REVIEW ARTICLE

Medical Consultation – Resonating with Patients, not exchanging digital information

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ABSTRACT

Historically, the medical consultation has been seen as a process during which patterns of words/meanings are exchanged between individuals, in the same way that digital computers exchange information. Recent developments have characterised the human brain as using analogue processes. This suggests that human interaction should instead be seen as a process of resonance or synchronisation. The implication is that teachers should recognise communication as a complex, highly personal ability developed through life long experience and that success should be seen as staff being able to resonate with their patients and effectively 'feel what they feel'.

Introduction

Historically, the teaching of medical communication skills has focused on the process of extracting symptoms from patients and the conversion of those symptoms into medical terminology for recording in the patient history[1]. Understandably, more recent research has shown that it is important for medical staff to understand that their patients may use words in ways that are difficult for the professional to interpret, especially when they are from different cultural backgrounds[2]. However this still emphasises history taking as an exchange of words, as tokens with specific meaning. Still more recently, the importance of non-verbal communication has been understood, with students assessed on both the words they use and their nonverbal communication[3]. This paper seeks to explore how an analogue paradigm of human cognition changes both how we perceive medical communication and the implications for medical teachers.

The above paradigms appear to be based on the concept of the human brain as a processor of information. This paradigm appears to be supported, both by the classical tradition of logical thought and a more recent comparison of the human brain with digital computers. In both cases, the process of thought is based on the processing of information according to logical rules with the process resulting in a single, correct answer. While individual verbal and non-verbal tokens may vary in meaning across cultures and geographical areas, it reduces the problem of communication to a simple question of how to interpret each word or gesture.

However, clinicians recognise that medical communication in practice is a highly complex process within which many influences may affect outcomes[4,5]. In addition, some aspects of communication appear to directly conflict with an information processing paradigm. For example, a period of silence is devoid of linguistic tokens and should therefore be devoid of meaning. Despite this, silence is recognised to be one of the most powerful tools clinicians can use[6]. Understandably, given the above, there does not to be any clear consensus on how to teach communication skills to medical staff[7].

Analgoue Computation

The term computer is now nearly synonymous with digital, electronic devices which process information according to logical rules and can be termed Turing Machines after the theoretic concepts described by the English mathematician Alan Turing[8]. However, prior to 1960, most computers used continuously varying components, for example the device used to calculate the tide heights for the D-Day landings in Normandy[9]. The human brain has also been reconceived as an analogue device[10,11,12,13]. In electronic, analogue computers, information is input into the processor via a digital signal (like sensory nerves) and results in a digital output signal (like motor nerves which produce behaviour). In between the two is a central processor which is formed of a large number of nodes that are interlinked and vary in voltage, like human dendrites[14,13]. Rather than being programmed with rules like a digital computer, an analogue computer gradually

learns through exposure to test data so that over many iterations, specific inputs produce a specific internal 'mind state' which then produces the required output[12]. Importantly, such computers do not have specific areas of memory or processing but instead act as a single, integrated processor. Rather than producing logical results, such massively complex and mathematically chaotic systems instead produce characteristic behaviours in the same way that chaotic systems such as weather produce predictable behaviours such as clouds, rainbows and tornados[15].

Analogue Thought

The paradigm described in this paper posits the brain as a single integrated analogue processor comprised of billions of dendrites connected through a massively complex system of neurones, synapses and junctions with the information encoded as the voltage of each dendrite. Any sensory input produces a change in massive numbers of dendrites, which produces a characteristic pattern or 'mind state' which then results in specific behaviours. Importantly, rather than an individual collecting information in their memory, the brain of an individual is a massively complex 'mind state' which has developed from the time their brain formed within the embryo and reflects their genetic makeup, their internal environment and every experience throughout their entire life[16].

The evolutionary origin and advantages of such analogue neuronal networks are obvious in that they can function with very low numbers of neurones, they have very high computational power, but at the same time

are highly energy efficient. For example, an electronic simulation of only eight nodes (which function in the same way as biological dendrites) have been used successfully to construct a character recognition device[10]. In evolutionary terms, the ability of organisms to develop complex behavioural responses to changes in their environment would undoubtedly provide them with an evolutionary advantage. For example, it would allow them to locate sources of food, identify possible predators and locate other organisms for procreation[17].

Analogue Communication

This provides an entirely different paradigm for human communication. Rather than a process of information exchange it suggests that communication should be seen as a highly complex interaction between the human brain and its environment with the organism seeking to synchronise with patterns within the overall environment. In particular, where organisms developed to the point of socialisation, there is a clear advantage to the organisms within the group having a coordinated response to any environmental challenge, so that the whole group feeds, fights, procreates and sleeps at the same time. The aim of communication can be therefore seen as a process of synchronisation or resonance[18]. This paradigm of cognitive resonance provides us with a new way of characterising medical communication and suggests educational strategies which may be more effective than current practice.

The primary inference is that communication is not the exchange of information, but rather

a process by which individuals synchronise their internal mind states. This can be seen in terms of musicians who take turns in playing and gradually build from simple notes to develop a shared tune, through exchanging notes and exploring different speeds, rhythms, tunes and styles of playing. Success is therefore defined as the individuals developing a shared mind state. So in a medical context, the professional does not extract information from the patient, but rather synchronises with them. This is more than just empathising, but rather that the profession 'walks in the patients shoes' or 'feels their pain' and the patient feels that the professional has shared their experience. This explains why non-verbal communication and such techniques as mirroring, where the professional adopts the same posture and movements of the patient can be so important[19].

The complexity of the human mind state has important implications, because an individual's mind state is not just learned information, but rather a reflection of their total individual and societal experience. This suggests that the greater the shared experience of the patient and professional the easier it will be to achieve resonance. For example, where two individuals have a shared language, a common social background and multiple previous encounters, it would predict that communication may be easy. However, where individuals have never met before, come from different communities and have a very different life experience it would predict that effective communication will require both

more time and greater effort from both individuals if resonance is to be achieved[20,21].

The concept of communication as a process of synchronisation also explains the importance of silence. Silence is therefore not a neutral act or an absence of communication, but an inability, or worse, a refusal to take part in the normal process of synchronisation, making it open to interpretation as a hostile or at least a negative action. In contrast, the musical metaphor above suggests a definite need for each individual to provide the other with space to express themselves, to listen and then respond appropriately. Unfortunately, the suggested complexity of interaction makes it difficult to predict the most efficient mode of interaction, but does suggest that where communication is expected to be difficult, alternating periods of expression and listening between individuals would be expected to be needed.

This complexity also means that human understanding is holistic in that the overall meaning of any human expression can only be interpreted in terms of the environment, the internal mind states of the individuals, their culture and both their verbal and non-verbal communication. This explains why senior staff in the workplace appear to communicate poorly, in that they rarely fully express their message in words, but instead rely on cultural norms to achieve shared understanding[22]. Any attempt to simplify communication to a set of rules or a template to follow will risk the professional focussing on the rules and forgetting the key skill of synchronising with the patient[23].

The effect of culture on communication has been widely explored with doctors identified as having over 20 known biases, linked to the race, age, dress, educational level and disability of their patient[24]. This bias has often been portrayed as a form of discrimination or poor performance leading to poor care[25]. The paradigm suggested here instead suggests that the effectiveness of communication will inevitably be degraded by any difference, in for example, culture, language or experience between the patient and clinician. This does not suggest that bias does not exist or that it does not worsen the outcomes of those who are different, but it suggests that the problem will not be solved by simply educating staff about bias[26].

Lastly, current training often portrays communication as a process of collecting information, clarifying meaning and a gradual process of developing shared understanding. In the same way that a digital computer is turned on, the information is entered, the data is processed, the final result is produced and the computer turns off. In contrast, analogue computers are effectively always on and running. This suggests that in any meeting the first few seconds of the encounter will have a very large effect on the outcome, with the communication having progressively less effect on the outcome as the exchange continues. This is supported by the finding that the positioning of articles of furniture in a consulting room can alter the effectiveness of communication[27]. It also explains why humans appear to take decisions even before they become consciously aware of taking a decision and why we appear to have a very

rapid decision making process and a slower more logical process. (Type I and Type II Thinking) [28].

The analogue communication paradigm suggested here is entirely dependent on the acceptance of human cognition being an analogue process and given the complexity of human cognition, it is likely that no simple theory can adequately describe human cognition. Despite the effectiveness of this paradigm in explaining some aspects of communication that are difficult to explain using a digital paradigm. The utility of this paradigm therefore rests on whether it is able to be used to design educational activities for communication skills development that prove more effective than those currently in use.

Conclusions

The major implication of analogue cognition for communication theory is that it radically alters the aims of any educational process, in that it makes the teaching of communication skills as a list of questions or as a process of extracting information invalid. It instead suggests that human communication should be treated a highly complex process of verbal and non-verbal communication between individuals with a mental structure built up throughout their lives and tightly situated in the environment. Communication cannot therefore be reduced to separate components without losing meaning.

Secondly, it suggests that the aim of communication is the synchronisation of the mind states of participants so that, for example, the medical professional does not

simply identify that the patient has pain, but rather 'feels' their pain. This synchronisation is achieved through a process of exchanging words and gestures which gradually leads to the mind states of participant being synchronised.

Thirdly, the complexity of individual mind states means that it will be impossible to avoid the process being influenced by the culture, education and experience of both parties, making truly impartial decision making impossible. While bias is inevitable and likely to be resistant to simple anti-bias training, it does not mean that new strategies cannot be developed to avoid poorer outcomes in minority groups[29].

Lastly, it implies that the development of communication skills can only be seen as a process which will require development through training, practice and experience over many years, and that success will depend on the communication skills that the person has already developed through their pre-professional life.

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