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TARGOWSKI AND BOWMAN MEET VTA

*I investigate the model of communication proposed by Targowski and Bowman (T&B)
from the point of view of Vocabulary Translation Analysis (VTA). I conclude that the
T&B model doesn't seem to be applicable to the sort of things I want to do. VTA is
better; but it's possible that a synthesis of the two could be more realistic.*

Targowski and Bowman[1] proposed a detailed model of human communication in which sender and receiver communicate with one another on many different levels simultaneously. They describe ten levels, each above the lowest depending on the lower levels for support. (!Page 10!: "These links are hierarchical, from the purely physical to the purely mental."!) At each level, "reflecting information" of a certain type is added to the message, affecting its interpretation. The lowest levels (!physical, systems, audience!) are associated with features of the environment, and are understood by both participants in the conversation. Higher levels deal with increasingly complex factors, such as the roles of the two participants, while the highest levels (!storage retrieval, value, behaviour!) are at the cognitive level and operate on the message as perceived by each participant separately. For perfect communication, each of these levels must work in just the same way for both participants; in practice, there will be differences in interpretation caused by differences in environment, understanding, expectations, and so on, and these will accumulate over the levels.

So far as I can see, they provide no experimental, or other, justification for their chosen ordering of the factors taken into account at the different levels. That the factors are significant seems reasonable enough; that they take effect in the hierarchic order described is less obvious. To demonstrate that the order was significant, it should be shown that a higher-level factor affects both a message and the lower-level factor's modification of the message, and not vice versa. The closest approach to a justification seems to be a statement on the effects of cultural and environmental factors, which they describe as "shared and private meanings". They say (!page 9!)!: "These meanings will differ in saliency, with some being (!or seeming!) more important than others. This results in a *layering* of meanings.". I find that less than compelling, particularly as different people might well perceive different orders of importance.

The references to "meanings" in that context are puzzling. The same notion seems to be considered elsewhere as the provision of reflecting information, which remains as information until the Cognitive Management Apparatus (!CMA!) evaluates the message in the context of the various items of reflecting information added. (!Page 9!: "In this case, the Cognitive Management Apparatus evaluated all the information available and made a decision about the meaning of the message."!)

All in all, it is less than clear whether they see the function of the various levels as just to add reflecting information or as to rewrite the message in some way. On page 8, they write "Each communication frame consists of an element of the message combined with a set of *reflecting information* supplied by the information-steering process" (!but what do they mean by "combined"!?!− and the "information-steering process" is a component of the mind, not the lower levels of communication!). In the next sentence, "The reflecting information modifies the data in the message itself, and is the reason why no message means exactly the same thing to two people ..." (!"modifies the data"!?!). These two quotations suggest that the message itself might be altered in the process, but later (!page 14!) they write "Value systems, however, provide their own separate information, a separate set of data that alters the message from sender to receiver not by filtering it, which implies elimination of a portion or distortion of the original, but by *adding* information which reflects on or modifies the message", and (!page 16!), "At each link, additional information is reflected on the message ...". But, on the other hand, we read (!page 17!) "As information flows along the paths and through the ten links, the sender and receiver add to and subtract from the 'bits' of information included in the actual message ..."; addition is fair enough, but subtraction is clearly a distortion of the original. Perhaps the final arbiter should be the diagram (!page 18!); their English might be sloppy, but

they would probably notice is the diagram were misleading. That makes a distinction between the contents of the message itself, which is the concern of the bottom two links of their scheme, and the intentions of the participant, shown as separate from the message and contributed by the eight upper links. The sloppiness of the discussion unfortunately obscures this pattern, and is continued throughout the paper.

SUMMARY OF THEIR MODEL.

They describe their model as a hierarchy of *links*, in each of which some operation is performed on the message. As I pointed out, the "operation" is probably the addition of some information, but I'll try to be non-committal where I can. Generally, the emphasis is on extending the original message with reactions, prejudices, beliefs, and other attitudes towards the attributes of the process considered at each level rather than on any recoding or reexpression. It is then the task of the CMA to assess the whole and to derive some sort of meaning.

Link	Process	Comment
Storage/Retrieval	Compare with memory.	Effect of previous experience with this communication method.
Values	Value systems of communicators.	Do they agree!?
Behaviour	Reactions to actions of sender and receiver.	Does the communicator behave as expected!?
Symbols	Symbol systems used.	How well do they agree!?
Functions and role	Relationship between the communicators.	Relative status, different functions.
Environment	Influence of ambient conditions.	Noise, surroundings, circumstances.
Session	Same or different space or time.	Immediate communication, or store-and-forward.
Audience	Reactions to the audience.	How many people, their perceived attitude.
Systems	Attitudes towards the medium.	Comfort, familiarity, confidence.
Physical	The communication medium.	Transports the bits. Is it adequate!?

HOW IT FITS IN WITH VTA.

The model assumed by VTA[2] is based on translation, with a message translated into a different vocabulary at every step of its transport through the communications system. The effect of T&B's links on the perceived meaning of a message would be modelled in VTA by effects on the nature and interpretation of the vocabulary used at the various levels.

Storage/Retrieval!: The effect of past experience on the formation or interpretation of communications, if perceptible at all, must eventually be describable as a translations from the vocabulary of the message into the "vocabulary" of ideas. It isn't clear that anything is gained by supposing that the corresponding link attaches information about the past experience to the history, and that the reflecting information is then taken into account by the CMA as it performs the "real" translation. If there's a difference at all, it's surely very subtle. The experience is effective in refining and developing the vocabulary and language structure used in the communication, as T&B themselves point out (!first full paragraph, page 15!).

Values!: Their example of the meaning of "freedom" is not convincing. I think they are suggesting that a message containing the word "freedom" should acquire a tag about the meaning of freedom!‒ but does the message {!"freedom", (!freedom means X!)!}, passed on to the CMA, mean anything different from an immediate translation!‒ perhaps not to be taken literally!‒ of "freedom" to X!?

A VTA description might be expressed in terms of a cultural semantic vocabulary, effective at the point where meaning is being extracted from words.

Behaviour!: It isn't clear from the descriptions whether this link is concerned with "body language" or with something else. On the whole, I think it's about behaviour in general, so I suppose it includes a change in the sender's planned response if, on being told to turn left, the receiver turns right. That makes it a very large, and very vague, field.

I think I'd want to be more precise in VTA. For example, I'd want to make body language a separate communication channel, with its own vocabulary, and with a later stage of interpretation at which the two streams were combined according to some internal vocabulary. In contrast, I'd deal with the turn-left example as a feedback channel, independent of the primary communication itself, but taken into account when planning the next utterance.

The broadness of the description, and the apparent extension of the period of a communication to include its consequences, suggests that T&B are thinking of something broader than simple communication at around the level of sentences. On the other hand, their use of the term "communication frames" (!page 8!), while not specifically identified with sentences, does suggest some such decomposition into units, which are coordinated and evaluated by the CMA.

Symbols!: The symbols link is concerned with "the extent to which sender and receiver share a symbol system" (!page 14!). This at least seems pretty close to VTA. Their examples (!at least they give some!!!) are differences in language, in non-verbal communication, and in jargon.

Once again, though, why not just do the translation!? It seems more economical than passing on the original and the information about how to translate it. It's true that there is some advantage in preserving a backward link so that it's easy to reevaluate the material if the context turns out to be other than expected, but you'd want to do the translation as well so that higher levels had the appropriate material on which to work.

A very significant difference from VTA is that symbols are considered as an isolated topic at a discrete level in the system. In VTA, symbols are discussed everywhere, with a new set for every cell on my diagrams. That's surely inescapable. The symbols used in the physical link can't be the same as those used in matching!‒ say!‒ behaviour with content in the behaviour link.

Functions and role!: As in the case of the values link, a plausible VTA approach to the effect of the relationship between sender and receiver could be modelled as a choice of vocabulary. It's probably a vocabulary at a rather higher level than I'd usually worry about with VTA, coming somewhere within the idea → communication stage, but that's where it would naturally fit.

Environment!: T&B's description again seems to mix factors of very different sorts. They comment on the noise of a gymnasium, and on the difference between watching television at home and watching a film in a cinema. It's true that both are environmental in some sense, but the noise is a physical problem which is addressed by looking for a close match between the perceived sound and the set of plausible words, while the difference between home and cinema is more a matter of choosing between slightly different vocabularies. Their example confuses the picture a little by mentioning the specific

vocabulary appropriate to a gymnasium, but that's independent from the question of the noisy channel.

Session!: The primary concern in this link is the immediacy of interaction between the communicators, and the discussion is about the distinction between immediate and store-and-forward methods. The gist is that different people prefer different means, so provide different sorts of reflecting information.

This seems just a bit unlikely. While it's undoubtedly true that people have different preferences, and that these guide their choice of mode of communication, does one really transmit a communication packet of the form {!statement, but interactive therefore untrustworthy!}!? And, if one does, shouldn't it happen at a higher level!? It would be very good to have some reason for their choice of order of the links.

A VTA model might regard some of this material as part of the environment, and use it to choose the appropriate vocabulary, and one would use the knowledge that this is (!or isn't!) an immediate conversation in planning strategy for running the interaction, but that's about all.

Audience!: I don't see much difference between this link and the functions-and-role link. The explanation given at the audience level is (!page 12!) "Sender and receiver have differing conceptions of themselves and of each other, and these conceptions influence the communication between them". That seems to fit the functions-and-role link exactly.

Systems!: While this link is ostensibly to do with the technology employed in the communication (!examples include telephone, print, electronic mail!), the important factor is again the attitude of the communicator to the technology. While this is not quite the same as the session link, it's very close, and I think that the same comments apply.

One other factor is mentioned!: people need certain knowledge to operate the technology used. That's something which came out of the VTA analysis[3], where I regard it as a matter of acquiring the correct vocabulary.

Physical!: This really is the technology, and alone among the links appears to contribute nothing to the message.

REMARKS.

There is no reason why the T&B approach should be identical with VTA. VTA was originally intended for use with communications which occur within machines, while T&B explicitly address human communication. Nevertheless, it has turned out that VTA can make some sort of job of describing human communication, so it isn't unreasonable to expect some correspondences between the two approaches which might throw light on both. I remain unconvinced that this desirable interaction is observable. One reason for the lack of correspondence could be that one of the methods acted as the mechanism of a single layer of the other!– so, some of the links (!such as the environment and functions-and-role links!) seem to fit within the idea $\rightarrow$ communication step which I've sometimes postulated when using VTA, but other examples don't fit this pattern.

If taken literally, perhaps neither model is credible!– it is hard to believe in the strictly layered activity in one's head which is required by both models. In this respect, T&B win a point by both maintaining the layered description over their top four layers, and hedging their bets by implying that they act cooperatively!: "... the mental links act as a unit, supplying a coordinated set of reflecting information"

(!page 13!). With both approaches, though, it seems that the model is not too bad so far as describing the processes is concerned.

At the more detailed level, the T&B model is very vague about combining symbols. How does the stuff received in the physical layer get joined together!? It must do, or higher layers couldn't comment on it. For example, how is the notion of "freedom", active in the values link (!page 14!), produced from the sequence "f, r, e, e, d, o, m" perceived in the printed page!? This synthesis is necessary before the values link is reached, or it could not exercise its function. It is true that VTA is not a lot better, but the up-and-down dimension is explicitly about this sort of synthetic (!or analytic, depending on the direction!) change.

One important question remains to be addressed!: can you tell the difference!? If not, the discussion is void, and we can use either model as it seems to be helpful. T&B don't discuss the question, except to the extent of asserting that there is no competition!: "... the Targowski/Bowman model is the first to provide a comprehensive means of understanding the nature of this process" (!page 17!). I can't discuss it much, because I don't know enough about the context.

What I can do is suggest that an even better model might combine aspects of both the T&B method and VTA. It is clear that some sort of translation (!as in VTA!) is necessary, as the "freedom" example shows. There is also value in keeping track of the full set of additions (!the reflecting information!) accreted along the way!: for example, if you don't know what a word means, you can infer something about it at a high level from context, then go back and modify the stored meaning of the word.

In such a model, a communication frame (!as envisaged by T&B!) for input would begin as a direct representation of the input received from the physical link, then proceed through a sequence of operations, each changing the material into a form acceptable to the next level (!as in VTA!), but also adding to the frame some record of the process carried out (!in effect, the reflecting information!).

REFERENCES.

1!:   A.S. Targowski, J.P. Bowman!: "The layer-based, pragmatic model of the communication process", *J. Bus. Commun.* **25#1**, 5-24 (!"Winter", 1988!).

2!:   G.A. Creak!: *Reaching beyond words in rehabilitation computer systems*, unpublished Working Note AC96 (!May, 1996!).

3!:   G.A. Creak!: *Interactors in rehabilitation system design*, unpublished Working Note AC97 (!August, 1996!).