ISSN 1361 - 6161

THE UNIVERSITY of MANCHESTER

Computer Science
University of Manchester

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Technical Report Series
UMCS-96-3-1

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31 March 1996

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Abstract

Language on the Internet allows us to communicate in ways which - in popular fears - threaten to undermine or even replace the material world. I argue that a distinction between language grounded in reality ("terminology") and language which goes beyond it ("fantasy") is fundamental to the nature of human language. Examples show that the use of language on the Internet simply accentuates this distinction: and that, as well as facilitating fantasy, it can take us back to a firmer grounding in reality. The nature of society and of perception also get involved.

The Internet has leapt into public consciousness, into the popular press, into conversations in the pub or with sheltered elderly relatives. Or rather, a parody of the Internet, a "virtual world" which threatens to take over from the world we feel safe with, to pied-pipe our children away inside the mountain never to return, a world seething with dangers and evils which are unreal, but none the less dangerous for that. Are we really watching the beginning of the end for the known material world, and a dangerous alternative to society as we know it?

> Real world cultures have mythic icons and forms which provide a "common place" and shared patterns of thinking. I-net is in a position to consciously create things which are ordinarily an unconscious part of society. As people "pretend" to believe these things and act them out we might see richer social forms emerging. They also have the potential of strengthening group identity. They may become a framework on which we can build richer social patterns than now exist. ...
>
> Those who spend time within this virtual universe may acquire new habits and techniques which they then inflict on the "external world" thus giving this medium the power to transform all human affairs (a power which is only theoretical, far from actualization, but none the less real, this is a potential lever to move the world). ...
>
> Many will look askance at the above and decide it is only silly? But is it? I think not. ("ac", alt.cyberspace, 19/9/95)

A more sober view, from a serious researcher in Virtual Reality:

> There are some important things that it gives us that may bring about a completely new way of interacting with machines - far more about the psychology than the technology. (West, p.c.)

1 Fantasy and the internet

Is there a real danger that virtual worlds will supplant the material world, as some critics fear, and some proponents seem to hope? Is the excitement just because all this facilitates fantasy? Is it just the fear of "unreal", immaterial worlds? But myth and fiction have been doing that for as long as we can tell. Fantasy is right up there with language at the top of the list of candidates for the criterion that best distinguishes humans from other animal species. (And religion, which, for our present purposes, is a form of fantasy.) Virtual worlds and electronic language are only doing what the worlds of art and the language of the imagination have always done: take us beyond the here and now, the material world under our feet and hands. I will argue that the languages of imagination and reality are fundamentally, provably distinct from each other; and then that in watching the ways in which we use language on the internet, virtual language, we can see that distinction with a new clarity.

2 The language of the abstract and the language of the concrete

There has always been a difference between words which are the names of things, language which refers to here and now (`hand, tree, Pepper the tabby cat`), and words for abstractions, fictions, imaginations (`justice, amusement, basilisk`). It has been argued that one of the most important criteria distinguishing human language, as language, from the signalling systems of other animals is that the latter can only refer to the here and now. A gopher has different warning calls to alert the group to danger from different predators, but it can only utter each call when the appropriate predator is detected. Animals cannot lie. (Although, come to think of it, Pepper is good at pretending she hasn't been fed...) Nor can they discuss might-have-beens, or abstract concepts. Human language can do all this and more. Arguably it is our ability, through language, to develop abstraction and imagination that has made possible human society, civilization, technology.

We find, very early, a recognition that the language of myth is distinctive in one way, and the language of natural science in another. Plato was well aware of the power of myth, critical of the potential bad influence of stories which showed the gods as less than morally perfect. At the same time, he was not above inventing his own when it suited him, like the explanation of love as the efforts of originally four-legged, four-armed creatures to rejoin with their sundered other halves; and his characteristic use of Greek is rich in metaphor and tinged with poetry. Compare this with the solid realism of Aristotle, his careful factual writings on physics and anatomy, his plain, matter-of-fact, even cryptic prose. On one hand, the language of science, grounded in the world, trying to understand and explain it: careful observation of biology and astronomy. On the other, the language of "philosophy", reaching beyond the observable world to debate the nature of knowledge, of "the Good", of government. Beyond this, from the priests and dramatists, language which leaves the material world altogether for worlds of the imagination. (Admittedly, this assumes a realist position, that things are as we preceive them to be, which could be debated. Indeed both virtual environments - simulations - and virtual reality - attempts to fabricate a complete, immersive perceivable reality - tend to undermine it.)

As commonly used, the distinction easily casts itself as between the language of science and the language of art (although with art we should include philosophy, fantasy, and religion). It has evolved through the centuries of evolving western thought, as more and more areas which for the Greeks were part of "natural philosophy" have spun off to independent status as natural sciences. Let us put another name to this distinction, and refer to the characteristic words of the language of science, words which are labels for unambiguous parts of the real world, as "terminology".

"Terminology" may smack of science and technology, and shade off into jargon: ironically, perhaps, the hallmark of a specialist's view, far removed from ordinary people's perception of the everyday real world around them. That is because, in an area we know nothing of, the language is as baffling as the things it refers to, because the things are. If we don't know what `positron` means, or `perceptron`, or `mother-of-all`, we are liable to blame it on the words, rather than on our ignorance of particle physics or neural modelling or the design of spinning wheels. If we do know the area, then we do not perceive its language as terminology. But `shirt` and `blouse`, `fork` and `spoon`, `front door` and `cat-flap` identify specific objects in just the same way.

One possible criterion for determining whether a word is a "term" comes from the use of computer models to hold our knowledge about (parts of) the world - "terminology" can be defined as the vocabulary which labels such a model. Let me briefly describe one such model and the lessons it offers about the nature of language.

GALEN (Rector et al 1993, 1995) is a European Community funded research project building an advanced medical information system, based on a central concept model of medical knowledge which can support a range of clinical applications (diagnostic decision support, epidemiological surveys, and automatic generation of patient history summaries, for example), in a range of different languages, at levels of technicality appropriate to a range of different users (such as surgeons, general practitioners, nurses, patients familiar or unfamiliar with their condition). Traditional medical terminology systems have been, at best, giant semi-structured dictionaries: GALEN's distinctive central component is its Concept Reference (CORE) Model, a formal representation of medical knowledge, of anatomy, physiological function, disease. Coded into the model are, for example, the fact that we have bones; that one kind of bone is a longbone; that there is a longbone in the thigh; and this is labelled `femur`. Bones can break, and a break in a bone is labelled `fracture`; a break in the bone of the thigh is labelled `fracture of the femur`. Such labels are the "terminology" of medicine in English. A separate component, the Multilingual Module, handles this labelling of concept entities, in any number of natural languages.

Similarly, a Code Conversion Module handles the mapping between concepts and other formal coding systems. These three modules together make up the GALEN "Terminology Server", which gives us, sharply defined and unambiguous, the names of things.

Medicine is a field in which terminology abounds and its correct use is essential, life-preserving, but any slice of the real world and its nomenclature could be represented in the same way: families and varieties of plants, the components of an automobile or aircraft engine, clothing, food. We can point to a freshly picked tomato and identify it as Red Alert. We cannot, in the same way, indicate that it is fragrant and delicious, let alone that we approve ideologically of its organic cultivation. Subjective perceptions of scent, flavour, and political correctness are not facts, and cannot be modelled.

3 Caveat

Let me sound a brief note of caution here, before taking the argument back to the internet. Our use of terminology, as native speakers of natural language, is not quite that straightforward.

> The assumption underlying the increasing internationalization of medicine is that there is a shared model of medical science and medical care which transcends local idiosyncracies of language and usage. It remains a matter of controversy as to how far such a language-independent model of medical concepts is possible. (Rector et al 1993).

Even words which are firmly anchored to definable slices of the real world, we understand and use with a vast contribution from our knowledge of the world and common sense - and that is before cultural assumptions and connotations come into play.

"The signal underdetermines the message." How often have you barely heard what someone was saying, in noisy surroundings, perhaps one word in four, yet understood perfectly what they were trying to communicate? How often have you "heard" someone say what you expected, and realized only later that they had actually said something quite different? (Thus the - probably apocryphal - book review which began "This book fills a badly needed gap in the field.")

Artificial Intelligence researchers in the two disjoint fields of computer vision and computer speech recognition are well aware of this. An acoustic wave- form is highly ambiguous or indeterminate on many levels: a person receiving it, in a particular context, with particular background knowledge, interprets it so quickly that the ambiguities are never noticed. Or we may "hear" something said to us, and only understand it after a few seconds, after we realize what the context is. Speech recognition research increasingly realizes that computers will need human-like world-knowledge and subtle powers of not-wholly-logical inference to achieve human-like understanding of natural speech.

Similarly in vision: the light waves which reach the human retina or a robot camera are a tiny part of the information and inference which allow us to recognize a familiar face, let alone the passing emotions expressed on that face. Look through a row of windows at a building opposite: how do we know that the building extends across the stretches of solid wall between the windows? This kind of interpretation and inference is perhaps the greater part of our understanding of both vision and language, even of terminology.

Along these lines, although Umberto Eco's (1986) "Travels in Hyperreality" pre-dates public consciousness of virtual reality or the internet, the observations in his essay "Towards a Semiological Guerilla Warfare" on mass communications are entirely appropriate here too.

> Not long ago, if you wanted to seize political power in a country, you had merely to control the army and the police. ... Today a country belongs to the person who controls communications. (Eco 1986:135)

But the real control of that centralized message, Eco argues, lies not with its originator but individually with each receiver, who will interpret it in the light of his or her particular circumstances; and, the more widely these media reach, the more diverse will be their interpretation.

> American scholars have realized what a Technicolor love movie, conceived for ladies in the suburbs, means when it is shown in a Third World village. ... variability of interpretation is the constant law of mass communications ... For a Milanese bank clerk a TV ad for a refrigerator represents a stimulus to buy, but for an unemployed peasant in Calabria the same image means the confirmation of a world of prosperity that doesn't belong to him and that he must conquer. (ibid:140, 141)

(We might think of Austin's (1962) distinction between locutionary force - what an utterance inherently means - and perlocutionary force - the meaning which is received - writ large.) And Eco urges us actively to use our power to interpret individually the mass message we receive:

> What must be occupied, in every part of the world, is the first chair in front of every TV set ... The battle for the survival of man as a responsible being in the Communications Era is not to be won where the communication originates, but where it arrives. (ibid:142)

One would expect the internet, with its openness of interaction, its power of universal participation and right to reply, to take this principle even further. Insofar as it does not, it is because, as yet, internet users are still culturally homogeneous. "More than half of the internet users in the UK are aged between 25 and 44, professional, and 90% are male" (Arthur 1995). Women form a larger, and growing, proportion in the United States (Miller 1995), but on a global perspective, compared to Eco's examples of Calabrian peasants and Third World villagers, we are still talking about a small sub-group of society which shares a sophisticated technology and the assumptions built into that technology. (An early, and impressive, exception to this restriction was the Zapatistas' use of the internet to keep the world informed of the progress, and the dreams, of their insurrection in Mexico (Berger 1995).) We can hope, and indeed predict, that as computer communications technology spreads more widely through the world, and adapts to the new cultures and assumptions it meets, truly global diversity of interpretation will spread with it.

Here, further, not only Artificial Intelligence, cognitive science, and cultural criticism, but also virtual reality meet traditional epistemology. A voice from the front line in virtual reality research:

> Ultimately the world we experience has far more to do with our own projections and constructions than whatever objective reality may be out there at least as regards the more sophisticated concepts we form, and possibly in basic perception too - we heavily interpolate, extrapolate, fabricate and ignore things from the raw sensory input - to a far greater extent than we generally realize. (West, p.c.)

This long and wide-ranging caution is important, and there are valid questions of degree rather than utter absolutes, but - I believe - it does not undermine the distinction I am arguing for. between terminology and abstract language. Even terminology is used and understood with vast resources of extra- linguistic knowledge, but it still comes down to material reality. A French and an English surgeon may use different words, and different cultural backgrounds, in referring to a disease of the human liver, but they will point to the same organ of the body and the same pathogen affecting it. A French and an English art critic, or high court judge, speak culturally unresolvable languages, where even approximate translation is difficult enough, and pinning to a common reference point in the material world is simply impossible, because there is none.

4 The internet as a test for reality

I have argued, first, that there is a fundamental distinction, as old as human language, between language which refers to the material world and is grounded in it - the language of science, "terminology" - and language beyond the material, the language of art and philosophy. Second, that a side-effect of building computer models of bits of the world and attaching words to those models gives us an objective diagnostic test to discriminate terminology from the vocabulary of the non-"material". Thirdly, that some caution is needed even then, due to the vast resources of world-knowledge and inference which we bring to bear in processing even the most solid and unambiguous of terms. Finally, I want to suggest that watching the way in which language is used on the internet offers a new sharpness to the distinction between "material" and "abstract" language, between terminology and fantasy.

Even from the list of internet newsgroups names a clear pattern emerges. Groups in the `alt` hierarchy are particularly prone to be populated by people for whom they are world enough. Here the language of beyond-the-real is spoken, as it always has been in myth and fiction and philosophical speculation. Compare these people to the young men who walked through the Agora with Socrates, debating the nature of knowledge and beauty when they could have been practicing estate management or the skills of war: the difference in technology is trivial compared to the similarity in motivation, and in the use and role of language.

On the other hand, most of the `rec` groups, for example, by their nature are about the material world, depend on it and feed back to it. On `rec.pets.birds`, for example, people exchange questions and advice on which sort of parrot is likely to talk best, or what to include in a varied diet for a cockatiel (dandelion leaves, but not chocolate). On `rec.sport.running`, the results of major races all over the world will be posted within minutes of happening.

Of course, it is too crude to say that some newsgroups speak in the language of reality and others in fantasy. There is always a mixture. But users are aware of the distinction, and of which is appropriate to which topic. `rec.pets.birds` discusses the ethics and ecological impact of importing wild-caught birds of rare species. `talk.philosophy.humanism` has been known to discus the format and distribution of car-stickers with humanist symbols, `soc.religion.quaker` the form of gravestones in old Quaker cemeteries. But this is felt to be out of character, and sooner or later - probably sooner - while the humanist goes back to discussions of Kierkegaard and the meaning of life, the runner will go back out on a new route, and the bird-lover will try again to teach the cockatiels to whistle "Pop goes the Weasel". The effect of the internet is to give them more and better informed, not less, interaction with the material world. It is not a substitute for the real, but an enhancement of the real, an empowerment in dealing with it. If too much of the immaterial intrudes, it is likely to find its invasion side-stepped by re-drawing the boundaries and terms of reference of the group.

An example which illustrates this well is the recent (and typical) history of the newsgroup `rec.food.veg`. Set up for discussion of all issues related to vegetarian food, the group rapidly became a wild miscellany within which some people debated the ethics of vegetarian living, some contested the health issues around various diets and dietary supplements, and some would ask "Does anyone know good recipes for a veggie barbeque, or for the glut of beetroot in my garden?" - and would usually have plenty of useful replies. After a while, discontent set in, and an ever larger proportion of the traffic on the group was about what the group should be for, which of these themes should be discussed. Eventually the group split into several, including a group dedicated to ethics - which has since died - and a group entirely for the one person who most dominated the original group with hundreds of words every day of opinionated statements on any topic under discussion, which has been moved to the `alt` hierarchy. The two survivors are `rec.food.veg`, for general discussion, and `rec.food.veg.cooking`, which is just that: a forum for sharing or requesting recipes. And, for those of us who read it, this is not a substitute for cooking! On the contrary, we are likely to rush from the computer to the kitchen, and eat something new for dinner.

I will conclude with a closer look at one particular group - a mailing list, in this case - "the KnitNet".

The KnitNet is a group of (at the time of writing) about 1000 knitters around the world, who share technical questions and advice, leavened with a great deal of humour and personal chat. The atmosphere is that of a traditional knitters face-to-face kaffee-klatch, and indeed many such meetings have been organized through it, and solid personal friendships formed. Let me quote a small selection of (mostly) more technical recent messages - for a sense of scale, the total traffic normally runs at 30-40 pages per day:

> My plan for the vest is a v-neck vest with each front having a cable (possibly two-colour, I'll have to decide soon) the length of each front, the background (or rest) of which will be large blocks of colour (I have about 7 balls at an ounce or two each). One colour will change to another via three rows of k1A, k1B, vertically, and the cable and front buttonband will

> separate the blocks horizontally.
>
> Does anyone want to trade two bags of Reynolds Fiesta cotton/acrylic blend in primary green and primary yellow? It's lovely yarn, but the colours don't speak to me in quite the right way.
>
> Just found out that I'll be in Rochester, NY for the afternoon this coming Thursday. I may have time to visit one or two yarn stores while I'm there. Any suggestions? What stores are there in Rochester, NY?
>
> Alpaca for socks? I've seen kits for alpaca socks but my own feeling would be: OK for the bottoms, 'cause it's a really warm fiber, but alpaca has no "give" so I think they might slide down your ankle if you used it for the tops.
>
> Someone asked about the accuracy of this pattern. I have knit them, and I do know that a correction needs to be made in the directions following the heel: It reads: "You will have less sts than when you started" and the pattern says "12(12,14)". The *correct* number of sts for the *medium* size should be 14, not 12.
>
> ... mentions using hair conditioner for her socks. I use it when washing all my woolens. I also use shampoo for washing. With 16 and 18 year old daughters I always have a good supply (you know, constant changing of brands before using up what you have). I was also told to use it in the last rinse when washing fleece. Works great.
>
> In my experience, Cascade 220 and Germantown worsted produce identical gauge on size 7 needles (I get 5 st/inch).

And here are, again, a very few of the replies I received when I mentioned to the KnitNet that I was writing this paper, and asked for their response (with deepest thanks to these six and many more, for their involvement and support, and for permission to quote their words):

> I've been knitting for over 40 years, but never had anyone to learn from (learned from a book in the dime store) and though I loved it, did not really develop more advanced skills until I joined the Knitlist. I came to appreciate finer finishing techniques, began buying books on new stitches, patterns and techniques, started using new yarns and patterns that others recommended, and also began actually finishing what I started. Before, I felt isolated and that I was the only one who got bored with a project and let it sit for awhile - now I know it's just a UFO (unfinished object), and I realize that I knit for the enjoyment of the process, perhaps even more than for the finished product. This list has inspired me, taught me and most of all, provided support I never have had. (Judy Sumner)
>
> I also like the use of this new technology to further the ancient craft of turning one-dimensional yarn in to three-dimensional garments. And another thing that you didn't mention; the (so-far) non-commercial nature of the 'Net, which inspires in people a matching altruism. Not only the pattern and yarn exchanges on the knit list (let alone the tons of helpful advice) but all the marvellous WWW sites that people create and maintain just for the hell of it. And the maintenance of the knit list, for that matter. (Diana Foss)
>
> Without this group I wouldn't have discovered Alice Starmore, or the peacock face cloth, or the Enchanted Forest sweater, or knitting backwards, or ...... I always knitted, but I've learnt an incredible amount from this group, and I really do find it has enhanced things for me. And, largely thanks to the internet, I have taken up a whole new hobby, ice skating. (Annabel Smyth)
>
> I have knit for many years and was almost beginning to believe the retail stores, who said they were: (fill in the blank) closing, cutting back, not carrying yarn anymore, because no one knits. I was beginning to feel that I and a few close friends were the only ones out there. Of course, now I know differently. I found the Knitting Guild of America, (almost sounds like a religion, doesn't it?), my friends and I formed our own guild, I got a computer system,

and the rest, as they say, is history. I have found new friends from all over the world. I have learned many new things. And you're right! I have been inspired. The list also gives me ideas to share with the guild, and think of all the people who can aswer my questions! I quess that's exactly what I'm working up to. The internet is a wealth of information, both on lists, such as ours and on bulletin boards. I don't believe people when the say that the internet is bad. Since when is information a bad thing? People in this country have a tendency to blame "things" for their inability to use common sense. (Ie.- "The ladder is at fault because it fell over while I was standing on the top step reaching two feet off to my left.") That's a bit of an extreme, but you get the idea. (Lynn Macquard)

From my perspective, many of the generalizations being made about the internet are based on a very limited sample of what actually is transmitted. Those samples are very male dominated, and I think some of the communication patterns are more about the gender of the participants than the technology. Knitlist is an interesting counter example, because it is a predominantly female list. I certainly think you are also right that it encourages "involvement" with real stuff, rather than substituting for it – I buy more yarn and (more importantly) keep knitting in more challenging ways thanks to the list. Since there aren't many knitters here in Alabama, that is important. I do have a knitting guild, but it's small and once a month contact isn't as good for inspiration. (Lynne Adrian)

Even though electronic communication is exclusive in some ways (one must be leisured enough to participate; relatively literate, both in the traditional sense and as far as computers are concerned; privileged enough to have access to a computer) within the cyber-community there is a powerful leveling effect which is unique to this type of communication. Differences that influence us in face-to-face communication (race, age, weight, accent, class, disabilities, sex, nationality, etc.) are hidden in electronic communication and need only be revealed when and if you wish. We are drawn together by our love for knitting and within our virtual community we form bonds based on this common interest. It broadens one's mind to find that the person you respect for their wisdom on the net belongs to some group of Others whom you fear or dislike in "real life." Even if one does not harbour actual prejudices, we are all, without exception, influenced to a degree by the outward physical attributes of people we meet. The virtual community sweeps these external differences aside. The question is, what is more "real": the inner person whose thoughts, opinions, advice and dreams are expressed in email? Or the outer person you see and react to when you meet someone face to face? This is not to say that the world of email is free of all problems and prejudices of its own. However, it can force us to re-think our perceptions of what really is, and hence it can change reality. (Laura Marple)

5 Conclusion

So, I would argue that we have here, indeed, a new technology of great scope and power, with implications for the organization of society and for our understanding of perception, but that what it does is reinforce and accentuate a distinction as old as human language itself, between the language of the material and the language of the immaterial, between terminology and fantasy, between language which is rooted in the real world and takes us back to it, and language which takes us beyond it. The language of the material, on the internet, may lead me to order fleece from a Perendale sheep breeder in New Zealand, to establish a long-term friendship with an American couple who come to England for ten days every summer and to be taken to dinner by a knitter in Nashville, to knit a jacket for a friend's daughter's first birthday from a little-known pattern, to learn to spin. Language beyond can go further beyond than ever before: the internet, and the technology of virtual reality, open new possibilities for the creative imagination, at least comparable to the excitement at the invention of cinematography, or still photography - which we take so much for granted now that it is hard to recapture that excitement. Our new virtual words and worlds are not a threat, but a creative challenge; and whatever new potential they offer to fantasy is there for terminology and "reality" too.

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7 Acknowledgements

Special thanks to Deborah A. Abbott, Jason Burton, John Frone, Rajeev Gore, Charles Sanderson, Suzanne Stein, Adrian West, and the KnitNet. Apologies to all whose contributions I was unable to use.