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Foundational Issues in Teaching Cognitive Narratology

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Introduction

The story of narratology is a story of a success and reversal, of near death and miraculous recovery. It begins as a structuralist exercise in the mid 1960s, when researchers in the humanities took their cue from structuralist linguistics and tried to lay down the rules that govern narrative texts. Out of this endeavor sprang a remarkable set of textbooks which are still readable today.[1] The almost fatal blow to these efforts came with the cultural, ideological and deconstructionist paradigm shifts which brandmarked structuralism as a decontextualized, formalist and logocentric fallacy. Today, narratologists are generally prepared to accept that classical narratology went wrong in many things – its arbitrary choice of core genres; its failure to acknowledge significant exceptions; its treatment of stories as self-sufficient products rather than as texts to be reconstructed in an ongoing and revisable readerly process; and its exclusion of the forces and desires of psychological, cultural, pragmatic and historic contexts that embed and shape them.

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[1]   Cf. Gérard Genette, Narrative Discourse, trans. Jane Lewin (Ithaca: Cornell University Press, 1980); Seymour Chatman, Story and Discourse: Narrative Structure in Fiction and Film (Ithaca: Cornell University Press, 1978); Dorrit Cohn, Transparent Minds: Narrative Modes for Presenting Consciousness in Fiction (Princeton: Princeton University Press, 1978); Gerald Prince, Narratology: The Form and Functioning of Narrative (Berlin: Mouton, 1982); Franz Stanzel, Narrative Situations in the Novel (Bloomington: Indiana University Press, 1971); Shlomith Rimmon-Kenan, Narrative Fiction: Contemporary Poetics, 2nd ed. (London: Routledge, 2002), and Mieke Bal, Narratology: Introduction to the Theory of Narrative, 2nd ed. (Toronto/Buffalo/London: University of Toronto Press, 1997).

Avoiding these faults, the postclassical narratologies[2] have since diversified into a large number of branches and sections, the plural of the term indicating the common dilemma of welcome multiplicity and regrettable fragmentation. The appellation 'narratologist' has ceased to be a term of abuse, at any rate, and theorists today have few qualms about calling themselves film narratologists, drama narratologists, feminist narratologists, legal narratologists, psychonarratologists, pragmanarratologists, rhetorical narratologists, historiographic narratologists, constructivist narratologists, cultural studies narratologists, natural narratologists, and so on. The problems raised by this plurification of schools and approaches are obvious, however. While there is no scarcity of survey articles,[3] it is becoming increasingly difficult to keep track of new developments. Hopefully, the *Routledge Encyclopedia of Narrative Theory*, to be published in 2005,[4] will provide a fuller view of the field.

Originating in humanities departments, narratology has always prided itself on being a transparent and teachable discipline. The challenge addressed in this essay is the design of an interdisciplinary course in which students and theorists from literature, linguistics, pragmatics, philosophy and cognitive psychology join forces in order to address the common subject of storytelling, memory and cognition. Since narratology, in its most general definition, is the theory of stories and storytelling, and, in its postclassical guises, has become strongly aware of psychological and cognitive factors, it offers an ideal meeting ground as well as a possible point of departure.

As early as 1959, Victor de Bono, an unjustly neglected pioneer of the cognitive turn, pointed out that the choice of an 'entry point' into a space or system can make all the difference, both in the perception of a thing or the solution of a problem.[5] Consider the 'road map' presented in Figure 1, and assume that the traveller must abide by the simple rule always to follow

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[2]   Cf. David Herman, 'Introduction: Narratologies', in Narratologies: New Perspectives on Narrative Analysis, ed. David Herman (Ohio: Ohio State University Press, 1999), 1-30.

[3]   Among the most recent surveys are Monika Fludernik, 'Beyond Structuralism in Narratology: Recent Developments and New Horizons in Narrative Theory', Anglistik: Mitteilungen des Verbandes deutscher Anglisten 11.1 (2000); Brian Richardson, 'Bibliography of Recent Works on Narrative', Style 34.2 (2000), 319–24, and Ansgar Nünning, 'Towards a Cultural and Historical Narratology: A Survey of Diachronic Approaches, Concepts, and Research Projects', in Anglistentag 1999 Mainz: Proceedings, eds. Bernhard Reitz and Sigrid Rieuwerts (Trier: WVT, 2000), 345–73.

[4]   The Routledge Encyclopedia of Narrative Theory, eds. David Herman, Manfred Jahn and Marie-Laure Ryan (in preparation); editorial orientation and list of entries are available at www4.ncsu.edu/~dherman/RENT.html.

[5]   See Edward de Bono, The Mechanism of Mind (Harmondsworth: Penguin, 1959).
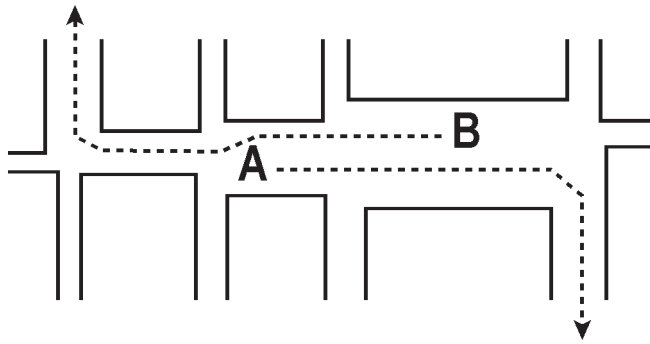
Fig. 1. The entry point effect.[6]

the wider road. Hence, if your starting or entry point is point A, you will go in an easterly direction and eventually end up going South. However, if you set off from point B, not so far away from point A, you will begin by moving in a westerly direction and eventually turn North.

There is reason to believe that similar mechanisms are at work no matter whether the playing field is the 'memory surface' of the human mind (de Bono) or the interpretive space of a discipline. Obviously, the pattern is present in all kinds of storytelling and in many minor and major political conflicts. As Baars nicely illustrates, 'When little Susie and Mary are fighting, Susie will begin the story starting from Mary stealing her bicycle, while Mary will begin the narrative at a different point, when Susie first called her a bad name'.[7]

Selecting a point of entry, one can be lucky and get where one wants to go, or perhaps one only gets where the going is good. Of course, one can also get lost, either in the perceptions of real life or in the varied approaches of competing disciplines. Before discussing the lie of the land and the possible stratifications, and definitely before deciding on the nitty-gritty of course units and materials (Section 4), let us address the fundamental issues.

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6   Adapted from de Bono, The Mechanism of Mind, pp. 145–6.
7   Bernard J. Baars, In the Theater of Consciousness (Oxford: Oxford University Press, 1997), p. 90.

2. Variations on a Theme by Necker

Consider the familiar ambiguous 'Necker cube', named after the French crystallographer Louis Albert Necker, who first saw 'it' in 1832.
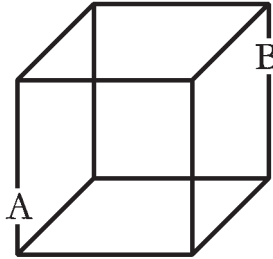

Fig. 2. The Necker cube.

All observers (important correction, all members of the community of adult, human, contemporary, educated observers) can see this as a three-dimensional wireframe drawing of a cube (even though this is not the only interpretation, see below). If you look at it long enough the cube will flip and assume a different orientation – typically, what's front goes back and/or what's up goes down. The reversal is as involuntary as it is erratic; in fact, instructions to see 'the other' orientation are difficult to phrase and harder still to follow. The fact is, your conscious mind is not in control, it cannot order your subliminal perceptual reflexes around. Nor does it matter because after a while the flips will come spontaneously. However, to get a theoretical grip on the effect let us pick out the two main squares of the graphic and mark them as A and B, respectively (as has been done in Fig. 2). Now one can ask, 'Can you see square A as a front surface and square B as a back surface? Or, B as front and A as back? Or, B as top and A as bottom?' Clearly, one of the main lessons to be learnt here is that humans have the ability (though some commentators believe it is a weakness) of 'seeing X as Y'.[8]

While all commentators agree that introspecting one's own cognitive processes is a suspect procedure, what happens in the Necker cube experiment is not beyond all rational explanation. Seeing a cube from one particular point of view seems to be fine for a while, but then some part of the mind seems to reason 'So what? Is that all?' and then generates one of the

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[8] On the broader philosophical and neuronal underpinnings of this notion see Jennifer Church, ''Seeing As' and the Double Bind of Consciousness', Journal of Consciousness Studies 7.8–9 (2000), pp. 99–111.

alternate views, perhaps pursuing a trial-and-error loop of interpretations until we've either had enough or found an answer that suits the present circumstances. If this is a generalizable explanation then the mind generates, foregrounds and assesses alternate interpretations until (hopefully) it produces the most perspicacious result. Put slightly differently, the mind seems to go through all options of what Jackendoff calls a 'preference rule system',[9] generating alternatives roughly along the lines of the formula *Prefer to see X as A; if this interpretation fails to yield sufficient cognitive payoff then prefer to see X as B; if this interpretation fails ... (etc.)*

The Necker cube is good for many informal experiments, but its evidence can also be interestingly controversial. Consider Figure 3, below, reproduced from Ramachandran and Hirstein's essay on 'The Science of Art: A Neurological Theory of Aesthetic Experience'.[10] In this graphic, A is one of the common instantiations of the cube. B, as Ramachandran and Hirstein point out, 'could depict an outline of a cube seen from one specific vantage point, but people usually see it as a flat hexagon with spokes radiating from the middle'.

Trying to capture the rationale of our *primary* preference – 'your visual system abhors interpretations which rely on a unique vantage point and favours a generic one or, more generally, it abhors suspicious coincidences' – Ramachandran and Hirstein play down the complexity of
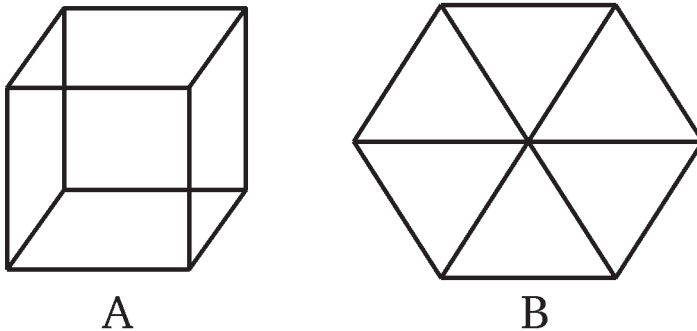

Fig. 3. A likely and an unlikely cube.[11]

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9   Cf. Ray Jackendoff, Semantics and Cognition (London: M.I.T. Press, 1983), ch. 8.
10 Cf. V.S. Ramachandran and William Hirstein, 'The Science of Art: A Neurological Theory of Aesthetic Experience', Journal of Consciousness Studies 6.6–7 (1999), 15-51; the full text of this special issue on art and the brain is available online: http://www.imprint.co.uk/rama.
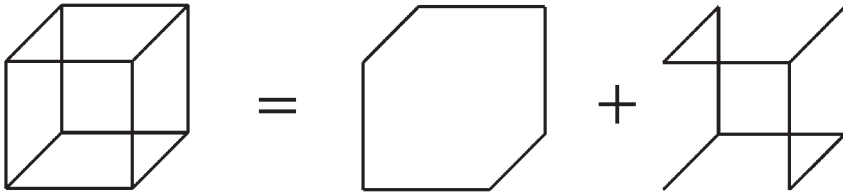11 Ramachandran and Hirstein, 'The Science of Art', p. 28.

Fig. 4. Unlikely (but not impossible) decomposition of the Necker cube.

the preference rule system that comes into play here. Clearly, the fact of the matter is that there *is* a secondary preference that allows us to see B as a rotated and tilted cube. Indeed, Figure 3 rather perversely illustrates – though wholly against the intentions of the two authors – that we can see A, the common Necker cube, not as a cube but as a flat geometrical shape composed of an outer hexagon and a fairly regular geometrical interior structure – like this:

Extrapolating from the evidence of a single primary cognitive preference, Ramachandran and Hirstein boldly move on to the following slippery conclusion:

> So if an artist is trying to please the eye, he too, should avoid coincidences, such as those in [B]. Yet one must be cautious in saying this since every now and then – given the perverse nature of art and artists – a pleasing effect can be produced by violating this principle rather than adhering to it. For instance, there is a Picasso nude in which the improbability of the arm's outline exactly coinciding with that of the torso grabs the viewer's attention – and is arguably attractive to him![12]

This is a deteriorating argument which leaves little to be salvaged. Not only do the authors get sidetracked into a normative mode of description (telling artists what to do), they end up discussing an example which roundly disproves their rule. The case is instructive nevertheless because it highlights the problem of choosing a low-level point of entry and exclusively focusing on standard preferences. The argument collapses on its own reductive terms, just as, I hasten to add, many high-level explanations collapse on their speculative terms. Yet, realizing what goes wrong here is an important step toward developing a more cautious approach.

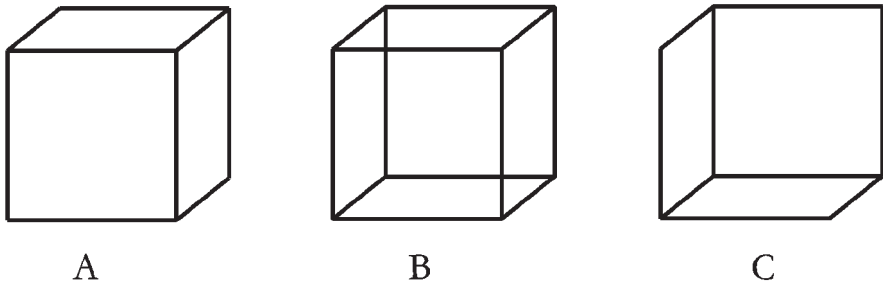[12]   Ramachandran and Hirstein, 'The Science of Art', p. 30.

Fig. 5. Visual and lingual preferences.[13]

For a third variation of the Necker cube, let us turn to an example originally presented by Charles Hockett. Hockett was an early cognitivist whose seminal reflections anticipated the project of cognitive linguistics developing in the nineteen-sixties. As shown in Figure 5, Hockett uses a complex Necker cube scenario in order to point to a lingual analogy.

Just as we tend to interpret visual input in a particular way (i.e., see cube B as either A or C), so language understanders will put a preferred construction on the string of words that they encounter at any one point in a sentence. Hockett's further comment is equally applicable to the visual and the lingual facts:

> When we look at the middle line-drawing B [...], we see it either as more like A, to the left, or C, to the right. With a bit of effort, we can make B 'jell' in either way. Physically, of course, B is an assemblage of line-segments on a flat surface. The depth that we perceive lies in us, not in the figure. Yet our experience in visual perception is such that it is hard to see B as a complicated plane figure rather than in three dimensions.[14]

Hockett rightly points out that lingual understanding, like visual perception, amounts to seeing X as Y. A 'jelling' interpretation is clearly a best-fit interpretation pre-empting generation of further alternatives provided by the preference rule system. Of course, Figure 5 can also serve as a model of local lingual ambiguity, a phenomenon Hockett is particularly interested in. Normally, language understanders have to make up their minds whether

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13   Charles F. Hockett, A Course in Modern Linguistics (New York: Macmillan, 1958), p. 149.
14   Hockett, A Course in Modern Linguistics, p. 149.

to see an ambiguous element (B, above) as either A or C.[15] Hockett himself uses the phrase 'A man eating fish' to illustrate the ongoing dynamics of local ambiguity resolution. 'A man eating fish' is momentarily ambiguous because it can refer to a piscivorous man or to an omnivorous fish. If the text continues '... on Friday is not necessarily a Catholic', then the first reading is strongly confirmed; if it continues 'called the piranha is found in the tropical waters of Brazil', the second reading is confirmed; and if it continues 'has an unbalanced diet', then neither reading is confirmed and further context is needed.[16]

What this type of material throws into focus is the aspect of cognitive error and failure, which is an important source of evidence in cognitive exploration. A 'garden path sentence' is a construction which traps the reader/hearer in a processing fault from which it is hard or even impossible to recover. The example commonly cited is 'The horse raced past the barn fell',[17] a sentence which usually floors uninitiated readers until it is pointed out that the grammatical subject is 'the horse (that was) raced past the barn'' and that the predicate is 'fell', hence that there is nothing whatsoever wrong with it, just as there is nothing wrong with 'The horse driven past the barn fell'. Here one can see how the mind gets tripped up by following a powerful first preference and fails to guard against this particularly vicious collusion of context and form. Clearly, when we come to 'fell', our interpretation has already stabilized or 'jelled' (as Hockett calls it), and the preference rule system containing the past participle interpretation has simply ceased supplying us with alternatives.

Generating alternatives is a standard cognitive procedure on many levels of meaning construction, as Stanley Fish likes to point out, referring to a hackneyed standard case:

Consider the small example of the utterance 'Can you pass the salt?' immediately construed by the vast majority of native speakers as a request for performance of a specific action rather than as a question about the hearer's physical abilities; but this is so because in the very hearing of the utterance we assume the mealtime setting populated by agents concerned with eating and drinking… If one varies the

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[15]   As readers may have noted, an interesting complication here is that A and C are not wholly unambiguous themselves.

[16]   Cf. Charles F. Hockett, 'Grammar for the Hearer', *Structure of Language and its Mathematical Aspects* (1961), 220–36, p. 226.

[17]   Thomas G. Bever, 'The Cognitive Basis For Linguistic Structures', in *Cognition and the Development of Language*, ed. John R. Hayes (London: Wiley, 1970), 279–361, p. 316.

setting and reconceives it as a conversation between a doctor and a patient recovering from surgery, the utterance 'Can you pass the salt' could indeed be heard as a question about the hearer's physical ability… Independently of some such already assumed context (and there could be many more than two), the utterance wouldn't have any meaning at all and wouldn't *be* an utterance, but merely a succession of noises or marks… In the example of 'Can you pass the salt?' it is always possible that someone at a dinner table may hear the question as one about his abilities, or that a patient may hear his doctor asking him to pass the salt (perhaps as a preliminary to an experiment).[18]

Note that Fish makes it a point not to overlook the range of interpretations suggested by the example, even though he does, of course, grant that not all readings are equally likely in a given situation. Fish also plausibly demonstrates that the only context that really matters is what the hearer happens to *assume* to be relevant, no matter what the actual situation might be like. Apparently, context, like beauty, is in the mind of the beholder.[19] Finally, consider also Fish's discussion of 'France is hexagonal', an example which highlights the role of alternatives and contexts in the determination of meaning and truth:

In the penultimate chapter of *How To Do Things with Words*, J. L. Austin presents a sentence and asks us to consider it. The sentence is 'France is hexagonal,' and the question he puts to it is a very familiar one in analytical philosophy: Is it true or false? The answer, however, is not so familiar. It depends, says Austin: 'I can see what you mean by saying that it is true for certain intents and purposes. It is good enough for a top-ranking general, perhaps, but not for a geographer'… In other words, the truth or falsehood of a sentence is a function of the circumstances within which it is uttered, and since it is always uttered within some set of circumstances or others, it is not in and of itself either true or false, accurate or inaccurate, precise or imprecise.[20]

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[18] Stanley Fish, *Doing What Comes Naturally: Change, Rhetoric, and the Practice of Theory in Literary and Legal Studies* (Oxford: Clarendon, 1989), pp. 295–6.

[19] For a pragmaticist corroboration of this view see Dan Sperber and Deirdre Wilson, *Relevance: Communication and Cognition* (Oxford: Blackwell, 1986).

[20] Stanley Fish, *Is There a Text in This Class? The Authority of Interpretive Communities* (Cambridge, Mass.: Harvard University Press, 1980), p. 197.

Truth or falsehood, like resolution of ambiguity, is again seen as determined by (mental) contexts, points of view and preferences. Austin, in his own discussion of the case, speaks of something being 'true for certain intents and purposes,' 'true for a general'. Just as in the case of 'Can you pass the salt?', it is not the situation *per se* that is relevant – a mealtime setting, a general glancing at a sketch of France, a cartographer talking to other cartographers – but the construction of the (or a) situation in the mind of the understander.

   Of course, 'seeing' is one of the most flexible (and ambiguous) words in the language. What I have tried to show in this section is that conscious or unconscious 'seeing as' is a crucial interpretive move in the perception of images and texts. Could seeing X as Y also help us clear the ground for a meeting of disciplines? My answer is going to be Yes, but it requires a brief excursion into the phenomenology of things and worlds.

3. Worlds, spaces and levels of description

Supposing one wanted a minimalist definition of what cognitive theory is all about, one reasonable answer might be that it is about the relations between perception, language and world. Additional rigorous assumptions are called for at this point, and I will follow Jackendoff in distinguishing between (1) the *real world* as it exists before perception and language, and (2) the *phenomenal world* as it is intuitively perceived and described by common, ordinary language concepts.[21] For reasons that will be obvious in a moment, I will add (3) a *world of specialist descriptions*. Call these R-world, P-world and S-world, respectively. The R-world provides our perceptual input, the P-world is what we intuitively perceive it as, and the S-world is a theoretically sophisticated way of describing things.

   Note that since we have stipulated that the R-world exists before perception and language we can only gesture towards it, or characterize it as 'a flux', 'a chaos', 'a pattern of sensory stimuli', a 'succession of noises and marks', 'black marks on paper', and so on. It is easy to see, however, that these latter circumlocutions are already P-world (or even S-world) descriptions of what cannot, by definition, be described; in other words, attempts to express the inexpressible. 'Black marks on paper', for instance, already strongly depends on P-world assumptions about cultural artifacts and standard human points of view. Of course, an even more radical constructivist assumption is that, even without being correlated with

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21   Cf. Jackendoff, *Semantics and Cognition*.

a language of its own, the very idea of an R-world is a mental projection just like the P-world and the S-world.[22] Naturally, there are interesting discrepancies between the different worlds and their ways of seeing things. One of the nicer complications is that everybody does not only intuitively grasp the objects of his or her P-world, but is usually also a specialist in one area or another. To use one of Marvin Minsky's splendid examples, a diagnostician can view a malfunctioning car battery either as part of a mechanical system ('the rotor has a pulley wheel driven by a belt from the engine. Is the belt tight enough? Is it even there?'), or as an electrical system, in which the 'rotor is seen as a flux-linking coil, rather than as a rotating device. The brushes and commutator are seen as electrical switches'.[23] Although the differences between the two specialist subworlds are substantial, the diagnostician will usually consider both 'frames' in order to locate the source of the problem.

Let us take another look at Hockett's comment on the Necker cube (referring to Fig. 5). 'Physically, of course', Hockett says, 'B is an assemblage of line-segments on a flat surface. The depth that we perceive lies in us, not in the figure'. The suggestion here is that from one particular point of view, or in a particular frame of mind, X is A (an assemblage of line-segments), whereas from another point of view, X is B (a representation of a three-dimensional cube). Now, Hockett clearly does not believe that both judgments are equally true – in fact, he suggests that the 'assemblage of lines' judgment is objectively or incontrovertibly true, whereas the 'cube' judgment is the result of an 'illusion of depth'. On this basis, statements like 'This assemblage of line-segments is a cube', or 'This cube is an assemblage of line-segments', are logically contradictory. However, perhaps it would be better to say, like Austin and Fish do in their discussion of 'France is hexagonal', that the final answer in this matter really depends on the circumstances, or even that there may be no final answer at all. Here, too, the relevant questions are really, 'A cube for whom?', 'A cube from what point of view?', 'An assemblage of line-segments in what context?', and so on. Indeed if one were asked which of Hockett's two interpretations – the cube interpretation or the assemblage-of-line-segments interpreta-

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22 Cf. Jackendoff, *Semantics and Cognition*, p. 26; Gilles Fauconnier, *Mental Spaces: Aspects of Meaning Construction in Natural Language* (Cambridge, Mass.: Cambridge University Press, 1994), p. 14; Ansgar Nünning, 'On the Perspective-Structure of Narrative Texts: Steps toward a Constructivist Narratology', in *New Perspectives on Narrative Perspective*, eds. Willi van Peer and Seymour Chatman (Albany: State University of New York Press, 2001), 207–24.

23 Marvin Minsky, 'A Framework for Representing Knowledge', in *Frame Conceptions and Text Understanding*, ed. Dieter Metzing (New York: de Gruyter, 1979 [1975]), 1–25, p. 21.

tion – is likely to be cognitively salient in ordinary circumstances, then the 'illusory' cube interpretation easily wins out over Hockett's blandly 'factual' description. Without denying the existence of illusions, seeing X as Y is not an error in principle. When it comes to the crunch we may be congenitally unable to see X (a piece of the R-world) as it really is. On the other hand, we must see X as Y in order to see something at all. Though skeptical and cautious, this constructivist approach to perception and cognition is not, on balance, a pessimistic view at all.

As has been realized fairly recently, under the banner of 'mental space theory',[24] language also gives us the means to construct statements which reach across not only the worlds defined above, but also any number of more narrowly defined cognitive spaces. For instance, the statement 'This physical set of line-segments looks like a cube' is clearly no longer contradictory in the sense that 'This assemblage of line-segments is a cube' was, just as there is no contradiction involved in what has become the prototype case of mental space theory, 'In Len's painting, the girl with blue eyes has green eyes'.[25] Mental space theory not only allows us to grasp 'seeing X as Y' as a 'space constructor' – as Fauconnier calls it –, it also makes us aware of the fact that ordinary discourse is full of elementary negotiations between spaces. The spaces involved can be the world of the present, the world of the past, the world of what is here, the world of what is there, the world of facts, and the world of imagined things. The world of imagined things, in particular, is closely related to both fictional and nonfictional stories. Although Fauconnier is reluctant to accept philosophically defined 'possible worlds' as mental spaces,[26] the imaginary possible worlds created in the telling and perception of narrative texts[27] can clearly be treated as cognitively defined mental spaces, as can the more general R-, P- and S-worlds introduced above.

In the present context, the space links between R-world, S-world, and P-world connect real-world sensory input and various levels of conscious understanding (the state of consciousness when we see something as a cube, or a rotor as a flux-linking coil). Our description of that link could very reasonably begin at the level of sensory input and neuronal activity

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[24] Cf. Gilles Fauconnier, Mental Spaces; Spaces, Worlds, and Grammar, eds. Gilles Fauconnier and Eve Sweetser (Chicago: The University of Chicago Press, 1996).
[25] Fauconnier, *Mental Spaces*, p. 12.
[26] Cf. Fauconnier, *Mental Spaces*, p. xxxvi.
[27] See Marie-Laure Ryan, *Possible Worlds, Artificial Intelligence, and Narrative Theory* (Bloomington: Indiana University Press, 1991), and Marie-Laure Ryan, 'The Text as World Versus the Text as Game: Possible Worlds Semantics and Postmodern Theory', *Journal of Literary Semantics* 27.3 (1998), 137–63.

and pursue the 'neuroscientific path' upwards. Alternatively, we could start with the high-level conscious product – conceptual identification, sense and truth assignment – and work our way down the 'mental models" road. Indeed, researchers might start out at either end, one group metaphorically tunneling upwards, the other down, and ideally there would be some meeting point where full explanation is accomplished and a good time is had by all.

Of course, this scenario is too naively good to be true. The road from the chemistry of the brain to active cogitation, from unconscious to conscious processes is not a straight one, nor is it necessarily a single road, and much of what happens even in conscious reasoning is 'backstage cognition',[28] which is inaccessible to intuition or introspection. As Fauconnier points out, 'the investigator is no longer a mere spectator. He or she is one of the actors, part of the phenomenon under study. The thinking and talking that need to be demystified are also the thinking and talking used to carry out the demystification'.[29] Therefore, as things stand, a cleanly partitioned top-down/bottom-up joint project is unlikely to work out. Fortunately, mental space theory opens the door to pursuing the more realistic project of letting the disciplines meet as mental spaces.

4. Cognitive narratology: a coursepack

A course on cognitive narratology would be primarily geared to graduate students of literature, philosophy, linguistics, psychology, cognitive science and (possibly) computational science.[30] Narratology indeed provides an ideal common focus because many of the disciplines listed above treat stories and storytelling as crucial phenomena in their fields. Obviously, a course moderator would make an attempt to rope in teachers and researchers from the partner departments and ask them to introduce relevant texts, give presentations on current research, and prepare exercise material for workgroup sessions.

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[28] Fauconnier, *Mental Spaces*, p. xvii.
[29] Cf. Fauconnier, *Mental Spaces*, p. xvii.
[30] The goals pursued in this section are strongly indebted to Freeland's essays on 'Teaching Cognitive Science and the Arts', which are accessible online: http://www.hfac.uh.edu/cogsci/index.html. There are three parts, one on visual art, one on music, and one on film; further parts on literature and other subjects are to follow. I agree with Freeland that this type of course is unsuitable for beginners. Beginners are understandably interested in learning something (i.e., one thing), not in learning alternatives or how to generate them. The uses of multiplicity will be appreciated once there is a background of knowledge and an awareness of possible problems.

Since teachers and students are likely to belong to a number of different interpretive communities, the course must immediately tackle the challenge of how to negotiate the specialist fields of knowledge, discourses and jargons. As Cynthia Freeland rightly says,

> The problems of presenting information to such a diverse group are obvious. Material covering recent developments in cognitive neuroscience is likely to be difficult for arts and humanities students; and conversely, students with better preparation for studying cognitive science may know too little about art to recognize reductionist or narrowly focused approaches to the perception of paintings.[31]

Clearly, teachers and students must recognize common interests and discuss possible problem-solving strategies. In fact, Stanley Fish's notion of interpretive communities (to be discussed in detail in Unit Three) could be put to organizational use from the very beginning. Questions like 'How are stories of personal experience handled in your discipline, and what kind of evidence are they assumed to provide?' could be asked at an early stage to create a very essential awareness of alternative approaches to a common subject.

In the following I am using an informal grading system grading materials as *easy (popular-science type texts or novice-oriented introductions), **advanced (sophisticated but clear), and ***difficult (specialist). Texts that are better suited for teachers only have been left unmarked. For additional or alternative texts check Alan Richardson's excellent online page 'Literature, Cognition & the Brain'[32] as well as the companion page 'Cognitive Science, Humanities and the Arts"[33].

4.1. Unit one: the shaping eye hypothesis
This is largely a getting-acquainted unit, surveying participants' interests as well as course aims and procedures.
- For a warm-up exercise, I would use material from de Bono's *Lateral Thinking*.[34] Indeed, many of the exercises described in de Bono's book can be used for mentally loosening up before, between and after more

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[31] Cynthia Freeland, 'Teaching Cognitive Science and the Arts', *Newsletter of the American Society of Aesthetics* (2001), available online: http://www.hfac.uh.edu/cogsci/index.html.

[32] See http://www2.bc.edu/~richarad/lcb/home.html.

[33] See http://www.hfac.uh.edu/cogsci/index.html.

[34] Edward de Bono, *Lateral Thinking: Creativity Step by Step* (New York: Harper, 1990 [1970]).

heavygoing material (not only in this unit). The main strategy of lateral thinking is 'the generation of alternatives'[35], or in the terms used here, the activation of full (rather than selective) preference rule systems. De Bono's 'quota strategy' ('give us three ways of seeing this shape') is particularly productive in work groups, and the text also contains an excellent chapter on brainstorming, which could be used in workshop sessions. Question: 'Identify strategies of vertical and lateral thinking in a humanities subject, a natural science subject and a social sciences subject'. Cases can be presented where blinkeredness prevented an efficient problem solution. De Bono usefully presents many of his cases in anecdotal form, hence one could also say something on the narrative structure of anecdotes as a text type. One of the best anecdotes presented by the author is the wonderful motto story.[36]

- Discuss the evidence of the Necker cube, possibly using the material presented here. Ask a work group to research and give a presentation of various Necker cube accounts available online (consider especially Mark Newbold's animated Necker cube at http://dogfeathers.com/java/necker.html).

- For literary examples, perhaps use a few stanzas from Lewis Carroll's 'Mad Gardener's Song' (this might raise the madness and creativity issue),[37] and/or James Thurber's short story 'The Macbeth Murder Mystery'.

- Credit for the shaping eye hypothesis must go to **Fish[38], and the chapter in which it occurs (ch. 14) presents suitable reading. Using Fish's notion of interpretive communities, address the pragmatic rules and conventions of the truth judgments in individual disciplines ('What counts as true on which evidence?'). The question of truth may also require a preliminary excursion into possible worlds and mental spaces (**Fauconnier[39]) (to be pursued in Unit Five).

4.2. Unit two: ambiguity: good or bad?
The phenomenon must be surveyed in as many forms as possible. What needs to come across is that ambiguity is a ubiquitous feature that suffuses all levels of understanding (in graphical shapes, letters, words, phrases, speech-acts, etc.).

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[35] de Bono, *Lateral Thinking*, p. 62.
[36] See de Bono, *The Mechanism of Mind*, p. 13.
[37] See The Complete Lewis Carrol, 3 vols., vol. 1 (Ware: Wordsworth Editions, 1999), p. 294. Here is the beginning of one stanza: 'He thought he saw an Elephant/That practised on a fife/He looked again, and found it was/A letter from his wife.'
[38] Cf. Fish, *Is There a Text in This Class?*, p. 333.
[39] Cf. Fauconnier, *Mental Spaces*.

- Show the awesome computational complexity involved in ambiguity resolution and contrast it to the extremely efficient ambiguity resolution ability of a human understander. Take any short sentence and, using a good dictionary, explore its combinatorial possibilities (**Raskin[40]). Present the old workhorse 'Time flies like an arrow' and refer to *Pinker[41] to discuss the *five* possible interpretations of that sentence. Conclude that no 'most sensible' reading can be taken for granted as an entry point.
- Discuss the famous case of **Swinney's[42] evidence. Swinney managed to prove that in the initial phases of sentence processing cognitive processes test all available options before committing themselves to a single interpretation. Superficially, this might look as if human understanders process sentences just like a computer would, or could. If so, however, why is the human language processor so much better at ambiguity resolution, and why are human understanders so inept at extricating themselves from garden path sentences? Why is today's AI approach to garden path sentences interested in creating program code that *falls* for the traps rather than to derive the sensible reading?
- Discuss the phenomenon of local ambiguity using Hockett's 'man eating fish' example. The extant garden-path literature supplies many further examples, often investigating the effects of contextual clues. On a more general level, discuss the experimental uses of generating cognitive failures.
- Show that garden path effects can also be present in jokes, riddles, short stories and novels.[43] Conduct a brainstorming session (see de Bono for many practical suggestions[44]), collecting jokes and riddles (hopefully this will produce ambiguity and garden-path examples to be recycled in Unit Three). Perhaps collect additional material under keywords such as 'children's humor', 'goofs', 'boobs' and 'gaffes', i.e. instances where proper understanding depends on appreciating the tension created by alternative readings. For literary material use Ambrose Bierce's 'An Occurrence at Owl Creek Bridge', Ursula Le Guin's 'Mazes', or Wil-

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[40] Cf. Victor Raskin, Semantic Mechanisms of Humor (Dordrecht: Reidel, 1985).
[41] Cf. Steven Pinker, The Language Instinct (London: Penguin, 1995), p. 209.
[42] David A. Swinney, 'Lexical Access during Sentence Comprehension: (Re)Consideration of Context Effects', *Journal of Verbal Learning and Verbal Behavior* 18 (1979), 645–59.
[43] Cf. Manfred Jahn, '"Speak, friend, and enter": Garden Paths, Artificial Intelligence, and Cognitive Narratology', in *Narratologies: New Perspectives on Narrative Analysis*, ed. David Herman (Ohio: Ohio State University Press, 1999), 167–94.
[44] Cf. de Bono, *Lateral Thinking*.

liam Thurber's 'The Secret Life of Walter Mitty'.[45] Of course, highly
spectacular visual garden paths can be culled from the work of artists
like M.C. Escher, Salvador Dalí and René Magritte.

- When the opportunity arises, ask: 'What would the world be like if there
were no ambiguity? A better place?' Contrast areas where ambiguity
is explicitly condemned (programming languages, legal discourse,
Grice's conversational maxims[46]) to areas where it is expected and
appreciated (poetry, jokes, puns).

4.3. Unit three: preference rule systems

This unit is largely concerned with finding narrative and narratological
exemplifications of the account presented by Jackendoff.[47]

- Read **Jackendoff[48] on preference rule systems, and discuss some
of the cases presented. Relate the concept of preference rule systems
to **Minsky's frame theory[49] and to **Schank and Abelson's script
concept[50]. Both frames and scripts supply default information in infor-
mationally 'underdetermined' texts. As **Raskin has shown,[51] script
analysis is also particularly useful in analyzing verbal humor. On this
basis, conduct a script-based analysis of a joke.

- Reopen the subject of garden paths introduced in Unit Two, and explain
some of the examples by relating them to preference rule systems. For
a narratological focus, work out a simple frame for standard narrative
situations comprising the roles of narrator, focalizer (point-of-view
character) and actor.[52] Use **Lintvelt for a more complex system of
typicality conditions.[53] If conversational storytelling is a focus of inter-

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[45] These examples have been discussed in Jahn, '"Speak, friend, and enter": Garden Paths,
Artificial Intelligence, and Cognitive Narratology', and in Manfred Jahn, 'Stanley Fish
and the Constructivist Basis of Postclassical Narratology', in *Anglistentag 1999 Mainz:
Proceedings*, eds. Bernhard Reitz and Sigrid Rieuwerts (Trier: WVT, 2000), 375–87.

[46] Cf. H.P. Grice, 'Logic and Conversation', in *Syntax and Semantics 3: Speech Acts*, eds.
Peter Cole and J. Morgan (New York: Academic Press, 1975), 41–58.

[47] Cf. Jackendoff, *Semantics and Cognition*, ch. 8.

[48] Cf. Jackendoff, *Semantics and Cognition*, ch. 8.

[49] Cf. Minsky, 'A Framework for Representing Knowledge'.

[50] Cf. Roger C. Schank and Robert P. Abelson, *Scripts, Plans, Goals and Understanding:
an Inquiry into Human Knowledge* (Hillsdale, N.J.: Lawrence Erlbaum, 1977); see also
Jackendoff, *Semantics and Cognition*, p. 140, and Jahn, '"Speak, friend, and enter":
Garden Paths, Artificial Intelligence, and Cognitive Narratology'.

[51] Cf. Raskin, Semantic Mechanisms of Humor.

[52] Cf. Manfred Jahn, 'Frames, Preferences, and the Reading of Third-Person Narratives:
Towards a Cognitive Narratology', *Poetics Today* 18.4 (1997), 441–68.

[53] Cf. Jaap Lintvelt, Essai de typologie narrative: Le point de vue (Paris: Corti, 1981).

est, rephrase **Labov's six-part structure[54] – abstract, orientation, complication, evaluation, result and coda – in terms of Minskyan frames and/or Schank and Abelson's scripts.

- Discuss ***Grice's 'Co-operative Principle'[55] as a preference rule system (following up the cue given in Jackendoff)[56]. Show how the implicatures generated by the 'Co-operative Principle' help to make sense of seemingly ill-formed or meaningless data. For instance, consider Chomsky's famous 'Colorless green ideas sleep furiously' and see the discussion in **Minsky and **Jahn.[57] What may become apparent here is that ambiguity can be appreciated positively as well as negatively – as a barrier to understanding and as an opportunity to make sense of what was not understood.

- Discuss **Jackendoff's wonderful chapter on 'dynamic taxonomies',[58] exemplified by the case of exception-and-typicality-conscious bird categories (these include the famous case of 'Roberts the robin', who has a broken wing and can't fly, and 'Ollie the ostrich', who has learned to fly). Let the students try their own hand on the anecdotal account of how the Navy and the Air Force handled the invention of the hovercraft – the Navy refusing to fund research by pointing out that they were airplanes, and the Air Force refusing funds because they thought they were boats. Another anecdote (ascribed to Konrad Lorenz) is that of a London bus conductor's attempt to determine the fare for a pet turtle: 'Let me see ma'm: Dogs is dogs and cats is dogs and squirrels in cages is birds, but tortoises is hinsects, we won't charge you none for that'.[59] Use these examples to work out the advantages and disadvantages of rigid taxonomies and to design Jackendoffian dynamic taxonomies.[60]

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[54] Cf. William Labov and Joshua Waletzky, 'Narrative Analysis: Oral Versions of Personal Experience', *Essays on the Verbal and Visual Arts*, ed. June Helm (Seattle: University of Washington Press, 1967), 12–44.

[55] Cf. Grice, 'Logic and Conversation', 41–58.

[56] Cf. Jackendoff, *Semantics and Cognition*, p. 155.

[57] Cf. Minsky, 'A Framework for Representing Knowledge', and Manfred Jahn, '"Colorless Green Ideas Sleep Furiously": A Linguistic Test Case and Its Appropriations', *Literature and Linguistics: Approaches, Models, and Applications* (Festschrift Jon Erickson), eds. Marion Gymnich, Ansgar Nünning and Vera Nünning (Trier: WVT, 2002), 47–60.

[58] Cf. Jackendoff, *Semantics and Cognition*, ch. 8.5.

[59] Cf. Edi Lanners, *Illusionen* (München: Bucher, 1973), p. 17.

[60] See Manfred Jahn, 'Narrative Voice and Agency in Drama: Aspects of a Narratology of Drama', *New Literary History* 32 (2001), 659-79, for a 'cognitive' taxonomy of narrative genres.

- Use **Schneider to show how schemas of social cognition determine the interpretation of literary characters,[61] and how these interpretations are likely to differ for contemporary vs. non-contemporary readers, expert vs. naive readers, or native speakers vs. language learners.
- Here and elsewhere, use (selections from) **Herman's comprehensive study for examples and discussion of how readers, hearers and viewers are led to construct mental representations of 'storyworlds'.[62] According to Herman, the key to the logic of stories and storytelling lies in the rules and strategies of cognitive (re)construction, simultaneously facilitating narrative comprehension and creating intelligent models of the world.

4.4. Unit four: reading and imaginary perception

In the standard story-telling scenario, the narrator is primarily grounded in a discourse here-and-now, the recipient in a reception here-and-now (in the audience, in front of the text), and the characters in the story here-and-now. However, story-telling also invokes crucial shifts to second or third level coordinates or spaces. Narrators may imaginatively transpose to the story here-and-now or adopt a character's view of the scene; characters may phase out to or return from daydreams or recollections; and readers may imaginatively hear the narrator speak and let themselves be imaginatively transported into the world of action. This unit focuses on the cognitive mechanisms of story reception and specific techniques of perspectivized narration ('focalization').

- Discuss a cognitive account of the reading process, introducing the concept of imaginary perception (preferably ***Jackendoff, for a simplified account see **Jahn).[63]
- *Bühler's account of the deictic field is an excellent eye-opener in matters of imaginary perception.[64] Especially useful is his distinction

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[61] Cf. Ralf Schneider, 'Toward a Cognitive Theory of Literary Character: The Dynamics of Mental-Model Construction', *Style* 35.4 (2001), 607–40.

[62] Cf. David Herman, Story Logic: Problems and Possibilities of Narrative (Lincoln: University of Nebraska Press, 2002).

[63] Cf. Ray Jackendoff, Consciousness and the Computational Mind (London: M.I.T. Press, 1987), and Manfred Jahn, 'Windows of Focalization: Deconstructing and Reconstructing a Narratological Concept', Style 30.2 (1996), 241–67.

[64] Karl Bühler, *Theory of Language: The Representational Function of Language*, trans. Donald Fraser Goodwin (Philadelphia: Benjamins, 1990 [1934]).

between three types of 'transposition to the phantasma'.[65] *Gerrig
discusses mechanisms of readerly performance and transportation,[66]
**Margolin and ***Fludernik highlight the pragmatic and narratological-
cal relevance of deictic (or 'indexical') cues;[67] for an account of 'deic-
tic shift theory' within the framework of computational cognition see
***Duchan et al.;[68] for a treatment of deixis in mental space theory, see
Rubba.[69]

• On the 'labor of imaginative construction' triggered by fictional nar-
ratives, **Scarry presents an enlightening analysis of the beginning of
Thomas Hardy's *Tess of the d'Urbervilles*.[70] Analyse how other texts
use deictic cues in order to anchor a deictic origin in a character's con-
sciousness and how they let the reader experience what it is like to be
a particular character in a particular situation. Many 'reflector-mode'
texts can be used for illustration and analysis; Mansfield's 'Bliss' is a
particularly interesting example because it presents a flagrant case of
misperception and culminates in a highly charged moment of recogni-
tion.

• While readerly immersion and transportation is usually associated with
Bühler's type (ii) transposition, type (i) is relevant, too, especially with
reference to the scenario of hearing an absent person's voice through

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[65] In Bühler's famous adaptation of the fable of Mahomet and the Mountain, Mahomet
is cast in the role of a human percipient, and the mountain (Mount Safa) is assumed
to be a distant object beyond the range of ordinary perception. Locked in his current
spatiotemporal coordinates (the 'I-here-now origin'), Mahomet can nevertheless (i) let
the mountain come to him by picturing it to be standing right outside his window, or
else (ii) he can mentally go to the mountain and see it from an assumed point of view,
or (iii) he can point in the direction of where he knows the mountain to be, describing it
from afar and relating it to his own bodily orientation. Type (ii) is what Bühler identi-
fies as the main type of 'transposition to the Phantasma' which readers execute when
they immerse themselves in a fairy tale, listen to a travelogue, read a novel, and so on.
Even in everyday perception and conversation, Bühler points out, we are continually
transposing to virtual deictic positions, mentally rotating our body axes in order to be
able to judge how something must appear to somebody else, or to guess what it must
have been like in such and such a situation.

[66] Richard J. Gerrig, Experiencing Narrative Worlds: On the Psychological Activities of
Reading (New Haven: Yale University Press, 1993).

[67] Cf. Uri Margolin, 'Narrative and Indexicality: A Tentative Framework', Journal of Lit-
erary Semantics 13 (1984), 181-204, and Monika Fludernik, The Fictions of Language
and the Languages of Fiction: the Linguistic Representation of Speech and Conscious-
ness (London: Routledge, 1993), ch. 1.3.

[68] Cf. *Deixis in Narrative: A Cognitive Science Perspective*, eds. Judith F. Duchan, Gail
A. Bruder and Lynne E. Hewitt (Hillsdale: Erlbaum, 1995).

[69] Cf. Joe Rubba, 'Alternate Grounds in the Interpretation of Deictic Expressions', in
Spaces, Worlds, and Grammar, eds. Gilles Fauconnier and Eve Sweetser (Chicago:
The University of Chicago Press, 1996), 227–61.

[70] Cf. Elaine Scarry, 'On Vivacity: The Difference Between Daydreaming and Imagin-
ing-Under-Authorial-Instruction', *Representations* 52 (1995), 1–26

the medium of written words, opening the door to a postclassical conception of voice in narrative texts.[71] In ***Jackendoff's model of the reading process,[72] the perceptual input of written text goes through a level of phonological processing both before and after it is conceptually understood. At one or more stages in this process, words (though perhaps not all words) are sounded as internal speech. Possibly, this secondary activation of auditory mechanisms can be used to explain how a reader can hear the narrator and the characters speak and think. The journal **New Literary History 32.3 (2001) has a special issue on 'Voice and Human Experience' offering a number of approaches from a wide variety of disciplines including philosophy, musicology, psychology, medicine and neurology. Brain images showing active neuronal areas during reading might come in useful at this point (*Baars).[73] Provided the infrastructure is available, this would also be the logical point to try an imaging experiment of one's own, comparing different types of readers and different types of narrative texts.

• For a possible-worlds account of deictic shifts or 'acts of recentering', or transportation, see **Ryan.[74] Cognitive viewing and experiencing frames are also used as foundational building blocks in ***Fludernik.[75]

4.5. Unit five: psychological issues of stories and storytelling
The final unit of the course addresses a selection of aspects of the psychology of story-telling.

• Jerome Bruner's nontechnical survey of his own approach towards 'narrative identity' is a most suitable starting point.[76]
• Roger *Schank's Tell Me a Story is a well-written introduction to the concept of 'story memory',[77] and the author's exposition of the mechanisms of indexing, reminding and intelligent story-telling contain a host of stimulating material. Many of Schank's examples and informal

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[71]   Cf. Manfred Jahn, 'Narratology: A Guide to the Theory of Narrative' (English Department, University of Cologne), available online: www.uni-koeln.de/~ame02/pppn.htm, ch. 1.
[72]   Cf. Jackendoff, Consciousness and the Computational Mind.
[73]   Cf. Baars, In the Theater of Consciousness.
[74]   Cf. Ryan, Possible Worlds, Artificial Intelligence, and Narrative Theory, and Ryan, 'The Text as World Versus the Text as Game'.
[75]   Cf. Fludernik, Towards a 'Natural' Narratology, ch. 1.3.
[76]   Cf. Jerome S. Bruner, 'The "remembered" self', in The Remembering Self: Construction and Accuracy in the Self-narrative, eds. U. Neisser and R. Fivush (New York: Cambridge University Press, 1994). 41–54.
[77]   Cf. Roger C. Schank, Tell Me a Story: Narrative and Intelligence (Evanston: Northwestern University Press, 1995).

experiments lend themselves to further course work including more detailed research projects.

- In the framework of transactional psychology, *Berne discussed the relevance of childhood stories (especially fairy tales) in 'scripting' a person's future behavior.[78] See **Jahn for a case study and a model of the feedback loop which links 'external' and 'internal' narratives.[79] For standard introductions to what is now usually identified as Narrative Psychology, consult **Sarbin and **Murray.[80] For an excellent online introduction and further resource guide, see *Hevern.[81]

- Mark *Turner's stimulating *The Mind and Its Stories* builds a powerful argument on the dynamic projectionism of parabolic story-telling.[82] Turner (who is a professor of English and an affiliate of the Center for Neuronal and Cognitive Sciences at the University of Maryland) not only claims that cognitive processes are of an essentially literary character, he also suggests, referring to recent neuroscientific research, that neuronal-level primary cognitive processes are closely paralleled in the high-level negotiations between conceptual mental spaces.[83] Both researchers have recently published a joint study on 'conceptual blending', further integrating many of the subjects addressed in this course plan.[84]

5. Conclusion

The synergetic promise of a course such as the one detailed above will be obvious. This is a direct consequence of two major procedural decisions – of asking the disciplines to look over their fences, and of allowing them to remain different and do it their way. This is more than just a theoretical position or a political trick. Because they talk about the same phenomena

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[78]   Cf. Eric Berne, *What do You Say After You Say Hello* (New York: Bantam, 1973).
[79]   Cf. Manfred Jahn, '"Awake! Open your Eyes!" The Cognitive Logic of External and Internal Stories' (under review).
[80]   Cf. *Narrative psychology: The storied nature of human conduct*, ed. T. R. Sarbin (New York: Praeger, 1986), and Kevin D. Murray, 'Narrative Partitioning: The Ins and Outs of Identity Construction' (1995), available online: http://www.narrativepsych.com/ or http://home.mira.net/~kmurray/psych/in&out.html.
[81]   Cf. Vincent W. Hevern, 'Narrative Psychology: Internet and Resource Guide' (2002), available online: http://maple.lemoyne.edu/~hevern/narpsych.html.
[82]   Mark Turner, *The Literary Mind* (Oxford: Oxford University Press, 1996).
[83]   Cf. Fauconnier, *Mental Spaces*.
[84]   Cf. Gilles Fauconnier and Mark Turner, *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities* (New York: Basic Books, 2002).

and do so in a specialist vocabulary does not imply that if one discipline gets it right the other must have got it wrong. Indeed, the advantage of 'Seeing X as Y' is one the central principles promoted in this essay, and it is gratifying to note that seeing stories and storytelling from different angles has become the major unifying assumption of the postclassical narratologies. As long as the specialist spaces remain sources of insight rather than confusion, surveying the disciplines' spaces is well worth the undeniable effort. The convergence that can be achieved here accrues from looking at the disciplines' specific expertise and exploiting projections across mental spaces. All parties are likely to benefit from this: research projects will result in well-written and readable textbooks because the authors will know they are writing for a larger, heterogeneous community, the empirical and technical camps are likely to supply as well as receive testable hypotheses, and the fine corpus of evidence available from literary and nonliterary narratives is bound to make a significant contribution.