

The Analysis of Meaning

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Yngve's Depth Hypothesis and the structure of narrative:
the example of detective fiction

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I will begin with a brief restatement of Victor Yngve's depth hypothesis (1 and 2), which I propose to apply by analogy to some features of the construction of narrative plots. The hypothesis states that if sentences can be produced by a finite-state device using a finite set of phrase-structure rules, and if these rules are to be expanded in a left-to-right direction using a limited amount of immediate-memory storage, then the leftward branching of the resulting phrase-structure tree is directly limited by the size of the immediate memory. Yngve has postulated, on the basis of Miller's demonstration that human short-term memory can accommodate only about seven items at once, that the immediate memory storage should be similarly limited in the finite-state device. He sees this hypothesis as an explanation of the fact that English, at least, seems to limit its left-branching (or 'regressive') syntactic structures in a systematic way, and to provide equally expressive alternatives to such left-branching structures, enabling them to be avoided.

The cause of such depth violations is the reapplication of a left-branched phrase-structure rule along the same left branch, as with the insertion of subject clauses:

- (1) That it is obvious isn't clear.
- (2) That that is true is obvious isn't clear.
- (3) That that that they are both isosceles is true is obvious isn't clear. (1, 458)

Here a repetition of sentence nominalisation and that-insertion makes the meaning of the sentence less and less clear. Similar examples show the same effect at work with nominalised questions and relative clauses as adjectival modifiers.

I wish to suggest here that if there can be said to be a grammar of narrative, then there may be certain narrative devices which can be explained as 'depth effects'--that is, effects of depth violations--in terms of this grammar. This analogy is all the more readily drawn since the depth effects in narrative are nearly all concerned with a question of identity, and thus can be seen as problems of narrative 'nominalisation'. If the case that can be made for this analogy is

adequate, then it may be possible to discuss more lucidly some anaphora problems in the machine reading of narrative.

If we consider the sort of process with which Yngve's hypothesis is meant to deal, it is clear that he is talking about the generative obverse of a linear parsing problem. Work on Augmented Transition Network grammars has shown that the difficulty of left-recursion may be connected with a tendency towards a 'depth-first' strategy of ambiguity resolution, where the most obvious path is pushed to its end and backtracking must take place if it turns out to be mistaken. To use these concepts for talking about narrative, we need to see this strategy as a scheduling rule in the application of a narrative grammar.

In the absence of such a grammar, I will borrow heavily from Schank and Abelson (3) for the terminology to talk about connected discourse. I would like to suggest that several forms of narrative depth effect may be explained in terms of false identification of certain elements in the Schank and Abelson scheme of discourse structure. I have chosen two for simplicity of exposition, but a more thoroughgoing discussion might incorporate all the elements in their scheme. The first of these is the script, an 'appropriate sequence of events in a particular context' (3, 41). A script is invoked by a script-header, which describes certain conditions under which it is appropriate and some of the things to be found in it. If items are mistakenly identified as belonging to a particular script-header, then the wrong script will be invoked. Themes, background motivational information about people, may be similarly mistaken when a theme recognizer pattern is wrongly identified. Schank and Abelson have described a mechanism called a 'weird list' for coping with anomalous events and descriptions: such items are kept in a list to be resolved when more information is available. But if a false script and/or theme has been invoked, then the same events or descriptions may not seem anomalous. Schank and Abelson reckon that we manage to process discourse successfully because we use devices like the weird list and the main conceptualisation of a script to summarise material which has already been processed, thus selectively forgetting unimportant material. But if the wrong script has been invoked, we may find that we have forgotten material that is very important indeed. This selective forgetting is the mechanism upon which depth effects in plot structure depend.

It seems to me that such depth effects are most obviously exploited in detective or mystery fiction. I will not attempt to claim that the examination of mystery fiction would be of interest in the context of information-handling to anyone except that rather shadowy agency of 'Six Days of the Condor', but as a genre in which narrative structure and the process of narrative construction are very much 'up front', mystery fiction has aroused a great deal of interest among students of narrative (cf. 4 and 5). Robert Champigny's very cogent definition highlights some of the factors with which we shall be concerned: 'A narrative is to be called a mystery story to the extent that the goal and result of the narrated process is the determination of some events anterior to the ending of the process' (5, 14). This means that depth effects will be exposed as such before the close of the narrative.

One of the conventions of detective fiction which was developed during its classical period in the 1920's was the concept of 'playing fair' with the reader. That is, the reader could assume that he would be given all the clues to the solution of the mystery as the narrative

went along, and that outside, privileged information would not be brought in at the end for a 'deus ex machina' solution (6, 105-110). This convention presented the writer of detective fiction with a problem: he had to find a way to 'hide' the clues to the solution while leaving them in full view. And in many cases it was to depth effects that he resorted to achieve his goal.

I want to give several concrete examples of these devices, so first I will give a brief summary of the novel from which they will be taken. I have chosen a novel of the 'classical' period, Felo de se? by R. Austin Freeman (7), first published in 1937. The plot of this novel concerns two murders, only one of which is immediately apparent as such. The narrator of the first part is one Robert Mortimer, a bank clerk who becomes involved in the profligate life of one of his customers, John Gillum, after having discovered the murder of a dealer in refrigeration equipment, Abel Webb. When Gillum's cousin, Arthur Benson, arrives from Australia to consult with Gillum on the investment of their money, Gillum is found dead in his flat, apparently a victim of suicide after the squandering of the money. The forensic surgeon John Thorndyke is called in to investigate, and the rest of the novel is narrated by his colleague, Dr Jervis. A connection is established between Gillum and two men who had come with him on the same boat from Australia: the murdered Webb and a doctor named Peck. Gillum is shown by Thorndyke to have been dead for two years, during which time his body has been packed in dry ice; Dr Peck has murdered Gillum and taken his place and his money; Webb was murdered by Peck to avoid recognition.

'The mystery in a mystery story is a narrative puzzle within a narrative development' (5, 18). Felo de se? uses an actual division of the narrative task among the characters to emphasise this, and the fact that the three narrative segments follow one another in sequence exaggerates the operation of the depth effects facilitated by such a division. In each case the reader is taken through a series of events by a narrator, so that his knowledge of these events is limited to that of the narrator.

In fact Mortimer's narrative has six sections. In order they are: the discovery of Webb's body, the expedition with Gillum to a gambling den, the inquest on Webb, the visit with Gillum and discussion of suicide, the arrival of Benson and discovery of Gillum's body, and the inquest on Gillum. Mortimer later tells Thorndyke that he meant to record 'the whole incident of my acquaintance with John Gillum' (7, 153), and the preponderant burden of his narrative is a description of the character of the man he called John Gillum, as Mortimer was given to observe it. His judgements of Gillum's character however, are amplified beyond the events by his inside knowledge of Gillum's monetary transactions. As a bookish, reticent banker, Mortimer's reactions to what little of Gillum's gambling he sees, together with Gillum's disquisitions on the joys of gambling and the sanity of suicide in the face of financial ruin, make Gillum's suicide eminently believable; it becomes the closing event of a 'financial ruin' script. Webb's death and inquest, in the context of the Gillum story, become merely two distractions in the script.

The significance of the narrative point of view is not to be ignored either here or elsewhere in the story. The reader follows Mortimer's narration with confidence, for Mortimer narrates as an eyewitness in most cases. But in following Mortimer the reader has been

led to construct a theme for Gillum which explains his behaviour in terms of the pursuit of pleasure and the avoidance of difficulty or pain, so that his suicide becomes the logical development of his financial ruin as his financial ruin was the logical development of his gambling. The presentation of a packet of blackmailing letters at the inquest confirms Mortimer's view. Webb's murder, which Mortimer believes was murder, is not seen to have any connection with Gillum's story at all.

The next narrative segment is Jervis' description of the events of the investigation. It begins with the introduction of the problem to Thorndyke and Jervis by Benson and Mortimer. Benson, who has known Gillum all his life, can accept only blackmail as a reasonable motive for his suicide. He wants the blackmailers caught. Thorndyke pursues the possible elements of a blackmail script involving Gillum, and immediately tries to establish a precondition header for it: what had Gillum done, where had he done it, who knew about it. It develops that the guilty act must have taken place aboard ship from Australia, and that Gillum's companions on board were the doctor and the purser. The purser, as it happens, was the murdered Abel Webb, whose acquaintance Gillum had never mentioned to Mortimer in spite of his presence almost at the scene of the crime. Webb's death took place a year before. Now Mortimer produces a graph of 'blackmail' payments by Gillum which show that they increased markedly -- also a year before. Jervis puts these new facts together and determines that Webb blackmailed Gillum, Gillum killed him, someone else knew about it and also blackmailed Gillum, Gillum committed suicide. This is the hypothesis, then, that is ostensibly to be investigated.

At this point the investigators acquire Mortimer's manuscript narrative. To Jervis it seems 'merely to repeat at greater length what he had already told us' (7, 159-60), but to Thorndyke, as we are not to learn for 92 pages, it has suggested a whole new sequence of events. For the rest of this segment, however, we are looking for the blackmailer with Jervis, though a number of facts come to light (such as Webb's ignorance of Gillum's address until just before Webb's death, or Peck's two-year absence) which rather spoil his theory, and we have to bear with his repeated wonder at what might be in Thorndyke's mind as he unearths 'trivial' facts. This portion of the narrative serves two purposes: it literally distances the reader from the known facts provided by Mortimer and Benson, thus preventing any reinterpretation. It also holds the investigation of many unrelated facts together by means of Jervis' constant efforts to fill in the slots of his blackmail script. Jervis has chosen a depth-first prediction strategy and is leading the reader down his garden path.

Again there are several sections of the narrative segment. Gillum's flat is examined, Webb's employers are visited, Peck's old quarters are visited, Peck himself is interviewed, the lumber room above Gillum's flat is seen, and the vacuumings from the flat itself are sifted. Again the emphasis seems to be on Gillum, but to Jervis the investigation reveals only that Webb did not blackmail Gillum, that Gillum may well have murdered Webb, and that Gillum sent the blackmailing letters to himself. On page 252 Thorndyke challenges Jervis -- and the reader -- to put all the evidence together as he has done.

By now, true to form in such fiction as this, we have indeed had

all the evidence, but it has been so widely distributed by the narrators in different mistaken script and theme structures that it has been impossible to put it together. Thorndyke reserves the logical presentation of this reorganisation process to himself. He first relates the clues he found in the evidence at hand before the investigation, most of which were hidden in Mortimer's narrative. It is immediately obvious that Thorndyke began casting around for possible scripts from the start, using a breadth-first strategy. He discounts the gambling because there is so little actual gambling in evidence and because Gillum's money withdrawals had been in cash; he notices that only two of thirteen thousand pounds were accounted for by the blackmailing letters. He focusses instead on the withdrawals and matches their pattern to instrumental actions in the script of a person robbing from another's account. The necessity in this script for two roles to be filled leads to the hypothesis of impersonation which in turn becomes the key to the whole affair. Thorndyke then looks for evidence that Gillum and the tenant of the flat were not the same person, and notices that the body was identified by Benson, who knew Gillum, and not those who knew the Tenant. The 'suicide' occurred just before Benson's arrival and after the withdrawal of the last of the money. As for the two-year preservation of the body, Mortimer's fainting spell near a huge coal-bin in Gillum's pantry suggests carbon dioxide gas from dry ice, thus hiding place and method of preservation. The identity of the impersonator must rest upon some resemblances to Gillum (height and eye-colour), but hair could be dyed and Gillum's embarrassingly obvious gold teeth could possibly be falsified. Gillum knew no one in England, therefore only Webb and Peck, his cronies on the boat, could be implicated. Webb is dead so Peck must be the impersonator. And if Peck is the only survivor, he must have killed Webb.

The investigation, in fact, had only to confirm the elements of Thorndyke's impersonation script. Jervis' narration, with its overtly expressed doubts, has had the effect of forcing the reader to attend to Jervis' own blackmail script but of urging him at the same time to try out other scripts of his own. Only when Thorndyke explicitly states his 'impersonation' script-header does the reader realize that he has been kept too busy to formulate such a header for himself. Because Mortimer concentrated on a 'hedonist/fatalist' theme and a 'gambling + blackmail' script to explain Gillum's actions, the reader accepted the meagre gambling examples as representative, considered the script requirements filled, and never questioned its appropriateness. Thorndyke looked at the monetary pattern and hypothesised a more comprehensive script, within which Peck's persuading Mortimer to believe in the gambling script is a plan of Peck's to aid in the success of his own script. It is significant that Thorndyke facilitates the reader's recovery from his mistaken theme structure for Gillum by providing a label, 'the Tenant', for the new theme structure which will have to be created.

The reader is Peck's victim as well, even though he may form an impression of Mortimer as naive and rather unworldly. Mortimer in any case would not lie, and the bulk of his real evidence rests upon his professional knowledge of Gillum's account, which is never questioned. In addition, until Mortimer's narrative is well over we do not know that he wrote it without knowledge of the true facts disclosed in the ending. As a result, the whole script is taken as read, and none of the evidence which should have been kept on the weird list as suspicious -- the worst probably being Gillum's initial appearance almost at the 'scene of the crime' -- is dealt with in this way at all.

This novel is not an unusual example of classical detective fiction, and it shows how the whole genre exploits memory organisation. Depth effects are only effective because the final solution permits the initial mistaken theme and script choices to be discarded in favour of correct ones which satisfyingly reorganise all of the evidence. The restatement by the detective of clues 'lost' through depth effects is thus not superfluous but necessary to the satisfactory completion of the whole. The criticism often heaped upon such restatement results either from a lack of skill on the part of the author who has not exploited depth effects or from the fact that the critic is criticising his own second reading rather than his first.

Depth effects are not limited to the genre of detective fiction, either; it is only the special case where the effects are obvious because they are made explicit in the statement of the crime's solution. We may be more concerned with documents emanating from a faceless but non-fictional narrator whose biases may cause him to frame problems in such a way that certain items become incidental. So that such pieces of information not be forgotten, it seems that a breadth-first strategy for the analysis of discourse structure is to be recommended, if only on the grounds of comprehensiveness.

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