

THE SUBLIMINAL AND THE EXTRASENSORY

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From the earliest days of parapsychology it has generally been acknowledged that, whatever part of us is responsible for mediating extrasensory information, it is not the part that we associate with our conscious or rational intellect. The concept of the unconscious became a commonplace of nineteenth-century thought long before it reached fruition in the work of Freud and, as can be seen from the writings of Frederic Myers or of William James, the phenomena of the séance-room played a part in its development second only to those of the clinic. Indeed both depth psychology and parapsychology can trace a common ancestor in the mesmerist movement of the early nineteenth century. But, although parapsychologists have never ceased to borrow freely from the treasure house of psychoanalytic ideas, these ideas for the most part were lacking the rigorous experimental basis that was necessary if they were to be integrated into an experimental parapsychology. There was, however, one concept of a psychodynamic nature that right from the start was firmly grounded in laboratory experiments rather than in clinical observations. Such was the concept of subliminal perception. In this paper I want to consider what implications, if any, the findings on subliminal perception may have for the study of extrasensory perception. Is there, in short, a useful parallel to be drawn between SP (Subliminal Perception) and ESP (if you will allow me this play on words or on letters)?

My interest in this question arose from reading a recent book by Dr. Norman Dixon of University College, London, entitled *Subliminal Perception*¹ which I had been asked to review. Dixon, I should say, is the foremost authority on this topic in my country and his extensive researches have done as much as anything to establish, on a secure scientific footing, a concept that not long ago was still being treated with suspicion, if not derision. It is noteworthy that Dixon subtitles his book "The Nature of a Controversy." As I read the book I was struck repeatedly by the fact that what he had to say about SP seemed to apply equally to ESP, and the analogy seemed the more telling in-

asmuch as Dixon nowhere makes it explicit. In fact, though I gather that he is open-minded on the question, he has no special interest in and no definite views about paranormal phenomena. To make my intentions quite clear from the beginning, however, let me declare straight away how far I propose to press my analogy and what I take to be its necessary limits.

Obviously, no amount of knowledge that we may acquire about the working of SP will account for the existence of ESP. There is, after all, an absolute difference between a stimulus of very low intensity and a target that, being isolated from all sensory contact with the subject, is, in effect, a stimulus of zero intensity. Thus, whereas Dixon devotes a considerable portion of the book to arguing that there is nothing in the physiology of the brain or nervous system that should preclude the existence of SP, this, of course, is just what we cannot argue with respect to ESP. For, whether or not one believes that ESP may eventually be assimilated within the framework of an expanded physics and physiology, the obdurate fact that we have to face is that, as of now, the problem of how a subject might acquire information about an extrasensory target remains a total and absolute mystery.

Hence my analogy can begin only at the point at which we may suppose that, somehow or other, the target has been apprehended. But, from that point on, what happens to the information, how it is decoded and processed, how the transition is effected from unconscious to conscious awareness, to questions of this order, Dixon's evidence and interpretations are, I maintain, relevant and illuminating. Following Dixon I am going to assume that we all possess two distinct cognitive systems, each mediated by its own set of brain mechanisms. There is, on the one hand, a primary system whose main function is to subserve selective attention and logical thought. This always involves consciousness, a relatively high state of arousal and the mediation of the ascending reticular activating system of the brain. There is, on the other hand, a secondary system that may operate in the absence of consciousness, is associated with a relatively low state of arousal and is mediated by limbic and mid-brain mechanisms. The function of this secondary system is less easy to define but it appears to be a kind of cognitive safety valve that allows us access to a wide range of information that would otherwise be entirely excluded by the inhibitory mechanisms of the primary system. It is, we may suppose, involved in dreaming, in free-association and spontaneous imagery, in intuitive thinking and, no doubt, in those "games of the underground" that Koestler has described for us so graphically in connection with the bisociative leaps of his creative thinkers.² It is to this secondary sys-

tem that Dixon ascribes our capacity for subliminal perception and it is my thesis that it is this system that is involved in the psi process.

In the classical or Cartesian tradition of European philosophy "mind" and "consciousness" are interchangeable concepts so that events or processes that are not conscious cannot be mental and must therefore be physical. According to a very different philosophical tradition, however, of which Bergson may here be taken as representative,³ our conscious self is nothing more than the residue that remains when awareness has been filtered of everything except that which pertains to the individual's biological needs. Mind itself is conceived of as being potentially omniscient and all-embracing but this universality is sacrificed, according to Bergson, in the ego-centered struggle for survival. Now, just as Dixon regards SP as a compromise between the restrictive demands of selective attention and the need for the organism to monitor a much wider range of stimuli, so I am going to suggest ESP may be regarded as a compromise between the exclusiveness of the Bergsonian filter and this cosmic capacity of mind to transcend the limits of the senses. Both phenomena, however, seem to be of marginal importance in everyday life relative to normal perception.

So much for the general viewpoint from which I am approaching this question. Now let us take a look at some of the facts and findings that research on subliminal perception has uncovered. First we should note that SP is a special case of the more general phenomenon of discrimination without awareness. No one can deny that we constantly make all kinds of adaptive discriminations without being aware of what we are doing. Indeed, the more skilled we are at any given activity the less we need to be aware of the details of our performance. What is peculiar about SP is that in this case the cues are so feeble physically that they could never reach the threshold for conscious recognition however hard we might try attending to them. Now it is one of the key points of Dixon's argument that SP is not just a dilute form of ordinary perception. Provided (a) the stimulus is well and truly below recognition threshold and (b) that it still retains any efficacy at all, then it will be dealt with by the subject in quite a different way from one that is strong enough to elicit a conscious sensation.

This is best illustrated when the stimulus in question is a familiar word.

Suppose your subject is shown a word and asked to report, as best he can, what he sees. Then, provided the word is visible at all, however faintly or however briefly, the subject's response is likely to bear at least some structural resemblance to the actual word. But if that word

is exposed at such a low intensity or for such a minute duration that it is in effect *invisible*, so that the subject can do no more than guess at it, as if it were an ESP target, then the evidence suggests that the response is unlikely to have any structural resemblance to the stimulus word but may very well have a semantic relationship. Sometimes the semantic processing involved, which, of course, all takes place at a purely unconscious level, seems to involve a rather elaborate symbolic transformation. This is particularly so if the word has some emotional or sexual significance for the subject. Dixon himself gives several examples of such responses that show a distinctly Freudian character. This qualitative shift in the response, which occurs when the intensity of the stimulus falls well below recognition threshold, is explained by supposing that it is then that our secondary system takes over from the primary system. Dixon further points out that subliminal perception is more likely to occur when the subject is in a relaxed or passive state, as when he is made to recline on a couch; in other words he functions best in a low state of arousal.

A special kind of subliminal perception that has long intrigued investigators is the so-called "Pötzl Phenomenon," after the Austrian neurologist, Otto Pötzl, who first drew attention to it in 1917.⁴ Briefly, what he found was that if his subjects were shown a picture in a tachistoscope for about a 10m.s. duration, so that it was impossible for them to discern more than the most fragmentary features of the picture, much of the remaining content could still be recovered, even if in a somewhat disguised or symbolic form, if the subject was later asked to recall his dreams of the subsequent night. Although, needless to say, the validity of this phenomenon has been strongly challenged, there have also been some good confirmations of it from recent experiments using very carefully controlled experimental designs.⁵ However, recent work has also shown that the effect is not limited to dreams. It appears to be sufficient if, after being presented with the picture in the tachistoscope, the subject is merely asked to relax and describe any spontaneous images that may then emerge into consciousness. It surely requires no special pleading to find a parallel here with the Maimonides situation.⁶ The Maimonides experiments exploit the same oblique approach in demonstrating an ESP effect in the way the picture target influences the dream imagery of the sleeping subject. Moreover, in this case, too, hypnotic dreams and waking imagery can be used as well as nocturnal dreams.⁷ In general wherever free-response techniques have been used to test for ESP, as for example in token-object reading, the symbolic distortions noted by Dixon when testing for SP are liable to occur.

One of the main points of departure for the modern study of SP was a series of observations arising out of the work of a group of experimental psychologists in the late 1940s who came to be known as the "New Look School of Perception." Leo Postman and Jerome Bruner, two of its leading exponents, claimed that, in general, recognition thresholds for emotive words differed from those for neutral words. If the threshold was raised, i.e., recognition took longer, as might be expected when the word had unpleasant, alarming or distressing connotations for the subject, then one had a case of "perceptual defense." If, on the contrary, the threshold was lowered, i.e., recognition became easier, as might be expected if the word had positive connotations for the subject, then one had a case of perceptual sensitization. Actually, whether the threshold for a given word is raised or lowered relative to a neutral word may depend as much on the personality of the subject as upon the character of the word, so that a perceptually vigilant subject may be expected to respond sooner even to a distressing signal. The important point, however, is the existence of this differential effect as between emotionally charged stimulus words and neutral words.

A particular experiment by E. McGinnies⁸ in 1949 sparked off what may well qualify as the longest specific controversy in the history of experimental psychology.⁹ In this experiment he exposed a series of words in a tachistoscope in which the critical items were so-called "taboo" words, i.e., words with a strong sexual flavor like "whore" or "rape." He duly reported that these critical items required longer exposure to reach recognition than control items of the same length. The interpretation was that a censorship was operating at an unconscious level to prevent identification of the forbidden words for as long as possible. Thus the concept of "perceptual defense" was postulated as a direct analogue to the Freudian concept of repression in the field of memory phenomena. Of course McGinnies' experiment was far too full of flaws to establish the validity of such a concept of its own accord. All kinds of reasons were put forward by critics to account for the fact that the taboo words took longer to recognize—subjects might have hesitated before pronouncing the words until they were quite sure, or the words might be less common than the control words, or perhaps less expected in the laboratory situation. Evidence and arguments both for and against the reality of perceptual defense continued to pile up during the 1950s and 1960s as supporters of the concept strove to meet each new criticism and counter-explanation. Eventually, however, though there still are doubters and waverers, perceptual

defense does appear to have been vindicated as a genuine manifestation of the unconscious.

In a sophisticated modern demonstration of perceptual defense, of the kind we owe to Dixon, or to A. G. Worthington, a Canadian psychologist, the subject never, at any time during the experiment, suspects that there *are* any words involved, let alone that some of them may be obscene. All the experimenter looks for is whether the critical words will raise the recognition threshold relative to the control words with respect to some quite neutral stimulus such as a patch of light. Thus, in Dixon's set-up, the critical word is exposed continuously to one eye only and at a level well below that at which he could be aware that there *is* any kind of stimulus present. At the same time the other eye is presented with a visible spot of light whose intensity the subject himself can control. His instructions are to keep the spot of light from disappearing altogether while at the same time not to let it exceed in brightness a second spot of light that surrounds it. Dixon duly found that the mere presence of the taboo word was in itself sufficient to raise the threshold-setting for the spot of light; the implication being that resistance to seeing the taboo word raised the general threshold for form discrimination.

In an experiment of this kind which one of my own students carried out this year,¹⁰ the subject was required only to indicate when a certain luminous rectangle was visible against a uniform luminous background. Unbeknownst to the subject the luminous rectangle was in fact a slide containing a word, either a sexually suggestive word or a carefully matched neutral word. Although great care was taken to guard against artifacts—for example the experimenter himself did not know which slide was being used on which trial—it duly transpired that the mean intensity necessary to discriminate the rectangle against its background was significantly greater when the word it contained was of an obscene nature than when it had no such emotional connotation.

Findings like these strike one as so bizarre, from a commonsense point of view, that one may be forgiven for wondering whether ESP might not be a more straightforward explanation for the results than one in terms of SP. Actually, Dixon himself has told me that one cannot rule this out as a hypothetical possibility since few experimenters have bothered to control for an ESP effect. Not that this would be difficult, all one would need would be for the stimulus to be present, as a target, on certain trials but completely screened from the subject. I do not think Dixon takes this possibility very seriously or he would already have done something about it. Neither do I take it seriously for

that matter. Nevertheless, it is a nice stroke of irony that, for once, we should be discussing ESP as a potential explanation of an alleged case of SP instead of, as so often, SP as an explanation for an alleged case of ESP.

The acknowledgment of perceptual defense as a genuine psychological phenomenon should make it that much easier for us to accept the concept of "psi missing" as a parapsychological phenomenon. For the point about perceptual defense is that it implies the possibility of identifying a stimulus at an unconscious level in order to prevent its recognition at a conscious level. Now it is true that in a case of psi missing the targets are not usually of an intrinsically threatening or disturbing nature; negative scoring is more likely to occur if, for some reason, the subject is feeling anxious at the time or is acting under stress. Nevertheless, given that we all tend to be apprehensive about anything paranormal, that we instinctively recoil from anything that threatens to penetrate our safe Bergsonian filters, it becomes understandable that we sometimes consciously deny what our unconscious, so to speak, already knows. For methodological reasons, however, it is difficult to compare psi missing at all directly with perceptual defense since the former can be clearly demonstrated only by using quantitative experiments of the forced-choice variety whereas the latter rely on qualitative free-response tests.

A type of perceptual defense that has been studied exhaustively in Sweden is that which is observed in the so-called "Defense Mechanism Test" designed by the Swedish psychologist Ulf Kragh. This test uses as a stimulus a TAT type of picture that invariably contains one threatening figure and one figure who is being threatened. A picture of this sort is then exposed in a tachistoscope at successive trials of increasing duration starting at a subliminal level, progressing through stages of preconscious recognition and ending when the entire picture is clearly visible. The assumption behind it is that an anxious subject will postpone for as long as possible acknowledging the threatening figure that he will contrive to see in various innocuous ways. Martin Johnson, a parapsychologist and a colleague of Kragh's at Lund University, using the Defense Mechanism Test (DMT) as a measure of anxiety, was able to demonstrate a very significant correlation between the subject's score on the DMT and his ESP score on a standard test of clairvoyance (his DMT protocols were of course scored blind, i.e., in ignorance of his ESP scores). In general the more anxious subject tended to be a psi-misser and the less anxious subject tended to be a psi-hitter.¹¹

Philosophers who write about parapsychology like to point out that

ESP is a misnomer, that really ESP is not a species of perception at all, or even of cognition, since the typical ESP test is assessed solely according to the proportion of guesses that coincide with the targets even though the subject himself cannot distinguish in any way between his correct and his incorrect guesses. This objection, however, stems from adopting the classic empiricist assumption that we cannot know anything unless we are consciously aware of knowing it. But it is precisely such an assumption that is challenged by the whole body of evidence that Dixon brings to our notice. Consider modern signal-detection theory as it has been developed by J. A. Swets and others as a branch of decision-making theory.¹² Here the concept of a conscious recognition threshold is abandoned entirely. The subject is asked simply to guess whether the signal in question is on or off for a given trial. Much of the time the subject behaves in the same sort of way as an ESP subject, that is to say he goes on guessing to oblige the experimenter but is not conscious either of the presence or absence of the stimulus. Yet the percentage of correct guesses can be shown to be a direct mathematical function of the intensity of the stimulus starting at the baseline of chance expectation, when the stimulus is at some very low level of intensity, and climbing to 100% accuracy when the intensity reaches some optimal level. Of course, somewhere along this continuum consciousness must supervene but from the standpoint of signal detection theory, which is behavioristic and operationist in its approach, this is quite immaterial.

Ultimately what terms we choose to employ is always a question of semantics and if a philosopher wants to insist that perception implies conscious perception he is free to do so and can no doubt adduce good precedents for his usage. The point I want to make here, however, is that the modern psychophysical study of sensation and perception provides us with a good analogue for describing extrasensory perception. The typical card-guessing demonstration of ESP corresponds to the subliminal zone of the perceptual continuum whereas an accurate clairvoyant ascertainment of pictures, objects and scenes, such as is occasionally reported with certain exceptional sensitives, corresponds to the superliminal zone. That, subjectively, there is no difference between ESP guesswork and subliminal guesswork was shown in an experiment that J. G. Miller published in 1940.¹³ He told his subjects that the task was one of telepathy and that they were to gaze into a mirror, as if into a crystal ball, and try imagining certain geometric figures that he was going to try and transmit to them. Actually, he projected very faint real images of the figures onto the back of the semi-transparent mirror and the subjects duly scored well above the

chance level but, and this is the point I wish to bring out, none of them suspected this ruse and all were surprised to learn that it was not after all a genuine test of telepathy.

Finally, are there any practical implications to be derived from the work on SP for research on ESP? One enticing possibility worth mentioning is that of using an SP set-up in order to disguise a test of ESP. The idea has gained currency lately that subjects perform better when they are unaware that they are using their ESP. For example, some success has been reported using an ostensible test of memory. Items on which the subject recalled one of the wrong alternative answers were analyzed to see whether these corresponded significantly with the alternatives which the experimenter arbitrarily designated as being the correct ESP target.¹⁴ It would not be at all difficult from a practical point of view to reverse J. G. Miller's procedure and make the subject think he was using his SP while in fact he was required to use his ESP. There is, in fact, one experiment in the literature which I have come across which does use this stratagem. This was an experiment by Jule Eisenbud published in 1965.¹⁵ He presented the numerals 2, 3 or 4 in a tachistoscope and the subject had to guess at each trial which of these three different numerals had just been presented. On the critical runs, however, the same constant stimulus, consisting of an amalgam of all three numerals, was presented at *every* trial. Meanwhile, in the next room, an agent was synchronously watching a series composed of the numerals 2, 3 or 4 being flashed on a screen at superliminal durations, the idea being to influence the subject's responses. Unfortunately, however, this ingenious idea did not work and no significant scores were found on these critical runs, nor did it make any difference on the ordinary runs whether an agent saw the stimuli or not.

There are, however, other ways of combining the subliminal and the extrasensory that are worth trying. Here again Martin Johnson has been breaking new ground with promising results.¹⁶ In an experiment, which he has recently completed, he exposed his words subliminally but these words were in the Finnish language so that any effects that they might have on the responses of his Dutch subjects would have to be due to ESP over and above any SP. It has also been suggested that, in a telepathic experiment, it is the agent who should be presented with the targets on a subliminal basis. The idea being that if it is indeed our unconscious that mediates the information, the best results should be expected if the target directly enters the unconscious of the agent. But, as yet, I have come across no actual accounts of experiments using this procedure. Lastly, as I have already suggested, I hope the time will come when experimental psychologists will have sufficient

respect for the ESP hypothesis to take the precaution of always introducing a set of ESP control trials in any future experiment on SP. It is not, however, my main concern in this paper to suggest how SP might be exploited in parapsychological research. My concern has been rather to consider how the advances that have been made in our knowledge of subliminal processes, both on the psychodynamic and on the physiological fronts, might contribute to advancing our knowledge of psi processes.

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DISCUSSION

TARG: I would be very interested to know from your reading of Dixon's book if he found any evidence that the subject in his SP tests improved with practice.

BELOFF: I do not know if he tested this hypothesis. I cannot recall

any experiments he has done, actually, to test this, but my guess would be that they do not improve. That is not to say you could not design an experiment with reinforcement whereby they would improve. I am quite sure they would.

SCHMIDT: I was interested to hear that a relaxed condition is favorable. We know ESP tests present another extreme, a very highly wrought, competitive situation for an egoist. Do you have a similar situation in subliminal perception, that it works under these two extreme conditions?

BELOFF: If there are any analogies here, I do not know any where the subject is very highly motivated. But certainly now that you bring it up, we heard this morning about the man who was bet \$100 to get all the Zener cards correct.

KOESTLER: Can you reverse the situation and discover any analogies between subliminal motor actions and PK? In subliminal motor actions, the subject is blindfolded and he has to decide whether his hand shook when he took a glass of water, or whether he had a nervous tick. There are certainly subliminal motor actions.

BELOFF: The example you have just given would be more a case of proprioception, would it not, rather than the action itself being unconscious actions one performs, but I don't know whether this would provide any sort of parallel. Certainly it is not what Dixon is talking about, because he is interested in the sort of semantic processing of the stimuli, and so on. I do not quite know what kind of parallels one would look for.

ROGO: Mr. Koestler has just asked about the relation of PK to subliminal motor movements. With some of the physical mediums in our history, there were observations that PK or telekinetic activity would be accompanied by spasmodic movements in the limbs of the medium which seem to have been subliminal motor movements. So I think there is a relationship there, but I do not know if there is any experimental evidence.

ZORAB: This motor action was stimulated in Heymans' experiment where the subject was seated behind a curtain and his head hovered over a kind of chess board. Heymans told me he tried telepathically to direct the finger of the subject to a certain square. The question I asked is, why do it by telepathy? Why not clairvoyance or ESP influence which had really moved it to the chosen square?

TARG: There are many outdoor sports that I think of as Zen activities. It means that a person tries to do, with regard to a sport, what is significantly harder than he has any right to be able to do. Michael Murphy has recently written a book on *Golf in the Kingdom* which

is very reminiscent of Zen and the art of archery. Just shortly after Murphy wrote his book, there was an American golf championship match at a very difficult, famous course called Pebble Beach. There had not been a hole-in-one on one of the lawn greens for thirty years. Then on one Saturday, one of the two leaders in the match made a hole-in-one, as improbable as any psychical results that a person might get, hitting a ball into the cup at 200 yards. Everyone was amazed that this should happen: it had not happened in such a long time. The next day, the second man in the runners-up spot did a hole-in-one into the same cup, but to show that he could not be outdone, he did it on a fly, which means that the pole was still in the hole so that the ball must have entered the hole at the one possible precise trajectory to go into it without encountering either the pole or the side of the cup. This not only seems unlikely, but is an event of zero probability. I think that he was undoubtedly encouraged by having seen his predecessor do it. Once he knew that it was possible to do, he was able to go ahead and do it also. It is not the sort of thing one could study to accomplish; it is obviously an unconscious skill.

CUTTEN: Possibly those golfers were not motivated at all. I think, usually, when a golfer makes a hole-in-one, he has not been trying to do that. He never expected to do it. I would hardly think a golfer tried to do it.

TARG: When he is trying to put the golf ball as close to the center of the green as he can, and if he optimizes what he has in mind, then that will be a comfort. The psychic guidance that a golfer is given is not to think about the ball, just to visualize the idealized trajectory. And, if you become very good at that, then the ball will follow the trajectory that you have in mind, I am told.

CAHN: In some experiments that I did last year with a psychic, using field targets and Milan Ryzl's technique of hypnosis, where there were successful results, I encouraged him not to say what the target was, but simply to give any kind of impressions he may have had. The kinds of responses I got were what I like to call primal and process imagery first, which later by association became clothed with specific detail and culminated in an effort to guess what the target was. I think the analogy between SP processes and ESP with respect to the brain mechanisms that are involved is a very good one. I think Dr. Servadio could give instances from psychoanalytic experience of the same type of thing. I also just very quickly note that the history of sport is the history of records that are exceeded.

CAMSTRA: Is there, as far as you know, any evidence that there might

be a mechanism parallel to the defense mechanism which seems to operate in subliminal perception?

BELOFF: I drew attention to the fact of psi missing. Would this not, in your opinion, be a sufficient parallel to a defense mechanism?

CAMSTRA: I can imagine that you say that in subliminal perception negatively loaded words are harder to perceive, and I can imagine the parallel you find in psychology in which, for instance, some words are better transmitted than negatively loaded words. Is there any evidence, as far as you know, in literature?

BELOFF: There have been a lot of experiments with differential scoring on different kinds of target words. So it does not exactly match positively or negatively loaded words. But there have been comparisons, and I am thinking of Rao's experiment with the Telegu words and the English words, showing that there is a preferred target that you score positively on and then there will be the other target on which you will score negatively. A few things will go in opposite directions. I think there are quite a few experiments of that nature. It is not exactly a parallel, but it is something to go on.

WEST: I would like to go back to Mr. Koestler's question about subliminal PK. It seems to me there is a relevance here with what I think is called ideomotor activity. That is, you will get, accompanying thought, a minute but detectable muscular activity. This can become microscopic in grading and detecting. I wonder, one could perhaps even make use of this as a detecting device in telepathy experiments, if you were to try to implant ideas of movements to the right or to the left and see what response you got.