

# A Semiotic Analysis of Memory Loss in Aging\*

Michiko Arima

Memory loss seems to be related to the consciousness of various degrees of vividness and our experience. Charles S. Peirce describes the process of attaining knowledge as follows:

There are such vast numbers of ideas in consciousness of low degrees of vividness, that I think it may be true...that our whole past experience is continually in our consciousness, though most of it sunk to a great depth of dimness. I think of consciousness as a bottomless lake, whose waters seem transparent, yet into which we clearly see but a little way. But in this water there are countless objects at different depths; and certain influences will give certain kinds of those objects an upward impulse which may be intense enough and continue long enough to bring them into the upper visible layer. After the impulse ceases they commence to sink downwards.

(CP 7. 547 [c. 1900])

Developing this notion of consciousness as a bottomless lake, Professor Ivan Mladenov proposes in his book *Conceptualizing Metaphor* (2006) a process model of thinking which shows how knowledge grows, resting on the fundamental claim that we learn something new by making clearer something that is already known. He writes:

I can now conclude along with Peirce that the awareness of something different than the self-consciousness is connected to the clarification of ideas....It [= the awareness of the Other] is a process of derivation and delegation of characteristics from the self-consciousness to 'an upper layer of consciousness',

where it 'continues' until the self-consciousness becomes mature to recognize this new phenomenon. (In child psychology, for example, the most important moments of the relations between mother and child are the ones when the child gradually realizes that it is a different body than that of his / her mother.) (2006 : 148)

The newborn baby does not know itself as something for itself because it cannot regard itself as something other than its mother's body. Similar ideas have been proposed by such people as Piaget and Lacan. French scholars of child development (i.e. Piaget and others) have argued there is a period at about 6 months when the dyadic phase is slightly displaced and the infant recognizes that it has an existence separable from its dyadic partner (Mother). This occurs when the child sees itself reflected and hence has an independent self. Jacques Lacan in his *Écrits* refers to this phase of childhood separation as the mirror phase of development when the sign slides beneath the signifier !

Today I'd like to address the loss of memory that typically accompanies aging from a semiotic perspective. It may sound a little bit incredible and ridiculous to young people like you that this kind of memory loss will probably happen to you in the future, but I suppose you have heard your parents, grandparents or some other elder people say, "Where did I put my glasses ?" "Oh, I can't remember the name of that person I met at the party yesterday," or "What did I eat for breakfast yesterday ?" Increasingly, as we age we share their frustrations, perhaps initially humorously, but later with more seriousness as we perhaps forget what medicines we have taken.

Loss of memory in aging may be roughly classified into two types: the ordinary that everybody experiences and the pathological such as Alzheimer's disease. The pathological type of memory loss causes a serious problem and it is nowadays much discussed mainly from a medical point of view in brain science or

studies in cognitive causality. On the other hand, the ordinary type of memory loss does not seem to have drawn much attention from researchers, probably because this does not cause much trouble to the people concerned. Loss of memory has a progressivity that makes it susceptible to semiotic analysis. We lose the ability to process (and thereby to interpret) events and information in a fairly predictable sequence as we age. An enhanced understanding of the mechanism of this loss and the ways in which it variably effects the relationship between sign and object would heighten our understanding of how we age and our informed sympathy for the aging process. Thus I'll limit my lecture today only to the ordinary type.

According to questionnaires given to 100 Japanese people of 40s~90s of age (see Arima 2005), when our memory decays in aging, we face such phenomena of memory as follows:

- (1) We seldom forget the names of such familiar people as our own family members or close friends even when we forget the names of mere acquaintances. Additionally, we seldom forget any kind of highly emotional experiences.
- (2) It often happens that we retain the feeling and image of our acquaintances and we can recognize who they are, yet we can't recall their names easily. There are also cases in which we retain some feelings and images and yet we can't indicate the people or event related to these feelings and images.
- (3) We retain memories of what happened in our childhood rather well with the vivid senses of taste, touch, smell and others.
- (4) Generally speaking, such senses as taste, smell, and touch often bring us back to the experiences related to them better than other senses such as sight or hearing.
- (5) Repeatedly used phonetic sequences are retained rather well in

memory. And generally speaking, any chunks (sequential signs) are retained well in the memory.

- (6) Some verbal signs are liable to be lost before others: seldom used verbal signs before frequently used ones, proper nouns before common nouns, and lexical items before grammatical relations.

We'll refer to these six items and explain them in the following discussion. It is indeed our common experience that we tend to lose our memory in a certain way as we grow old. Why and how do we lose our memory in this way ?

Semiotically speaking, it is certain that all our memories are embodied in signs, whether they are just a feeling, mere attention to an object, or some verbal expressions, because we feel, observe, and think only in signs. We are living in the world of signs. Therefore if we apply to this problem the semiotic ideas of Charles S. Peirce, we'll see that these mental signs are of a hierarchically mixed nature of symbol, index, and icon in their relation to the object, with symbol implying index, and index implying icon.

Peirce's division of signs into icons, indices, and symbols is based on quality, relation, and representation (*or* mediation) respectively, which is, in turn, based on the fundamental triadic relation of monadic, dyadic, and triadic; triads cannot be reduced to dyads, nor dyads to monads. Peirce's theory of signs is aggregative but never reductive. Triads are composed of dyads and monads, and dyads are composed of monads, logically making monads First, dyads Second, and triads Third, whose relations constitute the elements of thought. We see, therefore, that Third implies Second and that Second implies First. Peirce states:

First is the conception of being or existing independent of anything else. Second is the conception of being relative to, the conception of reaction with, something else. Third is the conception of mediation, whereby a first and second are brought into relation.... In psychology Feeling is First, Sense of

reaction Second, General conception Third, or mediation.... (CP 6. 32. [1891.]

Thus we find that feeling is First and the deepest sign, independent of anything else, that reaction is Second being relative to something else, and that general conception is Third and the semiotically most superficial sign relating feeling and reaction in itself. As all our memory is always constituted as / in signs, we may say that our memory consists of the hierarchical trichotomy of icon, index, and symbol.

Therefore we may assume the order of our semiotic hierarchy of the sign as 1) Icon, Feeling→2) Index, Reaction→3) Symbol, Mediation *or* General conception. This foundation of the iconic element in the structure of the sign explains the above item (1) why the iconic elements of emotional experiences are best retained in memory. And this order of Icon→Index→Symbol may also explain the above item (2) why symbolic elements such as names are potentially lost when the iconic element such as feeling and image or the indexical elements such as recognizing who they are are retained; and why memory loss of indexical element of identifying the object is potentially occurs when the iconic elements of feelings and images are retained. Relatively superficial elements are more easily lost from the memory. Thus we find memory loss occurs roughly in the order of Symbol→Index→Icon.

Now let us see the ontogenetic emergence of the human physical senses. The order of the ontogenetic emergence of the five senses shows that senses of taste, touch and smell are more primitive than those of sight and hearing: the sense of taste, touch, smell, hearing and sight emerges in this order respectively at about 7 weeks; 10~18 weeks; 24 weeks; 28 weeks; and at about 30 weeks after impregnation (see Ikuta 2002 : 59 – 60).

It is generally known and confirmed also by the result of my own research

(2005) that the more primitive senses of taste, touch, and smell are better retained in the memory of the aging than the less primitive senses of hearing and sight.

Incidentally modern brain research indicates that the senses of sight and hearing are processed in the linguistic new cerebral cortex as well as in the non-linguistic old cerebral cortex whereas the primitive senses of taste and smell are largely processed in the non-linguistic old cerebral cortex (see Tokoh 2004 : 103 – 105). If we may say that consciousness begins with symbols of language, the linguistic elements are primarily symbolic and related to the conscious level while the non-linguistic elements are primarily iconic and related to the unconscious and comparatively more basic level of the hierarchical structure of sign so that they may be unconsciously better retained in memory.

This will explain a part of the reasons of the above items (3) and especially (4) why we remember the experiences associated with senses such as taste, smell, and touch better unconsciously than the ones with other senses such as hearing or sight.

Newborn babies have experienced their semiotic world through senses even before they are born. We may say this is mainly iconic experience of quality and feeling.

According to Tomasello (2003), “six-month-old infants interact dyadically with objects, grasping and manipulating them, and they interact dyadically with other people, expressing emotions back and forth in a turn-taking sequence....But at around 9 – 12 months of age a new set of behaviors begins to emerge that are not dyadic,...but triadic in the sense that they involve infants coordinating their interactions with objects and people, resulting in a referential triangle of child, adult, and the object or event to which they share attention.” This emergence of what is called “joint attention” is the beginning of “tuning in” to the social behavior taking such form as gaze following (to look where

adults are looking), joint engagement (to engage with adults in relatively extended bouts of social interaction mediated by an object), social referencing (to use adults as social reference points) or imitative learning (to act on objects in the way adults are acting on them). This is regarded as the essence of language acquisition and other human symbolic activities.

This symbolic ability grows along with the iconic and indexical experience of the world during the critical period denoted as language acquisition period in the childhood. This is the period when a language called the mother tongue is mastered along with a vividly active iconic and indexical experience. Once we learn the symbolic expressions for our sense experience and when they are repeatedly used, the vivid senses of the experience will come to be weakened owing to the entrenchment of this conventionally symbolic interpretation.

As we see in the item (4), the more the senses are primitive, the more they are structurally basic as sign, the better to be retained in the memory. This is why we usually retain the experience connected with the more primitive senses of taste, smell and touch better than the one with the less primitive senses of sight or hearing, as Proust's famous Madeleine attests.

Items (5) (Repeatedly used phonetic sequences are retained rather well. And generally speaking, any chunks are retained well) and (6) (Seldom used verbal signs are liable to be lost before frequently used ones, proper nouns before common nouns, lexical items before grammatical relations) share the characteristics of repeatedly used sequence. First of all, it'll be necessary to explain the relationship of chunk and grammar to the repeatedly used sequence.

Bybee (2002 : 110) argues that "sequentiality is basic to language and that constituent structure emerges from sequentiality because elements that are frequently used together bind together into constituent."

We have well-proved data that (1) Humans from 12 months to adulthood can

learn repeated sequences of meaningless syllables as shown by Saffran et al. 1996; Gomez and Gerken 1999, 2000. (2) Both babies and adults can learn sequences of two nonce words that are separated by a third ‘word’ chosen from a large class (Gomez 2001). This makes it clear that meaning is not necessarily involved in learning sequences but recurring sequence makes the basis for constituent structure.

Bybee (2002 : 109 – 134) argues that sequentiality is basic and that constituents and hierarchy of grammar arise because frequently-used strings are chunked as single units: “repetition of sequences of units is the main factor in the creation of linguistic patterns that have been identified as constituent structure” and that “automation of lower level sequences makes the composition of hierarchically complex sequences possible”. Bybee (2002 : 112) argues also that *high levels of repetition*, articulatory gestures can overlap one another and individual gestures can be reduced both in duration and displacement, that in this way extreme phonological *fusion* and *reduction* become possible to occur and that repeated sequences become fluent because they become automated into a single *chunk* that can be accessed and executed as a unit, e.g. *wanna*, *hafta*, and *gotta*.

Tomasello (2002 : 313) also argues for the usage-based emergence of grammar saying that “...children are consistently and persistently: – storing utterances and their functions. Extracting functionally coherent constituents from those utterances. Abstracting across stored utterances and stored constituents to form utterance schemas and constituent schemas with open slots”. We know that Peirce already noted this algebraic aspect as well as the usage-based aspect of grammar (see CP 2. 279 ; 4. 544).

It may be significant to note that frequently used sequences become automated into a single chunk that can be accessed and executed as a unit. Thus the knowledge of grammatical constructions has become largely procedural



like how to tie shoelaces or how to ride on a bicycle. Procedural knowledge is largely iconic (and indexical) on the unconscious level, and more basic in the trichotomy of signs. It is interesting to find the usage-based grammar develops largely unconsciously with much feelings during the biologically founded critical period of language acquisition period.

Generally speaking, the frequent use of the same verbal signs will strengthen their iconic and indexical elements, while low frequency of use will make the signs weakly iconic and indexical, making their memory more easily lost. As a result of this process, less used signs will come to be lost before frequently used ones.

Now, as we see in the item (6), why are proper nouns lost before common nouns? This problem also seems to be related to the relative strength of the indexicality of the sign in question.

Proper nouns will be found to be indexically weaker and more independent from context than common nouns, because they usually indicate only one particular object and indexically remain rather unstable while common nouns indicate any object of a given category and are made stable by infinitely more indices to a given category of object. This weaker indexicality may tend to cause proper nouns to be lost before common nouns, even though such proper nouns as the names of much familiar people or places are seldom forgot because of their strong iconicity with the deep emotion and also because of strong indexicality with high frequency in their usage..

Generally speaking, the more signs depend on context, the more stable they will be in context and better retained in memory, because such signs may be more easily guessed or indicated abductively in a given context. Thus the degree of context dependency may be roughly taken as the degree of indexicality.

So far I have explained how we lose memory in aging from a Peircian

semiotic point of view. Peirce tells us that feeling is mainly iconic, referencing is mainly indexical, and general conception is mainly symbolic. We have seen that the iconic elements are deepest in the structure of signs and the last to be lost in memory, that the indexical elements are the second to be lost, and that the symbolic elements are the earliest to be lost.

Thus we see that any emotional experience is retained best in memory, and any strongly indexical experience is retained better than simply symbolic experience. We have also seen that the language acquisition period features the relative salience of the iconic and indexical elements of signs due to relatively underdeveloped degree of the symbolic elements in this period. This is taken to explain why any experience during this period, especially comparatively early part of this period, is mainly unconsciously well retained with vivid sensations.

Concerning sensory memory, it was found that any experience with such primitive senses as smell, touch and taste are retained better due to the stronger iconicity than sight and hearing. We have also seen that chunks are more iconic than symbolic and this is why they are retained better in memory. As to the problem of different degrees of forgetfulness of proper nouns, we assumed at least some different degrees of indexicality in syntactic context and some different degrees of iconicity might be relevant to this problem.

We may conclude, on the whole, that in aging we are liable to be more iconic than indexical, and more indexical than symbolic in our way of interpretation. This type of interpretation seems to go along with the more iconic aspect of interpretation as found in the typical children's way of interpretation and any kind of deeply artistic type of interpretation. This may be proved by the fact that elder people and children are usually in good terms and that distinguished artistic works are much produced by the elder people as well as by the small children.

## Notes

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