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PSYCHOLOGY OF THE OTs: THE OBSERVATIONAL QUASI MOTOR MODEL (OQM) - Part 1

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Abstract

The observational theories (OTs) deal primarily with "engineering" components, such as random generators and psi sources . Psychology seems to have been discarded somewhere along the way . This paper brings psychology back into the mainstream of the OTs, where it belongs . The OTs turn out to fit snugly into the elastic framework of cognitive psychology .

In purely engineering terms, the effect of a psi source on the external world is totally dependent on the nature of the feedback channel, which connects the random generator to the psi source . The information processing functions of the feedback channel can be simulated by a computer program .

A human being is a wondrously complex information processing system . If the brain of a psi subject contains a psi source, it is clear that sensory input will be subjected to much processing before reaching the psi source . This part of the human information processing system (HIP) is an internal feedback channel .

Psychologists have learned much about the workings of the HIP in normal sensory perception/motor response : this knowledge may be used to predict paranormal behaviour . If examined in the same experiment the attempt is, in effect, to "bug" the internal channel . This approach leads to a novel theory-based program of research into the psychology of psi .

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1. Introduction

From the inception of parapsychology as a scientific endeavour, the psychology of psi effects has attracted considerable attention . Nonetheless this area remains in an unsatisfactorily fragmented state . Theoretical speculation has, on the whole, followed closely upon empirical findings . Despite the pioneering attempts which have been made, particularly by Stanford (1974 a,b) to systematize this heterogeneous material, the psychological theory of each particular effect tends to be ad hoc and unrelated to any general picture .

A single model has, however, dominated attempts to erect a general theory of the psychology of psi (or to be more precise ESP) : it is here designated the "Quasi Perceptual Model" . The central assumption is that in ESP, a very weak signal enters the central nervous system (CNS), by some as yet unknown means : despite its unconventional entry, this signal is further processed just like any other weak signal . Subliminal perception thus provides an accessible analogue for the psychology of ESP .

In this paper are sketched the foundations of a new model of the psychology of psi, based on the observational theories . While stated here explicitly for the first, similar ideas have been implicit in the literature, perhaps most clearly in the work of Schmidt (1975) . In the OTs, psi is seen as a sort of motor activity (PK) driven by perception (feedback), rather than as basically quasi-perceptual in nature . The new theoretical picture is here denoted the "Observational Quasi Motor" model (OQM). This emphasises the intimate connection with the OTs : from a psychological point of view, however, "Perceptual Quasi Motor" or "Cognitive Quasi Motor" might be more appropriate . Perception/motor response is the analogue for the psychology of psi .

2. Engineering and psychology

2.1 Engineering aspects of the OTs revisited

The idea of a psi source was originally suggested by the effects produced by a few human subjects in ESP and PK experiments . The scoring of psi subjects is reported to be delicately dependent upon psychological factors . The psi source is an idealized PK subject with the corrupting effect of his changing psychology removed . This conceptual strategy highlights the study of the physical properties of the psi source, unencumbered by the complications of human psychology .

In this vein the general psi circuit of figure 1 was introduced (Millar, 1986) . There are two elements in addition to the psi source "machine" (PS) : a random generator (RG) and the feedback channel (FC) . The essential property of the psi source is to bias random systems (represented by the RG) remote from it in space and time. For this to be possible, it is necessary that a feedback channel carries information from the RG to the PS .

The nature of the "magical" influence exerted by the PS is such that it results in an enhanced proportion of pulses on its

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own 1 (active) terminal . The pattern introduced by the PS in the outer world and where it becomes manifest, however, are determined by the function of the feedback channel . For example, one might attempt to decrease temperature in a group of fever patients in New York by means of a feedback channel device which stimulates the active input of a PS in Paris for every measured decrease (and the 0 input for every increase) .

A convenient way of modelling the FC is to regard it as a computer . The computer inputs signals from the external world and outputs a pulse to the active input of the PS for every occurrence which is defined as "desired" by its program (0 for "not desired") . The psi source does not "look" at the world directly but only via the computer .

2.2 Cognitive psychology

No convenient inanimate PS has yet been found ; thus, in practice, psychological factors cannot be regarded simply as fluff, to be swept under the OT carpet . Furthermore, the psychology of psi effects is an important area of study in its own right . Psychology must be explicitly (re-) introduced into the OTs . To do so, use is here made of ideas from cognitive psychology (Bourne et al, 1985) . This provides a very useful general framework within which to treat the psychology of psi .

The attention of the classical behaviourist psychologist was, for ideological and strategic reasons, limited to directly observable events : the organism was treated as a stimulus/response machine . Cognitive psychology arose in the reaction against this approach, which was considered unnecessarily restrictive . For the cognitive psychologist the crux of the matter is just those internal processes which mediate between stimulus and response.

Cognitive psychology is concerned with models of the "human information processing" system (HIP) . The signals which enter the human being via his senses are processed in complex ways . Discrete processing functions are typically illustrated as boxes, having more or less complex interconnections, along which information passes . The backbone of introductory texts is the three different types of human memory and the relationships between them : memory forms a foundation without which complex processing would be impossible .

This approach to psychology owes much to computer modelling of human processing activities and the underlying realization of the unity of logical functions, whether implemented by neurons or silicon chips . This independence from the substrate is particularly attractive for modelling the human psi system, where next to nothing is known about the physiology. Irwin (1979) pioneered this approach in parapsychology .

Both cognitive psychology and the OTs spring from the same general world view and they can thus be combined in a natural way. Furthermore, psychologists with other approaches can readily

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translate its concepts into their own terminology .

3. The classical Quasi Perceptual Model of ESP

Before beginning to develop the new model it is instructive to examine the classical quasi perceptual model in like terms . This is diagrammed as figure 3 . On the input side the sensory organs shown are eye and ear . The outputs depicted are hand (representative of the voluntary nervous system) and heart (autonomic) . Each particular input and output has associated with it its own special processing (box) . Each such idiosyncratic processing system is somewhat similar to the special "interface" needed for a specific computer peripheral : at any rate these boxes can be regarded as relatively fixed in function and intractable to modification, except possibly by physical intervention .

Many of the processing functions of the central box are doubtless also built in. One example of the organization of the "hardware" is the "split brain" patient, whose right hand (in special set-ups) literally doesn't know what his left hand is doing . But as a whole, the most striking characteristic of the central unit is its amazing plasticity . Data from eye and ear may be combined and/or treated as equivalent for further processing . Outputs may all be determined by the same sensory input signals, or visual input only may be relevant for the hand, while auditory input influences heart rate . Exactly what happens is largely determined by the momentary psychological state of the subject, in other words the "program" or software running at the time .

To this rudimentary representation of the HIP, psi must somehow be added . The classical quasi perceptual model does this by analogy to the sensory systems : psi information is supposed to appear at some locus in the CNS, here represented by an eye of Horus . Once arrived, there is some (minor) idiosycratic processing (small box) before the signal is passed on, like any other weak signal, to the central box for further processing . The significance of the dotted line running back from the main unit to the "eye of Horus" is discussed in section 4.3 .

The processing implicated in ESP is thus quite analogous to that involved in the processing of weak sensory stimuli. The entire topic of subliminal perception (SP) has given rise to considerable controversy within psychology, as Dixon (1971) has amply documented . There is some evidence (debated) that reaction to very weak sensory stimulation can be detected on a physiological level (e.g. skin resistance) while the subject fails to report having perceived anything . If real, this apparent differential sensitivity of disparate output systems in response to weak sensory stimulation may be due to the nature of the physiological "hardware" . Elements of subliminally presented pictures, too, may emerge later in dream imagery (the Poetzl phenomenon) . This may be interpreted either as the result of running a different "program" (dreaming) or as the effect of physiological changes on the information processing functions of the central

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box .

Analogously, it has been claimed that ESP responses can be detected by physiological means more readily than by introspection (though this author considers that the empirical evidence does not support this conclusion (Millar, 1979a)) . Further, dreaming is often regarded as a particularly favourable state for gaining information by ESP .

(In the history of parapsychology ESP has been thought of as the basic psi modality ; PK has been relatively neglected. Classically PK has been conceptualized as some kind of motor-like function . In order to achieve his goal (say the 6-face of falling dice) the subject must "know" when to exert his "mental push". The pioneers of experimental parapsychology reasoned that this required information about the momentary state of the dice, which must be acquired by ESP . This "Cybernetic Quasi Motor" model, too, may be represented by a schematic diagram . However, since few contemporary parapsychologists take it seriously, it will not be pursued further here .)

4. The Observational Quasi Motor model of PK and ESP

4.1 The internal feedback channel

A few human beings, for at least a limited period, display apparent psi abilities ; thus on the general OT picture it is reasonable to assume that a psi source is "wired in" at some point to the HIP . The parts of the HIP involved perform information processing functions on sensory inputs before passing the transformed signals on to the PS . The concept of a computer interposed between external world and PS has earlier been used under the umbrella "feedback channel" . The HIP can be neatly subsumed under the same heading, albeit the complexity and sophistication of the organic processing dwarfs currently available inorganic computer systems .

A first attempt to represent a human PK subject influencing a random generator is given in figure 2 . Two FCs are shown in series, between the RG and the PS : the external and internal feedback channels respectively . The internal FC, as well as the psi source, are built into the human being .

The external channel is more directly accessible to experimentation than its organic counterpart : while the RG end of the channel may be inaccessable (e.g. a distant star), the output of the external FC can be monitored, or it can even be modified by the addition of further information processing . By contrast the output of the internal channel, which feeds the PS, is not immediately available . The internal FC and PS are both inside the organism . Even if researchers can (ethically) get inside, they have little idea of where, amongst a maze of tangled circuitry, to stick probing electrodes . But (cognitive) psychology has a fund of knowledge about the structure and output of the internal channel .

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4.2 Perception/motor response as analogue

In figure 4 the observational quasi motor model is represented schematically . This affords a more detailed view of the internal feedback channel than figure 2 . From the viewpoint of the OTs the psi source is just another motor (-like) organ : it is shown connected to the output of the central unit . The traditional output capabilities of the CNS, "twitch" and "squirt" are augmented by the addition of a third possibility "enchant" . The diagram for the OQM, on this level, is surprizingly similar to the classical model, apart from the site of the psi unit .

For ESP a slight complication arizes : an internal RG (illustrated) is necessary for the generation of guesses . This is not a particularly controversial component of the normal HIP and it will not be further discussed here .

The processing of sensory input and monitoring of the organism's reactions have been intensively investigated by psychologists . It seems that the HIP generally keeps rather few secrets about sensory input : information is widely shared between different output systems . There is, for example, a high relationship between introspective report and physiological measures such as skin resistance . Hand and PS are, then, probably functionally connected to about the same point in the HIP. Perhaps this reflects the organization of the system on a "hardware" level .

It seems likely, then, that by monitoring other outputs, such as hand or pancreas, a rough picture of the output of the internal channel can be gleaned . Of course, no one-to-one relationship can be expected : different outputs are not connected to quite the same point in the CNS : the hand does not twitch every time the psi source is stimulated .

Sensory perception/motor response can, then, for the observational quasi motor model, be used as accessible analogue for psi behaviour . (This may be compared with the analogue of subliminal perception for the classical quasi sensory model .) The great store of knowledge psychologists have built up about these normal processes can be applied directly to predict psychic behaviour .

4.3 The threat of possible internal FC/PS interaction

It has implicitly been assumed that the PS is independent of the state of the internal channel . But what, for example, if the strength of the psi source depends on cortical activation, which itself is under the influence of the input . This kind of interaction may in fact occur with the normal motor organs . A problem arises only if the interaction is markedly different for the PS than other outputs . In such a case the simple model of independent internal channel and psi source breaks down and it must be replaced by some interactive version .

In the general OT picture, the PS is regarded as a "black box", devoid of (discernable) internal structure . The possibil-

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ity of internal FC/PS interaction hinges upon just the internal organization of the PS . Specific theories of PS structure are needed in order to generate predictions in the event of interaction existing . Examples are Walker's (1979) physiological theory and (perhaps) Schmidt's (1975) speculation that a strong psi source may be built up in the brain by connecting together many weak ones .

The possibility of interaction exists, too, within the classical quasi perceptual model : the sensitivity of the "eye of Horus", might react differently to factors such as cortical activation, than the conventional sensory organs .

Experimentalists may well hope that interactive effects of this general type do not exist in practice . If they do, it will greatly complicate the otherwise rather general and elegant approaches of both old and new models . Empirically, indeed, such interaction could only be deduced by difference between experimental results and the predictions of the standard (linear) models . In figures 3 and 4 the possible differential interaction is shown as a dotted line from the central unit to the psi element .

5. OQM research program for the psychology of psi
(Bug the internal channel !)

There are two general strategies which may be used to get to grips with the psychology of psi, either on the basis of the classical quasi perceptual or the observational quasi motor model. First of all, knowledge of the analogue, acquired in the context of separate psychological investigations, can be applied to predict psi behaviour . The predictions so derived will be relatively general ones .

Secondly, it is possible to look at the analogue and psi together in the same experiment . This strategy holds the promise of making more fine grained predictions about the psychic behaviour of a particular subject in a given experimental set-up, from moment to moment . In the current section this latter approach is developed.

The analogue for the classical quasi perceptual model is subliminal perception. To measure SP, some motor response is required of the subject. Thus, in practice, the analogue is SP/motor response. The psi modality is ESP . The paradigmatic experiment is comparison of subliminal perception and ESP . How SP/motor response can best be measured for this purpose will not be considered here . The basic prediction is that scoring will have the same pattern under both conditions . Those targets on which the subject scores high in SP/motor response will also yield high scores in the ESP condition . Also, the errors will be similar for SP/motor response and for ESP .

Kelly et al (1975) carried out a version of the paradigmatic ESP experiment for the classical quasi perceptual model . Playing cards were used as target material . They worked with

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target/response matrices (confusion matrices) . Two confusion matrices were constructed : one for weak visual perception and one for ESP .

They then proceeded to show that the two confusion matrices were similar in pattern . Because the ESP confusion matrix was based on relatively low levels of scoring, the pattern had somehow to be teased out of the noise . Statistical methods uncommon in parapsychology (multidimensional scaling) were used to do so . This technical complication may have distracted the attention of parapsychologists from the fundamental simplicity and elegance of such a theory-based approach to the psychology of psi .

The analogue for the OQM is perception/motor response . The psi modality is PK . The paradigmatic experiment is comparison of perception/motor response and PK . The basic prediction is that scoring will have the same pattern under both conditions . The targets on which the subject scores high in perception/motor response will likewise yield high scores in the PK condition . Also, the errors will be similar for perception/motor response and for PK .

It may be noted that the classical quasi perceptual and the observational quasi motor model in many respects parallel each other . Experimentally, they will be quite difficult to distinguish . The primary difference between them is that between SP and normal perception .

The underlying rationalle differs for the two models, however . From figure 3 it can be seen that the SP analogy is the result of regarding all sensory organs as, in some sense, equivalent, including the mysterious "eye of Horus" . On the observational quasi motor model, however, (figure 4) the reasoning is that output organs are equivalent, including the psi source . In this case the attempt is to tap off the input to the PS, using a natural output system (such as the hand) to do so . In other words, the idea is to "bug the internal channel". The predictive value of the perception/motor response analogue will, then, depend on how effectively the bugging operation can be carried out .

It has been argued above that psi source and hand (say) are probably connected to about the same point in the HIP ; the same signals are available to each . But much depends on the "program" running in the central unit : in the extreme case hand and psi source may be fed totally different information . Is there any way of ensuring that identical signals are sent to both?

The output of the internal channel means "desired" or "not desired" by the criterion of the program running at that moment . Human subjects are often reported to be able to direct their psi influence to order e.g. high-score or low-score . This implies that to some degree the "program" (the product of a lifetime's experience) can be changed simply by giving the subject appropriate instructions . Such malleability on the "programming level"

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suggests that the internal channel output might possibly be directed to (say) a hand, by merely issuing the proper instruction .

But what is the proper instruction : perhaps "Indicate whether the input just observed was "desired" or "not desired" ? This is too simplistic : it has been reported that some subjects psi miss when put in a frustrating situation : presumably they would still report hits as "desired" . Many workers have suggested links between psi and emotional gratification . A better guess might be "Indicate whenever you feel pleased by the sensory feedback" .

Figure 5 is used to illustrate a version of the paradigmatic experiment for the observational quasi motor model . Much of the detail of the internal channel shown in figure 4 is omitted here. The output of the external channel is shown "plugged" directly into the HIP, while in reality it will be input via some sensory organ. Two additional inputs are shown (again the input would be sensory). These are labelled GOAL and INSTRUCTIONS . The GOAL is the target state the subject is requested to produce with his PK. The subject is given two push buttons (to parallel the two different inputs of the PS) . INSTRUCTION specifies what internal state he will signal by using his hand to press these buttons .

In the illustrative experiment the subject's GOAL is to use his PK to produce matches between a pre-prepared list and symbols chosen at random by an RNG . These are presented on a computer screen . The INSTRUCTION is to indicate if he is PLEASED by the feedback by depressing the "1" switch or NOT PLEASED, by using the "0" . On each trial the subject attempts both PK and presses a button .

Half of the trials are used by the experimenter solely for their behavioural indication and the remaining half only for the PK result . For each of these conditions, perception/motor response and PK, confusion matrices can be constructed and the similarity between the two can be investigated as Kelly did for the classical quasi perceptual model .

However, it is instructive temporarily to set the error elements aside and to restrict attention to hit rates with different target types . It would be desirable to use target types which result in a wide spread of PK scoring . This may be done either empirically or on the basis of psychological theory .

In figure 6 the results of an ideal paradigmatic experiment are shown . Figure 6a shows the PK success rate for four different target types : 6b displays the corresponding SP/motor response expressed as the percentage of "1" button presses for each of the four different target types . The PK and behavioural index are combined in part c where PK success is seen to be a monotonic function of the behavioural measure .

The experiment above is meant purely as illustration : its

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purpose is to demonstrate clearly the ideas involved in the observational quasi motor model . The behavioural response system with its two buttons is particularly schematic . In practice the two buttons would be replaced by a continuous scale and one would probably monitor, too, some measure of the autonomic system . Innumerable modifications suggest themselves, too many to detail here . Such work is, in fact, potentially the basis for an entire research program which offers a virtually virgin field for experimental ingenuity.

6. Pros and cons of the OQM

6.1 Precipitate Popperians

At this point the murmers of the Popperians have doubtless swelled to an anthem of disapproval . For Popper a theory is scientific only to the extent it can be falsified . It is clear that the observational quasi motor model presented here is not simple to falsify . If an experiment on paradigmatic lines should not result in the promised monotonic relation, then a variety of potential explanations (excuses?) may be offered.

(a) NO PK. In this case it is clearly impossible to test any prediction involving PK.

(b) WHO IS THE SUBJECT ? The internal channel of the PK subject should be monitored . To do so he must be identified . In parapsychological experiments there is considerable reason to think (Millar, 1979b) that the experimenter or someone else associated with the experiment may often be the real source of any psi detected rather than the nominal subjects .

(c) HARDWARE. Pancreas secretion, for example, might reflect the behaviour of the PS better than hand movements .

(d) SOFTWARE. The "program" running at the moment is wrong . In the extreme case quite a different program might control the hand as that which feeds the PS . In other words the psychology of the subject is inappropriate to bug the internal channel . This may be due to an inappropriate INSTRUCTION .

(e) INTERACTION. Even if the current hardware and software are perfect, departure from monotonicity may be due to the internal channel directly influencing the psi source .

Of these problems (a) and (b) are not specific to the quasi motor model : they are a "catch 22" and "23" which bedevil psi experiments in general . Indeed, it may be possible to identify the real subject primarily by the fact that his psychology proves to be relevant . Points (c) and (d), hardware and software, are the most important uncertainties in the OQM . They boil down to imperfect knowledge about how best to bug the internal channel . In other words, it is not known under precisely what conditions the analogue perception/motor response should be measured . The problems with the observational quasi motor model here seem more severe than those of how best to measure SP for the classical model . The problem may, however, be turned upside down . Instead of trying to demonstrate the truth of the model by using arbitrary INSTRUCTIONS, it is possible to try out different INSTRUCTIONS . On the basis of the OQM, that INSTRUCTION which produces the most monotonic relationship gives some indication of where

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the PS is connected into the HIP . The INSTRUCTION is used as a probe to investigate the psychology of psi . As to (c), the possibility of interaction, as pointed out earlier, this is a potential problem with the classical model too.

In spite of the weaknesses a Popperian will delight in noting, the observational quasi motor model compares reasonably well, in terms of potential falsifiability, with its only serious contender, the classical quasi perceptual model . In the current state of the art in psychology in general, both models look quite promising . The OQM offers a whole range of fine grained prediction . This stands in marked contrast to the present rudimentary and largely empirical state of most psychological research into psi phenomena .

While the topic of this paper is the new observational quasi motor model, the classical quasi sensory model seems to be worth pursuing more vigorously than in the past . Perhaps the OQM can rescue this research from the doldrums by providing the stimulus of competition .

6.2 Intelligence and psi

One of the most striking characteristics of psi effects is that they are intelligent . This sets psi apart from the normal blind forces of the physical world . Because paranormal phenomena are, to a surprising degree, independent of the usual space/time constraints, many have seen in parapsychology an indication that the intelligent part of our being may not be limited by the constraints of space and time .

The trend of main-stream psychology today is increasingly to regard intelligent actions as the product of computational activity in brain tissue . The OQM is in line with this approach . On this basis the intelligence of psi effects lies in the computational activity of the HIP . Where and how psi appears in the external world depends on the nature of the "program" run in the internal channel . The OQM may well look unattractive, at first sight, because it seems to contradict the hopes which initially brought many workers into parapsychology . On the other hand, the observational quasi motor motor model may have more attractions for psychologists since it brings the psychology of psi effects into the same framework as normal psychology .

7. Conclusion

In this paper the observational quasi motor model of the psychology of psi has been introduced . It is the offspring of a union of the general OT picture with basic ideas from cognitive psychology . The article forms part of a series on the OTs, a preliminary version of which is appearing in our "house journal", the SRU Bulletin. Polished versions will be published in the new Theoretical Parapsychology. This is the first of a trilogy of papers on the psychology of psi. Here the outlines of the model are sketched, with particular relevance to PK . The second article will deal primarily with ESP, while in the third the literature will be examined in the light of the observational quasi

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motor model.

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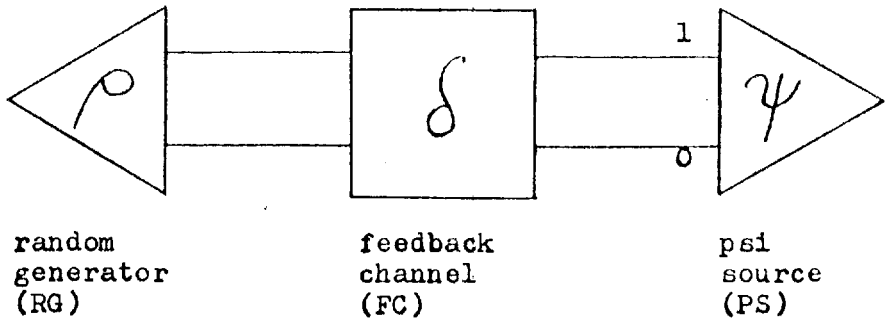

Figure 1 : The general psi circuit

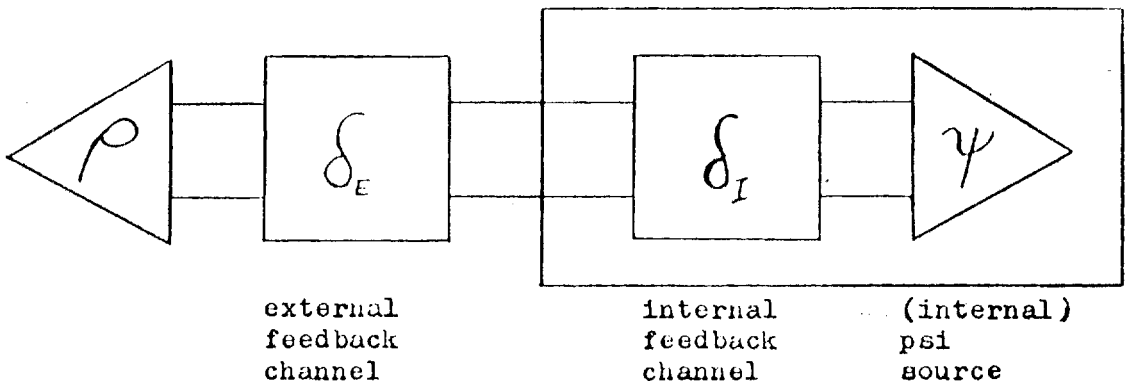

Figure 2 : Human PK - a first representation

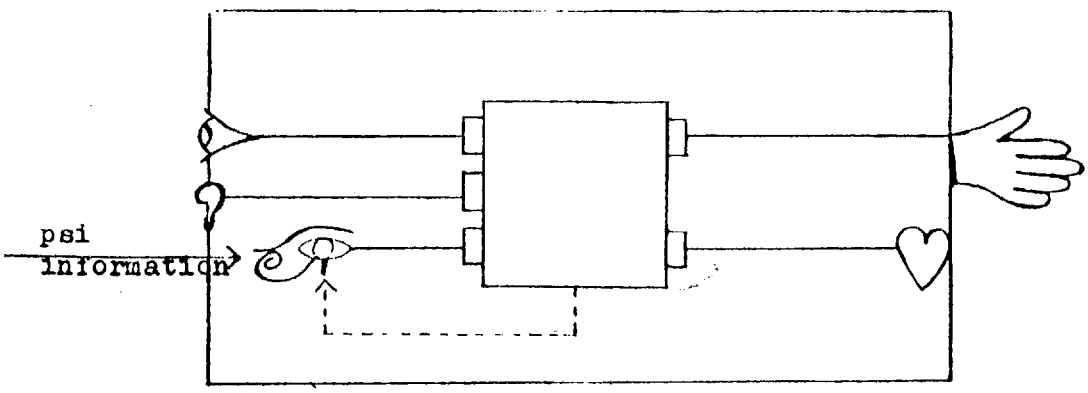

Figure 3 : The classical Quasi Perceptual Model of ESP

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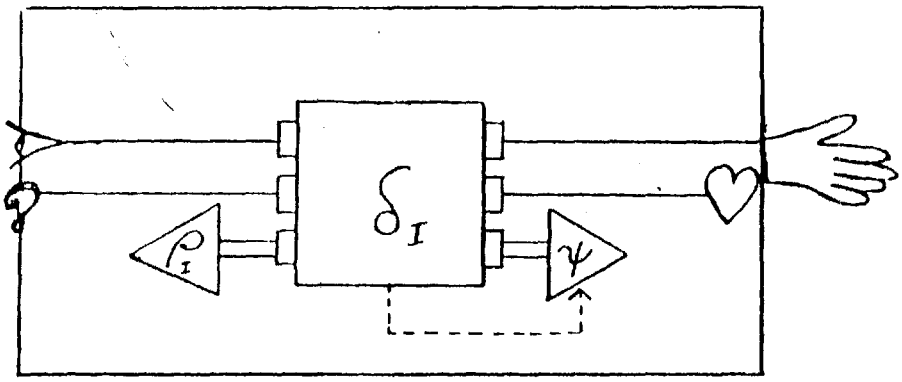

Figure 4 : The Observational Quasi Motor Model of PK and ESP

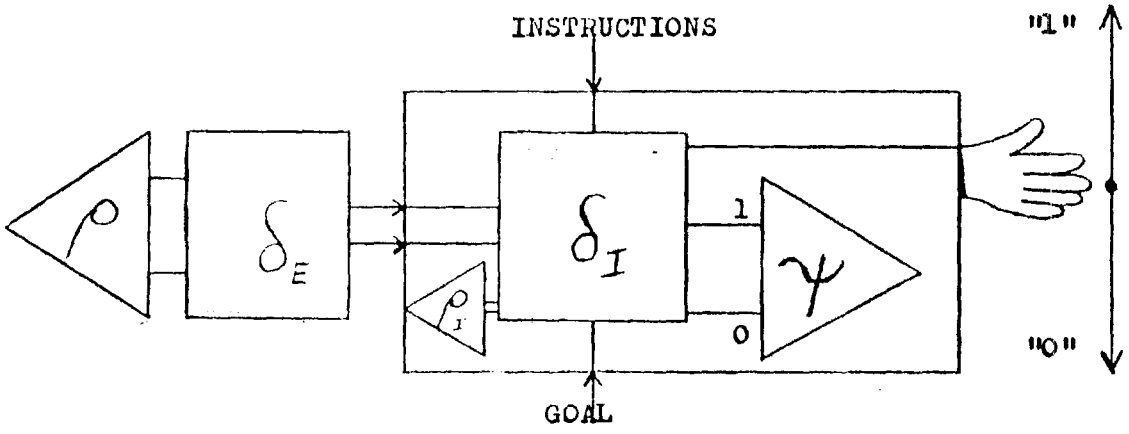

Figure 5 : Bugging the internal channel

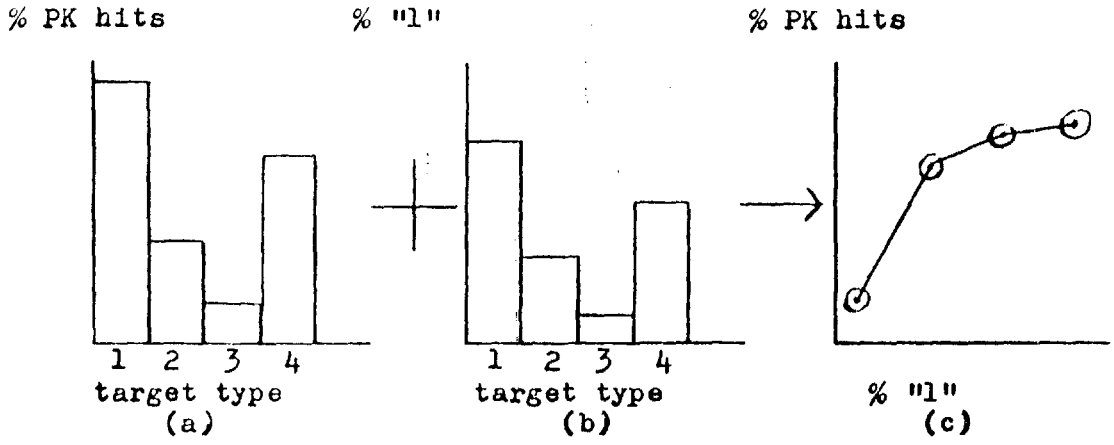

Figure 6 : Results of ideal paradigmatic PK experiment on the OQM
(a) PK scoring rates for different target types.
(b) SP/motor response : switch pressing behaviour (% "1") for different target types.
(c) monotonic relationship between PK and behavioural index.

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