

## Visual Imagery in Aphasia Treatment: A New Look

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Recent research and a renewed interest in the right hemisphere (RH) have led speech pathologists to reconsider ways of involving the intact RH in aphasia therapy. One of the most intriguing and attractive of these proposals emphasizes the assumed visual imagery capacity of the RH. Operating under the premise that "visual imagery can function as a mode of symbolic representation" (West, 1977, p.240), proponents of this theory have suggested that stimulus materials in therapy be chosen for their potential to evoke strong visual images. Based on the results of paired-associate learning research, it has been proposed, for example, that pictured stimuli in a naming task be "highly imageable"--dynamic rather than static, concrete rather than abstract (West, 1977; 1978).

The rationale for gaining access to the RH through visual imagery is predicated on the following reasoning: 1) that the RH is specialized for processing concrete visual-spatial input; 2) that there exists a dual coding system in which verbal processes and non-verbal imagery represent the two alternate systems (Dual Coding Theory, Paivio, 1971); and 3) that while the left hemisphere (LH) is dominant for more abstract verbal coding, the RH is dominant for more concrete visual imagery coding.

Since almost every list of RH capacities includes visual imagery, it is not surprising that the concept of approaching the RH through imagery was developed. Unfortunately, however, the concept is flawed by a restricted definition of visual imagery and of RH functions which yields a somewhat inappropriate rationale for the use of imagery in aphasia treatment. The purpose of this paper will be: 1) to expand, redefine and clarify the concept of visual imagery; 2) to reexamine, in light of this expanded definition, the supporting arguments for accessing the RH through visual imagery; and 3) to suggest additional ways in which imagery may be used to approach the RH in therapy.

It would be a mistake to deny the existence of visual or mental images, but it is equally misleading to offer simple explanations of what, in fact, is a complex and elusive concept. What exactly is a visual image? Currently accepted concepts of images are based on the extensive work done in paired-associate learning research (Bower, 1970; Bugeleski, 1968; 1970; Paivio, 1969, 1971; and Rowher, 1970)--and herein lies the problem. This work envisions images as a sort of "mental picture" or representation of sensory input in the "mind's eye." Weber and Bach (1969), for example, define images in terms of a subject's ability to "generate or synthesize a sensory-like datum in the absence of physical stimulation" (p.199). Allen Paivio (1969) states that a verbal response "could just as logically be mediated by a 'mental picture' as by 'mental words,'" (p.242).

Also, based on paired-associate learning (PAL), it has been suggested that "imageability is associated with concreteness," (West, 1977, p.241). Relating this notion to aphasia therapy, West explains, "the more concrete the material, the better," (West, 1977, p.242). Paivio claims that imagery

is specialized for the "symbolic representation of concrete situations and events," (Paivio, 1971, emphasis supplied). If this were so, then all images could readily be transferred to the more abstract verbal code. Yet, everyone has experienced events or situations which are vividly recalled, or imaged, but which are difficult, if not impossible to put into words.

Paivio may be right in assuming that "mental pictures" can be evoked by words in an association task, but, unfortunately, this narrow view--in which images function as a mnemonic device in a PAL task--has been extrapolated to represent the sum total of our experience of images. The assumption that images are pictures specialized to depict concrete events denies the essential complexity and multidimensional aspects of images.

Since conversations and other communicative events are not a series of PAL tasks, it is worth considering imagery as it functions in our ongoing mental experience. Imagery as a "symbolic coding system" can operate in concert with, or independently of, the verbal system. Unlike verbal processes, images are not ordered sequentially. They are non-linear, free from temporal constraints, and this suggests a far more powerful separation between the two forms of coding input than the abstract/concrete duality adhered to by proponents of the Dual Coding Theory. Ezra Pound, the late 20th century poet, observed that an image, "represents an intellectual and emotional complex in an instant of time," (Whalley, 1967, p.76). This sense of grasping at once multiple, sometimes conflicting, dimensions of a situation, event, or object, is critical to a definition of imagery.

Rather than a picture or recording that bears some structural relation to raw sensory data, an image is a nonverbal confluence of emotion, intellect, and sensation. It is a simultaneous integration of multiple levels of perceived (or interpreted) experience which contains the intersection of many currents of feeling and thought. It thereby violates any one-to-one or type-token correspondence with real objects or events. Thus, the word "home" may evoke a single image which, in one instant of time, captures knowledge of multiple and possibly conflicting aspects of all the homes one has known across temporal boundaries. And these qualities make possible the feeling that through the image one has recalled the essence of experience. It is these same qualities that make it difficult to transfer complex images directly into words, but which yield the rich verbal associations that we hope to access in therapy.

It is worth considering this expanded concept of imagery as it applies to RH processing. Research with normal, split-brain, and brain-damaged subjects has supported the hypothesis that the RH predominates in holistic and synthetic processing while the LH is dominant for linear and analytical thought (Bogen, 1969; Cohen, 1973; Gazzaniga, 1978; Ornstein, 1973; Patterson and Bradshaw, 1975; and Zaidel, 1978). It is in the nature of synthetic processing that sequential operations are suspended and that there is an instantaneous integration of multiple elements and relationships. It has been suggested, furthermore that the speech of subjects with RH damage is characterized by, "difficulty in extracting critical bits of information, in seeing the relationships among them, or in reaching conclusions or drawing inferences based on those relationships," (Myers, 1979, p.39).

Taken together, the expanded definition of imagery as a confluence of multiple dimensions in a single instant of time, and of the RH as specialized for the synthesis and interpretation of multiple relationships suggest a very powerful connection between the RH and visual imagery. It is far more powerful than the connection suggested by the concept of "mental pictures"

subserved by a visual-spatial processing system adept with concrete input.

This is a critical distinction with important implications for therapy, for the results of PAL research have demonstrated that in such tasks, easily pictured, concrete, "action words" are more effective in arousing images. In addition, much has been made of the RH's capacity to recognize and comprehend verbs. Thus it is that clinicians have been encouraged to use pictures and words that depict concrete actions. This was a good first step--it encouraged movement away from static stimulus materials (Figure 1) to more dynamic ones (Figure 2).

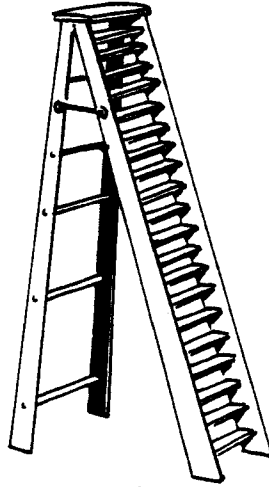


Figure 1. Example of a static stimulus picture.



Figure 2. Example of a dynamic stimulus picture.

But it would be a mistake to conclude that only concrete, easily pictured verbs are accessible to the RH imaging system. There are additional aspects of "action words" to consider aside from the degree to which they are "manipulable" (West, 1978) or "operative" (Gardner, 1973). Actions involve relationships, (i.e. the boy running...from somewhere to somewhere; the ball falling...from somewhere to somewhere). The RH appears to have more facility for integrating and managing such relational aspects of reality than the left. The image is stronger, not necessarily because an iconic representation has been produced, but perhaps because the action suggests a relationship, requires an interpretation, and invokes rich associations in a way that a static constant does not.

To go one step further, by developing therapy materials that express interactions, rather than simple actions, we are more likely to involve the imagery system and the RH in our treatment efforts. Stimulus materials that call for an interpretation by the patient will be more effective than unidimensional, single word, concrete ones. Thus, we should consider advancing from simple action pictures (Figure 3) to ones which not only present an action, but set it in context and require an interpretation of events (Figure 4).

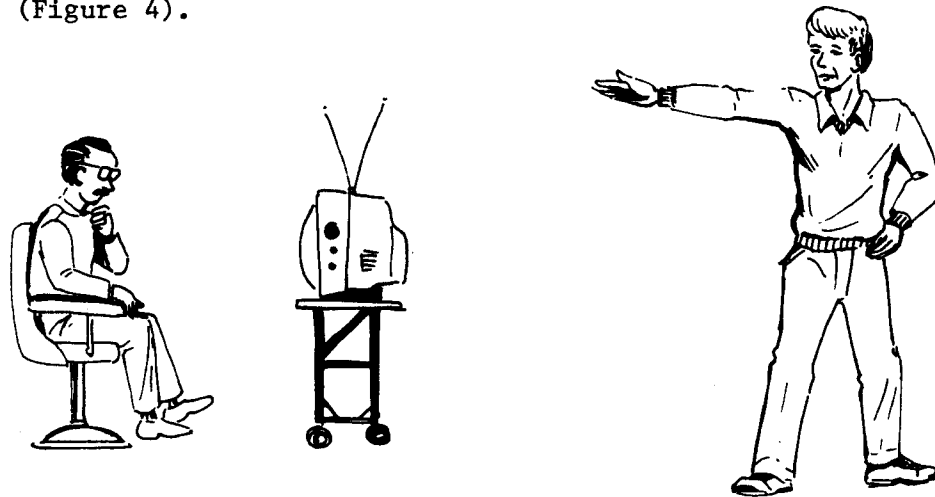


Figure 3. An example of simple action pictures.

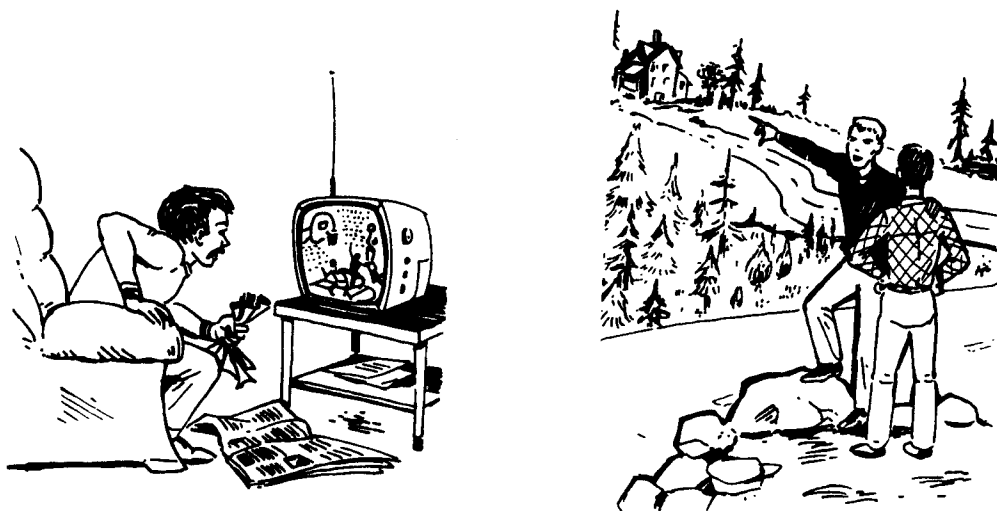


Figure 4. An example of actions in contexts.

As Eron Zaidel (1978) pointed out, the RH needs exposure to rich and associative patterns, and this helps to explain the success of contextually rich stimuli in naming and comprehension tasks. Wilcox et al. (1978) and Stachowiak et al. (1977) have found that aphasic subjects and normals did not differ significantly in their ability to comprehend material that required the integration of extralinguistic cues. In a pilot study investigating naming in aphasic patients, Williams and Canter (1979) found that performance improved when stimulus pictures depicted a situational context rather than a single object. It is possible that the associations and relationships inherent in contextually robust material helped to arouse strong mental images. In addition, the integration of contextual cues probably results in an interpretation of the stimuli—thereby potentially involving the RH.

In a different, but equally relevant study, Faber and Aten (1979) demonstrated that pictures of broken or altered objects were more successful than their intact counterparts at generating topically related phrases. Their pictures depicted an object and an event at the same time—precisely the sort of juxtaposition and instantaneous integration of dimensions that characterizes visual imagery.

Faber and Aten's pictures and the contextual stimuli mentioned above are a few examples of the type of therapy materials that stimulate visual imagery as it is defined in this paper. If we are serious about utilizing imagery and about involving the RH in treatment, then we should consider stimuli that actively engage the patient. The difference between a picture depicting a pair of boots (or even a man walking in a pair of boots), and the picture in Figure 5 is not merely one of visual complexity. The real

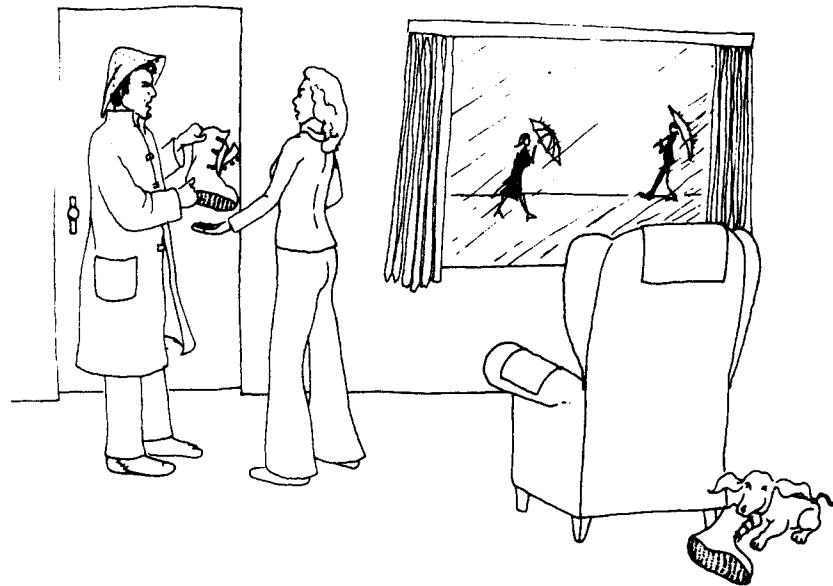


Figure 5. Stimulus picture showing relationships among objects.

difference is that the meaning in Figure 5 is embedded in the relationships among the pictured items. The chair, for example, exists not only as a chair, but as a hiding place for the dog. The man exists not only as a

person standing in rain gear, but as a man who has lost his boot and has a question on his lips. He is connected to the woman, to the dog, and, ultimately, even to the chair. The context consists of relationships. The picture is dynamic, not because it illustrates an action, but because it contains interactions which must be synthesized before they can be interpreted and must be interpreted before the picture can be understood. Rather than concentrating our efforts on approaching the RH and the imagery system through the use of concrete actions that supposedly evoke a strong mental picture, we should direct our energy toward developing stimuli that are rich in context, relationships, action, and interdependencies, and which require some level of interpretation by the patient.

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#### ACKNOWLEDGMENT

Figures 1 through 4 are from LaPointe, L., and Horner, J., Reading Comprehension Battery for Aphasia, C.C. Publications, Tigard, Oregon, 1979 (reproduced with permission).

#### DISCUSSION

- Q: Penny, you were alternating, I think, between visual imagery, mental imagery, and imagery. I am wondering if the term "visual imagery" isn't a bit misleading in the context in which you were speaking. . . in that it leads us to think of something visual. You seem to be speaking of something that is not visual, yet not necessarily non-visual either.
- A: I think that's a good point. We talk about visual imagery and the verbal system, and about mental imagery and the verbal system, as though these were the only two types of mental representations that exist; which, I think, is not true. There are probably mental representations which we can't call forth in our conscious mind, or which we cannot look at from within or without. I don't really like the term "visual imagery." Yet I think there is a visual component to it. I am in agreement with you that there is some mixing of the terms, but I think it's a mistake to consider that visual imagery might be something separate which is in the form of a mental picture. I don't think that exists. Go on.
- Q: On my way over here I had an experience which relates to this. As I was walking over I got a whiff of what I think was burning pine. That and the clouds and the fog took me back almost instantaneously to another place and another time . . . a whole flood of what I would call images were evoked that made up that whole context of events . . . and it wasn't anything visual. I don't know what it was. It started with the olfactory sense, I think.
- A: But it called up some sort of nonverbal mental experience which gave you the essence of some former experience? That's what I am talking about. I would say that that is the much more common form of ongoing mental imagery. I don't think there is such a thing as a straight visual image except in something like a PAL task, and I don't think that is what we should be trying to get at in therapy.

- Q: I agree with everything you said, and would also like you to consider that a lot of these actions are stimulating or evoking whole body responses. Even global patients can appreciate whole body commands when they cannot do other things. But I'd also like to make one comment about your pictures. I think we must be careful of the detail. Given the evidence from neuropsychology that the right hemisphere appreciates outer configurations and the gestalt of pictures, whereas the left hemisphere takes care of the detail, we must be careful that our pictures not be too busy. We must take care that our aphasic patients with a damaged left hemisphere not be overwhelmed by all this detail.
- A. I think that is a very good point.
- Q: Some of the people doing studies on normal communication are talking about people drawing up images that are visual, kinesthetic, and auditory; saying that different people perceive things in different ways. They set you up in a situation and try to see what kind of images are drawn up. It's kind of subjective, not really objective. They ask the person, "Does your mouth water, do you feel like you're feeling or seeing something?" And that's all the kind of images you're getting into—it's not just visual.
- A: Yes, I guess the overall point you are making is that mental imagery is not defined according to a specific modality as in auditory, visual or what-have-you -
- Q: Penny, are you suggesting that if you show a pair of overshoes you're stimulating the left hemisphere, but if you show a dog now eating one of those overshoes, you've now got the right hemisphere in the action? Or is it possible that by showing a dog eating a shoe you've actually given the left hemisphere more to work on, and even though it's damaged, it does better.
- A: Yes, I think that probably the reason why people respond better to contextual information as opposed to a single static stimulus item has to do with things other than just mental imagery. It may be that such pictures are richer lexically or linguistically. That is, there is more to say about it. I think it depends on what you are asking the patient to do—describe the picture or name specific things. Does that answer your question?
- Q: This is really a follow-up on the previous point. You keep going back to Allen Paivio, but as I hear you saying it, there is something more general. People like Dominique Pissaro have suggested that we process information through something like an abstract generative memory. I think that other information processing theories like Pissaro's perhaps more efficiently accommodate what you're trying to tell us. I think your point is excellent—that we have a need to get away from strict visual imagery, but I do think that there are some suggestive theories that very much accommodate the point that you're trying to make for us.
- A: Yes. There was an example in the literature that suggested that if we say the word "rectangle" and that calls forth a mental image, we are really calling up a notion of "rectangleness." We don't image every single rectangle we've ever seen. There is some abstract feature of "rectangleness" that is evoked.



- Q: Exactly. And the implication is that it may not matter what the sensory modality is, but that the information can be stored in an abstract form, and that it is accessed in code.
- A: So that gets back to the comment before yours (comment #4). Are we straddling the hemispheres by presenting contextual pictures? I think we are bringing in functions in both that may not be language versus nonlanguage.
- Q: You mentioned contextual cues—the work by Stachowiak, and the fact that linguistic redundancy is facilitative. Do you think that what's going on with redundancy is that it is calling up mental images?
- A: I think that's partly what I was trying to say. I think that contextual cues and redundancy not only provide more language but it can evoke other associations. The effect of context, in my opinion, is that it contains relationships among items and requires the patient to interpret rather than just label. And this process may stimulate the right hemisphere.
- Q: The contextual richness of your pictures is something we've been shooting for in PACE therapy. Especially with patients who are very poor verbally. What happens when we give those individuals pictures of an event that is contextually rich is that they not only have a free choice of mode, vocabulary, and so forth, but they have a free choice of what to talk about. They can talk about whatever that particular stimulus has evoked in them. I think having a richer view of that gives the patient many more options in therapy in his attempt to get an idea across.
- A: There's an additional point about contextual pictures. I think we should aim for pictures that require an interpretation. It's not just that it should be richer. It should make the patient more active. The difference between the first man watching TV and the second is the difference of the context. In the second picture, there is some sort of emotional experience going on. We tend to steer away from pictures that evoke some emotion. And I think Pound's point about images was good—that they are emotional and intellectual complexes.
- Q: Some of the cognitive literature has suggested several years ago theories about "top-down" and "bottom-up" type processing, particularly in the area of interest and expectation. Do you think imagery is stimulating more "top-down" than "bottom-up" processing?
- A: I don't know what either "top-down" or "bottom-up" processing is, so it is going to be hard for me to answer that one. Do you want to expand on that or . . . ?
- Q: Maybe I will . . . next year!
- Q: Do you avoid coloring your pictures? I remember some time ago reading an article about the importance of seeing red or something like that. Do you have any feeling about that?
- A: I think intuitively that color overloads and is not necessary. As far as I know it doesn't really matter. I believe that Joyce West tried simple line drawings versus colorful pictures and found no significant differences.

Q: I have the feeling that aphasiologists are about to stampede over to the right hemisphere. Do you have anything you want to say about the stampede . . . any cautions?

A: Yes . . . I think it is good to begin a movement to the right hemisphere. I guess that the major caution would be this: that we don't really know a whole lot about it (the RH). We're just beginning to learn. I think that one should try to avoid simplistic ideas about what the RH does. Even in this discussion here tonight we've talked about the interaction of the two hemispheres in a different way than we might when we merely consider a linguistic versus nonlinguistic system. We must be aware that a lot of facile explanations of what the RH does are currently in vogue and we should be careful of oversimplified assumptions--particularly as we move toward actual treatment of the RH damaged patient.