Effects of Immediate Feedback on ESP Performance: A Second Study

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ABSTRACT: An experiment was undertaken to replicate the successful ESP training study reported earlier by Tart. The experiment again commenced with a two-stage screening process. Percipients who successfully passed the screening then completed the Training Study, 20 runs (500 trials) with immediate feedback on either the four-choice trainer (Aquarius) or a more fully automated version of the original ten-choice trainer (ADEPT), which was introduced midway through the screening phase. The screening was significantly less successful in providing talented percipients on the ten-choice trainers in this experiment than in the first experiment. Nevertheless, seven percipients completed the Training Study on ADEPT, but their scores as a group were close to chance. The screening was somewhat more successful with Aquarius, but only three subjects completed training on this machine. However, these percipients continued to score significantly above chance as a group.

Too few sufficiently talented percipients were selected by the screening process to allow a meaningful confirmatory test of the learning hypothesis in this experiment, and it is concluded that the status of this hypothesis is the same as it was at the completion of the first experiment.

INTRODUCTION

This experiment was designed to replicate, with a minimum of procedural variation, the successful ESP learning experiment conducted two years earlier and reported elsewhere (Tart, 1975, 1976). Data from the first experiment provided support for several hypotheses derived from the learning theory proposed by the first author more than 10 years ago (Tart, 1966). These hypotheses apply to the present experiment as well:

1. For motivated percipients who have some psi talent to begin with, and under boundary conditions such as not working in experiments that go on for so long that they lose their motivation, the provision of immediate feedback will slow or eliminate the fre-

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quently observed decline of ESP scoring that typically leads to total extinction.

2. Some percipients will significantly improve their ESP performance from the beginning to the end of immediate feedback training. Such improvement in this context is considered to be evidence of learning, although alternate interpretations cannot be completely ruled out at this stage of the research.

3. The degree to which a percipient profits from immediate feedback training will depend on how much psi he or she brings to the training, other factors such as motivation, memory ability, general learning ability, etc., being equal.

Each of these hypotheses has received support from other research. The prevalence of decline in ESP experiments not involving immediate feedback has been frequently noted by parapsychologists (e.g., Pratt, 1949). Yet the only percipient we could find in the literature who has shown a significant decline with immediate feedback training was one tested by Beloff and Bate (1971; see Tart, 1976, pp. 15–16). On the other hand, we were able to find 15 percipients reported in the literature who manifested significant linear increases in performance during such training, one of whom was tested in our first experiment. For a review of the literature, see Tart (1975, 1976).

The third hypothesis was supported in our first experiment, where on our ten-choice trainer (TCT) we found a significant positive correlation $(+.71)$ between number of hits in the Confirmation Study (the final phase of our screening process) and the performance slope in the training phase of the experiment. A comparable relationship on our four-choice machine was not significant $(r = -29)$.[2]

The current experiment again consisted of three phases: a Selection Study (SS) to screen a large number of individuals to find those who had exceptional talent in ESP "guessing" tasks; a Confirmation Study (CS) to weed out those persons who scored significantly in the SS by chance; and a Training Study (TS) in which it was sought to improve the scoring rate of the remaining individuals by providing them with trial-by-trial information about the correctness of their responses over 500 trials.

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[2] In the original publications reporting these data (Tart, 1975, 1976), the correlation was erroneously given as $+.29$; although the magnitude of the correlation is well below the level of statistical significance, its erroneous positive sign was interpreted as giving mild support to the talent threshold concept. I wish to apologize for not catching this error prior to publication.—C.T.T.

<div align="center">SELECTION STUDY</div>

The experimenters for this and subsequent phases of the experiment were students in C.T.T.'s upper-division undergraduate course in Experimental Psychology taught in the fall of 1975 at the University of California, Davis. In groups of three or four, the experimenters screened 2425 persons, most of whom were students in 23 other undergraduate classes ranging in size from eight to 260. Students in each class completed two 24-trial runs in which they were asked to guess the numbers of playing cards, i.e., ace through four ($P = \frac{1}{4}$). Thus each percipient wrote down 48 responses, of which on the average 12 should be correct by chance.

A more complete description of the procedure and results of the SS are reported elsewhere (Palmer, Tart, and Redington, 1976). The results were of considerable interest, but in this paper only those will be reported that pertain to the selection of talented percipients to go on to the CS.

Results

There is no evidence that more percipients scored significantly above chance than would be expected if no ESP were operating. Of the 2425 persons screened, 1835 recorded 48 valid responses. (The computer was instructed to flag the remaining cases prior to computing their number of hits.) Using the .05 level (two-tailed) as a criterion of statistical significance,[3] if only chance factors were operating one would expect 69 persons out of the 1835 to obtain significantly positive scores (18 hits or above) and 50 to obtain significantly negative scores (6 or below). These estimates are based on exact probabilities computed from the binomial formula. In fact, 70 percipients scored significantly above chance, and 47 scored significantly below chance. Both figures are very close to the expected values. We had decided in advance to use the results of the SS as a basis for selecting CS percipients regardless of the outcome of this analysis, which was not available to us anyway at the time the CS began. It seemed reasonable to adopt as a working hypothesis that some of the significant scorers in the SS had genuine psi talent, even if this could not be demonstrated statistically at the time of the SS. Moreover, because of other evidence suggesting psi in the data (Palmer et al., 1976), it is likely that our sample included some subjects with genuine psi talent.

The formal criterion for being selected for the CS was that a

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[3] All *p* values are two-tailed unless stated otherwise.

percipient had to score at least at the .05 level of significance (two-tailed) on either SS run or on both runs combined. Contrary to the first experiment, we decided to test a small number of significant *psi-missers* in the CS as well as psi-hitters. We were curious, first, to see if this psi-missing would continue in the CS and, second, to see if it could be converted to psi-hitting in the TS. If the psi-missing reflected a simple mis-focusing of ESP rather than a *motivated* avoidance of the target, cues available from feedback training might help the percipient to shift his ESP to the correct response. In practice, we were more generous than the formal .05 level criterion: percipients qualified for the CS if their ESP scores on a single run were 11 or greater or one or less, or if their total scores were 18 or greater or six or less. Percipients were assigned to various experimenters for CS testing by J.P.; although the experimenters knew there would be some missers selected, they were ignorant of which ones they were. This was to avoid the possibility of their treating hitters and missers differently.

Of the 1835 percipients tested in the SS who turned in complete response sheets, 226 qualified for the CS by the above criteria. Seventy-eight of these went on to complete one or more runs in the CS. We naturally first contacted the best scorers of those who qualified, so many of those who qualified only marginally were not approached due to time and manpower limitations. Also, many of those who were contacted chose not to participate in the CS.

CONFIRMATION STUDY

The purpose of the CS was to screen out percipients who scored significantly in the SS on the basis of chance. Each percipient who entered the CS was asked to complete six runs on our two ESP training machines: two runs on each machine followed by two additional runs on the machine the percipient preferred.

Throughout most of the CS, the machines were the same as those used in the original experiment. These were the Aquarius Model 100 (four-choice machine) and the Ten-Choice Trainer or TCT (described fully in Tart, 1975, 1976). About two-thirds through the CS, the TCT was replaced by a new machine called ADEPT (Advanced Decimal Extrasensory Perception Trainer). ADEPT is a ten-choice machine very similar to the TCT, except that its internal circuitry is more sophisticated. The random number generator (RNG) is built into the sender's console instead of being a separate piece of equipment. The most important new feature of ADEPT is its provision for automated recording of targets and responses by a modified electric typewriter attached to the sender's console. A

more complete description of ADEPT has been published elsewhere (Redington and Tart, 1976).

Results

A total of 88 percipients completed at least one run in the CS, 73 of whom completed the full complement of six runs. Eleven of these were psi-missers in the SS, and their results will be considered later.

Seventy-two of the percipients who had been selected from the SS as potential psi-hitters or personally nominated by the experimenters as likely to have psi talent even if they had not met the formal SS criteria completed at least one run on Aquarius. They accumulated 1554 hits over 5951 trials, 66.25 more hits than expected by chance and statistically significant psi-hitting (CR = 1.98, p = .05). The mean number of hits per run using the subject as the unit of analysis was 6.35, which does not differ significantly from the expected value of 6.25. The reason why these analyses yielded different conclusions is that the highest scores were contributed by those persons who completed the greater number of trials on Aquarius. The significant analysis can be interpreted to mean that some ESP was occurring on Aquarius among those percipients who were selected for the CS as potential psi-hitters. However, no inferences can be drawn concerning performance on Aquarius in a larger population.

As for the TCT and ADEPT, 73 predicted psi-hitters (as defined by SS performance) completed 4520 trials with 467 hits, 15 more than expected by chance. Their mean score was 2.55, whereas the expected value is 2.50. Neither the total number of hits nor the mean run score differed significantly from chance on the TCT and ADEPT.

Although the overall mean scores in the CS were not significant on the TCT and only marginally significant on Aquarius, it was still quite conceivable that several individuals in our sample possessed genuine ESP talent. We therefore decided to go ahead and apply the same criteria used in the first experiment as a basis for selecting the most promising individual percipients for the TS. Ideally, we should have run more students through our SS and CS procedures, since the learning theory application calls for highly talented percipients, but time and manpower limitations did not allow this. We did predict that our second TS results on ADEPT would not be as significant as it was on the TCT in the first TS experiment.

Thirteen percipients qualified for the TS on the basis of their Aquarius scores and 15 qualified on the basis of their TCT (or ADEPT) scores. Three of these qualified on both machines. The

minimal criterion for qualification was that the percipient score significantly above chance ($p \leq .05$, one-tailed), either on any run or on the total of his run scores on one machine. This rather liberal criterion was adopted so as to guarantee as much as practically possible that any percipients who might have genuine psi talent would be given an opportunity for training.

Did the Selection Study Predict Later Performance?

In the original experiment, there was suggestive evidence that persons who obtained the highest qualifying scores in the SS got the highest scores in the CS, at least on the TCT. However, since the CS percipients had such a restricted range of scores in the SS due to our procedure of only inviting high scorers in the SS to participate in the CS, a strong correlation could not be expected. This was one reason we decided in the present experiment to include a small sample of psi-missers from the SS in the CS to better evaluate the predictive utility of the SS.

Since the distribution of SS scores to be analyzed was highly discontinuous, simple correlations between SS and CS mean scores would not be appropriate. Therefore, the CS scores were broken down into categories based on SS scores. The results are presented in Table 1. The first three rows represent percipients who qualified

Table 1

MEAN SCORES IN THE CONFIRMATION STUDY IN RELATION TO TOTAL SCORES
IN THE SELECTION STUDY

Selection Study Scores	Aquarius		TCT/ADEPT	
	No. Ps	Mean/Run	No. Ps	Mean/Run
18 Hits	32	6.55	34	2.53
19 Hits	11	6.17	12	2.46
20+ Hits	14	6.27	13	2.38
Single Run (12+ Hits)	5	5.00*	4	3.19
Total Predicted Hitters	62	6.30	63	2.53
Psi-Missers (6- Hits)	11	5.58**	12	2.65
Special Percipients	10	6.73	10	2.65

* $p < .05$, two-tailed.
** $p < .05$, one-tailed.

as psi-hitters based on their total number of hits in the SS, 18 being the lowest qualifying score. The fourth row represents those percipients who qualified because of a highly significant score ($p \leq .01$) on *one* of the two SS runs but whose total score was not significant. The fifth row is the sum of the first four. The sixth row represents those who qualified because their total score in the SS

was significantly below chance ($\leq$ 6). Finally, the seventh row represents percipients who did not complete the SS but were friends of the experimenters who the latter felt might have psychic ability. These were predicted to be psi-hitters.

The results for Aquarius are interesting from a number of standpoints. Those who qualified on the basis of significantly positive total scores in the SS did not continue to score significantly in the CS. The combined mean of all the predicted psi-hitters is 6.30, just slightly above chance. The five percipients who qualified on the basis of single run scores actually scored below chance in the CS to a significant degree ($t = -2.80$, 4 df; $p < .05$), a most puzzling finding, if genuine.

Ironically, the SS proved to be a much better predictor at the negative end of the distribution. The psi-missers in the SS continued to score significantly below chance as a group in the CS ($t = -2.05$, 10 df; $p < .05$, one-tailed). Furthermore, the mean difference between the predicted high scorers (from the SS) and predicted low scorers was significant ($t = 1.74$, 71 df; $p < .05$, one-tailed).

The highest scoring group of percipients on Aquarius were those who had not participated in the SS. Since these were all friends of the experimenters, it is possible that superior rapport between sender and percipient was responsible for this relative success.

Selection criteria had no predictive utility with respect to TCT scores in the CS. Since the SS involved a four-choice test, it perhaps is not surprising that it predicted performance better on the four-choice Aquarius machine than on the ten-choice machine.

TRAINING STUDY

Randomicity Checks

Both Aquarius and ADEPT were tested for randomicity prior to the Training Study. The checks were conducted by having student experimenters manually generate 1000-trial blocks on one or both machines. Fourteen students each generated 1000-trial blocks on Aquarius ($N = 14,000$) and 10 students each generated 1000-trial blocks on ADEPT ($N = 10,000$).

The trials were analyzed by chi square at both the singlet and doublet levels. Analyses consisted both of individual chi squares (each based on 1000 trials) summed over experi' ,enters and total chi squares based on all the trials with a given ,achine. None of these analyses provided significant evidence of nonrandomness.

Overall Results

As was the case in the CS, not all of those who qualified for the TS chose to participate. Those who did go on to the TS were

encouraged to continue with the machine on which they obtained the most significant scores in the CS, although the final choice was left to the percipients themselves. In fact, only one percipient chose to work with the machine on which she was less successful in the CS, although she qualified on both machines.

There were seven percipients who completed the full quota of 20 runs on ADEPT. The mean run score of these seven percipients was 2.61, which does not differ significantly from the value of 2.50 expected by chance.[4] Likewise, the total number of hits contributed by these percipients did not differ from the expected value.

Only three percipients completed the full 20 runs on Aquarius. Their mean run score was 7.23, as compared to 6.25 expected by chance. Although a t-test was not significant with so small a sample ($t = 3.54$, 2 df; $p < .10$), the total number of hits obtained by these percipients exceeded chance to a highly significant degree (CR = 3.52, $p < 10^{-3}$).[5] As before, this means that, although some psi was present in the data, inferences to population parameters are not justified.

ADEPT

ESP data.[6] The left-hand columns of Table 2 show the hit data for each of the seven percipients (three men, four women) completing training on ADEPT. Only one percipient, P9, scored significantly above chance. One other percipient, P8, scored significantly below chance. Thus, these significant scores effectively cancelled each other out as far as group averages are concerned. Both of these percipients had qualified for the TS on the basis of significantly positive individual run scores in the CS. Scores on individual runs in the TS on ADEPT ranged from zero to six.

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[4] One additional percipient had to discontinue training after only 10 runs because the school term had come to an end. Her mean run score at that time was 2.80, which is slightly higher than the sample mean of 2.61.

[5] One percipient discontinued training after completing five runs, by his own choice. Unfortunately, his data sheets were lost. His experimenter recalls that his scores were near chance or below. To bring the total number of hits of Aquarius percipients below significance, this percipient would have had to have an average score of 1.4 hits per run or less. Such a performance would have constituted highly significant psi-missing (CR = -5.01, $p < 10^{-6}$). If we assume that he completed the full 20 runs, he still would have had to score significantly below chance (103 hits, CR = 2.27, $p < .05$) to bring the total number of hits below significance. This percipient had been the experimenter's boy friend during the CS, but their relationship was in the process of breaking up during the TS. Thus the psychological conditions in these two phases of the experiment were radically different for both percipient and experimenter.

[6] An *a priori* decision had been made to consider in this and the following sections only the results from percipients who completed the full 20 runs of training.

Table 2

MAIN ESP RESULTS AND LEARNING, PERCIPIENTS COMPLETING
TRAINING ON ADEPT

| | Main ESP Results | | | | Learning | |
Percip.	Hits/ Expected	Mean Run	*P* (2-tailed)	CS Mean Run	Overall Slope	Mean Within/ Session Slope
P#9	64/50	3.20	.05	4.25	+.02	+1.00
P#5	62/50	3.10	n.s.	2.75	−.02	−.88
P#7	54/50	2.70	n.s.	3.50	−.05	−.14
P#6	53/50	2.65	n.s.	3.50	+.13	——
P#10	51/50	2.55	n.s.	4.50	+.07	−.08
P#4	44/50	2.20	n.s.	2.75	−.04	+.05
P#8	37/50	1.85	.05	4.00	+.05	−.41
Means	365/350	2.61	n.s.	3.61	+.02	−.08

Learning. The right-hand columns of Table 2 present the overall slopes and mean within-session slopes in the TS. These slopes reflect the linear increase or decrease in scoring within the whole TS on ADEPT and the average increase or decrease within particular sessions, respectively. None of the slopes of individual percipients differ significantly from zero, nor do their means. In other words, none of the percipients evidenced significant learning during the training, but neither were there any significant declines.

ESP ability and slope. The learning theory predicts a positive correlation between ESP ability prior to training, as defined by mean ESP score on the TCT or ADEPT in the CS, and overall slope in the TS. The correlation we obtained in the TS was +.51. This correlation is nonsignificant (partly due to the small sample size), but in the predicted direction.

Training vs. confirmation studies. The fact that percipients generally had to have high scores in the CS to qualify for the TS restricts the range of CS scores and thus attenuates empirical estimates of the actual correlation between scores in the two phases of the experiment. Individual TS mean scores were uncorrelated with CS mean scores ($r = -.03$). The correlation between TS mean scores and the highest run scores (which can be interpreted as a measure of peak psi potential) in the CS was more suggestive ($r = +47$), but it was not significant with only seven percipients.

There was a significant drop in the mean run score from the CS to the TS (3.61 vs. 2.61; $t = 3.12$, 6 *df*; $p < .05$). Some statistical regression to the mean would be expected because the CS scores incorporated in the analysis were selected from the extreme end of a large distribution of scores. It is also possible that the added psychological pressure of the TS caused the genuine scoring rates to decline somewhat.

Aquarius

ESP data. Only three percipients (one man, two women) completed training on Aquarius. The left-hand columns of Table 3 show hit data for each percipient. Only P3 scored significantly above chance, although the mean of P1 approached significance ($p < .10$). The remaining percipient, P2, was the only percipient who achieved her highest CS scores on the machine other than the one (Aquarius) she selected for the TS.

Learning. The right-hand columns of Table 3 present the overall slopes and mean within-session slopes of the three Aquarius percipients. None of the individual slopes are significant and both groups are close to zero.

Table 3

MAIN ESP RESULTS AND LEARNING, PERCIPIENTS COMPLETING
TRAINING ON AQUARIUS

	Main ESP Results			Learning		
Percip.	Hits/ Expected	Mean Run	P (2-tailed)	CS Mean Run	Overall Slope	Mean Within/ Session Slope
P#3	155/125	7.75	.004	9.50	−.01	+.23
P#1	143/125	7.15	n.s.	8.00	−.12	−1.36
P#2	136/125	6.80	n.s.	6.67	−.02	+1.19
Means	434/375	7.23	4×10^{-4}	8.06	−.05	+.02

ESP ability and slope. It would not be meaningful to compute a correlation between these variables with only three percipients. The figures reported in Table 3 reveal no evidence of a trend within this small sample.

Training vs. confirmation studies. Again, it would not be meaningful to compute a correlation between CS and TS means due to the small sample size, although Table 3 reveals a positive trend among the three percipients tested.

There was a drop of mean scores from the CS to the TS (8.06 to 7.23), but this is not significant.

THE TWO EXPERIMENTS: A COMPARATIVE ANALYSIS

Overall Level of Performance

It is quite clear that the overall level of talent was lower in the present experiment than in the first, especially on the ten-choice machines. The mean Aquarius score in the first CS was 6.53, compared to 6.35 in the second CS. The CS discrepancy on TCT/ADEPT was considerably more pronounced (3.32 vs. 2.55).

Data records are not available to allow a comparison of means by *t*-tests. However, a comparison of total proportions of hits from the

two CSs reveals that the difference on Aquarius is negligible (CR = -0.01), while the difference on TCT/ADEPT was highly significant (CR = 4.77, $p < 10^{-5}$).

These trends continued into the TSs. The mean run score of the 10 percipients who had completed training on the TCT in the first TS was 3.61, which was significantly greater than chance ($t = 2.66$, 8 *df; p* < .05). The total number of hits obtained by these percipients was 722 compared to an expected value of 500, a highly significant outcome (CR = 10.47, $p < 10^{-24}$). (The reason that the CR analysis yields a more significant outcome is that the markedly above-chance scoring in the first TS was not uniformly distributed throughout the sample, but was concentrated in five of the 10 percipients. This results in a very large error term for the *t*-test.) In contrast, the mean of the seven ADEPT percipients in the second TS was only 2.61, and the number of hits was 365, only 15 more than chance expectation.

It is obvious that a higher level of ESP scoring appeared in the first TS than in the second TS on the ten-choice machines. Although a comparison of individual percipients' total scores in the two TSs was not significant by either a *t*-test or Mann-Whitney *U* test, a comparison between the total proportions of hits in the two TSs yielded a highly significant difference (CR = 6.07, $p < 10^{-8}$), again due to the extremely positive scores of a few percipients in the first experiment. This result is further evidence that we were unable to find the small number of highly talented percipients to work with for the second TS on the ten-choice machine that we found for the first TS.

The mean run score of the 15 percipients who completed training on Aquarius in the first TS was 6.72, which is not significantly above chance ($t = 1.95$, 14 *df*). The total number of hits was significantly greater than chance, however (CR = 3.66, $p = 4 \times 10^{-4}$). As was the case with the ten-choice machines, the discrepancy was due to an extremely large number of hits among a small proportion of the subjects (see Tart, 1976). In the second TS, the mean number of hits per run was 7.23 and the total number of hits above chance was significant ($p < 10^{-3}$). Thus, in contrast to the ten-choice machines, results on the four-choice machine were relatively uniform in the two experiments, although the results for the second TS likely would have been attenuated somewhat had the fourth subject who began training on Aquarius completed his 20 runs (see footnote 5).

ESP Ability and Slope

An important prediction from the learning theory application is a positive correlation between pre-training ESP talent (operationally

defined as mean CS score) and improvement during training (operationally defined by the TS "slope" measure). On the ten-choice machines, this correlation was positive in both the first ($r = +.71$) and the second ($r = +.51$) TS, although only in the former was it significant.

The best overall estimate of the current status of this prediction is to combine the data from the two experiments. The resulting correlation is $+.42$, which is not quite significant ($p < .06$, one-tailed). The relationship is illustrated in Figure 1. The fitted regression line for the combined studies is shown as a dotted line in the figure.

The reason why the combined correlation is lower than the average of the two correlations from the individual experiments has to do with the mean CS and TS slope scores from the two experiments. While the first CS mean was considerably higher than the second CS mean (4.78 vs. 3.61), the mean TS slopes, which one would expect to be higher in the first experiment than in the second, were virtually identical ($-.01$ vs. $+.02$). This increased the variability of the CS scores associated with each TS slope, thereby attenuating the correlation.

It is our opinion that the results obtained so far modestly support the prediction that the most talented percipients entering the TS are those who benefit most from the training on the ten-choice machines. More specifically, the data suggest that the most talented percipients improved slightly as a result of this minimal training, while the inherent confusion generated from the very large proportion of chance hits was already working toward extinction for the least talented percipients. (These two processes canceled out, for our proportions of variously talented percipients, producing a net mean slope close to zero.) Further support for the prediction over shorter time periods will be presented in another paper (Tart, Palmer, and Redington, in press).

Adding the data from the three percipients who completed the TS on Aquarius in the second experiment to the data from the corresponding percipients in the first experiment produced a negligible change in the correlation between CS mean scores and TS slopes, i.e., from $r = -.29$ to $r = -.27$ ($N = 16$). Thus the prediction clearly was not supported for Aquarius.

DISCUSSION

The most important difference between the results of the second and first experiments was the failure to obtain much overall evidence of psi-hitting on ADEPT in the second experiment. Statistical tests revealed that we had significantly less talented percipients
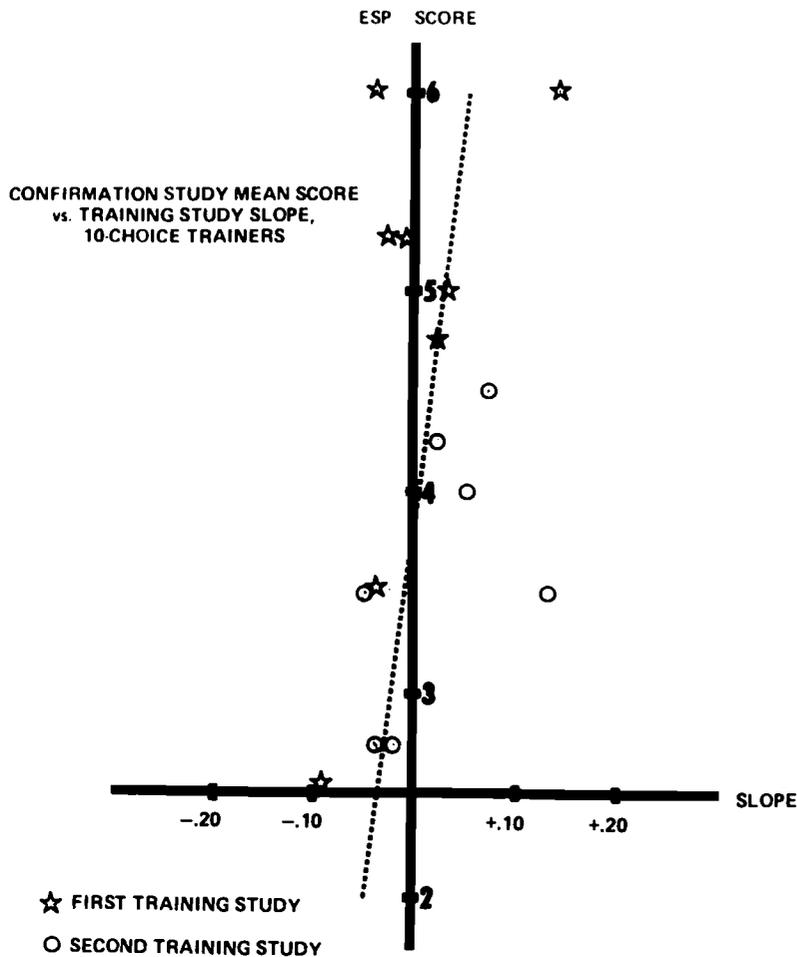
Fig. 1. Confirmation Study mean score vs. Training Study slopes, ten-choice trainer and ADEPT, first and second studies.

qualify for the TS in this experiment than in the first experiment. Why was this the case?

We can offer no definitive answer to this question, but a few speculations may be in order. Because the level of scoring in the first experiment was so high, it would be absurd to argue that the results of the second experiment mean that the results of the first experiment were a mere statistical fluke. With respect to psychological interpretations, several people who have had close contact with students at the University of California, Davis, over the past

three or four years have told us of a dramatic change in the attitudes of students during that period. In the last year or two, students have become more serious, competitive, and achievement-oriented than they were at the time of the first experiment. Such "uptight" attitudes are less compatible with strong interest and motivation to explore or develop a "useless" talent such as ESP. Indeed, we noticed that quite a few of our percipients in the present experiment did not seem to really "get into" the experiment and were anxious to "get it over with."

The situation also was different for the student experimenters in the two experiments. Experimenters in the first experiment could legitimately feel that they were embarking on a new adventure. Despite our best efforts to create the same enthusiasm in the second group of experimenters, there was no way to deny the fact that we were asking them to simply repeat an experiment designed and executed by others before they ever arrived on the scene. It is understandable that they did not feel as intensely involved in the experiment as did the first group of experimenters, and this factor could have been responsible for the relatively poor performance of their percipients. Indeed, several of the more seriously involved experimenters later told C.T.T. that they were quite disturbed by the attitude of some other experimenters who "just wanted to get it done with."

Finally, we were constantly plagued by machine malfunctions during the second CS and TS, and this was a source of continual annoyance and inconvenience to all concerned. Fortunately, the malfunctions were not of a type to invalidate our results, but they did adversely affect morale. The replacement of the TCT with ADEPT midway through the CS was another disrupting factor. Because of our tight schedule, we could not postpone the testing until the machines could be adequately repaired. This may indeed be a crucial factor, because high levels of scoring were maintained on the Aquarius machine in the second TS.

Because of the overall low level of ESP manifested in the second TS, the results of this experiment neither add nor detract from the status of the learning theory. The learning effects which we were interested in exploring are, according to the theory, absolutely contingent upon at least some of the percipients demonstrating moderate to high levels of initial ESP talent that were generally not present in this experiment. With respect to the ESP ability-slope correlations on the ten-choice machines, for example, the data from the second experiment merely filled in the lower left-hand portions of the scatter plots, the low talent range.

We are in the process of collecting data from a third experiment that we hope will provide a higher yield of ESP and thus a better

opportunity to replicate and explore the relationships uncovered in the first experiment. We also recognize the need for more research on the nature of the ESP process in our experiments, both as a means for helping us to achieve more reliable scoring increments and as a means of providing further evidence that the effects uncovered in the TS of the first experiment were in fact attributable to immediate feedback. This will be the next stage in the long-term project we have undertaken.

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