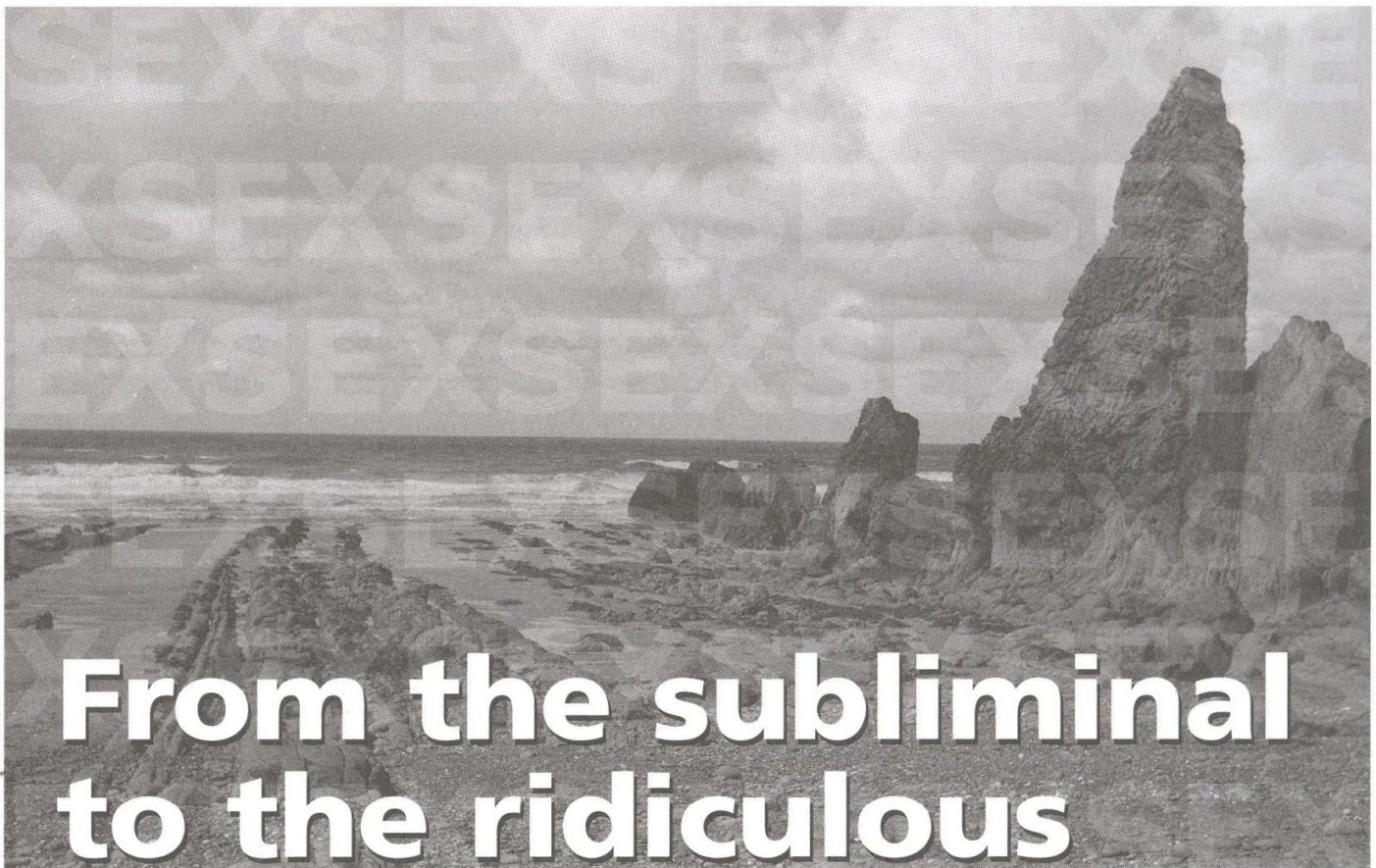


Virtually all experimental psychologists now accept that our behaviour can be affected by stimuli of which we have no conscious awareness. Such effects are typically not very dramatic even though they are reasonably reliable. However, such results do not on the surface appear to offer much support to claims of profound and lasting behavioural changes brought about by subliminal advertising or subliminal self-help tapes.



From the subliminal to the ridiculous

IS THE BEST WAY TO READ CHRIS FRENCH'S ARTICLE BACKWARDS?

The processing of sensory information is one of the central topics of psychology. We will not fully understand the processes involved in the causal chain that begins with energy impinging upon sensory receptors and ends with high-level conscious perception until we have a better conceptual grasp on the nature of consciousness itself.

This is a topic which clearly provides work for philosophers as well as psychologists and I think we can be justly proud of advances in our understanding achieved by both disciplines

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while recognising that there is still a long way to go.

The subject of this article, however, is not conscious processing of sensory information. Instead, it deals with the intriguing issue of the ways in which sensory information we are not consciously aware of can (and cannot) influence our behaviour. I want to present an overview of what is known about subliminal processing and explode some of the myths that surround the topic. In order to properly address the philosophical issues raised by subliminal processing, it is essential to separate claims that are based on a good empirical foundation and those that are pure mythology.

The word *subliminal* literally means *below threshold*, therefore a stimulus is subliminal if the energy level of the stimulus is below that which is required to detect the presence of the stimulus. Many cognitive psychologists make a distinction between the *subjective* threshold and the *objective* threshold. The subjective threshold refers to that threshold below which a person reports that he or she does not consciously perceive a stimulus. However, it can be shown that if such a person is then required to guess whether or not the stimulus is present with presentations at lower energy levels than this, they will be right more than would be predicted by chance. Once the energy level is reduced to that level where even forced choice guessing is at chance level, this is referred to as the *objective* threshold. There is no doubt at all that stimuli presented below the subjective threshold but above the objective threshold can often affect behaviour in measurable ways. Many psychologists believe that stimuli presented at or below the objective threshold

can also produce similar effects although others contest this.

Subliminal presentation of stimuli can be achieved in a number of ways. For example, auditory stimuli may be presented with a very low signal-to-noise ratio and visual stimuli may be presented very briefly or very faintly, often followed by a pattern mask (such as a jumble of random shapes) or an energy mask (a flash) which effectively curtails further processing. In addition to these techniques, which can properly be labelled as *subliminal*, there are other techniques of stimulus presentation which are also sometimes referred to in this way but with considerably less justification. For example, techniques which involve the presentation of unattended stimuli (for example, words presented to the left ear while the participant is repeating back the message presented to the right ear) are not using true subliminal presentations insofar as the unattended stimuli would be clearly perceived if the person chose to pay attention to them. Even less deserving of the label are those techniques which transform stimuli in various ways (for instance, blurring of pictures, filtering of auditory stimuli) in order to make them less recognisable.

There are numerous examples of well established subliminal perception effects. For instance, lexical decision tasks require participants to judge, as quickly as possible, whether or not a presented letter string is a word. If the target letter string is a word and it is preceded by another word (referred to as a *prime*), the speed of response is affected by the degree of semantic relatedness between the two words. Thus, for example, if the target word

“bread” is preceded by the prime “butter”, participants will recognise it as a word more rapidly than if it is preceded by “doctor”. Interestingly, however, similar semantic priming effects are reported even when the prime is presented subliminally, resulting in reaction times that are reliably a fraction of a second faster in the related condition compared to the unrelated condition.

Another example of a reliable subliminal effect is known as the *mere exposure* effect. When asked to choose between pairs of similar stimuli in terms of which ones we prefer, we tend to choose those that we have already encountered. Studies such as those conducted by Kunst-Wilson and Zajonc have shown that such preferences for familiar over novel stimuli are found even if the original exposure of the stimuli is below the threshold of awareness (for example, one millisecond exposure of nonsense shapes). In such experiments, the preference bias shows through even though participants are unable to discriminate between the novel and familiar stimuli in a forced-choice paradigm asking them to indicate which stimuli have already been presented.

Many other examples of well controlled techniques that reliably demonstrate subliminal processing effects could be cited, but two main conclusions should be drawn at this point. First, virtually all experimental psychologists now accept that our behaviour can be affected by stimuli of which we have no conscious awareness. Second, such effects are typically not very dramatic even though they are reasonably reliable. For example, subliminal priming effects result in changes in reaction times of a fraction of a second and the mere exposure effect

produces small but statistically significant differences in preference ratings between novel and familiar stimuli.

However, such results do not on the surface appear to offer much support to claims of profound and lasting behavioural changes brought about by subliminal advertising or subliminal self-help tapes. The current techniques used by experimental psychologists to study subliminal processing are the result of decades of methodological refinement and the conclusions drawn from studies using such techniques are based upon a sound empirical footing. Unfortunately, the same cannot be said of many other claims presented under the banner of “subliminal influence”.

Consider subliminal advertising. Almost everyone has heard of the classic study carried out in the 1950s by James Vicary, an advertising expert, in which he subliminally flashed up the messages “Eat Popcorn” and “Drink Coke” every five seconds during the showing of a film using exposure durations of one third of a millisecond. The study lasted six weeks, involved thousands of participants and produced very clear results: sales of Coke and popcorn increased by 18% and 58%, respectively. People were understandably concerned (and angry) regarding this sinister mind control technique. If it could be used to persuade people to buy snacks and soft drinks, what else might it be used for? As a result of public concern, the use of such techniques in advertising is prohibited in many countries around the world to this day.

There is only one slight problem with accepting the results of the notorious Vicary study: it never actually took place. Vicary made it up as a publicity stunt to generate interest in his



struggling advertising agency. Furthermore, subsequent attempts to test the idea that subliminal advertising can dramatically affect consumers' behaviour have failed to support the idea. It is probably sensible to adopt the precautionary principle with respect to bans on the use of subliminal techniques of this kind in advertising but there is little evidence to suggest that they are actually effective.

Although the Vicary study, had he ever actually carried it out, would have involved truly subliminal presentation of stimuli, the phrase "subliminal advertising" is often used to refer to other techniques allegedly used by devious advertisers to get us to buy their products. Among the more ridiculous of such claims are those of Wilson Bryan Key. Starting from the widely shared assumption that "sex sells," Key claimed in a series of best-selling books that advertisers were cleverly embedding words and images into superficially innocent products and advertisements in order to arouse the viewer and seduce them into parting with their money. Key could find sex anywhere! For example, he found the word "sex" on everything from Ritz crackers to a picture of ice cubes in a gin ad. Needless to say, there is no evidence to suggest that such techniques, even if they were ever used, would actually be effective. It should also be noted that such stimuli would not be subliminal in the true sense of the word at all.

The subliminal self-help industry also appears to be thriving, despite a complete lack of any scientific evidence to support its claims. The idea is that by listening to tapes or CDs which contain subliminal messages of various kinds one can be cured of a wide range of problems, ranging from smoking through low self-esteem

to inadequate sexual or athletic performance. When the tapes are played, the listener will usually hear nothing but music, but it is claimed that the faint and inaudible messages are processed by the unconscious and have a powerful effect upon behaviour. This notion that subliminal messages produce a more powerful effect because they bypass the conscious mind and tap directly into the unconscious mind is a common theme and, as you have probably guessed by now, totally without foundation.

Numerous studies have now shown quite conclusively that this technique simply does not work. A typical study is that carried out by Pratkanis, Eskenazi, and Greenwald in 1994. Participants completed measures of memory and self-esteem and were then randomly assigned to subliminal self-help conditions alleged to bring about improvements in either memory or self-esteem. After following the programmes for five weeks, memory and self-esteem were reassessed and no changes were found. In other words, the programmes did not work. However, participants themselves reported that they believed they had improved in the way the programmes had promised. Perhaps the most interesting design feature of this study is the fact that half the participants in each group were deliberately given tapes which had been wrongly labelled, i.e., some participants thought they had the memory tape but actually had the self-esteem tape and *vice versa*. The subjective reports of improvement corresponded to the participants' *beliefs* regarding which tape that had been given, not the true nature of the tape.

Christian fundamentalists have also claimed that rock music contains "subliminal" messages

designed to encourage listeners to adopt a more satanic lifestyle than they would otherwise have done. These messages can only be heard by the conscious mind when the record is played backward, but it is claimed that the unconscious mind picks up on the messages even when the record is played normally, and is powerfully influenced by them. At the risk of sounding a bit like a cracked record myself, such claims are completely without foundation. There are, however, various web sites where you can hear such clips for yourself and they provide an excellent opportunity to experience the power of “top-down processing”. This is a phrase used to describe the way that your memory and perception can be influenced by your own knowledge, belief and expectations about the world, especially when the stimuli you are processing are degraded or ambiguous. To listen to my own personal favourite, type “Stairway to Heaven Backwards” into a search engine and go to one of the many sites that will allow you to play this clip. It is very important that you listen to it the first time without knowing what it is that you are supposed to hear. Then try it again when you have read the “hidden” message. You will be amazed at how different it sounds the second time, thanks to the influence of top-down processing.

One of the best known advocates of subliminal techniques today is Derren Brown, a gifted and entertaining performer. But is he really achieving all of those amazing effects by the application of psychological science as he often claims? The discussion so far ought to have you at least wondering about his oft-repeated claims that by the use of subtle “subliminal” cues, he can predict with absolute certainty the

final outcome of some chain of apparently freely taken decisions. I would love to know where this “psychological science” has actually been published, because it certainly does not come up in any of the literature searches that I carry out. As I have said before, if he is really achieving these effects in the way he says he is, he has single-handedly made more progress in research in this area than the collective efforts of the entire community of psychological researchers over many decades. Personally, I find it more plausible that he is being a little bit “economical with the truth” in the explanations he presents. You can make up your own mind.

Try listening to “Stairway to Heaven” backwards

Well controlled studies of subliminal processing have established that our behaviour can be influenced in subtle ways by stimuli of which we are completely unaware. Pseudoscientists often refer to this literature as if it provided support for their own outlandish claims of dramatic and lasting behavioural change brought about by subliminal advertising and self-help tapes. Christian fundamentalists echo the claim that the unconscious mind can pick up on information that bypasses the conscious mind and has a more powerful effect as a result. In all of these cases, the claims are based upon nothing more than wishful thinking, confirmation bias, and sloppy reasoning. As for Derren Brown, he’s just a tricky little blighter – but at least he’s entertaining.