

EDUCATION AND DEBATE

Heuristics and bias in homeopathy

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The practice of Homeopathy ought to be strictly logical. In the Organon Samuel Hahnemann gives the impression that the unprejudiced observer should be able to follow an algorithmic route to the simillimum in every case. Judgement and Decision Research, however, indicates that when people grapple with complex systems like homeopathy they are more likely to use heuristics or empirical rules to help them reach a solution. Thus Hahnemann's concept of the unprejudiced observer is virtually impossible to attain. There is inevitable bias in both case-taking and remedy selection. Understanding the types of bias may enable the practitioner to reduce his/her own bias. *Homeopathy* (2006) 95, 237–244.

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Introduction

In the Aphorisms of Hippocrates,^{1,2} one of the books of the Hippocratic Corpus regarded as having been genuinely written by Hippocrates himself,³ the aphorism is seen as an ideal vehicle for passing on the wisdom of experience. In reading these today one can almost imagine the father of western medicine sitting under the famed plane tree on Kos and delivering his nuggets of wisdom to his eager pupils. It is generally accepted that we must thank the Classical Greeks for the aphorism as we know it: a short segment of distilled wisdom designed to express a general truth. Aphorisms are like proverbs and adages: essentially they are empirical rules. Sometimes they are discrete packets of wisdom, at other times they are building blocks which link up with others to make a greater whole. Aphorisms characteristically speak with authority, without supporting evidence or reason. They imply that the authority is dependent upon long experience, great wisdom or some form of revealed knowledge. And there is an important point here, since the person who can recite the nugget of wisdom can appear to be the possessor of that wisdom. Aphorisms are an interesting literary form, partly because although they

have been written down, they are actually suited for oral tradition. Like proverbs, oracles, adages and other empirical rules, aphorisms are easily recited and passed on from person to person. They were an ideal way of transmitting knowledge in a preliterate society.

This leads us to the question, why did Samuel Hahnemann, living and working in a literate society, choose to write in aphorism form? Other medical writers wrote in prose, or in textbook style, so why did Hahnemann choose to differ? Was it because of a desire to emulate the classical writers of the past? Or was it to stamp his authority on medicine, to set his theories down in a manner that his 'disciples' could spread around the world?

Homeopathy and the Organon

Hahnemann⁴ wrote his theories in aphorism form in his great work, the *Organon of Medicine*, first published in 1810. Over the following 23 years he continuously revised it, as he modified his ideas through practice and experimentation. It went through five editions, a sixth having been completed by 1842 shortly before he died, but published only many years later. We can only speculate about his reasons for using the aphorism form, but if we consider his personality, his utter conviction that his method was superior to that of the orthodox practice of the time, then it seems likely that he chose the form in order to stamp his authority on the new practice. It also seems equally likely that he thought that his text would become a philosophical classic, a true seminal work

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which would be referred to over the decades and centuries to come. By stating each tenet of his philosophy in the authoritative manner of the aphorism he was at once standing firm against the orthodox view and maintaining his position as the originator of a new method.

The *Organon* is essentially a sort of blueprint. It directs the reader to follow the precise route guided by Hahnemann, for in his view, there was no better way of treating a patient. There is a logic to the pattern of the *Organon*. He tries to build aphorism upon aphorism, in order to produce a definite, logical pathway. In a sense, Hahnemann believed that he was producing an algorithmic method, one which would be bound to lead to the *simillimum* and thence to the cure of the patient.

The unprejudiced observer

After outlining the requirements of a physician in the first five aphorisms, Hahnemann describes the necessity that the physician be an unprejudiced observer in Aphorism § 6.⁵ This aphorism is considered fundamental by homeopathic practitioners. It has been extended by some who perceive it to mean that one should not allow one's thoughts, or perceptions to intrude into the process of working out the *simillimum*. However, in the very process of taking a history, the case-taker inevitably formulates questions, follows leads and uses thought processes that are not entirely conscious. It is virtually impossible to be an unprejudiced observer.

The methodologies of Homeopathy

The selection of the remedy as indicated to us by Hahnemann would seem to be a relatively simple process. Nowadays, however, with a *Materia Medica* of several thousand remedies derived from animal, vegetable, mineral kingdoms and from biological sources and from a large unclassified group, the *imponderabilia*, and a range of methodologies homeopathy is highly complex and difficult to master. Experience suggests that there are many ways to approach a case. Indeed, studies have shown that several homeopaths faced with the same case will come up with different treatments.⁹ The important thing is that the patient must gain from the prescribed remedy.

The following methodologies are commonly recognised: classical, aetiological, layers, therapeutic prescribing, complex homeopathy, and miasmatic prescribing.⁶⁻⁸ Other methods are also used, including drainage, isopathy, tautopathy and even more esoteric methods such as chakra prescribing. Various 'schools' based on a particular method have been described by various exponents and prominent homeopaths. These methods are essentially models devised to promote understanding of how a health problem may arise, and

which have a built in method of reaching a remedy or a group of remedies. As such, they are based on heuristics and will inevitably have bias associated with them. Some homeopaths feel more comfortable with a particular approach, so may use that most of the time. Others have an eclectic attitude and flit from approach to approach depending upon the case.

Judgement

In an ideal world, judgement would be a matter of pure logic, whereby following a sequence of steps would lead to a correct solution. In other words, an algorithmic path would lead to the solution. Experience, however, teaches us that judgement can be extremely difficult, whether it is a straightforward decision between two options or selecting one item from many, when there are both positive and negative factors to consider. In psychology, the field of Behavioural Decision Research (BDR) is concerned with judgement and decision making. There is now a wealth of work which shows that in a complex and changing world we tend to use simple empirical rules or heuristics. In general, these empirical rules are successful, and fairly accurate, even though they are not necessarily based on the same logical sequences as are algorithms. But they are typical of human thought.

Algorithms and heuristics

Let us digress for a few moments into the world of cybernetics: there are two basic types of process that are programmed into Artificial Intelligence or AI systems: algorithms and heuristics.

Algorithms are named after the ninth century Persian mathematician, Al-Khawarizmi. The word algorithm refers to a detailed sequence of actions to perform in a finite number of steps, in order to accomplish a task. In the cybernetic sense it is logical thought involving a purely mechanical, logical sequence of steps. Any computer program is by this definition an algorithm.

Heuristics are essentially empirical rules. They reduce or limit the search for solutions in areas that are difficult, complex or poorly understood. But a heuristic is not necessarily logical. While an algorithm will always deliver a logical answer, a heuristic may not always. The term is of Greek origin, meaning 'serving to find out or discover.' The word was introduced into the English language in the early 1800s, at which time it meant 'a useful, even indispensable thought process for solving problems that *cannot* be handled by logic and probability theory.'¹⁰ Currently, an heuristic is understood as a thought or cognitive process that we tend to use if not in place of logic, at least as a short cut or empirical rule. The bulk of evidence shows that people working in complex situations of uncertainty tend to operate heuristically. Note that these processes are not consciously brought into operation; it is

something that one just does automatically, as if the mind reaches into a toolbox and selects the appropriate heuristic tool.

Cognitive heuristics

Heuristics are also thought processes, mostly unconscious, which we all use all the time. In general there are three situations or types of problem to which they seem to be particularly suited. These are:

1. where the problem is 'fuzzy' or not easily definable,
2. where the problem is complex and not easily decomposable,
3. where the problem is large, but yet not neatly limitable.

Simon¹¹ introduced the term *satisficing* in 1957. His concept was that in difficult situations one may strive to obtain an outcome that is 'good enough.' It is essentially a corner-cutting process that we opt for when time is running out. Rational theories of decision-making propose that one chooses the best option available from all the alternatives on offer. Simon argued that people are more likely to *satisfice*, that is to achieve a good enough result, even though it is not necessarily the best. They effectively choose the first alternative that meets their minimum criteria, thereby reducing the minimum time and mental energy required. One can see how a swift remedy selection in homeopathy could arise from a *satisficing* heuristic.

Judgement heuristics

Following Simon's work, Kahneman and Tversky¹² in the 1970s introduced their '*heuristics and bias*' approach. Their work highlighted the reflexive mental processes that are used to make complex decisions manageable. The basic concept that they introduced was that judgement in an uncertain setting is often based on a limited number of heuristics, rather than formal logical processes.

They identified three general judgement heuristics:

- (1) *The representativeness heuristic*: This involves judging the likelihood of an event, based on similarity between that event and existing knowledge about past similar situations. Essentially, judgements influenced by what is typical in a situation.
- (2) *The availability heuristic*: This refers to the way in which probability or frequency judgements are influenced by the ease with which past examples are recalled. Essentially, judgements based on what comes easily to mind.
- (3) *The anchoring and adjustment heuristic*: This refers to the tendency to make a judgement that is biased towards a certain value (anchoring) and then to adjust up or down to arrive at the ultimate result. Essentially, judgements relying on what comes first. Wiliam¹³ illustrates this by considering the mathematical manipulation of numbers, as, for example, in

the television quiz programme Countdown. Contestants are given a set of numbers, and in limited time are required to use addition, subtraction, multiplication and division, with these numbers alone, using every one only once, to arrive at a random target number. For example, they may be given the sequence 20, 11, 1, 5 and 3, with a target number of 105. With limited time, people tend to operate heuristically, producing an estimate by multiplying 20 and 5 to get 100, and then work back and forth at the same time. The number 100 almost 'jumps out' as the first step. The thought process has 'anchored' on the number 100, then adjusted up and down.

Other heuristics

There are a host of other heuristics which operate in decision making, all of which may relate to homeopathic decision making.

Affect heuristic: Thought is never emotionless. We are all subject to how we feel, even at times when we try to distract ourselves, to immerse ourselves in some subject or process. The effect of the emotion is to produce the affect heuristic, by which we unconsciously tag factors as being good or bad. In medicine empathy is important. Our feelings for an individual may have an effect upon how we wish to help him or her. Our subjective impressions about patients are amenable to this heuristic, with the resultant possibility of bias.

Elimination heuristic: Faced with choice of a number of possibilities, one tends to categorise them, then produce a factor that can be applied to eliminate a number of them.

Recognition heuristic: This is a very simple heuristic that produces a fast answer or result. It is simply the 'one good reason.' heuristic. The obvious weakness is that it supersedes and disregards all other factors.

Dual processing

In addition to heuristics much research has been done on dual processing in human judgement. This postulates that some judgements are made according to mental processing akin to 'intuition,' but others by processes similar to 'reason.' This two-tier system is thought to operate all the time. It is not a new concept, Aristotle considered it, as did William James in 1890 and Jean Piaget in 1926, among many others.

In cognitive psychology there has been great debate over the last decade or so about whether people can be best considered as parallel processors of information, utilising diffuse associative links, or as linear analysts, working from logical step to logical step. The dual processing model seems to satisfy both arguments, and indeed, it seems likely that this is how the mind works. There does seem to be a difference in the two types of thought. Reasoned, 'clinical' thought does not seem to have the same quality as the intuitive idea that

suddenly erupts, like a flash of inspiration, or the solution to a problem that one wakes up with after having slept on it. If intuitive thought is associative, that is, arising from a network of associative mental links, then one can see it as perhaps operating heuristically. Rational thought, by contrast seems to be more like the linear-processing algorithmic mode of the computer. And there is no reason why the two types of thought should not take place simultaneously. Indeed, it may well be the way the mind has evolved.

When one has accumulated experience, a 'sixth sense' often develops. One hears of policemen developing a 'nose for sniffing out villainy,' and of doctors having a 'sixth sense' for picking up serious or rare complaints. Heuristics may offer part of the explanation as to how this occurs.

Heuristics and bias

Kahneman and Tversky were aware that heuristics could be both very accurate but also subject to bias, possibly resulting in faulty or less than satisfactory decisions. Let us consider some of the heuristics mentioned above and see how bias can creep in.

The representativeness heuristic: There is a tendency to judge things positively if they represent the expected features of an event. This can be biased according to the 'conjunction fallacy', which is the belief that the conjunction of two events is more likely than one of the events alone. For example, we know that a man over 50 with a raised cholesterol is more likely to have a heart attack than a man over 50 with normal cholesterol. This is a conjunction which is correct. On the other hand a man over 50 with a raised bilirubin level may be perceived to have a greater chance of having a heart attack than a similar aged man with a normal bilirubin. There is no evidence that such a link exists, yet the conjunction fallacy may sway us unless we know a lot about the subject.

In medicine we are taught that common things occur commonly, so there is a tendency for bias towards the commonest. Thus, because certain remedies occur commonly in the repertory we are biased towards them. The fledgling homeopath might consider, all men are *Sulphur* and all women are *Pulsatilla*. On the other hand, because we know that not all men are *Sulphur*, we may bias our selection against it, when at times it undoubtedly will be an appropriate remedy.

The availability heuristic is based upon what comes to mind. The greater one's experience, the more cases one will have seen. There may be greater availability, so there may be greater chance of selecting the wrong item. And there may be a tendency to remember a single dramatic case, which is an obvious bias.

The anchoring and adjustment heuristic can be very accurate, but the following example illustrate that it

can be very inaccurate. Consider two series of numbers:

A: $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8$

OR

B: $8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$

After seeing each of these numbers for a few seconds, people shown series A tend to underestimate the product at around 512. People shown series B tend to estimate to around 2,250. The right answer in fact is 40,320. This comes about because people tend to anchor on the first few numbers then adjust upwards for the next numbers. People who see series A have a smaller anchor, so their psychological start point is smaller than those who see series B. In addition, as in this case, we often do not adjust enough from the anchor to achieve accuracy.

In a homeopathy we may anchor on a family of remedies then adjust through it. For example, using the periodic table, one could anchor on *Nat mur*, then adjust through the Natrum salts, or through the muriaticums. Similarly, one can anchor on a particular remedy then consider its complementary remedies. The bias that could ensue is clear. The crucial point of course is to anchor in an appropriate remedy in the first place.

The affect heuristic is also open to bias, because we may have a positive feeling for someone, for a particular approach, a particular family of remedies, or even for particular remedies perhaps associated with past successful use of it.

The elimination heuristic is a tendency to focus on one aspect or attribute of the alternatives, and eliminate those alternatives that do not meet a particular criterion for that attribute. The process may be repeated until only one alternative is left. In homeopathy, the point at which elimination is used may be critical. If you eliminate too soon, you may well eliminate highly significant remedies prematurely. For example, eliminating on the strength of a modality.

The recognition heuristic is the widely recognised 'bull's eye' phenomenon, the instantaneous feeling that indicates the 'right answer.' It is common in homeopathy, particularly after one has learned a new approach, studied a new family of remedies or just found out about a new remedy. It is valuable, but open to bias, because we may be too prone to allow the case to fit, or too eager to select rubrics that will permit our use of the approach, family or remedy.

Heuristics and bias in homeopathy

Homeopathy is a complex therapeutic system, practised in different ways by different groups. It is used for self-help treatment by people buying remedies over the counter from chemists and health shops and by various groups of homeopaths.

Self-care homeopathy has become very prominent on the high streets. Most health shops and many

pharmacies offer homeopathic remedies, together with simple advice when requested. In the UK, the choice of remedies is generally restricted to the polychrests and choice of potency is restricted to the 6c and the 30c. The following general empirical rules are known by many self-help users of homeopathy: Bruises need *Arnica*, sore throats need *Belladonna*, *Lachesis* or *Merc sol*. These little empirical rules contain some information, but the information is biased, in that it only gives a limited number of choices.

The recognition heuristic is the cognitive heuristic that is likely to be most widely operated in the self-help situation. It is fairly straightforward, and simple key words trigger off a response. If you consider the following example, from my self-help book,¹⁴ you will see how it illustrates the simple recognition heuristic.

Nose-picking

Arum triphyllum—when there is much crusting of the nose. The individual picks at the crusts until bleeding occurs.

Cina—for itching and picking of the nose in irritable, never satisfied types. May also grind teeth while asleep.

Natrum carbonicum—when there is a feeling of release from tension after 'boring' into the nose.

Sulphur—for nose-picking in dominant, lazy types who always fidget.

The satisficing heuristic is also used: The information that best applies, no more than that, will reveal the best remedy. And of course, the elimination heuristic has already been applied by the author thereby biasing the selection, see Figure 1.

The Homeopathic consultation

During a homeopathic consultation the case will be taken. In aphorism § 6 of the Organon, Hahnemann

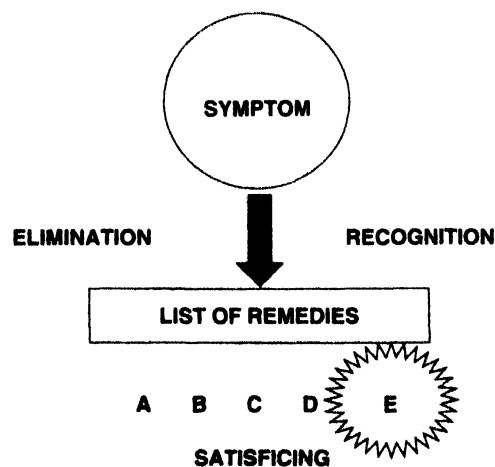


Figure 1 Self-prescribing utilises recognition heuristic and satisficing, elimination having already been done for the self-user.

stresses that the physician must be an unprejudiced observer. In aphorisms § 84–104 he discusses how to take a case. He builds on the unprejudiced observer concept, essentially saying that the physician should record the patient's account, without interruption, asking only open questions, avoiding leading questions, and by observing the patient as he or she is giving in their history.

Taking a case is like gathering all the information, and letting it fall through a large sieve. The simillimum should then be what remains at the end of the sieving process. It is doubtful that this ever happens; in reality it is almost impossible to take a history like this. A physician needs to elicit information. That means that a method of questioning is used in order to obtain useful information as opposed to information that will not take you any further forward.

When questions are asked, they do not come in a haphazard manner. The homeopath usually works to a framework of questioning, aiming to elicit information about the main problem, the past history, the emotions, mental symptoms, physical systems, likes and dislikes, modalities and so on. But try as one may, the process will inevitably be prejudiced. Case-taking is an active mental process not an inactive one. Questions follow on from another as a train of thought is carried through. Something of significance will be recognised by the homeopath (*recognition heuristic*), the unfolding picture will strike a chord (*representativeness heuristic*), or remedies will spring to mind as past cases are unconsciously recalled (*availability heuristic*), and some questions will be like Knight's moves, in that the questioning will move to another area, and then that track will be followed for a while (*anchoring and adjusting heuristic*), before reverting to the original plan. Many homeopaths annotate their cases notes, as possible remedies present themselves. Further question selection may then revolve around confirming or refuting particular remedies (*elimination heuristic*).

We are often far from unprejudiced observers. We all tag things, people, attitudes, etc as positive or negative. The affect heuristic is a normal part of mental life and the homeopath is as likely as anyone to be operating the affect heuristic during the consultation as he assesses the individual as 'nice, sweet, kindly,' or perhaps as 'haughty, arrogant, selfish'. The homeopath feels that the/she has a perfect right to make these judgements, since they are seeking to help the individual with a remedy. Yet these are not objective assessments, but subjective ones involving affect.

Homeopathy in General Practice

General practice is an ideal setting for homeopathy. More and more patients are seeking a homeopathic response and solution to their problems. But General Practice consultations are short, varying in length from five minutes to fifteen minutes, so time is an important

constraint. In order to operate effectively within this constraint general practitioners develop strategies, empirical rules and sequential appointments to monitor progress and treatment. One can divide general practice homeopathy into acute and chronic, in both of which cognitive heuristics are used.

Acute prescribing

In the acute case in general practice, one inevitably uses the recognition, availability and representativeness heuristics. In addition, the satisficing heuristic is frequently used, to discriminate between a number of close remedies. Prescribing in this situation is most likely to mean prescribing for a specific condition or specific symptom or symptom cluster, so the range of homeopathic methodologies is quite small. In my experience the following are the most usual:

Specifics: This is recognition heuristic, resulting in a so-called specific remedy for a condition. Hence: *Arnica* for most bruises, *Hypericum* for trapped fingers, *Melilotus* for nosebleeds, *Mag pol australis* for ingrowing toenail (IGTN) (Figure 2)

Therapeutic prescribing: This is similar to the use of self-help books. There are books written with the practitioner in mind, listing conditions and giving remedies with their characteristic features appertaining to the condition.^{14 16} Of course, the shorter the list, the more biased the remedy selection, with the risk of missing the best remedy. This can be improved by checking two or three rubrics in a repertory, so-called spot-check repertorising. One then uses the rubric as an anchor and adjusts among the remedies within it, using the anchoring and adjustment heuristics (Figure 3). In addition, the general practitioner will eventually see all sorts of cases, and will build up a memory bank of cases. The representativeness heuristic then comes into play, in that similar cases may bring the memory to the surface, bringing with it a remedy.

Keystone prescribing: This is a heuristic-based method of prescribing well suited to general practice acute homeopathy. It is the use of a few well-recognised characteristics features of remedies. The very nature of some of the keystones act as eliminating symptoms in themselves (see Figure 4). A feature may be highly

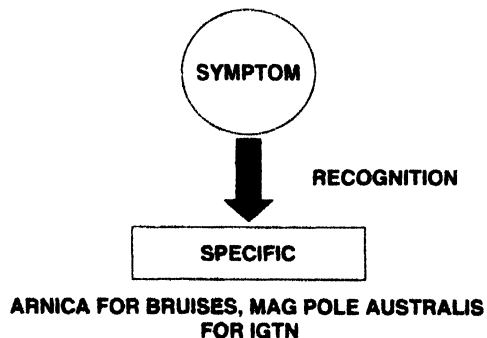


Figure 2 Specific prescribing depends solely upon the recognition heuristic.

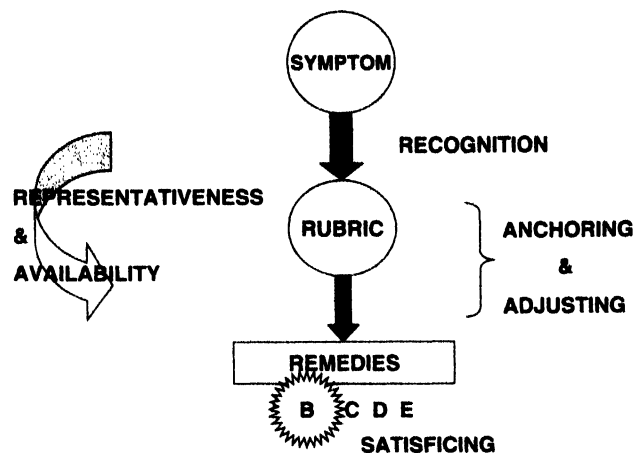


Figure 3 Therapeutic prescribing involves recognition, representativeness and availability, anchoring and adjusting and satisficing heuristics.

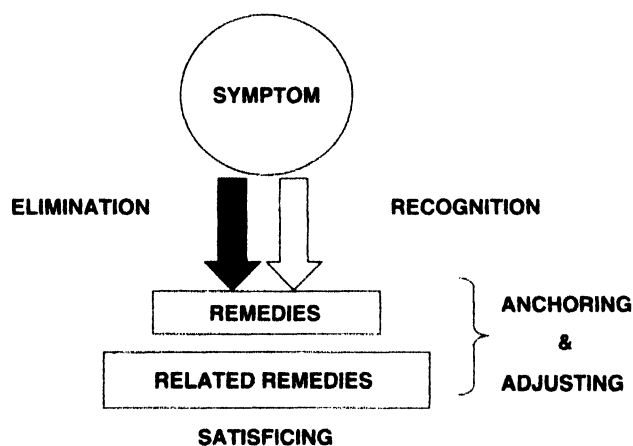


Figure 4 Keystone prescribing involves, elimination, recognition, anchoring and adjusting and satisficing heuristics.

characteristic in the acute situation. For example, *Lac can* and alternating sides (eg sore throat), *Bryonia* when motion aggravates (in arthritis).

Actiological prescribing: Here the prescription is based on an obvious past trauma, illness or feature that stands out. Yet another example of the *recognition heuristic*. For example: The trauma remedies— *Arnica*, *Aconite* and *Hypericum*, or the Never Well Since (NWS) nosodes—eg Glandular Fever, Streptococcin, Influenzinum.

Constitutional prescribing: For some homeopaths the constitutional remedy is a sort of Holy Grail. Indeed, some practitioners believe that when one knows someone's constitutional remedy, it can be given in virtually any situation with good effect. This is a naïve concept in my view, since the current picture always has to be taken into account. Having said that, general practice is an excellent milieu in which to observe the patient over weeks, months, years even, in order to work out constitutions. Indeed, as an ongoing process it has much to recommend it. And at times, the judicious use of the constitutional remedy may have a

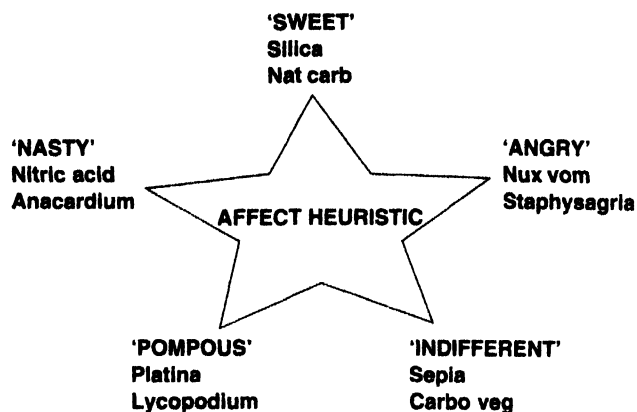


Figure 5 The affect heuristic 'tags' characteristics in a 'good or bad' sense. This is used with the recognition heuristic in assessing and arriving at a constitutional picture.

dramatic effect in acute situations. The recognition heuristic is again used, as is the affect heuristic. Figure 5 illustrates how we often tag features in a judgemental manner; hence we talk about 'nasty *Nit acid*,' 'haughty *Platina*', etc.

Chronic Prescribing

This is the use of homeopathy in long standing cases. There is a distinction to be made between two types of chronic prescribing. Firstly, there is the type of case that involves seeing a patient regularly, hence case-taking may be an ongoing process over a long period of time. Secondly, there is the patient that sits down with for a long formal homeopathic consultation.

In an ongoing chronic homeopathic case the picture slowly unfolds. The GP has a great advantage in getting to know about many facets of the patient's life. Usually, this type of case is dealt with in repeated consultations. As mentioned earlier, this almost inevitably necessitates the use of empirical rules or heuristics. For example:

Miasmatic prescribing is a contentious issue, now as it was when Hahnemann first developed it. It can, however, be invaluable in managing an ongoing chronic homeopathic case. Indeed, because the general practitioner has access to the life-time case notes of the patient, he has the opportunity to see if there are any trends within the case history which may indicate any particular miasm. As a heuristic model it may help the busy practitioner to select an appropriate remedy, see Figure 6.

When the homeopathic practitioner sits down with the patient for a long consultation it is usually the first meeting, so a lot of ground has to be covered. At the end of the consultation, or perhaps even during it, depending upon the complexity of the case and the pattern of practice of the practitioner, a particular methodology will be selected. This may allow the practitioner to prescribe immediately, or arrange for a

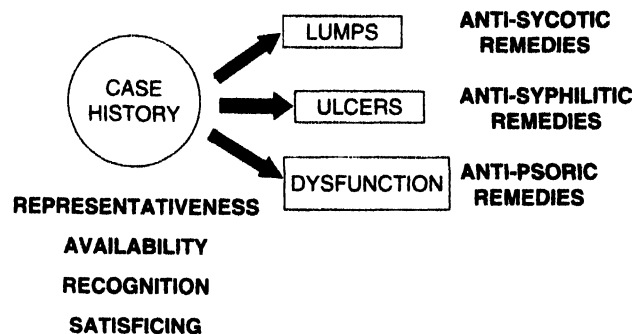


Figure 6 The miasm spotting model, utilises representativeness, availability, recognition and satisficing heuristics.

prescription to be dispensed after some background work.

What is to be treated?

Assuming that the homeopath has taken a full and good (unprejudiced) history and performed the appropriate examinations the question is then to decide on the focus of treatment. I have elsewhere touched upon the various homeopathic methodologies. Some homeopaths will almost always follow one particular approach, possibly because they have developed it heuristically, and feel that it works for them. Others will have an eclectic approach and opt for a particular approach once they have taken the history and decided on the main focus of the case. Still others practice according to a particular school or method.

Swayne⁸ has produced two fine heuristic models which are useful in helping the practitioner select the right focus and the appropriate strategic option for a case. By focus he describes the way that we may portray the patient in three depths: close-up, wide angle or long distance. By strategic option he identifies three types of prescription: those based on the presenting *problem*, those based on the whole *person* and those based on the wider *context* of the current clinical picture.

Repertorisation

The repertory is one of the most sophisticated tools available to the homeopath. Some homeopaths even claim that effective homeopathic prescribing can only be done by using a computerised repertory. But there are problems with repertorisation. For one thing, if too much dependence is laid upon it, one can start to believe that as long as you put enough information about the case into the program, you will receive an objective breakdown of the likeliest remedies. One can get multi-coloured graphs of families of remedies, analysis of small remedies, polychrests, nosodes, and so forth. All of this can bias remedy selection in different directions. For example, bias is in a way programmed into some of the 'expert' systems or into the 'default' analysis, because they are built upon an

individual's bias. The technology is impressive, yet it has to be remembered that computerised programs are just tools. The skill is in selecting the correct rubrics in the first place. And this very act can engender bias itself, since one has to formulate symptoms in rubric format. That is, you have to translate symptoms into rubric language in order to find the information.

More than selecting the right rubrics, of course, the homoeopath has to extract the best information about the individual's experience of their illness and even try to gain a sense of what it is like to be the person. It can be a mistake to form an opinion too early as to what kind of a remedy a patient will need. By doing so, by relying too heavily upon the recognition, representativeness and availability heuristics one can effectively narrow the questioning in order to steer the information towards that remedy.

Conclusion

Whether we like it or not, we all use heuristics to make sense of complex systems. Homeopathic Medicine is a highly complex system, and like all biological sciences, it is not exact. The use of empirical rules is almost inevitable. The cognitive heuristics that have been delineated by Behavioural Decision Research can be seen to be operating, for example, during the taking of a case history, and when we select particular homoeopathic methodologies. They can also be seen to operate when we anchor in a family of remedies and adjust, or satisfice to finally choose the remedy that is to be given to the patient.

In the *Organon*, Samuel Hahnemann gave us a method to start using in homeopathy. It seems that he believed this method to be a matter of pure logic, a method algorithmically-based, which would, if assiduously followed, lead inevitably to the simillimum. That premise has to be questioned today. It is almost impossible to be a truly unprejudiced observer. Homeopaths think both algorithmically and heuristi-

cally, and also often intuitively. In recognising all this and working with it, the practitioner may be able to reduce bias in the selection of the best treatment for the patient.

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