

The handling of texts and reading
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Since documents and reading figure widely in the modern world, it is important that we begin to find out how to handle them in hard-science linguistics. Documents can be seen as props having the physical properties required for them to function as prop parts in linkages. But since in order to read something, a person has to see it, our attention is turned first to the question of how to understand visual input in HSL terms.

We start by asking whether there is any evidence that visual input operates similarly to hearing input that was examined in the context of hard-science phonetics-phonology (Yngve 2004). Evidence was reviewed there that important processes of perception in hearing operate from the top down on the basis of expectations, which can be formalized in HSL. Both hearing and vision are crucial to the survival of the individual in the wild so we would expect that the selectional pressures on vision would parallel those reviewed for hearing.

The mechanisms in the case of hearing were seen to operate on the basis of expectations, which can be formalized in terms of expectation procedures and other types of procedures in hard-science linguistics. The organism, if it is not hiding quietly out of sight, scans its environment for particular threats, mates, and food. This means that the organism has some internal expectation of what the input might show. Considerations suggesting a mechanism of operating with expectations in vision as well are as follows:

A person can recognize a cartoon caricature of the face of a familiar person or public figure. Since the caricature is not a photographic likeness of the person, this recognition ability must operate on the basis of a best match against a store of remembered expectations.

Perhaps related to this is a person's ability to recognize letters in a variety of different type faces and handwriting styles with the characters distorted in various curious and fancy ways. There seem to be not only expectations but also expectations of known things under known types of distortions.

A child can scan a drawing of a leafy tree and count how many birds the artist has concealed in the tree, but only if the child expects to find birds and is searching for birds.

In searching for something, there is a visual expectation of sorts to which the visual field is compared. Examples include looking for a lost small object on the ground, searching for a particular object in a large box or drawer filled with many diverse objects, and searching on the table for the particular piece in a jigsaw puzzle that will fit a certain unfilled place in the puzzle.

These pieces of evidence may already have been noticed in the literature. In any case they are testable by means of suitable controlled experiments.

But we should move on to what's at issue here, namely: Does reading as well as vision generally proceed also on the basis of checking for consonance with expectations? It is easier to specify expectations in reading than in the general case of vision because we can represent the alphabetic script in the theory using ordinary orthography while no convenient way is available for representing expectations of general visual patterns.

There is strong evidence that reading proceeds by checking against expectations. A person misread the book title "From grammar to science" as "The grammar of science" to fit the reader's expectations from a strong background in the philosophy of science. Such misreading phenomenon could be checked experimentally.

In skimming or scanning a book, a person might get an idea of what topics are treated but not much idea of how they are treated. Tests are possible through timed reading tasks and testing for comprehension using normal educational test materials.

A person can quickly find his own name in scanning a list of names. There is also the great difficulty in proofreading

one's own prose. Expecting what one had intended to write, one reads right over misspellings time and time again.

In some cases when one reads one imagines how it would sound if read aloud, but speed reading courses discourage this as being too slow. In "speed reading" courses, people learn to read several words at a glance. Children read slowly and haltingly while learning to read, but speed up as they begin to recognize whole words and short phrases. There has been some success in teaching reading by recognizing whole words.

In applying these insights to hard-science linguistics, we turn as a source of examples to a paper previously presented by one of us (Sypniewski) at the 2001 SLE conference in Leuven, Belgium and published in "Hard-science Linguistics", ed. Yngve & Wasik (Sypniewski, 2004) as "Reconstituting Austin's Verdictives". That paper was a preliminary attempt to describe one of J. L. Austin's performative utterances (the verdictive) in HSL terms. Verdictives were examined in the context of guilty pleas and findings in criminal proceedings. This required reference to several documents (an indictment, a plea agreement, a presentence report, and a jury verdict form) which were represented as props. These props had important properties which directed the flow of events represented in the various linkages described. Hence our present interest in documents.

At the same time we will make use of the latest methods in hard-science linguistics introduced by one of us (Yngve) in the first paper in this workshop "Thing, concept, and name in hard-science linguistics and advances in linkage theory". We now limit our discussion to that portion of a typical criminal trial known as the "return of a verdict". A return of a verdict presents us with a very simple document that will help us review some of the issues involved and suggest some solutions to the problems illuminated by prior work. An uncompleted "jury verdict form", also known as a "jury verdict sheet", with dummy information replacing case specific information, appears in Appendix 1. For a fuller discussion of the legal procedures involved in the return of a verdict, please see Sypniewski (2004).

Although the return of a verdict is a simple process, a proper examination of this procedure for the purpose of an HSL analysis requires us to recognize eight sequential events, with a ninth event necessary only in certain circumstances. The nine events are as follows:

1. The judge is informed that the jury (which deliberates in a jury room separate from the courtroom in which the trial took place) has reached a verdict and tells (through court attendants, usually) those necessary to assemble in the courtroom in order to hear the verdict.
2. The jury files into their seats in the jury box.
3. The jury foreman hands the completed jury verdict form to a court attendant who then hands it to the judge.
4. The judge checks it for completeness, hands it back to the court attendant, who hands it back to the jury foreman.
5. The judge asks the jury foreman, on the record (see below), whether the jury has reached a unanimous verdict.
6. The jury foreman verbally acknowledges that they have.
7. The judge asks the foreman "On count one, charging the defendant with ... how do you find the Defendant So-and-So?" No specific language is required. There may be some variation without any legal effect.
8. The foreman says either "guilty" or "not guilty". Again, there may be slight variations like "We find the defendant..."
9. Events seven and eight are repeated for each count of the indictment that is sent to the jury.

The "record" refers to a complex of documents, recordings (sound or transcriber's notes) and objects which, together, form the official "history" of the litigation. "Asking the foreman on the record" means that the judge asks the jury foreman certain questions in a context such that the questions, answers, and any attendant discussion are recorded so that they may be referred to at a later date or time, if necessary. The purpose of the record is to act as an official archive that can be used to resolve disputes about events or conversations that have occurred during the litigation. As such, the record is a limitation on future discussions about the litigation and serves to establish a context for any such discussions, should they occur.

It is important to note that the return of a verdict is, essentially, a "formality", meaning that the events that occur during the return of a verdict are not subject to any significant variation from one return of a verdict to another. Indeed, any significant deviation might raise legal problems. While it is often easy to ignore such formalities, for us a formal process of this type simplifies the analysis and exposes behavior which might otherwise be difficult to observe.

Prior to the first event, the judge, perhaps with input from the attorneys in the case, prepares the jury verdict form for the jury to use in reporting their decision. As can be seen from the example in Appendix 1, a jury verdict form is a bare outline

of the charges against the defendant and contains just enough information to identify the case, the defendant, and the jury's decision as to the defendant's guilt on each count of the indictment. The jury verdict form is given to the jury prior to what we here describe as the first event.

We set up a linkage [Trial], which has a task called <return the verdict> and role parts for the judge, jury foreman, and jury: [judge], [foreman], [jury], and others. This task models each event in our list. The purpose of the formality of a return of a verdict is to allow the jury to state an unambiguous verdict to the court and the public at large. In our linkage model, we reflect this by using expectations. When the judge has prepared the jury verdict form to be given to the jury foreman, the form is incomplete, awaiting the written input of the foreman. We model this with a prop part [form]:

(1) [form]<-completed>

In our model of the first event, The judge expects that the jury has reached a unanimous verdict, <expect unanimous verdict>. The judge also expects that the jury foreman properly filled out the jury verdict form, i.e. that [jury]'s subtask <fill out verdict form> was completed, <expect proper completion>. In the fourth event, which we can model with a subtask called <check form for completeness>, these last two expectations are either satisfied or not. If they are satisfied, the rest of <return the verdict> continues. If they are not satisfied, [judge] performs a subtask to make [jury foreman] complete <fill out verdict form>. Unless <expect unanimous verdict> and <expect proper completion> are satisfied, <return the verdict> cannot continue.

In <ask foreman>, which models the fifth event, the judge expects the foreman to affirmatively answer the question, <expect confirmation>. When the foreman does (event six), the expectation is satisfied. The judge expects the foreman to read the answers to his questions (the seventh, eighth and ninth events) as they were written on the jury verdict form, <expect answers>. We model this with <read from form>, a subtask of <return the verdict>.

Using recent advances in HSL notation, we may model a portion of the first event as follows:

(2) [foreman]<notifies>(judge) :: [judge]<expect completed form>

Once the judge receives the jury verdict form, he inspects it for completeness. He has an expectation that it is completed but, in the event that it is not, must get the jury foreman to complete it. We model a completed jury verdict form as follows:

(3) [form]<defendant/John Doe; indictment number/04-12345A; vicinage/Corn County; completed>

The <defendant/John Doe> property models the defendant's name, <indictment number/04-12345A> models the unique indictment number, and <vicinage/Corn County> models the vicinage (location of the trial). An incomplete jury verdict form is modeled the same way except for the last property which is <-completed>.

How does [form]<-completed> become [form]<completed>? Let us assume that the indictment charges the defendant with two counts of violations of the criminal code. In American law, a jury can only decide that a defendant is guilty or not guilty of a charged crime. For each count of an indictment the jury verdict form has places to check either "guilty" or "not guilty." A properly completed form, then, would have a check mark for guilty (G) or one for not guilty (NG) for each count of the indictment. Letting G1 represent a check mark for guilty of count 1, NG2 represent a check mark for not guilty of count 2, etc., the pattern of check marks for a properly completed form for a two-count indictment would be:

(4) (G1 x -NG1 v -G1 x NG1) x (G2 x -NG2 v -G2 x NG2)

Thus the procedure for the judge to scan the form for a two-count indictment to inspect it to see whether it is properly completed or not would be:

(5) [judge] <scan> (form) ->
<expect image of
"(G1 x -NG1 v -G1 x NG1) x
(G2 x -NG2 v -G2 x NG2) x
etc. ">

-> <match> Y <continue> N -> [judge]<ask about form>(form)

If the judge sees that the check marks on the jury verdict form satisfy the judge's expectation that the form has been properly completed, the return of the verdict may proceed, otherwise the judge's expectation is not satisfied and the judge must correct the discrepancy. We will not describe <ask about form> in (9) but the goal of the task is to set [form]<completed>.

In this example, the act of reading is modeled with <scan>. Something specific is being looked for. This is obviously not the case with all reading. However, the model of the jury verdict form presented here should act as a starting point for HSL researchers who wish to develop models of reading. As we have shown, even a simple act of reading involves many expectations. Any reader expects that the text will somehow be comprehensible and that he will be able to comprehend it. Traditional grammatical theories inherently assume that reading is akin to decoding. Even from our brief presentation, we can see that there is significantly more going on than simply decoding. Reading must be seen as a social act involving role parts in a linkage rather than as a solo endeavor.

Conclusion.

We have modeled a simple type of reading in a way similar to how hearing was modeled in Yngve (2004). While our results are preliminary, we may anticipate that hearing and reading have certain features in common. Our offering is an advance in HSL theory but there is much more that needs to be done. The exact nature of a text as a prop needs to be better described. Not all texts will have the same prop-part properties. For example, a document which one has written can serve as a prompt when the text is read out loud. This document will have different properties from one which has never been seen before. In the case of a jury verdict form, the judge ignores most of the text when scanning the form for completeness. If he reads a note from the jury, he treats the note as a new document. The next advance in HSL theory needs to address the issue of a "new document".

Even from the reading of a jury verdict form, we can see that expectations are likely to play a significant role in any development of HSL theory regarding reading. Even when a document has never been encountered before, the structure of the document may create certain expectations for the reader. For example, a reader may expect that an index will supply certain types of information that will not be found in a bibliography and vice versa. The expectations help in the processing of the document and must be carefully treated in any developed theory of reading.

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