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Memory for Text: The Relationship between Form and Meaning

Amjad Saleem [*]   Muhammad Umer [†]

Abstract

A linguistic sign, according to Saussure (1966), is a combination of a signifier (form) and a signified (meaning). Form without meaning is just half of the sign. Although in some situations surface forms are excellently retained in memory over time, in most circumstances, explicit long term memory for the surface details or memory for forms of long-past linguistic events is poor or non-existent. Taylor (2012) and Port (2007), however, have proposed that there may be implicitly accumulated memory traces for all aspects of the language— nothing is thrown away. In the present study, 'form refers to physical properties or surface features such as the orthographic, phonological and acoustic representations of a text, while 'meaning' refers to semantic properties, including contextual and pragmatic information. There are some curiosities about their relationship, which this paper will tease apart. The curiosities relate to how language is processed, represented and retained in different circumstances.

Key Words: Form, Meaning, Memory, Memorization, Text, Processing

Introduction

Meaning is an abstract and conceptual property expressed through concrete linguistic forms, such as morphemes, words, formulaic sequences, sentences, signs, and pictures etc. The relationship between form and meaning or a signifier and a signified, however, is not simple. A core element of this discussion relates to the following observation by Jacoby (1975):

It is undoubtedly the case that in normal circumstances, the word is treated as a symbol and processed only to the extent that is necessary to reach that which it symbolizes. However, with an appropriate set, the physical information that is embodied in a word can become the object of study and be remembered over the long term (p. 251).

What Jacoby means is that in the normal course of comprehension, words are taken as carriers of meaning and are processed only to the extent necessary for comprehension: in everyday use of language, words are only superficially processed and encoded, unless they are objects of study in their own right as warranted by appropriate conditions. This implies that form and meaning are remembered differently under different circumstances. This study aims at answering the following questions in order to find out how we can best conceptualize the nature of memory of a text that one does not understand.

What type of information is remembered better over short- and long-term intervals?

Under what circumstances is verbatim memory for form possible?

Despite the different mechanisms of memorization of 'text' in different art traditions, such as acting (Noice and Noice1993, 1996), oral poetry

[*]Assistant Professor, Department of English & Applied Linguistics, University of Peshawar, Peshawar, KP, Pakistan.
[†] Assistant Professor, Department of English, Islamia College University Peshawar, KP, Pakistan.
Email: mumer@icp.edu.pk

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(e.g. Lord 2000), and Opera singing (Wray 2008), memory for form is largely anchored in meaning. This is relatively easy if one memorizes in the language(s) one knows. In such cases, it is, therefore, difficult to separate memory for form from memory for meaning.

The poetic text is remembered better than prose because prosodic patterns, such as rhythm and rhyme, assist with anchoring the form in memory. From the account of oral poetry, it is clear that although the bards remembered the text over the long term, they enjoyed flexibility in narrating the story. Bards had a long term memory for the contents of the poems in that they told the same (core) story over and over but also added changes to (and thus created) the text. Indeed, creativity was the very essence of this type of oral transmission, and no one definitive version of the story would be recognized until it was written down.

Faithful/verbatim remembering occurs when a memorizer is (or considers himself) an agent of the words of the author of the text. Actors are one class of such memorizers. Actors are not normally the authors of the text and, as such, do not have the authorial rights to amend or edit it. Only if one is the writer/creator of the script does one own the text and have the latitude to change or improvise around it. This 'right' cannot be claimed by an actor who just performs a script written by someone else unless the author agrees. Bards were able to manipulate and play with the text of their work because they were the 'authors' of the text and thus owned it (Wray 2008).

One of the most common experiences from daily life is that we remember the message or the gist of what is said to us but not the exact language in which it was said (Sachs 1967; Gernsbacher 1985). So, why do we generally remember meaning for a longer duration than the form? The answer to this is that under normal circumstances of daily discourse, form is discarded after comprehension has taken place (Baddeley 2010).

The Traditional Superiority of Memory for Meaning over Form

According to Van Dijk and Kintsch's (1983) cognitive model of discourse comprehension, a reader simultaneously builds three different mental representations: (a) a surface representation of text; (b) a representation of the propositional textbase; (c) a representation of the situational model. According to Van Dijk and Kintsch, the three levels of mental representation correspond with the relatively shorter or longer memory trace for text. Van Dijk and Kintsch first identify the surface representation of text, consisting of the exact words and syntactic structures. Memory for surface details, i.e. words and syntactic features as opposed to meaning, is normally rather limited, poor and quickly lost. The representation of surface information, according to Sachs (1967; 1974) and Brewer (1975), is phonologically coded and is kept in memory for a few seconds only. The phonological nature of surface forms is borne out by everyday experience in that we keep on repeating a telephone number we have to dial or have to rehearse an address until we have written it down, lest we forget it.

In VanDijk and Kintsch's model, the second level of representation is the propositional textbase which is an abstract representation of the message/meaning or idea of the text which consists of connected propositions or word concepts and is independent of the wording used.

Memory for the meaning of a text lasts longer than memory for phonological forms or syntactic structures, but it tends to be lost after some time, as people find it difficult to differentiate ideas in the text from ideas that are to be inferred but are not explicitly mentioned in the text (Radvansky 2008, p. 229). The representation of text at the propositional textbase level explains why Bartlett (1932) found distortions of meaning during text recall. Using folktales from other cultures as his study material, Bartlett asked his British participants to recall the story as best as they could. He found that his participants recalled the story in a distorted fashion: their version of the story was based on their cultural assumptions and expectations, which were the result of their general knowledge. This knowledge, according to Bartlett, is represented in the form of a schema that assimilates whatever it receives into an underlying gist. People, in the course of comprehension of a text, normally organize their memory along semantic lines and reconstruct their recall in a non-neutral way on the basis of the pre-existing schema. This observation also shows that

form is not important in the recall because if it was, it would tend to anchor the meaning more reliably to the original and prevent distortion since the original meaning could be reliably revisited. Van Dijk and Kintsch's third level of representation is the situational model, which is a mental representation of the situation to which the text refers or of the event being described. It assumes that a reader while reading a text is chiefly concerned with the events being verbally described and not with the language of the text itself. The situation model tries to capture what is involved in text comprehension and is, therefore, seen in terms of multi-dimensional representations involving, among other things, information about the tempers-spatial, causal, social and structural aspects (Wyer and Radvansky 1999; Radvansky and Zacks 1991).

Memory for situations or events is much longer and more durable than memory either for surface features or the textbase. Bransford et al.'s (1972) experiment on sentence memory shows that people fail to notice the difference between two formally different sentences that are situationally identical, indicating that they retain the situational information but not the form or precise meaning. For example, people failed to discriminate *Three turtles rested on a floating log and a fish swam beneath them* from *Three turtles rested on a floating log and a fish swam beneath it*. In contrast, they were more likely to differentiate *Three turtles rested beside a floating log, and a fish swam beneath them* from *Three turtles rested beside a floating log, and a fish swam beneath it* because the sentences describe two different situations (that is, exactly where the fish swam). Similarly, in a study by Kintsch et al. (1990), people, after reading a text, were tested for the three different levels of representation at different intervals: immediate, 40 minutes later, two days later, and four days later. Results showed that while participants had high retention for all three representations of text at the immediate interval, a consistent decline in memory was observed for surface and textbase at longer intervals. As for the situational representation, retention across different intervals remained stable, showing superior memory for situations and events as opposed to memory for surface forms and meaning.

The sort of evidence that led Van Dijk and Kintsch to formulate the model gives us a flavour of how memory for text operates. One of the pioneering studies on representation and retention of surface features in memory was conducted by Sachs (1967), in which she established the short-lived nature of surface features as opposed to the long-lived nature of meaning. Her study investigated what features are retained from listening to prose after comprehension has taken place. Participants listened to short passages. Their task was to decide whether or not a given sentence, presented after some interpolated material, had occurred in the original passage. The participants were to state whether the test sentence was identical to an original ('base') sentence or whether the test sentence had been changed in some way. Test sentences related to sentences in the original passage in one of four ways: (a) identical to the original; (b) semantically different from the original; (c) active voice changed to passive voice, or vice versa, and (d) changed in form but similar in meaning.

Sachs' studies demonstrate that, at least in recognition tasks, memory for surface features fades away quickly compared with memory for meaning. These results are generally considered as indicative of differential memory for form and meaning in discourse comprehension, and they lend support to Van Dijk and Kintsch's position. Having said that, we need to bear in mind that the short term memory constraints for written texts will not be identical to those for spoken input. Research has shown that memory for visual information is superior to memory for phonological information (Cohen et al., 2009).

That memory for meaning normally predominates over the memory for form has largely been attributed to semantic integration (Bransford et al. 1972; Bransford and Franks 1971). According to the integration hypothesis, surface details are lost because during comprehension, information gets integrated into a gist: the greater the integration of information into a gist, the greater the surface information loss. Gernsbacher (1985) argued that this is what normally happens in the comprehension process as the goal is to understand the meaning by extracting it from the words. Words are, therefore, not represented in memory in their original form but

within an amalgamated meaningful context. She illustrates the process by an analogy with cake-baking, where different ingredients gradually lose their separate representation as they are no longer available in their original form. According to her, surface details for thematically related sentences will be quickly forgotten as they get dissolved into gist; on the other hand, surface forms for thematically unrelated sentences will be better remembered because they stand as individual units, defying integration into a thematic whole. If Gernsbacher is right, then it implies that for natural languages, memory for meaning will always trump memory for form.

Memory for Form

Although the above account demonstrates the relative superiority of meaning over form over the long term, it does not mean that memory for form is not possible. There is evidence in favour of verbatim recall of text at longer intervals: surface structures can be retained and recalled faithfully after long periods of time under specific circumstances (Saleem 2015; 2018b).

Because there is an unavoidable form-meaning relationship, it is very difficult to separate the learning of form from the learning of meaning in tasks performed either in the first language(s) or another that is well-known. A true measure of learning form independently of meaning might, therefore, only be obtainable using nonsense input in a foreign language when semantic contents are not comprehensible to the learners (Gathercole 1995; Ellis 2001). Only in this way can we gain an idea of how, if at all, 'words' are stored on their own as 'meaningless' phonological strings. Can one just learn a lengthy text by rehearsing the form over and over without access to meaning? Can one just learn a lengthy text by rehearsing the form over and over?

In a pioneering work, Ebbinghaus (1964) showed that memorizing Byron's poem *Don Juan* in English was easier than memorizing nonsense/meaningless syllables. According to him, they are memorizing meaningful material required only one-tenth of the effort required for learning nonsense stimuli, i.e. consonant-vowel-consonant (CVC) triads. The concepts of meaninglessness and

meaningfulness are, however, not one-dimensional. 'Meaning' can operate at different levels because something that is apparently 'meaningless' can be given meaning by the individual. Meanwhile, something meaningful can be made meaningless if it is removed from the context. This means that what may appear meaningless to different people or in different situations may not be meaningless to other people or in other situations. Moreover, meaningfulness is not necessarily restricted to meaning in terms of the contents of language. Meaningfulness may be the work of several other variables such as familiarity (how familiar an item is to a person), frequency (how often an item has been encountered), imagery (the degree to which an item evokes or produces an image) and regularity of structure which in turn may determine the learnability and memorability of form. This means that even if the meaning is not available, learners can learn and memorize form if they 'know' it in other ways.

The curious case of Quran memorizers

The tradition of faithful memorization and transmission of the Quran text through the generations is such that, many centuries later, all Muslims continue to agree on every detail of form and content, unchanged in any way from the original. The manner in which this has been achieved makes us wonder at the capacity of the human brain when inspired by a spiritual task. It is even more remarkable when we realize that many of those memorizing the Quran do not know the words and grammar of the language in which it is written. Quran memorization thus offers an interesting case of divorce between meaning and form.

Saleem (2015; 2018b) explains how non-Arabic speakers of the Quran commit a large text to memory in a language they don't know. He argues that familiarity with the text enables a learner to chunk (i.e. create higher-order units of information), which is vital for efficient memorization: chunking increases processing efficiency. Although it is typically assumed that knowledge of the language system and meaning is necessary for chunking in relation to committing information to memory, it may not be absolutely essential. Chunking can be the result of perceptual relatedness too. Someone who

knows nothing at all of the languages, except the phonology and/or orthography, is obviously at a disadvantage (in terms of encoding and recall at will) as compared to a proficient speaker who can exploit natural sequential associations inherent in a language to form chunks. One can, however, use other cues to chunk and commit text to memory. Familiarity with the sound and structure of a language may be one such cue. In addition, features such as word-likeness, phontotactic similarity, and frequency of occurrence also help in chunking and committing text to memory.

It sounds that are chunked 'meaningfully' might be easier to articulate than sounds without any pattern. What the Quran text provides is not just irregular 'words' but 'words' with the regularity of sound pattern. Once the learners find a way into the phonology of the language, it might be possible for them to sequence sounds according to the phonotactic structure of the language. They could then store sequences of sounds in a patterned way. Quran memorizers' memorization benefit if they already familiar with Arabic phonology and script (Saleem 2018b)

In addition to constant repetition and rehearsal of the text as a means to keep the information 'at hand', the Quran memorizers support and enhance their short term phonological memory by the visuospatial imagery of the text. In other words, they will be mapping sounds of the words onto visuospatial details—image, colour, font size and location of the text on the page. This is an important idea, implying that in the absence of linguistic meaning, the visual and spatial information may provide a means to hold the text in memory. 'Meaning' therefore needs to be broadly defined. That is, semantics derived from lexis and grammar is just one kind of 'meaning' that might be able to anchor memory. Quran memorizers might thus use visuals and other features of the text to compensate for linguistic meaning as a hook in memory.

Saleem (2018a) argues that coding information at several levels leads to a rich representation of the memory trace as the text will then be available in several codes: phonological/articulatory, acoustic, and visual. All a memorizer does is to weave all this information into a unified whole as they have encoded the text at all these levels to make a multi-modal and detailed memory. Encoding the Quran at multiple levels enhances retention and the chances of successful retrieval. Memorizers buttress/support their fleeting phonological memory by means of visuospatial mnemonic hooks.

The memorization practices of the Quran memorizers suggest that phonological memory on its own is inadequate because it is associated with Short Term Memory (STM). The information encoded phonologically is of limited duration, and the quantity of material is very limited. Saleem (2015; 2018b) argues Quran memorizing does not meet the conditions for LTM storage, as typically understood in the research literature. The Quran text might be stored in Long Term Memory (LTM) as one large entry, or in smaller chunks, with hooks that are not semantic. Faithful and errorless recall thus prevents sensitivity to language patterns.

Conclusion

We wanted to know what the relationship between form and meaning was in the context of remembering text. It has been found that in everyday discourse, people process and remember the meaning and gist of the information as opposed to the form. However, this paper suggests that memory for form is possible under certain circumstances relating to the text type, fidelity to the text, deliberate practice and focus on linguistic details. Although one can just learn a lengthy text by rehearsing the form over and over, it does not necessarily end up in the long term semantic memory, as is evident from memorization of the whole of the Quran text by people who do not speak Arabic.

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