive reversal occurs when the reader abandons the garden path.

The narrator's main focus is naturally on the alien who basically instantiates an "evil" alien frame as found in science fiction and mythical monsters lore. The alien is "a giant" whose behavior is marked by an "elaborately perverse cruelty" (181). Not only does it provide inedible food, it forces on the narrator the Sisyphean task of (re-)running mazes of varying complexities (hence one meaning of the title). About half-way into the story, the narrator briefly describes the alien's physical features, and then expands on its lack of communicative intent or ability:

(17) But it remains very hard to ascribe its behavior to ignorance.

After all, it is not blind. It has eyes, recognizable eyes. They are enough like our eyes that it must see somewhat as we do. It has a mouth, four legs, can move bipedally, has grasping hands, etc.; for all its gigantism and strange looks, it seems less fundamentally different from us, physically, than a fish. And yet, fish school and dance and, in their own stupid way, communicate!

The alien has never once attempted to talk with me. It has been with me, watched me, touched me, handled me, for days: but all its motions have been purposeful, not communicative. It is evidently a solitary creature, totally self-absorbed. This would go far to explain its cruelty. I noticed early that from time to time it would move its curious horizontal mouth in a series of fairly delicate, repetitive gestures, a little like someone eating. At first I thought it was jeering at me; then I wondered if it was trying to urge me to eat the indigestible fodder; then I wondered if it could be communicating labially. It seemed a limited and unhandy language for one so well provided with hands, feet, limbs, spine, and all; but that would be like the creature's perversity, I thought. (183-4)

However firmly the reader's alien frame may be in place, at this point it becomes symptomatically difficult to follow the narrator's reasoning. Much as one is inclined to empathize with the narrator's plight, one cannot help noticing now that her deliberations are predicated on a set of extremely unusual premises. Of course, like other science fiction characters who live in a different time and world, the narrator will be granted a certain amount of exoticness. However, the number of "complaints" now generated by data not complying with important frame

¹¹ The narrator's gender is actually uncertain, but according to the gendering convention proposed by Lanser (1981, 166), when there is no indication to the contrary, a narrator may be assumed to have the same gender as the author. I am invoking Lanser's rule here merely in order to be able to use a pronoun; unlike in Cortázar's "Story With Spiders" (Mey 1991), the narrator's gender has no bearing on the story's garden path.

conditions, and more specifically, the number of "excuses" (Minsky [1975] 1979, 18) now needed to naturalize the narrator considerably weaken the present frame. Even as one continues to use the present frame, subattentive reasoning begins to argue somewhat along the following lines: If oral communication ("communicating labially") strikes the narrator as a strange thing¹² ... **[end of p. 187]** but is natural to us as readers ... then the story's alien is not as unfamiliar to us as it is to the narrator ... add to this that a maze experiment is a common procedure for testing an animal's intelligence ... add to this that descriptors like "is a giant" and "alien" are strictly relative terms ... So ... what if the story's alien isn't an alien but a human ... in that case could the narrator be an animal? ... No, animals don't tell this type of story (note, too, the narrator's remark about fish) ... *So, what if the alien is a human and the narrator is an alien?*

Of course, this is indeed the replacement frame that undoes the garden path, successfully navigates the story's maze, and lets everything fall into place. Implicating the reader by offering a garden path and then letting him/her reason a way out of it, "Mazes" is a story about the limits of intelligence and mutual communicational failure. The story's human scientist certainly fails to pass his test of intelligence by blindly trusting his maze experiment. He should be forewarned, by the principle of uncertainty, that a measuring instrument may affect and distort the measurement. It should be in his intellectual grasp (especially since he cannot fail to realize that something is wrong) that a maze can be a piece of art as well as a piece of testing equipment. On the other hand, the narrator must be blamed for failing to see that her carefully choreographed dance through the maze is little more than an erratic failure when performed in the context of a "purposeful" intelligence test. (Repeating the maze tests, the scientist, far from intending to torture her, actually gives her a second chance.) The narrator should also realize that devouring the "indigestible fodder" she is given ("So I ate and ate, and starved," 181) can only be a wildly misleading signal.

To a good part, however, the protagonists' failures are also due to adverse circumstances. The worst of this is that both the narrator and the scientist are displaced from their natural habitats. The narrator's remarks about a "heavy foreign air" (181) and the "strange, smooth, curved wall" (182) of her prison are easily recognizable (in retrospect) as allusions to a spaceship manned by a single astronaut, himself "a solitary creature" (183). As a consequence, neither of the protagonists is able to observe the other in social contact or communication with his or her own kind, and all their tests and communicative gestures are doomed to remain ineffectual probings in the dark. When the narrator finally reads the scientist's body language, the message she gets is one of resignation and defeat:

(18) There were no words, yet there was communication. I saw, as it stood watching me, a clear signification of angry sadness Never a word came clear, and yet

¹² As has been pointed out to me by one of my students, when the narrator compares physiological features, the one organ she misses is ears. In (17), she just sees the scientist's lips move, and on that basis guesses that he is trying to say something. From this, the student concluded that the narrator has neither ears nor a concept of auditory communication. In fact, since the narrator's code of communication is basically kinetic she does not need either. Belatedly, her own discourse, i.e., the narrative we are reading, is identified as a mental dance: "I am dancing this, of course, in my mind" (185).

it told me that it was filled with resentment, pity, **[end of p. 188]** impatience, and frustration. It told me it was sick of torturing me, and wanted me to help it. I am sure I understood it. (185-86)

But the narrator also knows that the "alien" cannot reciprocate even in this: "No doubt it will come in to watch me die; but it will not understand the dance I dance in dying" (186).

As can be imagined, this is a text that works well in a classroom. Navigating into and recovering from its garden path is an exciting and rewarding experience. Exploiting the potential of ordinary preferences (narrators are human, aliens are alien, texts are textual, etc.) Le Guin manages to achieve the coveted feat of depicting what it is like to be an alien. Throwing into relief the narrato-logic of the reading process and releasing the energy of close and attentive reinterpretation, the story turns into an enlightening study of the problematics of alterity, epistemological limitations, and communicational failure.

5. Conclusion: the uses of garden paths

One salutary effect of looking at garden paths in a range of text types rather than in contextless linguistic sentoids alone, was that a number of operational linguistic concepts could be extended and modified to be used within the larger cognitive models of frames and scripts. In the widened context it became clear that garden pathing is not always caused by local ambiguity and that the symptom, if present, translates not only into lack of cognitive payoff but into the scenario of a frame or script on point of breaking down. The literary forms, especially, showed that a garden path's cure does not always involve the wholesale rejection of the first reading. Although it has often been claimed that garden paths are a mark of good literary texts (Perry 1979, 50n10), even of literary discourse in general (Cook 1994: ch. 7), this hypothesis is contradicted by the existence of garden path headlines and garden path jokes which have little or no literary merit. However, whether dealing with contextless sentences, or with minimally narrative "simple" forms, or with more sophisticated texts like the stories by Thurber and Le Guin – the garden path effect was always found to be tied to a dominant readerly preference. Following Jackendoff, such first preferences were placed within the framework of larger preference rule systems containing second, and third, and complementary preferences, and preference rule systems were in turn seen as forming a part of a frame/script configuration. Since each major preference can, given an appropriate context, generate a garden path, occurrences of garden paths in oral or written, fictional or factual, literary or non-literary texts constitute a **[end of p. 189]** rich source of material for further analysis and research. Genre related frames/scripts and preferences such as those discussed in sections 3 and 4 clearly merit more detailed attention as particularly productive generators of functional garden paths (cf. Culler 1975, ch. 7). In addition, a number of worthwhile projects would emerge from an investigation of the forms and uses (or mis-uses) of garden paths in philosophical, political, and juridical discourse; in indirect speech acts, irony, parody, equivocation, jokes, riddles, surprise stories, and shaggy-dog tales; in nonsense verse, detective novels, and unreliable narratives; and, above all, in the work of authors like Henry James (Booth [1961] 1970, ch. 12), Ambrose Bierce, William Faulkner (Perry 1979; Andringa and Davis

1994), Vladimir Nabokov, Julio Cortázar (Mey 1991), Victor Borges, and Thomas Pynchon (McHale [1987] 1994, ch. 8), to indicate what is clearly only the tip of an iceberg.

As was shown in section 1, a garden path's difficulty correlates with the time and energy it takes to find the reading that provides better cognitive payoff. A closely related issue is what one might term a garden path's *vitality across a history of re-readings*. In second or third reading, garden paths based on low-level preference rules seem to reactivate more fully than those based on high-level preferences. For instance, *The horse raced past the barn fell* is not only a very persistent and difficult garden path on first reading, it also deceives a reader repeatedly, though presumably not indefinitely. Whereas low-level preferences such as Bever's main clause preference (section 2) are largely beyond a reader's conscious control, many higher level preferences are direct counterparts of overt convention and etiquette (maxims like "Be relevant," etc., Leech 1983, 8), and consequently are readily identified and remembered as a garden path's source of error. Still, as many commentators rightly point out, recalling a garden path and its error does not necessarily protect one from falling for it again (Perry 1979, 357; Jackendoff 1987, 244-45), especially in a context of art or play (i.e., stories, jokes, and riddles), where it may have an important function.

This essay's attempt to marry AI and narratology brought out two main points of contact – a common focus of interest (stories, story-telling, story comprehension), and a common methodology (structuralism). Artificial Intelligence theorists have always been dedicated structuralists, and their models, unlike those of narratologists, were never sicklied o'er by the pale cast of poststructuralist thought. Because a dumb computer must have spelled out for it even the most trivial detail, AI programmers take nothing for granted, neither a self-adjusting hermeneutic circle nor automatic ambiguity resolution. The lesson to be learned from Artificial Intelligence is that one can use process models (like stacks and scripts) as well as state models (like frames) without losing the **[end of p. 190]** heuristics of structuralism; specifically, an enriched and flexible structuralism of this kind allows narratology to escape from its atomistic-holistic doublebind. Fortunately, postclassical narratology can also contribute its share to a fruitful exchange. For instance, when deictic shift theorists assume that "[r]eal readers conceive of canonical fictional language (that is, narrative without a narrator) as self-constituting rather than emanating from a fictional teller" (Galbraith 1995, 32) then it is apparent that their approach could well profit from a dose of "natural" narratology (Fludernik 1996a).

The present author was never, for a moment, tempted to question the assumption that readers can be garden pathed identically. Even a reader who happens not to be garden pathed by a particular example will generally be able to appreciate its garden pathing potential – copy editors do that all the time. For many of the items quoted in section 1 the garden path effect is an empirically measurable fact, and for the other items it is a probable speculation which any reader of this essay can confirm or contradict on the spot. The matter cannot rest there, of course. If readers are garden pathed identically then it is likely that they access identical preference rule systems and come to identical cognitive decisions about a text – a nontrivial conclusion considering the postmodern truism that no two readers ever

read alike. On the other hand, no evidence was found here to make the radical (and reactionary) counter-claim — that readers always and generally read identically, or always and generally work on identical preference rule systems. Quite the contrary: many of the examples suggest that garden paths and preference rule systems can differentiate as well as define what Stanley Fish (1980) has termed "interpretive communities." Getting garden pathed by *The postman bit the dog* (section 2), children ostensibly use a different preference rule system than adults. A linguist will not be garden pathed by *The horse raced past the barn fell* in the same manner that an ordinary reader will (linguists smell this type of garden path a mile off). Following up this lead, it might be instructive to turn to comparative analyses of culturally determined preference rule systems (Schank [1990] 1995) or the ongoing project of liberating and constructing the preferences for "reading as a woman" (Culler 1983, Morris 1993, ch. 1). Here and elsewhere, the methodological apparatus of frames, scripts and preference rule systems is bound to shed some interesting light on the commonalities of interpretive communities. As things stand, the circumspect cognitive critic will probably have to recognize a reading both in its potentially idiosyncratic character (where each reader is an island) and its dependence on commonly accepted interpretive moves and strategies of persuasion (where no reader is an island). As I have shown here, garden paths provide the most direct route into an individual's or an interpretive community's preference rule systems. Moreover, because **[end of p. 191]** garden paths can be suspected and ultimately cured, they also lead somewhere in the sense that they show a way out of the theorist's dilemma of "situatedness" — one's "proceeding in the context of innumerable beliefs which cannot be the object of my attention because they are the content of my attention," as Fish (1989, 326) puts it.

In ordinary communication, garden paths are a nuisance and an embarrassment, and the maxims of co-operation forbid them for good reason. Cognitive scientists deliberately invent vicious garden paths on the rationale that "if a mechanism is a sealed black box, the only way to determine how [it] works is to determine how it begins to fail" (Marcus 1980, 218). Narratologists turn to garden paths in order to investigate the narratorial manipulations that trigger and support them, and to assess their cognitive and aesthetic benefits. Perhaps in real life, too, one should welcome the day-to-day deceptions and misunderstandings for their ecological greater good, i.e., for presenting an opportunity to exercise one's ability to recover from them. On second thought, perhaps one would not actually want to face a message like *In case of attack destroy documents and telephone*, where a misreading could be costly. Thankfully, it is quite sufficient, as well as more convenient, to "stage" such cognitive exercises in a riddle, or a joke, or in the virtual world of fiction (Iser 1993; Mey 1993, ch. 4.4.5).

Imagine that you are standing in front of a secret stone gate, and the powers of darkness are right at your heels. You know the gate opens on a password, and there is an instruction, chiseled into the stone, that says *Speak, friend, and enter*. Naturally you say something, anything, but nothing happens. Either the gate's mechanism is broken or your reading gets no results (not the required amount of cognitive payoff). Of course, as you may well suspect, the problem is an effect of your unconscious preferences, and when the solution finally hits you it is "absurdly

simple, like most riddles when you see the answer."¹³ Temptation and challenge, the garden path educates everyone, characters, readers, cognitive scientists, narratologists.

Notes

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¹³ J.R.R. Tolkien, *The Lord of the Rings* 1:397. The password is *friend*.

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