HUMAN INTUITION

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ABSTRACT

Intuition is often defined as the ability to understand something instinctively, without the need for conscious reasoning. Many psychologists believe that such an ability refers to information we already possess, but which lies below the threshold for awareness.

The aim of this paper is to show that intuition actually requires contact with the future and is explained in terms of psi. Precognition is considered to be the fundamental phenomenon of psi, and consists literally of *pre-cognition* referring to the future cognition of an event.

The model is based on the concept of the block universe, and therefore requires a compatible version of quantum mechanics. David Bohm's theory of the implicate order is based on the zero-point energy field that extends throughout space and time. The implicate order unfolds to create successive slices of space-time, which build up to form the block universe. Bohm proposed that similar structures created at different times *resonate* within the implicate order, and tend to unfold in a form in which they are more similar to one another. The resonance is attributed to non-local effects of *de Broglie-Bohm* pilot waves over the quantum mechanical processes involved.

The principles are applied to the neuronal spatiotemporal patterns that are activated in the brain. Precognition occurs when the pattern activated at the time of the future experience of an event resonates with any similar pattern (spontaneously) activated in the present. It enables the activation of the present pattern to be sustained until the threshold is reached at which the percipient becomes consciously aware of an event similar to the event experienced in the future.

Intuition occurs when there is an *absence* of resonance between the present and future patterns. It enables the brain to detect knowledge that a given event will *not* occur in the future. For example, a percipient, in the present, intends to carry out a given action, and her brain activates the corresponding pattern. However, if later she will be unable to do so (e.g., because an accident would prevent her) there will be no experience of carrying out the action in the future. The present and future patterns are different and resonance does not occur. The absence of a precognition in this case serves as an *intuitive warning*, which indicates that she will be unable to fulfil the intention. She can therefore change her intention to that of doing something else instead. The mechanism shows why intuitive feelings are somewhat vague—the contact with the future says nothing about the accident. The percipient instead has to deduce, in the present, that such an accident could occur.

The mechanism suggests two conditions for an intuition to be successful. First, the event resulting from the fulfilment of the intention must produce some emotional impact. Re-entry of stimuli from the appraisal networks leads to further re-activation of the pattern and a stronger resonance is produced. Second, the time interval between the creation of an intention in the present and the fulfilment of the intention in the future should be short, so that the synapses forming the pathways through the networks are less likely to be affected by neuroplasticity. A closer matching between the patterns is obtained and again a stronger resonance is produced. The stronger resonance will have a greater effect on the pattern activated in the present. It will therefore be easier for the brain to notice the *absence* of such an effect, in the scenario in which the intention is not fulfilled.

The model rejects clairvoyance and suggests that in a precognition experiment, the participant must be given feedback of the target information in the future, so that the brain can receive and

encode that information. The mechanism is applied to explain the results of forced-choice target-guessing experiments, in which the idea of selecting the target is, in the future, associated with the idea of scoring a "hit", to produce the emotion of satisfaction. The participant intends, in the present, for each of the target options to be associated with the idea of scoring a hit. In the case of the incorrect options, there will be no experience of this occurring in the future and intuitive warnings are produced. Inhibition from working memory prevents continued activation of the pathways corresponding to those options. However, when the correct option is selected, there is no intuitive warning. Resonance occurs, and the pathway corresponding to the option continues to be activated. When the threshold is reached at which the motor networks are triggered, the participant registers the option.

Free-response and remote viewing experiments are explained in a similar way. In the present, the participant tentatively scans a number of items in the memory networks until a combination is found that corresponds to features of the target, and in this case, the combination is associated with the idea of producing a successful result. Then, in the future, the same combination is associated with the idea of producing a successful result, when feedback of the result is given. Again, resonance occurs, and the activation of the present pathway is sustained, thus enabling the participant to describe or sketch his impression of those features.

When intuitions occur in day-to-day experience, they occasionally enable people to avoid accidents and disasters. This can apply to events that occur minutes or even hours later. However, intuitions are expected to be far more reliable over shorter time intervals (e.g., a few seconds) and they may serve as a constant aid to one's survival and well-being by guiding one's actions in moments of potential danger.

Over very short time intervals (e.g., less than one second) intuition may serve as an important aid to recognition and problem solving. The brain associates a number of items with the idea of solving a problem, in the present. Each of the items is then evaluated a moment later, in the future, until one is found that does solve the problem. The re-activation of the future pathway produces a resonance and the activation of the present pathway is sustained, so that the impulses can go on for further processing without having to wait whilst the evaluation is being carried out. The mechanism shows how we are able to *recognize* items in memory.

This paper attempts to clarify and extend my previous work on the subject of precognition. It is hoped that by offering a mechanism based on sound physical and biological principles, it will help overcome scepticism towards psi, and bring parapsychology into closer alignment with mainstream science.

INTRODUCTION

The concept of intuition is familiar to most people but its precise meaning is little understood. Richard Broughton (1992, p. 303) refers to intuition as "coming to a decision or making a judgement without quite knowing why". It often seems to arise from instinctive feeling rather than conscious reasoning. Psychologists understand intuition to be based on information we already possess, but which lies below the threshold for conscious awareness.

These descriptions give no indication as to *how* this instant apprehension is achieved, nor do they take into consideration the fact that intuitions often seem to involve some sort of link with the future. In this paper, I shall propose that intuition consists of a subtle variation on ordinary precognition. To explain how it works, it will be necessary for me to recapitulate the main points of my model for ordinary precognition.

First, we have to be clear about the nature of the phenomenon. Meta-analyses performed on the results of forced-choice precognition experiments (e.g., Honorton & Ferrari, 1989; Storm et al., 2013) give outstanding evidence for contacts with the future, but they don't tell us with what the contacts are made. The majority of parapsychologists assume the contacts to be clairvoyant, made directly with the targets generated in the experiment. However, the clairvoyant interpretation would be

difficult, if not impossible to explain using currently understood principles in physics. For example, how could information about the target be collected and encoded in a form intelligible to the brain? And how could the brain possibly obtain selectivity between the target and the "decoys" when they may be in proximity with one another in the laboratory?

The failure to provide a satisfactory explanation in physical terms has led to widespread belief that precognition would require a metaphysical explanation involving consciousness as carrier of the extrasensory information. Such an explanation does little to convince the majority of mainstream scientists and it has led to scepticism towards precognition itself. For example, the results of Daryl Bem's landmark series of precognition experiments (Bem, 2011) were severely attacked in the press by a number of scientists (Cardeña, 2015).

My model considers precognition to be the fundamental phenomenon of psi, and that it occurs when a percipient connects with her future knowledge of an event, rather than with the event itself. It is literally *pre-cognition*, referring to the future cognition of the event. Thus, precognition is a link with the percipient's brain in the future, after the percipient has received feedback of the target information. Such feedback enables the participant to receive and encode the target information using her ordinary senses.

The model is based on David Bohm's theory of the implicate order (Bohm, 1995), according to which similar structures created at different locations in space and time *resonate* with a tendency to become more similar to one another. The principles are applied to the neuronal spatiotemporal patterns of activation in the brain to show how the information transfer is produced. Thus, precognition occurs when the pattern activated at the time of the future experience resonates with any similar pattern (spontaneously) activated in the present. This enables the activation of the present pattern to be sustained until the threshold is reached at which the percipient becomes consciously aware of an event similar to the event experienced in the future.

Intuition is a variation on precognition—one could almost look upon it as the opposite of precognition. Rather than detecting knowledge that an event will occur, the brain detects the knowledge that an event will not occur! The percipient starts with an intention, in the present, to carry out a given action in the future. However, if she will be unable to able to carry out the intended action (say, because an accident would prevent her) there will be no future experience of carrying out such an action. The present and future patterns of activation are different. There is no resonance and the absence of a precognition warns her that she will be unable to fulfil the intention. She deduces that it could be due to an accident and decides to do something else.

The model suggests that telepathic contacts with other people are less likely to be produced because different brains are involved—the patterns activated are quite different from each other. And the possibility of clairvoyant contacts with inanimate objects is eliminated because of the dissimilarity between an object and a person's brain. Most cases of telepathy and ostensible clairvoyance are explained in terms of precognition of the percipient's future knowledge of the event, knowledge obtained upon receiving feedback of information about that event.

The paper is divided into two parts. In the first part, I present an overview of my model for ordinary precognition. I outline the physical principles involved in transferring information through time, and the neuroscientific principles involved in detecting the information in the brain. These principles were described in Taylor (2000, 2007, 2014) and they lay the ground for understanding intuition.

In the second part, I describe the mechanism of intuition and apply it to explain the results of precognition experiments. I then show how it plays an important role in our day-to-day activities, by warning us of potentially harmful situations and events. Finally, I show how intuition may be fundamental to the neural processes involved in thinking and decision-making.

TRANSFERRING INFORMATION THROUGH SPACE AND TIME

The occurrence of precognition supposes that the future events already exist. This conforms to a block universe model in which past and future events co-exist in the space-time continuum, in accordance with the special theory of relativity. The concept of such a universe is widely accepted within mainstream science, and Paul Davies (2002, p.42) suggests that "physicists

prefer to think of time as laid out in its entirety—a timescape, analogous to a landscape—with all past and future events located there together".

To explain the information transfer, we therefore need a version of quantum mechanics that is compatible with relativity theory. One such version is David Bohm's theory of the implicate order (Bohm, 1995). The implicate order is based on the zero-point energy field that extends throughout space and time. The implicate order unfolds to create successive slices of space–time, which build up to form the block universe. Bohm proposed that similar structures created at different places and different times "resonate" within the implicate order and unfold in a form in which they are more similar to one another (Bohm, 1990, p.93). The resonance is attributed to non-local effects of *de Broglie-Bohm* pilot waves on the quantum mechanical processes involved, and the existence of these pilot waves has been demonstrated in a recent experiment by Steinberg and associates (Mahler et al., 2016).

Structures in the environment are represented by *processes* in the brain, in which neuronal networks are connected, or associated with one another, to form spatiotemporal patterns of activation. Similar patterns activated at different locations in space and time resonate, and the replication tendency between their structures results in a transfer of information. In fact, an association between any pair of networks represents a process in which the activation of one network causes the activation of the other. Thus, if the same pair of networks is activated on different occasions, the replication tendency will affect that pair of networks.

It is important to notice that the resonance doesn't produce changes after the pattern has unfolded; the pattern is unfolded in a form that has already been *already* been affected by the resonance. Thus, for precognition to occur the brain doesn't have to look for something that changes over time; instead it has to determine whether the pattern has unfolded in a form which is slightly different from that in which it would have unfolded if it hadn't been affected by resonance. Any transferred information is already inherent in the structure that is unfolded, and there is no *transmission* of a signal through time.

DETECTING THE TRANSFERRED INFORMATION IN THE BRAIN

In the case of an event caused by outside circumstances, the percipient associates information about the event with information about her previous experiences with the event. If the event is significant for her well-being, an appraisal is carried out in the amygdala (LeDoux, 1998, pp. 283-296). Re-entrant stimuli from the amygdala increase the degree of activation of the pathway through the networks. This produces a strong resonating field, which affects any similar pathway activated elsewhere in space and time.

Precognition occurs when the percipient (spontaneously) activates a number of pathways in the present, until one of them happens to be similar to the pathway activated in the future. The resulting patterns resonate, and the synaptic connections forming the present pattern are slightly strengthened. This facilitates the flow of a few extra impulses that travel, via re-entry circuits, to the *working memory* system. The working memory cells sustain their activation, thus overcoming the effects of inhibition and leading to a sustained activation of the pattern (Fuster, 2003, pp. 155-164). The degree of activation may increase to the threshold at which it produces conscious awareness of an event similar to the event experienced in the future.

FEATURES OF ORDINARY PRECOGNITION THAT ARE RELEVANT TO INTUITION

Three predictions of the model are relevant to my discussion of intuition:

1. For precognition to occur, a percipient has to activate a pattern in the present that is similar to the pattern she will activate at the time of experiencing the event. If she doesn't witness the event directly (e.g., by observing it), then she must be given feedback of information about the event. Evidence for such a requirement is given by the Honorton & Ferrari (1989) meta-analysis which included a subset of experiments for which details were provided about the feedback given to participants. The results showed that when no feedback was given, *the significance of the results fell to chance expectation*.

2. Precognition is more likely to occur when the experience of the event in the future produces strong emotional impact. Re-entry circuits from the amygdala increase the degree of activation of the pathway through the networks. This leads to a *concentration effect*, producing a strong resonance that is more likely to affect the pathway activated in the present.

3. Precognition is more likely to occur when the *precognitive interval* up to the moment of experiencing the future event is short. The synaptic connections forming the pathways change constantly due to neuroplasticity, so that closer matching and stronger resonance are to be expected for short precognitive intervals. The results of the Honorton & Ferrari (1989) meta-analysis were highly significant for precognitive intervals of a few hundred milliseconds and they fell to non-significance when the interval was increased to more than one month.

INTUITION: DETECTING THE FULFILMENT OF AN INTENTION

An event caused by outside circumstances is one that will occur anyway—there is nothing we can do to change it. Foreknowledge of such an event simply refers to what will be a fragment of our own future history. Thus, a precognition is more useful to us when it refers to an event that we can influence, such as the event resulting from an intention to do something.

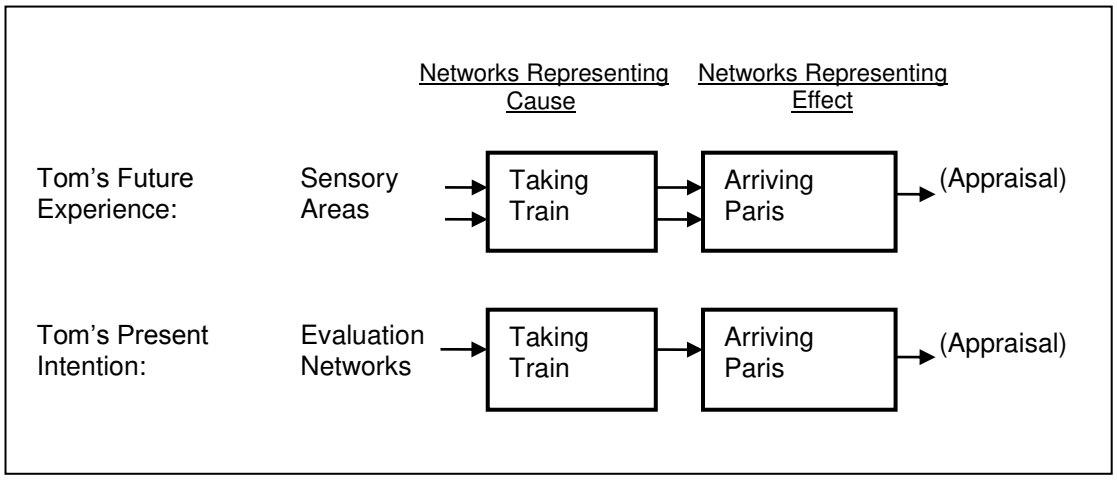

Figure 1. Intention Fulfilled: Precognition Occurs

Let's suppose that a percipient, Tom, is thinking about taking a train to Paris. He activates networks in his brain through which he associates the idea "taking a train" with the idea "arriving in Paris". As the degree of activation increases, it leads to an *intention* being created to carry out the corresponding action (Fig. 1). Further activation leads to triggering the motor networks, so that Tom goes ahead with the intended action. We suppose that Tom later fulfils his intention, so that his future *experience* is that of taking the train and arriving in Paris. Because the present and future patterns are similar, resonance occurs, and Tom might be able to precognize the knowledge that he will be successful in fulfilling the intention.

INTUITION: DETECTING THE INABILITY TO FULFIL AN INTENTION

Now consider the scenario in which Tom intends to take the train to Paris, but on this occasion, the train is destined to crash (Fig. 2). If Tom takes the train, his future experience will not be that of arriving in Paris; instead it will be that of experiencing the crash. His intention will not be fulfilled. The present and future patterns are different—there is no resonance and precognition does not occur. However, Tom is unconsciously expecting to arrive in Paris and he is expecting a precognition to occur. In this case, the absence of precognition can serve as an *intuitive warning*, which tells him that some other event will prevent him from fulfilling his intention. It doesn't tell him specifically that the event will be an accident, but it leads to a feeling that "something is wrong". This enables him (unconsciously) to deduce that an accident could occur, so he decides to stay at home.

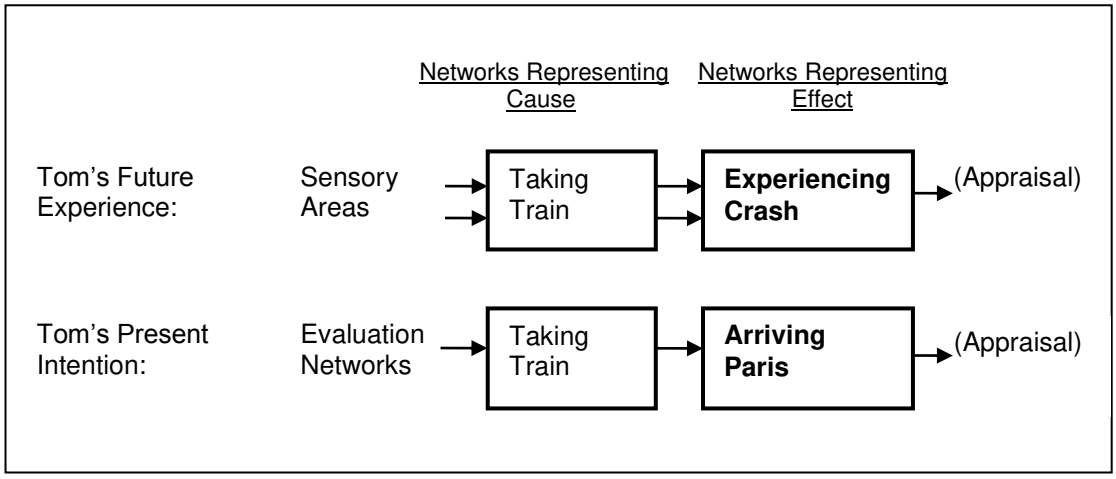

Figure 2. Intention NOT Fulfilled: Intuitive Warning Produced

This detection of the absence of an intended future could form the basis of intuition, in which Tom becomes aware of a possible danger, perhaps without knowing exactly what the danger is. It explains why intuitions tend to be somewhat vague—they don't actually detect the harmful event; they only lead to the percipient suspecting that such an event might occur. And it explains why intuitions occur instantly—there is *already* an unconscious intention to do something in the future, and the resulting intuitive warning makes the percipient instantly aware that something is wrong.

Evidence that people can use intuition to avoid accidents is given by W.E. Cox (1956), who carried out a survey of passenger statistics on the U.S. rail networks. He found that significantly fewer people travelled on trains that were involved in accidents than on comparable trains not involved in accidents. The survey doesn't say what made the people

stay off these trains, but it would seem reasonable to suppose that they found themselves looking for something else to do on the day of the intended journey.

Larry Dossey (2009, pp.41-44) described a case in which information from the future ostensibly saved the lives of 15 choir members at a church in Beatrice, a small town in Nevada, on 1 March 1950. A choir practice was due to be held at 7.20 pm that day, but none of the choir members turned up. An explosion, caused by leaking gas, destroyed the church at 7.25 pm. Although seven of the choir members were prevented from attending due to circumstances beyond their control (e.g., because the car failed to start), the remaining eight members all stated that they had some uneasy feeling or found themselves looking for something else to do. None of them had any conscious precognition about the nature of the disaster to come.

Sometimes a percipient may notice several intuitive warnings corresponding to things he intends to do *after* the time when the potential accident would occur. For example, when Tom activates the pattern corresponding to his intention to take the train to Paris (in the scenario in which the train crashes), he may also activate patterns corresponding to things he intends to do after his arrival, such as visiting his sister, or going to the theater. If he fails to fulfil these intentions, they will also lead to intuitive warnings and contribute towards his decision to stay at home.

This conclusion is supported by the results of Cox's survey, which showed that the passengers who stayed off the trains were mostly passengers who would have travelled in the damaged or derailed coaches. They were the ones who would have had their plans disrupted to a greater extent by the crash. For example, if a passenger had to spend a week in hospital, he might have noticed intuitive warnings corresponding to most of his intended activities for the week. A passenger travelling in one of the other coaches would have been taken on to her destination a few hours later, and only a few of her intentions would remain unfulfilled. The overall effect of the intuitive warnings in her case would not have been sufficient to cause her to stay off the train.

Notice that there are occasions when a percipient thinks that a precognition occurred, and that she used the information to intervene and change her future as a result of the precognition. For example, a case reported by Andrew MacKenzie (1974, p. 49) concerned a woman who dreamed about the crash of an aircraft on which she had booked a seat. She cancelled her reservation and thought she was doing it because of the dream. However, the dream referred to her future experience of watching the crash from a point on the ground, and not that of being *involved* in the crash. So she must have made her decision to stay off the aircraft *independently* of the dream. She probably noticed intuitive warnings corresponding to things she intended to do on arrival at her destination. She associated the warnings with the possibility of a crash (especially if she had a fear of flying) and this led to the decision to cancel the booking. She was then able to dream of her actual future in which she read about the crash, or watched a report on television. But the dream only occurred because she had already made the intuitive decision to stay off the plane.

TARGET-GUESSING EXPERIMENTS IN PRECOGNITION

Perhaps the best example of the use of intuition is given by the forced-choice experiments, in which a participant has to guess which of a given set of options corresponds to the target that will be randomly selected in the future. We assume that the participant will be given feedback of target information in the future. Thus, if the participant knows that she has guessed the target correctly, she can associate this knowledge with the idea of "scoring a hit". The association has emotional impact and is appraised to produce satisfaction. Re-entrant stimuli from the appraisal mechanism lead to many more activations of the pathway through the

networks, and this leads to a strong resonance that affects any similar pathway activated in the present.

Thus, intuitive decisions are used to find the target. First, we take a scenario in which the percipient selects an *incorrect* option. Her present intention is for the selection of the option to be associated with scoring a hit. However, there will be no future experience of that occurring when the target information is revealed. The patterns of activation corresponding to the present intention and future experience are different and an intuitive warning is produced.

The participant moves on to another option and repeats the process. When she comes to the correct option, there is no intuitive warning and she goes ahead with her intention to register the option. She therefore has to *systematically eliminate the incorrect options* until she is left with the correct one. She must start by assuming that each option is the correct one—she must have a genuine intention to register that option, so it is the intuitive warning that *stops* her from doing so in the case of an incorrect option. The mechanism avoids a causation loop, in which the resonance would cause her to select the correct option and the selection of the correct option would lead to the resonance occurring.

In neurological terms, the brain applies stimulation to the pathways corresponding to each of the target options. In the case of an incorrect option, the pathway is not reactivated in the future and resonance is not produced. Inhibition from working memory prevents the activation of the present pathway from continuing and the option is not registered. When the correct option is selected, a similar pathway is activated in the future and resonance is produced. The present activation is sustained until the motor networks are triggered and the participant registers that option (Taylor, 2007, p. 565).

The activation of each pathway must be allowed to build up until it is close to the threshold at which the motor networks are triggered. Only at this critical level will the effect of inhibition be sufficient to prevent activation of the motor networks in the case of an incorrect option. It suggests that the participant should be slightly distracted in order to allow the intuitive process to occur naturally (White, 1964). For example, if the participant is deliberately *trying* to score a hit, it means that she is applying excessive stimulation to each of the options. This overrides the possibility of the inhibitive influence preventing an incorrect option from being selected. But if attention is kept away from the options, and tension is allowed to increase gradually, the level of activation of each of the pathways also increases gradually to the threshold at which the correct option is registered.

REMOTE VIEWING EXPERIMENTS

A good example of free-response experiments is given by the remote viewing experiments, originally conducted at the Stanford Research Institute (e.g., Puthoff & Targ, 1976). The participants had to try to describe features of remote target locations that were selected at random. The participant thus had to make intuitive decisions by activating various combinations of possible target features, until a combination was found that corresponded to the target that would be shown to him in the future. The correct combination would therefore be associated with the idea of producing a successful result, thus leading to satisfaction.

Participants were taken to the target locations to obtain feedback after the viewing sessions, but such feedback was at the time considered only to serve as an aid to "psi training" and to improve future results. Experiments later carried out within the CIA-sponsored STAR GATE program (e.g., Puthoff, 1996; Targ, 1966) produced outstanding results in field trials in which feedback was given. However, they were found to be less successful in intelligence gathering (May, 2014; Mumford, Rose, & Goslin, 1995), and this may have due to the impracticability of taking participants to the locations to receive feedback.

However, regarding the necessity of feedback, Russell Targ (2012, p. 55) noticed that whilst feedback is normally important, there were isolated occasions when such feedback seemed unnecessary. One of the participants, Patrick Price, was able to describe the construction of a containment vessel at a research facility in Semipalatinsk, Siberia, although feedback did not become available until after Price's death, two years later. Thus, rather than obtaining the information intuitively, Price (an exceptionally gifted psychic) could have accomplished the more difficult task of obtaining the information by precognitive telepathy with other people in the future who possessed that information.

In most of the experiments, participants were initially informed about the approximate geographical location of the target site. Such orienting clues could have influenced their unconscious thinking to include the *kinds* of elements that might be found at the target site, thus facilitating the intuitive decisions. In fact, one of the participants, Ingo Swann, reported that it was extremely difficult "to make decisions on what is there and *what is not*." (Targ & Puthoff, 1978, p. 2, author's italics). This corroborates the idea that a participant finds the elements forming part of the target by making decisions to eliminate those that do not form part of the target.

Later in the STAR GATE program, targets were used that involved a transformation of energy, and Edwin May noticed that sudden entropy changes may have been an intrinsic target property responsible for the high quality of the remote viewing (May & Lantz, 2014). However, any violent or destructive event, such as a train crash, represents a sudden entropy change and is likely to produce a strong emotional impact on the participant—not because of any intrinsic property of the target event, but because of the way the participant appraises her knowledge of the event. Such an event is likely to be appraised as harmful to personal well-being, leading to many re-activations of the neuronal pattern, and thus to extrasensory contact.

If the target is an entropic event, the remote viewer is likely to use ordinary precognition to detect her experience of the event in the future. The experience is appraised as harmful, producing fear or distress. This is in addition to her using intuition to select elements of the target that she will associate with the idea of producing a satisfactory result, on receiving feedback. These associations are appraised as beneficial, to produce satisfaction. This explains the high quality of the remote viewing. For an entropic target, ordinary precognition is expected to make a strong contribution to the result. Caroline Watt (1988) carried out a study suggesting that the best remote viewing targets are those that have emotional impact, due to the targets standing out from their surroundings or creating interest or incongruity.

The mechanism described for the target-guessing and remote viewing experiments suggests that a radically new approach may need to be taken in the design of some of these experiments, in order for better repeatability to be obtained. The fundamental requirement is for target feedback to be given in the future. The design should also allow for strong emotional impact to be produced in the scenario in which a satisfactory result is produced; this allows the intuitive warnings to "stand out" and be noticed in the scenarios in which a satisfactory result is not produced.

USE OF INTUITION IN EVERYDAY LIFE

When a person makes an intuitive decision, she has to start with a *definite intention*, one way or another. The intention serves as an initial point of reference, and an intuitive warning is produced if the intention is not to be fulfilled. If she notices the warning (i.e., because the activation of the corresponding pattern is not sustained), she can use the information to *change* her intention and do something else instead.

In fact, the mechanism probably explains why people seem to benefit from "sleeping" on a decision. If they make the wrong decision, their intention will not be fulfilled and they may notice an intuitive warning corresponding to the absence of the intended outcome. They awaken feeling uneasy with the decision and change it. On the other hand, if they make the right decision, their intention will be fulfilled and they can precognize the successful outcome. They awaken feeling reassured about the decision made.

Intuitive decisions can often be made without us being in any way aware of them. Such decisions might, for example, enable us to pass people in the street without bumping into them and without have a moment's hesitation whilst deciding on which side to pass. In this case, we start with an intention, say, to pass the person on the left, and if an intuitive warning is produced, we change our intention to that of passing the person on the right. But if an intuitive warning is not produced, we continue with our intention to pass the person on the left. The entire process takes place unconsciously. We are conscious only of the fact that we do pass the person smoothly on one side or the other. Sometimes, however, we start to think about the decision as we approach the other person and this prevents the process from occurring spontaneously. The intuition fails and we find ourselves dodging from side-to-side, unable to decide on which side to pass!

SHORT-TERM INTUITIONS

Intuitive decisions occasionally refer to outcomes that occur hours or even days in the future. A typical example is that in which a person decides to stay off a train because of an intuition that the train will be involved in a crash. However, intuitions are expected to be far more effective over shorter intervals, during which the neuronal patterns are affected less by neuroplasticity. In many of the target-guessing experiments, the precognitive interval was less than a second before feedback was given, and highly significant results were produced.

In day-to-day situations, such short-term intuitions may serve as an important aid to survival, guiding our actions in moments of potential danger. Rex Stanford (1990, 2015) proposed that living organisms constantly scan the environment, looking for information related to the fulfilment of their needs. He called it *psi-mediated instrumental response* (PMIR) and suggested that the scanning is done using ESP as well as the ordinary senses, and that it leads to an instrumental response to satisfy the need.

Stanford was alluding here to a direct clairvoyant contact with the environment, but his hypothesis is interesting because it suggests that the response can be produced in ways that the percipient seldom notices. This supports the possibility that intuitions may be far more widespread than commonly believed, and it also suggests that effects can be produced in quite trivial situations as well as the more life-threatening ones. It enables us to explain many of the odd coincidences that turn out to have unexpected significance, such as just happening to find oneself in the right place at the right time. These are the kind of coincidences that Carl Jung (1985) referred to as *meaningful coincidences* between the future event and a person's prior knowledge of it.

James Carpenter has taken the idea a step further, suggesting that our psychic sense should really be given priority over our ordinary senses. He provided evidence that such a sense acts as a kind of psychic radar which allows us to reach out "a little beyond ourselves in space and ahead of ourselves in time" (Carpenter, 2012, p. 311).

WOMEN'S INTUITION

Women are often considered to have greater intuitive ability than men, especially in situations in which a quick response is needed. For example, a woman rushes into a field just in time to save her child from a runaway train. It often involves reacting to the actions of young children, suggesting that the faculty has evolved to a greater extent in women, so they can protect their children in moments of danger.

However, the results of target-guessing experiments show little or no difference between the sexes, and these experiments do depend on the ability to make intuitive decisions. So if the ability is the same, perhaps the difference is to be found in the amount of *time* needed to make the decision. Women possess many more nerve fibers in the *corpus callosum* that connects the two hemispheres of the brain and this allows a more rapid exchange of information between what are often referred to as the "analytical" right and "intuitive" left hemispheres. Because the processing of the decision requires a deduction as to the kind of event that might prevent fulfilment of the intention, a faster flow of information between the hemispheres allows a faster decision to be made. The percipient reacts more quickly in a situation of potential danger.

INSPIRATION AND RECOGNITION

When discussing the target-guessing experiments, I pointed out that concentration on the target options seems to be counter-productive to scoring, and some distraction is necessary to allow the intuitive process to occur spontaneously. We find that distraction also seems to be necessary when looking for inspiration. The ideas never seem to come when we are concentrating on a problem, but if we go off and do something else, we find that the answer comes suddenly and without any effort.

When we try to solve a problem or look for something new, we may have to search through a large number of alternative ideas. This can be done intuitively by activating various items (or combinations of items) until one is selected because we *then* find that it provides a satisfactory answer. It's exactly the same as the target-guessing experiments, except that instead of associating the alternative symbols with the idea of scoring a hit, we associate alternative items with the idea of solving a problem.

First, the various items are activated in the long-term memory system. Each is associated with the idea of solving the problem, and the corresponding pattern is activated in the present. The item is then evaluated, and if it is not found to give a satisfactory answer, there will be no re-activation of the pattern in the future, and the item is rejected. However, if an item is found to be satisfactory when it is evaluated in the future, re-activation does occur and resonance enables the activation of the present pattern to be sustained until the threshold is reached at which awareness is produced.

Notice that the evaluation is carried out *immediately* after the pathway through the networks has been activated in the present. The precognitive interval between the present and future activations is minimal, and the synaptic connections are unlikely to be affected significantly by brain plasticity. The patterns are closely matched and resonance is easily produced.

When the problem is important, and finding the answer arouses a strong feeling of satisfaction, we claim to have a "flash of inspiration" or to have discovered something. But the same principles can be applied when dealing with trivial problems. We systematically eliminate the irrelevant options until we arrive at the one we are looking for—the one we *recognize* as providing the answer.

The present models of memory do not satisfactorily explain how the brain is able to recognize the items it needs. Francis Crick (1980) suggested that the brain must possess some undiscovered control system. However, such a system appears to need a second memory to recognize the required items, and a third memory to recognize items in the second, and so on, leading to an infinite regress.

However, the faculty of intuition resolves the problem in a subtle way. We don't need a second memory to recognize the items: instead this is done by the *same* memory a moment later (in the future) and the required items are precognized a moment earlier (in the present). The brain associates a number of items with the idea of solving the problem in exactly the same way as when we look for inspiration. Intuitive decisions are made to systematically eliminate unsuitable items until it is left with a suitable one. The activations of the pattern corresponding to this item are sustained and the information goes on for further processing.

Thus, the mechanism allows the brain to recognize items before it has had time to evaluate them, and this speeds up the process of thinking and decision making. Whilst the brain is still evaluating the items, the impulses that travelled through the networks a moment earlier are already undergoing further processing. The mechanism helps explain how the brain functions as a self-organizing system.

ANALYTICAL AND INTUITIVE THINKING

There are two ways to create intentions and make decisions. The analytical method depends upon the systematic evaluation of options, which continues until the most suitable one is found. The intuitive method depends upon the unconscious scanning of options until one is selected, because it is *then* evaluated and appraised as being the most suitable.

The method chosen seems to depend on the kind of situation involved. If the problem is complex and requires a detailed examination of each of a known set of options, the analytical method is probably more suitable. But if one is looking for new ideas or trying to select the best out of a simple set of options, the intuitive method is likely to be easier and faster.

For a deliberate use of intuition, the first requisite is that of being in a relaxed but alert state, in which one is likely to notice any fleeting impressions that might arise. It is important not to start by thinking about a given option, because it supposes that the neural impulses are already being applied to the corresponding network. The option is selected *anyway*, without the help of intuition. Distraction is therefore needed to allow the process to occur spontaneously. However, the distraction must not be caused by an emotional event, otherwise *that* event will dominate attention and the percipient will fail to notice the option selected intuitively!

Successful use of intuition also seems to require a positive attitude towards finding the best answers. An optimist activates and appraises associations corresponding to options that give such answers and the emotion of satisfaction is produced. A pessimist tends to look for associations that give the worst answers, because they are the answers that correspond to his belief—this being an example of the "sheep-goat" effect (Schmeidler, 1945; Taylor, 2014, pp. 32-33). However, a person should not be over-optimistic, because that can lead to the assumption that the first option to be considered will provide the best answer. Again, one starts to think about this option and others will not be taken into consideration. This probably explains why psychically gifted people sometimes lose their ability after a period of making accurate predictions. They become over-optimistic about their ability to make such predictions.

Science has traditionally been associated with analytical thinking, and the role of intuition has been almost totally ignored—but if a scientist is to make progress, then his

intuitive ability would seem to be just as important. A quotation often attributed to Einstein put it this way:

> The intuitive mind is a sacred gift and the rational mind is a faithful servant. We have created a society that honors the servant and has forgotten the gift. (Graham & Baize, 2011, p. 166).

People nowadays are beginning to show an increasing awareness of the role of intuition in everyday life. In fact, it is said that just by slowing down we can encourage intuition. The Japanese habit of bowing is also said to allow the brain a moment of free intuition; and so does learning to make quick decisions over minor matters, such as ordering from the menu, or deciding what to wear or what film to see.

CONCLUSION

Intuition guides our thinking and serves as a constant aid to our day-to-day survival and well-being, warning us of the dangers in the world around us. In this paper, I have given a brief overview of the mechanism and its applications, and more details will be given in my forthcoming book: *Contact with the Future*, in which I have extended the applications to include survival and homing instinct, as well as faculties such as dowsing and the use of the *I Ching* as an aid to decision-making. I have avoided speculations involving an active role for consciousness. By offering a physical mechanism, I hope to bring precognition and intuition into closer alignment with mainstream science. However, it is clear that the mechanism involves a multidisciplinary approach, and whilst I have provided the broad outlines of such a mechanism, it will be important for specialists in the distinct fields to scrutinize and if necessary, amend some of the finer details.

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