

## RESEARCH ARTICLE

### On the Resurrection of Trans-Temporal Inhibition

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Submitted February 24, 2017; Accepted March 4, 2017; Published March 15, 2017

**Abstract**—Application of basic learning theory to multiple-choice ESP tests, like card guessing with delayed feedback, revealed this standard procedure to be an *extinction paradigm*, an analysis further supported by the evidence of frequent declines in ESP performance with continuing practice. This application of learning theory predicted that percipients who possessed some demonstrable ESP ability to begin with, who were attentive and motivated to learn, and who received immediate feedback, could learn how to score better and not experience declines. In a 3-stage Selection, Confirmation (for ESP ability), and Training Study, not only were declines absent, but much higher ESP-hitting than usually seen on the present time target was observed. A later exploratory analysis showed unexpected and very strong ESP-missing on the immediately future target. The theory postulated to explain this, Trans-Temporal Inhibition (TTI), parallels sensory enhancement processes in our ordinary senses, and, perhaps more importantly, suggests that some aspect of the mind may have a temporally wider “now” than our ordinary “now.” The author hopes that presentation and discussion of this material here may stimulate others to devise more adequate physical theories about the nature of time and/or psychological theories about information processing procedures in ESP.

#### Introduction

Being blessed (or perhaps cursed<sup>1</sup>) with wide-ranging curiosity, I have studied many aspects of consciousness and psychic (in the paranormal sense) functioning. One of my most curious and frustrating findings, but one which may contain important clues as to how various forms of ESP or consciousness may function, is something I named *Trans-Temporal Inhibition (TTI)*. Until this Journal’s editor, Steve Braude, sent me a draft of his Editorial [in this issue] and an invitation to comment on it, I had resigned myself to thinking the concept of TTI was too strange or too far out to tempt scientists to investigate further, and I would see no more of it in my lifetime.<sup>2</sup> Yet I think TTI may be very important, so I thank Dr. Braude for this resurrection.

Dr. Braude has done an excellent job of explaining in his Editorial what TTI is, but the data and theory are complex, so let me start from scratch and from somewhat different perspectives to enrich the description and explain the theory.

While still in graduate school, and required to take a rather boring course on the psychology of learning, I had an insight about the standard multiple-choice type of test of trying to psychically identify a sensorially shielded target without immediate feedback that was almost universally used in parapsychology. This was typically some form of card guessing. But rather than only a test of possible skill, it was, from a learning theory perspective, actually a classical *extinction paradigm* of the sort typically used to confuse and inhibit a skill. Empirically supporting this analysis, so many multiple choice ESP tests showed decreasing above-chance scoring with repeated trials that this *decline effect*, as it had been named, was expected and, indeed, was correctly cited as supporting the existence of ESP (Tart 1966). “Chance” doesn’t get tired or bored or inhibited, but people do.<sup>3</sup>

This also meant, in a perverse way, that parapsychologists were unwittingly killing off, extinguishing, the ESP talent they wanted to study.

I published this as a formal theory in 1966, staying largely within classical behaviorist learning theory, and later elaborated on possible internal processes involved (Tart 1977b). Briefly, studies of *confidence calls*, where a would-be percipient felt they were more likely to be right on a given trial, showed they indeed were more right on those trials. So while a percipient might be guessing most of the time, once in a while ESP had given them the correct information as to target identity on that trial *and* percipients could sense something different about their impressions on that trial. So if a percipient wanted to learn to get better at ESP, she could inspect her mental/body/emotional state on each trial, note any particular characteristics, then respond. If she got immediate feedback of right or wrong, she could gradually form a catalog. “When I feel A, I should relax and not make a call, I’m almost always wrong when I feel A. When I feel B, I’m right a lot of the time, let me try to perceive B more clearly and learn to use it as a guide for when to respond. Etc.”

Immediate feedback was almost never given, however, when the usual ESP task was guessing the order of a shuffled deck of cards. The Zener 25 card deck, e.g., had 5 cards each of wave, star, plus, circle, and square sign, and a standard run was 25 guesses at a thoroughly shuffled deck that was sensorially isolated from the percipient. Chance was 5 correct hits, and statistical evaluation of more extreme scores was straightforward and well understood. If you gave immediate feedback of what the target was after each trial, though, a simple card-counting strategy could raise scores greatly



**Figure 1. Symbols on the Zener cards, widely used in classical studies of ESP.**

without any ESP being involved. When you knew most or all of the stars had already been used in this run, e.g., you guessed other symbols, etc.

With a lot more work than simply thoroughly shuffling the target deck before each run, you could effectively eliminate any usefulness of a card-counting strategy. If you blindly and randomly created a deck of 25 cards from a much larger deck, say 50 Zener decks all mixed together, then you usually didn't have an equal number of each target card in the target deck, and the changes in chance expectation became too small to worry about. But by the 1960s, when I was in graduate school, any lab could have some kind of electronic random number generator (RNG), where each trial was independent from the previous trial, so immediate feedback that did not confound the statistical evaluation became practical.

I began teaching an upper division class on experimental psychology in the 1970s at the Davis campus of the University of California, and decided to teach by having the students be my apprentices in some real experiments involving immediate feedback to see if (a) the typical decline effect could be eliminated in ESP studies, and (b) learning, increased ESP performance with increased practice, might result. My students were very pleased with doing something real that might make a contribution, instead of old textbook exercises, and devoted many extra hours beyond those required to act as experimenters. I considered and treated them as my colleagues and co-experimenters (Co-Es), and they responded very well to being treated this way. The basic work has been described in detail elsewhere (Tart 1975a, 1976), and this kind of collaborative atmosphere is probably quite important in most psychological experiments, not just parapsychological ones.

In teams of two or three, my students requested the last few minutes of

class time from a variety of professors at UC Davis and, after a brief pep talk, gave a quick multiple-choice GESP card test, with no feedback, to the class. This was the initial Selection Study. *My learning theory approach required that potential learners have some ESP talent to begin with, otherwise immediate feedback about chance-driven responses would be useless for learning ESP.* I emphasize this, as several researchers later applied an immediate feedback approach to would-be percipients who had not been selected for having clear ESP talent to begin with, with no demonstrable effects of feedback. Such an outcome is what would be predicted with my feedback learning theory, but trivial. Multiple-choice guessing is full of hits from chance alone, and without a sufficient number of ESP-mediated hits also, there is nothing for the feedback to do to produce learning.

Students who scored highly in this initial mass Selection Study were invited by a co-experimenter to our laboratory for the Confirmation (of probable ESP talent) Study, half a dozen individual ESP tests on both a 4-choice and a 10-choice tester/trainer. Because so many students were tested in the initial Selection Study, some would have scored high by chance alone, but the odds of a particular student scoring high by chance twice in a row were much less (roughly  $.05 \times .05 = .0025$ ), so those who did well in this Confirmation Study phase were invited to the actual Training Study. In that Training Study, each percipient chose to work exclusively with either the 4-choice trainer (Aquarius ESP Trainer) or a purpose-built 10-choice trainer (TCT, Ten Choice Trainer) for 20 runs. These 20 runs of 25 trials each were scattered over a variable number of days, determined by laboratory availability, class schedules, etc. Performance indicative of a high level of ESP was shown by both groups. I will focus on the TCT results here.

Ten percipients completed the planned 20 runs each on the TCT, with immediate feedback of target identity on each trial (the intended target lit up), scoring a total of 722 hits when 500 were expected by chance. This has a 2-tailed P value of  $2 \times 10^{-25}$ . As predicted by the theory, no significant declines were seen, and several percipients showed signs that could be interpreted as learning, even though 20 runs were probably not really enough training.

I will ignore the importance of the elimination of declines and possibilities of learning better ESP performance here, as we have a different focus.

I was unable to expand this research on the value of immediate feedback for learning better ESP skills for reasons beyond my control, and I also got involved in the SRI remote viewing research, but I'm pleased to note that relatively quick and non-interfering feedback<sup>4</sup> has generally been a part of remote viewing research, and declines are seldom, if ever, spoken about, in that literature.

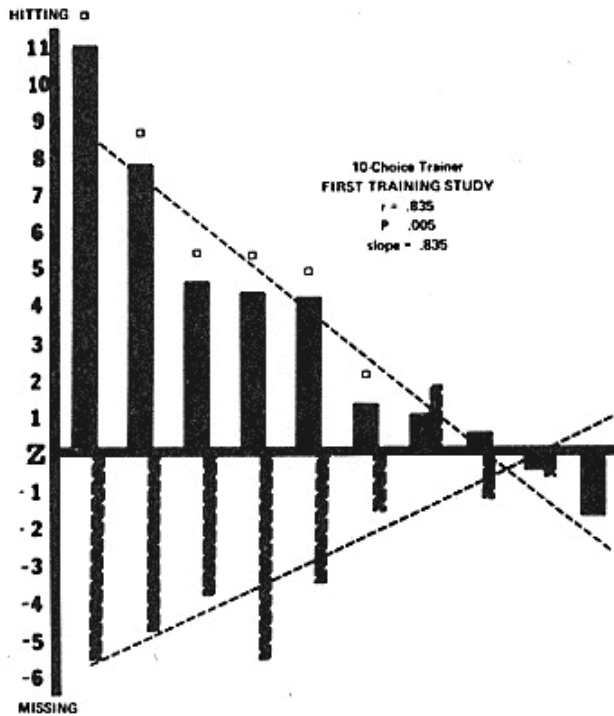
### Other Results of the Training Study

In addition to the obvious analyses for the presence of ESP, declines, and learning, I looked at the mass of data in various exploratory ways to see what hypotheses might be generated. One of these ways, often reported in the classical experimental parapsychology literature, was looking for temporal displacements. That is, might a percipient have been using ESP that was not “focused” properly in time? The stated task, for both percipient and co-experimenter, in our studies was to score high on the real-time telepathic task, to push a response button that matched the associated light that the co-experimenter/sender, in another room, was trying to telepathically “send” on each trial, time T.

I had been pleased that there was such highly significant hitting on the intended, present-time target, a degree of hitting well above that usually found in parapsychological studies. But what surprised and amazed me when I examined temporal displacements was an enormous amount of psi *missing*, scoring way below chance, when the response at time T was compared to the target at  $T - 1$  or  $T + 1$ .

ESP-missing had been discovered long before I got involved in parapsychological research. If I shuffle a deck of ordinary playing cards, e.g., conceal it from your known senses, and ask you to call red or black as we go through the concealed deck, we know 50% correct is expected by chance, and we can evaluate the statistical significance of deviations from 50%. If you called every card correctly, 100%, that would be enormously significant, (one in  $.5^{-52}$ , probability about  $2 \times 10^{-26}$ )! But what most people don't realize until they think about it is that it would be just as significant if you did not get a single call correct, 0%! Interestingly, various studies in the last century showed that significant psi-missing was associated with psychological factors, particularly a stated *disbelief* in ESP. This is usually referred to as the *sheep-goat effect*. This has long fascinated me. These were usually studies on students, people strongly conditioned to believe that tests show how much you know, or are at least supposed to show that. It makes psychological sense, then, that a person who believes there is no ESP, a goat, is pleased when they do poorly on an ESP test. It apparently validates what they believe; there is no such thing as ESP, thus there is nothing to know, so of course they got a low score. But scores significantly below chance can occur only if you postulate that some unconscious part of the goats' minds, intending to uphold their conscious beliefs, occasionally uses ESP to know the *correct* identity of a target card and then influences the conscious mind to call anything but that, thus producing the pseudo-validation of low scores . . .

Focusing on the TCT results, the 10 percipients got 720 real-time



**Figure 2. Real-time ESP-hitting versus +1 precognitive missing in the Training Study on the Ten Choice Trainer.**

hits when 500 were expected by chance, with the conservative 2-tailed statistical likelihood of this being  $2 \times 10^{-25}$ . But in looking at T + 1 hits (precognition), the percipients got only 318 hits in 4,790 trials<sup>5</sup> when 479 would be expected by chance, the conservative 2-tailed P of this being  $8 \times 10^{-15}$ , a level of missing hugely stronger than that typically reported in ESP studies.

There was also highly significant missing for the T - 1 trials, but since this could be conservatively attributed to people's general belief that random numbers do not repeat, and the percipients knew what the T - 1 target had been because of sensory feedback, and so deliberately did not use the last target identity as their call, we will not give much attention to the T - 1 performance here.

Figure 2 shows real-time hitting and +1 missing scores from the ten percipients using the TCT, my first Training Study, the data from which the TTI theory was developed.

What was going on?

### **There MUST Be Something Wrong With The Statistics!**

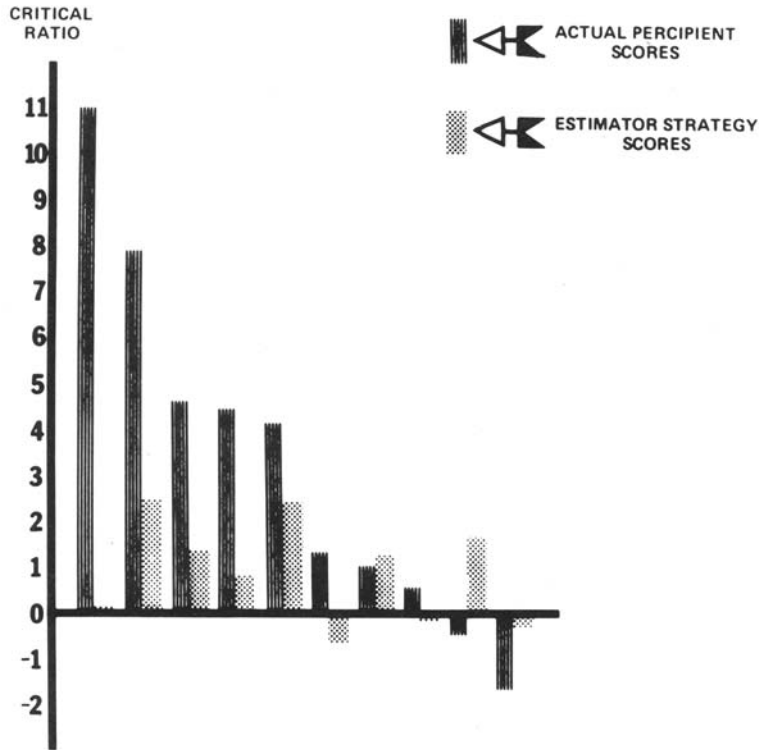
Since experimental evidence for the existence of ESP became well known, especially once J. B. Rhine's laboratory at Duke University published extensive studies, resistance to the idea that ESP could be real has been widespread, and almost universally includes a charge that there must be something wrong with the probability statistics used to analyze the data. My assessment is that this is usually primarily irrational rather than scientific resistance, as the critics almost never actually prove just how the statistics of a given experiment can be wrong, simply reiterating that they *must* be wrong. Nor do the critics deal with the fact that if the very basic analyses that have found significant hitting, arguing for the existence of various forms of ESP, are indeed fundamentally flawed, then the bottom has been knocked out of many scientific disciplines which use the same methods. See Utts for elaboration of this (Utts 2015).

But of course statistics are occasionally used incorrectly, or target sequences in repeated calling are not adequately random, so one of the first analyses I did of the Training Study data was to examine the target sequences post hoc for signs of deviation from randomness. The size of the possible biases in target sequences was rather small, however, while the present time hitting was large. But could they have accounted for the real-time hitting results?

I devised a computer-based card calling program, the Probabilistic Predictor Program (PPP), to see if these biases could explain the observed hitting, and Eugene Dronek, a colleague at UC Berkeley, wrote programs to test it on a mainframe at UC Berkeley.<sup>6</sup>

Here is the abstract of our published report (Tart & Dronek 1982):

With increasing use of immediate feedback of target identity in parapsychological research, the question of departures from randomness (equal probability and serial independence) in target generators becomes important, as it is possible that some percipients might identify such departures and develop a mathematical inference strategy for predicting targets, thus artifactually inflating their scores. A key aspect of randomness of relevance is not a lack of pattern per se, but the predictability of the generator. It is shown that standard chi-square tests of randomness are poor measures of predictability in short to moderate length experiments. A direct approach to the predictability of possibly biased target sources has been developed, the Probabilistic Predictor Program (PPP), which is probably much more powerful than most human percipients could be. The operation of the PPP is described in detail. The PPP is then applied to both the target and response data of Tart's first training study, where some small departures from randomness were found in the electronically generated target sequences



**Figure 3. Real-time ESP-hitting in the Training Study by actual percipients versus the card-calling strategy of the Probabilistic Predictor Program.**

and, of course, in the percipient-generated responses sequences. The PPP was found occasionally to score significantly on the target sequence, but far less successfully than the actual percipients did. The more biased response sequences were predicted quite significantly by the PPP. Examination of the internal displacement scoring patterns of the PPP was also compared with the patterns of actual percipients and found to be radically different. For these two reasons, it was concluded that use of mathematical inference strategies of the PPP sort could have only accounted for a trivial portion of the extremely high target scoring of the percipients in the first training study. While we should normally strive for completely random targets sequences, the PPP is offered as a powerful approach to the question of predictability when departures from randomness do occur, and can be of use in working with other experimental data.

Figure 3 shows how the PPP scored compared with the actual percipients' real-time hitting scores. You can see why I think the slight



biases in the target sequences were of no real consequence. As noted briefly in the quoted abstract above, it did not produce the +1 missing pattern that the actual data did.<sup>7</sup>

Somewhere in the middle of my career I noticed that statistical analyses applied to testing the existence of ESP were almost always of the most basic sort, deliberately and appropriately conservative. Once we accept the reality of occasional ESP, though, exploratory examinations of those old datasets might contain valuable hints on the nature of ESP or the style of its psychological processing, such as TTI. I tried to interest colleagues in setting up a permanent data repository, with no luck. It was too labor-intensive at that time.<sup>8</sup>

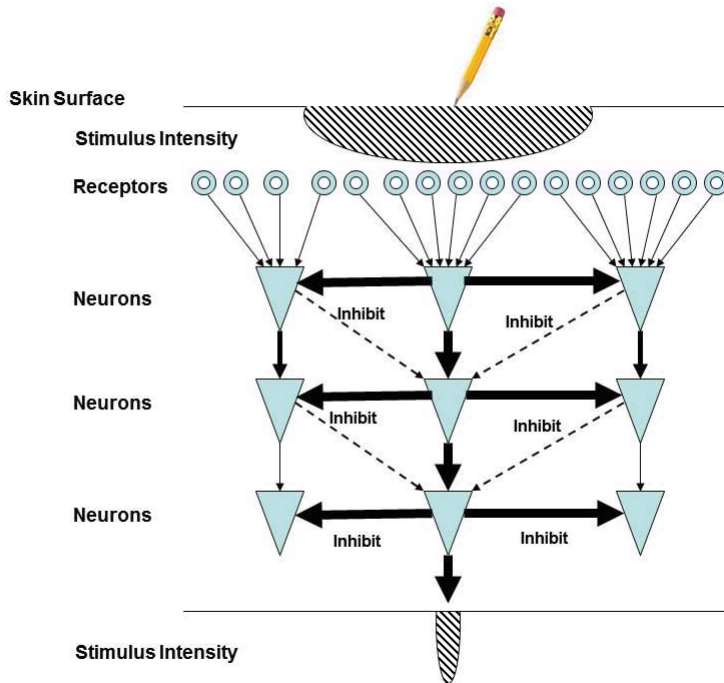
### **Reaction to Huge ESP-Missing**

I should add that, personally, I found this enormous ESP-missing shocking! Years before, I had intellectually accepted the reality of occasional precognition occurring as a result of studying the experimental literature. That ESP-missing, commonly referred to as psi-missing, (on the designated, present time target) could occur was not surprising to me, and I had always been fascinated by the psychological theory that such ESP mediated missing happened to support conscious disbelief in ESP. And with almost all laboratory ESP results being weak, real-time ESP or deliberate precognition, statistically significant at the .05 or .01 level but weak in actual magnitude, precognition was just an intellectual concept to me. But this very strong level of it, happening in my own laboratory, forced me to think more deeply about it, and I realized that while I *intellectually* accepted precognition's reality, at a "gut level" it did not exist, the data could not be like this! I couldn't even say that I had psychological resistances to the concept of precognition; you don't have or need defenses about things which make so little sense that they obviously don't exist. I lived in a Newtonian universe, the present was real, the past was gone, the future did not yet exist.

But here was powerful data, and my attempt to explain it away as some sort of artifact in the random order of the targets didn't go anywhere. What could I make of it?

### **A Clue—Lateral Inhibition**

After hearing me give a preliminary presentation on the feedback training study and its +1 psi-missing (Tart 1980) to the Langley-Porter research division of the University of California in San Francisco, research director Enoch Calloway told me it reminded him of a sensory phenomenon of neural inhibitory fields surrounding a stimulated neuron, so I looked into the work



**Figure 4. Lateral inhibition in touch receptors.**

of Nobelist Georg von Békésy (von Békésy 1967). My Figure 4 shown here, inspired by one of von Békésy's drawings, shows the phenomenon for our sense of touch.

Picture a small, sharp object like a pencil point pressing down on your arm, hard enough to depress the skin a quarter inch or so, but not hard enough to break the skin. What will you feel? A sharp point pressing down, of course.

But think about it. The skin is stretched all around the pencil point. For simplicity, assume your touch-sensing receptors (represented by the triangles in Figure 4) are distributed in a fairly regular grid. The shaded area at the top of the figure represents maximum skin displacement/pressure around the pencil point. Touch receptors all around the pencil point are being stimulated as well as the one directly underneath the point, although not quite as strongly. Simplifying to one linear dimension and just three receptors in the figure, the middle receptor, directly under the pencil point, will be receiving the strongest neural impulse (represented as 6 arrows),

while those on each side receive a weaker stimulus, represented as 4 or 5 arrows.

But if we look at the outputs of each receptor, the receptor directly under the pencil point puts out a much larger signal than those to the side, and with each neural layer we get a strong signal directly under the pencil point and none from the stretched skin around it. This is because each neural receptor also generates an inhibitory signal laterally to those around it, represented by the heavy, horizontal arrows in the figure. The first stimulated receptor is telling the next receptor up the chain toward the brain, "Pass on a strong signal," but telling the receptors beside it: "Relax, no need to respond much." After just a few levels, the nervous system is transmitting only a signal of a sharp point, not of a stretched area.

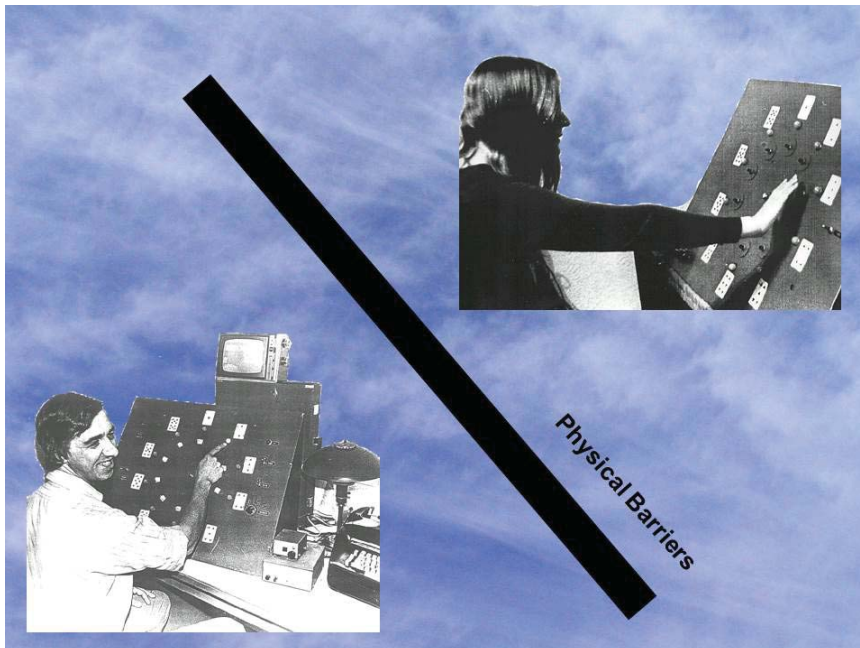
This kind of signal processing has been found, to my knowledge, in all the classical sensory systems, and the process makes stimulating objects stand out from each other more clearly. The same process is used in modern electronic equipment, where it may be referred to by names such as *edge detection* or *contrast enhancement*.

### **An Initial Theory, Trans-Temporal Inhibition**

Then followed months of looking at the data in many ways, plotting it out to look for possible visual patterns, reading in the philosophical and scientific literature on the nature of time, etc. This reading on time was both interesting and frustrating, as I learned all sorts of clever ways of thinking about time, multiple instrumental and scientific ways of dividing and subdividing time ad infinitum, etc., getting further and further from the way I actually experience time, particularly the *now*. It's clear, e.g., that when I examine my experience and say something like "I am sitting in front of my computer, typing and thinking, and I'm doing it *now*," that makes perfect sense and useful sense to me and others. Worrying about ideas like "now" as actually a mathematical abstraction of no or infinitesimal duration, that it is only an abstraction dividing the past and the present, doesn't shed any light on my actual experience. And seeing "now" as a useful psychological concept for experience does nothing to explain how precognition could work . . .

Let's look at my main study procedure in more detail.

Imagine you are the designated percipient in a formally designated telepathy experiment. Each time a signal light in the center of your Percipient's console shows a new trial has been initiated, you know from previous instructions that a distant experimenter/sender has triggered an electronic RNG to select a number from zero to nine, has switched that target light on on his or her Sender's console, and is trying to mentally send it to you.<sup>9</sup>



**Figure 5. Experimenter/Sender's console (lower left) and Percipient's response console (upper right) of the Ten-Choice Trainer.**

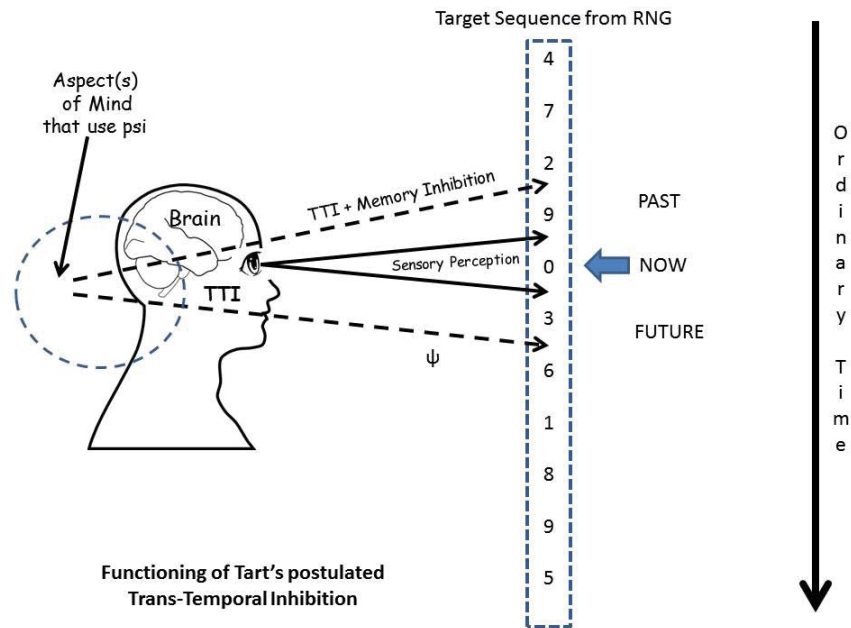
Figure 5 shows the response panel before which a percipient sat, at upper right, with the lit Ready light in the center (almost covered with the percipient's hand in this photo), showing that a trial had commenced. The experimenter/sender, me in this photo, lower left corner, is concentrating on sending target number 2. The TV screen is connected to a camera above the percipient's console giving the experimenter/sender continuous feedback as to where the percipient's hand is on the TCT response console.<sup>10</sup>

When you, as percipient, finally make a choice by pushing a response switch, your choice is recorded and shortly the next trial is initiated.

### **Theory of Trans-Temporal Inhibition**

Figure 6 below shows an illustrative sequence of 11 consecutive trials. On the first the target is 4, next it is 7, then 2, etc.

If the percipient could visually see the lit target number, as in ordinary sensory perception, it would be conventional and useful to talk about a small amount of time, an experienced "now" that focused on the first target,



**Figure 6. A sequence of 11 ESP trials.**

then moved to the next target on the next trial, etc. This is shown by the narrow sensory perception cone in Figure 6.

It's straightforward to think in ordinary terms that this narrow cone of perception constitutes a "now" of its own, "Now I am looking at the fifth target," to be followed by "Now I am looking at the sixth target," etc.

But the strong precognitive missing effect in the data suggested to me that the "now" cone for ESP can be temporally wider than the present time "now." I have sketched it in in Figure 6 as including both the immediately past -1 trial (where the target was 9) and the immediately upcoming future +1 trial (where the target, not yet selected by the RNG, will be 3). While the percipient is trying to psychically identify this fifth target (a zero in Figure 6), at some level of the mind, probably not conscious, the percipient may, during the experienced "now" of trial five, develop positive feelings about both the number zero and the number three, which, while not yet picked by the RNG, will be the target randomly picked for trial six. The possible precognitive perception of the 3, the next target identity, is *wrong*, though for the intention of using ESP to identify the current target, the ordinary "now" target. Thus it would help performance on calling the now targets

if there were inhibitory feelings, negative feelings of some sort about the identity of the next target, even if it is in the “now” cone of the ESP time present. I named this inhibition to call the next target when you’re trying for the ordinary time “now” target *Trans-Temporal Inhibition, TTI*.

Note I sketched in and theorized that the “now” for ESP can be wider in both past (-1) and future (+1) directions, as I’ve been influenced by knowing (at a lay person’s level) that many (perhaps most?) of the successful equations of physics are symmetric with respect to time. In this data, though, the excessive missing on the immediately past, -1 targets, could be more conservatively explained, as noted earlier, as memory of the sensory feedback about past targets’ identities, combined with a common human bias that “random numbers don’t repeat.” Insofar as the “now” of ESP can be wider than our ordinary sensory “nows,” however, it will be important to experimentally determine if there is a psychic TTI for the (immediate) past as well as the (immediate) future, and this could be done in repeated calling studies using no sensory feedback.<sup>11</sup> For its stimulation value, though, I’m going to assume that TTI is a time-symmetrical phenomenon, so the -1 missing is a combination of both memory plus bias about random numbers not repeating, as well as ESP-mediated post-cognitive identification of the identity of the -1 target, combined with some recognition that this is adjacent to, not the same as, the desired now target, and so should be inhibited.

As I stated at the beginning of this response, I doubt that I really understand what’s going on with this strong psi-missing, but it’s powerful empirical data, and I hope this response and the earlier data-rich reports on TTI and the learning aspects of immediate feedback training (Tart 1975b, 1977a, 1977b, 1978a, 1978b, 1979a, 1979b, 1979c, 1979d, Tart & Dronek 1980, 1982) will stimulate others more competent than I to come up with better understandings.

I have long been impressed with Stanford’s hypothesis of Psi Mediated Instrumental Responses (PMIRs) (Stanford 1974b, Stanford et al. 1976) and Carpenter’s further rich development of the psychology of ESP (Carpenter 2012), postulating that normally unconscious aspects of a person’s mind may scan that person’s immediate spatial location for events and conditions that would help that person fill their various needs and, sometimes, subtly influencing that person to, for no obvious reason, just happen to wander to that location and be “lucky.” Now I see I have been forced to expand that idea to non-conscious ESP scanning of a person’s immediate future, not just spatial location.

I should also note that there has been a fair amount of interest in a form of precognition usually titled *presentiment* in the last decades. As a recent meta-analysis (Mossbridge et al. 2012) observes in its abstract,

This meta-analysis of 26 reports published between 1978 and 2010 tests an unusual hypothesis: For stimuli of two or more types that are presented in an order designed to be unpredictable and that produce different post-stimulus physiological activity, the direction of pre-stimulus physiological activity reflects the direction of post-stimulus physiological activity, resulting in an unexplained anticipatory effect. . . . The results reveal a significant overall effect with a small effect size [fixed effect: overall ES = 0.21, 95% CI = 0.15 – 0.27,  $z = 6.9$ ,  $p < 2.7 \times 10^{-12}$ ; random effects: overall (weighted) ES = 0.21, 95% CI = 0.13 – 0.29,  $z = 5.3$ ,  $p < 5.7 \times 10^{-8}$ ]. Higher-quality experiments produced a quantitatively larger effect size and a greater level of significance than lower-quality studies. . . .

Whether I, or anyone else, can make satisfactory sense of precognition, then, more and more data force us to deal with it.

### Putting it Together

As living, biological organisms, we need to protect ourselves from danger and find and use resources to make ourselves reasonably happy and safe. The vast majority of the time, our classical biological five senses are superb for telling us about relevant events in our immediate physical environment, but clearly there are times when some sort of ESP would give us advance warning of both dangers to avoid if possible and opportunities that would be highly advantageous.

So let's imagine that I am here in the role of would-be percipient, sitting in front of the response console. My experimenter has explained to me that we will be doing 25 trials in this particular run, and on each trial she will be using an electronic device, an RNG, to randomly select one of the 10 possible targets and trying to send its identity to me. I am to pay attention to whatever impressions I get, hoping that one of them will be about the identity of the target my experimenter is sending, and push the corresponding response button. I am to be on the lookout for subtle clues about my own state that are associated with hitting or missing, and adjust my strategy accordingly. If I have a certain feeling on a given trial that is usually associated with missing (which I potentially know from the feedback I get), I can push the Pass button to skip that trial, or I can just wait till that feeling goes away, or some feeling associated with hitting comes up, or I could just push a button pretty much at random.

My psychological universe of concern has been set up to be the run of 25 trials.

Insofar as the TTI theory is correct, there is a part of my mind which uses ESP, and its "now" is inherently wider than my ordinary sensory "now." So as I try to pick up subtle hints from that part of my mind to help

me respond, it's picking up information about the +1 and -1 targets, as well as the current now target.

If somehow I could control that extrasensory part of my mind so that its now was narrowed down to only include the present trial, possible confusion or distraction caused by the +1 and -1 targets wouldn't matter. But apparently, at least sometimes, it's the nature of the ESP part of the mind to have a wider "now," and, in this case, include the +1 and -1 targets. For efficiency, then, there has to be some quality detectable by the extrasensory part of my mind that identifies the +1 target as future and the -1 target as past (or at least as not-now), and so I develop a negative feeling toward the +1 and -1 target identities. This happens often enough to come out to be quite statistically significant, thus the phenomena of TTI appears.

The TTI process, this contrast enhancement, is not a conscious experience of the percipient, though, and whether this happens "unconsciously" to whatever part of the mind uses ESP or is a "conscious" process within that part of the mind is unknown.

So is TTI telling us something about the actual "physical" or "non-physical" nature of reality, or does the phenomena represent only information processing that has nothing to do with the nature of ESP and/or precognition itself?

### **So Reality Is?**

The beauty and power of science, as I understand it (I discussed science's basic nature in 1972 in a forum widely read in the scientific community, and I have not seen any refutation of my basic description of scientific method since then) (Tart 1972), comes from its insistence that *data is always primary*. Theory to explain the data is our goal, but that theory must lead to predictions that can be empirically tested. If no empirically testable predictions can be made, the theory is philosophy; interesting perhaps, but not science. If the predictions don't work out, the theory is inadequate or wrong, no matter how logically and mathematically elegant and appealing it is.

Sometimes a theory will not lead to testable predictions for some time, but acceptance of or commitment to such new theories may lead to considerable effort on them continuing. For years, for example, I've been reading accounts of how string theory remains one of the biggest activities in physics, invisible "strings" in their own dimensions, perhaps 4 of them, perhaps many more of them—in spite of the fact that there is still no clear empirical evidence supporting the existence of these strings. So I'm now asking people to think about the possible nature and implications of TTI, a request that apparently goes against long-established physical theories . . .



yet there is a great deal of empirical evidence for precognition, as opposed to invisible strings . . . ☺

With TTI, I've created a first draft of a theory to try to make sense of some strong ESP data, and the theory predicts psi-missing on +1 trials in repeated guessing tasks and suggests (Tart, Puthoff, & Targ 1979) that the difference between real-time ESP-hitting and +1 ESP-missing (and perhaps also -1 ESP-missing in non-feedback studies) may be a more sensitive indicator of the operation of ESP than simply real-time scoring. If the TTI idea of a "wider" "now" for a part of the mind that uses ESP is even partially correct, it may suggest, to those more educated in physics than I, new ways of thinking about time and the physical world.

Meanwhile, as I've learned from physicist colleagues, it may be quite "interesting" to think about a different physical understanding of time and/or a part of the mind that is "spread out" in time.

### Notes

- <sup>1</sup> Cursed in the sense that with so many interests I seldom have time to explore a particular finding in the depth I would like.
- <sup>2</sup> I originally presented this material as a Presidential Address to the Parapsychological Association in 1977, where it was printed in the *Proceedings* (Tart 1978b), and later as a book chapter (Tart 1979c) in a scientific book focused on remote viewing, not realizing few active investigators think of book chapters as sources of data, so it had only narrow exposure to relevant research communities..
- <sup>3</sup> I will be putting lots of terms in quotation marks in this essay to indicate how rough and imprecise the usage of many terms are, but it would take us too far afield to go beyond the relatively apparent meanings in each context.
- <sup>4</sup> In the classic remote viewing procedure (Targ & Puthoff 1977), the viewer is taken to view the actual distant target after the viewing trial is completed. This is not immediate feedback, but there are no other remote viewing trials sandwiched between this viewing and the feedback, like there are other card-guessing trials before delayed feedback in standard card-guessing tests, so I expect the comparing of qualities that call for emphasis because they are associated with remote viewing success is effective rather than the confusion of other trials before feedback in card guessing. To clarify that, in the usual delayed feedback card guessing, suppose on the 12<sup>th</sup> and 17<sup>th</sup> trials you had a similar funny feeling. Maybe that would be a guide to being more sure it was ESP? But before you got any feedback (scoring at the end of the standard 25 trial run, you made 13 and 8 more calls. Then you found out you were right on the 10th call.

Were you sure that funny feeling was on the 12<sup>th</sup> or the 17<sup>th</sup>? What about feelings a little earlier or later? But in classical remote viewing, you make your description, you officially/psychologically stop trying, and the trial, the data collection, is now over. There's a 20-minute or so drive with the returned outbound experimenter (beacon person), probably with social chitchat about other things, a clear non-RV related period before feedback, probably making it easier to recall any special feelings during the RV session. In classical learning theory, "immediate" usually means less than several seconds to get feedback on the consequences of your response, here "immediate" has more of the connotation of non-interfering or confusing activity between response and action. Probably the best "immediate" feedback would be only a few seconds after the response and with no interfering activity. See (Tart 1977b) for detailed consideration of possible internal processes involved in learning better ESP performance.

- <sup>5</sup> Remember there was no future target for the last call of each run, so N, allowing for some missing data, is 4,790 rather than 5,000.
- <sup>6</sup> The computational demands of the PPP were huge for the time, making it impractical for most people who did not have a lot of mainframe time available to work with it, but I hoped (still hasn't happened) someone with good programming skills could write a version of it that will run on today's desktop computers. The PPP could be a practical and much more understandable test of randomness than the rather abstract mathematical tests traditionally used. Anyone knows that if you count cards, which is basically what the PPP does, you gain an advantage.
- <sup>7</sup> In the 25+ years since I retired from UC Davis, the analyses supporting that conclusion disappeared in the course of moving material from my office and laboratory to my home office when I retired.
- <sup>8</sup> Today, with so much data being computer-recorded from the outset, it would be easy. I put my data banking and sharing proposal at <http://blog.paradigm-sys.com/proposal-to-create-a-parapsychological-2/> in the hope it might stimulate someone to set up something along those lines. Or go to <http://www.paradigm-sys.com/>, choose CTT Articles Library, then "Proposal to Create a Parapsychological Database."
- <sup>9</sup> We don't really know how much the experimenter/sender's efforts matter in this kind of experiment, as results could occur by clairvoyance or precognition, but we'll stay with the framework that percipient and experimenter/sender are trying to telepathically communicate. Incidentally the experimenter/sender gets immediate feedback as to the percipient's choice, so it's possible that this kind of immediate feedback allows the experimenter/sender to learn to "send" more effectively. But

we have no way of assessing this separately from overall results in this kind of GESP experimental procedure, although it could be assessed with a different procedure, such as only giving the experimenter/sender feedback of the percipient's hand movements and choices on random trials and comparing those with no feedback trials.

- <sup>10</sup> Percipients often “dowsed” over their response panel, although the equipment was designed so there were no differential electrical fields there that might be associated with the target on each trial, even if the percipients had some unknown electrical field detection sense. Seeing how this dowsing was going was rewarding and involving to the experimenter/sender, often focusing the sending process to something like thinking “Now!” when the percipient's hand was over the correct button or “No! Keep moving!” when it looked like the percipient was going to press an incorrect button. There is no space to consider this phenomenon here, but all the experimenters felt this dowsing-like behavior could provide valuable clues to when the percipient was getting a correct impression.
- <sup>11</sup> To avoid possible confusion, a few parapsychologists have explored theories that postulate that all apparent present-time forms of ESP are actually accomplished by precognition of the percipient's future brain state when they receive sensory feedback of target identity. Thus there is no strange mystery of ESP-mediated information crossing the space between percipient and target, but “crossing” time is acceptable for some physicists. This tends toward theoretical predictions that no ESP will be observed if there is no future sensory feedback about the targets to the percipient. While I can envision this kind of precognition as happening in some cases, there are too many instances of successful ESP with no future feedback to make this a general case.

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