Final Report:

Training Anomalous Cognition in a Motor Task with Subliminal Auditory Feedback

Background and Rationale

The general hypothesis tested in the overall research program is that psi is facilitated by dissociated states of consciousness and that the most dissociated form of psi expression is motor automatisms, such as automatic writing and dowsing, where conscious cognitive processing is minimized. The purpose of the proposed experiment was to select promising participants from a previous study (Palmer, 2013) supported by the Bial Foundation and give them long-term training using the motor-automatism technique applied in that study. This, in turn, was a follow-up of an earlier study (Palmer, 2011).

In Palmer (2013), 80 volunteer completed the Dissociative Processes Scale (DPS; Watson, 2003). A Ouija board analog was created consisting of a 16-square grid with each square numbered 1 to 4. For each of 36 trials one square was randomly selected as the target. Participants (Ps) indicated their response by stopping on a square for 1 second. To lay the groundwork for dissociation, the task was preceded by a progressive relaxation exercise, followed by suggestions for dissociation and success in the task. The independent variables in the 2 x 2 factorial design were the hand used to move the pen and one of two methods to facilitate dissociation by getting the conscious mind "out of the way" during the task -- (a) keep the eyes closed and blank the conscious mind; (b) distract the conscious mind by reading humorous quotations on a computer screen. There was significant AC hitting for location in 3 of the 4 conditions combined. In these conditions, location hits were significantly higher among Ps who reported that they experienced their hand being moved by an outside force sometime during the task (state dissociation) and high scores on a subscale of the DPS (Detachment).

Previous psychological studies of automatic writing (esp. Solomons & Stein, 1896) suggest that much more practice is needed to master motor automatism techniques than I could provide in the practice period of Palmer (2013). In addition to practice, I thought immediate feedback of hits might improve scoring through the well documented principle of operant conditioning. The few published feedback training studies of AC have yielded mixed results, and it is often not clear if superior post-training performance was due to learning (Braud & Wood, 1977; Honorton, 1970, 1971, Jackson, Franzoi, & Schmeidler, 1977; McCallam & Honorton, 1973, Tart, 1976; Tart, Palmer, & Redington, 1979).

As Tart (1976) pointed out, the operant conditioning approach presupposes that there are genuine psi hits to be reinforced. This is why I selected the participants for the present study based on their results in Palmer (2013). Because the 36-trial forced-choice task was too short to be a reliable indicator of psi ability, I chose P's capacity to enter what according to my theory is a psi-conducive (i.e., dissociative) state during such a task. I made three additional assumptions about the conditioning process. First, psi would be operative on only a small percentage of the trials, as evidenced by the performance of the best forced-choice test subjects in the history of parapsychology. Second, activation of the psi process is accompanied by an internal cue or sensation that the participant can identify, at least unconsciously. The feedback informs the participant that the internal cue is associated with hitting. Third, once the cue has been identified with hitting, the participant will "learn" to wait for it before stopping the pen. As multiple presentations of the cue are necessary for the participant to associate it with hitting, the experiment had to include a large number of trials, which had to be spaced over multiple sessions to avoid fatigue.

I used subliminal auditory feedback for two reasons. First, supraliminal feedback would interfere with the blanking of the mind that I felt to be necessary for detection of the internal cue. Second, that subliminal feedback interacts with mental activity at the unconscious level fits the main assumption underlying my research, viz. that AC is a function of the unconscious mind, and it performs this function best when it is dissociated from and unhindered by the conscious mind.

Most of the evidence for effects of subliminal stimulation or priming on cognition or behavior has involved visual stimuli (Bornstein, 1989, Bornstein & D'Agostino, 1992), and Bem (2011) used apparently subliminal primes to significantly influence picture preferences retroactively in an AC adaptation of the mere exposure effect. Although auditory subliminal stimulation has been used much less frequently than visual, evidence of its effectiveness has been demonstrated in several studies (Kouider et al., 2010; Mitchell, 1993; Sloan, 1996; Zenhausern, 1974). A study reporting the effects of subliminal auditory messages on autonomic nervous system (ANS) measures (Borgeat & Goulet, 1983) is especially relevant because ANS activity has been shown to mediate psi in numerous AC presentiment experiments (e.g., Bierman & Radin, 1997).

Aims

The aim of the study was to test the following hypothesis pre-registered with the Koestler Parapsychology Unit Registry: Scoring on the AC task by the 5 Ps, both individually and collectively, will be significantly higher after training than before training.

Methods

Participants

Five participants (Ps) were drawn from a pool of 80 persons who completed the author's previous successful motor automatism experiment (Palmer, 2013) who were considered most likely to succeed in the training based on the following criteria: (a) availability for testing over a continuous period of at least 2 months; (b) comfort with computers; (c) a positive response to the outside force (state dissociation) question in Palmer (2013); (d) a score of 20 or above on the DPS Detachment subscale. Persons who met these criteria were prioritized according to (a) the percentage of time they felt their hand was being guided by an outside force; and then (b) the extremity of their deviation score from mean chance expectation on the AC test.

Test Protocol

Relaxation exercise. Immediately prior to the AC task, Ps listened to a taped progressive relaxation exercise adapted from Jacobson (1938/1974). This was followed by suggestions for success at blanking the mind and getting a high score on the task, as well as a brief review of the task procedure. The exercise was recorded with my voice an saved as a .wav file. The file was played through external speakers in the baseline and test sessions and through the computer's speaker in the training sessions.

Apparatus and target selection. The AC task was completed on the same type of computer writing tablet used in Palmer (2013). The target area was again a 16" square grid conceptually divided into 16 1" squares classified further as 4 quadrants of 4 squares each, but there were no number targets. As the theme was described as map dowsing, the target area was covered by a landscape photo map of barren terrain with no vegetation, and there were no visible lines representing the squares. Strips of balsa wood 1/4" high were pasted along the outer edges of the target area to keep the pen inside the area during the task.

For each trial, one square was randomly selected as the target using the thoroughly validated algorithm of Marsaglia and Zaman (1987). Participants can get a square hit (P = 1/16) and a quadrant hit (P = 1/4). The dependent variable consisted of *z*-scores representing an unweighted average of square and quadrant hits. They are referred to as "location *z*s."

Response Procedure. The eyes-closed method was used throughout because it is simpler than the quotations method and the two methods worked equally well in generating location hits in Palmer (2013). All Ps performed the task with their dominant (right) hand. For each trial, P begins by exploring the target area with the computer pen ("dowsing rod") lightly touching the surface. When ready to make a response, P stops the pen for 1 second. This response is registered by the tablet and sent to the computer for storage. P then resumes moving the pen for the next trial. During the task, P attempts to blank the mind with eyes closed, not looking at the writing tablet. An audible tone signifies the end of the task.

Pre-training (Baseline) Sessions

The two baseline sessions took place at the Rhine Research Center (RRC). They were on separate days but no more than 1 week apart. At the beginning of the first session, Ps read and signed the consent form, which included a description of what they would be doing in the experiment. They then completed two baseline runs, each consisting of 60 trials. The first run was preceded by however many practice or "warmup" trials P and I deemed appropriate. When Ps were listening to the relaxation exercise and doing the AC task, I was in an adjacent room with the door closed reading. Ps knocked on the door when the AC task was complete, at which time I gave them a rating scale containing the outside force questions, as well as questions about their expectations for a high AC score, success in blanking the mind and level of relaxation, followed by an open-ended question about anything distinctive about the session that they considered worth mentioning. After they completed the scale, I interviewed them about their answers. They were not given feedback of their AC scores at the end of the session.

Preparation for Training Sessions

Creation of feedback stimulus files. The protocol specified that I create 3 feedback files: (a) the spoken word "good" at 25 db, (b) the spoken words "good good" at 25 dB, and (c) no sound, each superimposed on 40 db noise. The files were created using Audacity software. After setting my computer's speaker volume and Windows Media Player volume to their maximum settings, I first created a 1.5 sec. baseline "brownian noise" file from the Audacity "Generate" menu. This sounds more like the pink noise used in psi ganzfeld experiments than Audacity's pink noise. On playback, I found that the output of this file registered at 60 db on my decibel meter, which I held near to my ear as I was seated in front of my computer. Using the "Amplify" option on the "Effect" menu, I progressively reduced the volume of this file until my meter recorded 40 db. This corresponded to a reduction of 30 db on the Audacity "playback level" scale compared to the baseline file. As my db meter is not sensitive below 40 db, and getting a more a meter with that capability would be prohibitively expensive, I used an extrapolation procedure to determine the proper volume for the word stimuli. I first created a "good" file by speaking the word "good" into the computer at moderate loudness. When I played the file, my meter showed about 62 db. I then created a series of additional files, lowering the Audacity playback level the same amount each time and noting the meter reading when I played the file back. As expected from theory, the reduction in the meter reading was about the same each time, meaning that the relationship between the two measures was linear. A 10 db reduction in the playback level corresponded to about a 7 db reduction in the meter reading. Given that the playback reduction from the baseline file that produced a 40 db meter reading was 35 db, I could deduce that reducing the playback to 55 db from baseline would correspond to a meter reading of 25 db. Finally, I mixed the 25 db."good" file and the 40 db brownian noise file to create the subliminal "good" file. I next created the "good good" file by inserting a repeat of the "good" sound in the baseline "good" file immediately following its location in that file. I then repeated the extrapolation and mixing procedures to create the "good good" feedback file. To create the "silence" feedback file, I mixed a "silent" file from the Audacity menu with the 40 db brownian noise file.

Uploading of files. The plan was for Ps to bring the laptop computer they plan to use for the training sessions (at home) to the second baseline session. After the AC run, a folder containing the files needed for the training runs was to be uploaded onto this computer. A calibration and a threshold test (described below) were then to be performed on this computer.

This plan was followed successfully for Ps 1, 4, and 5. I was unable to upload the software onto P2's computer. Thus, I uploaded the software onto my laptop computer. As this was the computer on which I had created the feedback stimulus files, I was confident that the calibration test would succeed on the first try, and it did. I then had her perform the threshold test with my computer. P3 owned only a desktop computer so I went to his home to conduct the preparation procedures. However, I was unable to get the programs to run properly on his system. Thus as with P2, I uploaded the software, calibrated the sound stimulus, and performed the threshold test on my laptop computer.

Calibration of subliminal feedback stimuli. To calibrate the feedback stimuli, I or P set the speaker volume settings on the host computer to their maximum level. I then played the baseline brownian noise file to be sure that the output measured 60 db on my decibel meter. I then played the noise file on Ps computer and had P lower the volume until the meter reading was 60 db. P was instructed to never change that volume setting until the training ended.

Threshold test. The purpose of the threshold test was to assure that Ps could not hear the feedback words over the brownian noise. Ps took the test seated in front of the host computer. The "good good" stimulus and the silent stimulus were presented in random order across 20 trials. After each trial, Ps were asked indicate with a mouse click whether they heard anything other than the noise, yes or no. I considered a passing grade to be a score from 7 to 13 (max $z = \pm 1.34$) All Ps met this criterion.

Training Sessions

Testing locations and schedule. P1, P4, and P5 completed their training sessions at home. Because P2 and P3 were to use my computer, and also because their home environments were not ideal with respect to ambient noise and comfort, I conducted the sessions at my apartment, which is very quiet, especially after I turned off humming appliances. I felt that my apartment would provide an ambience more similar to the P's home than would the RRC.

The original intention was to have each P complete 20 1-run (60 trial) training sessions at mutually convenient times. However, due to a memory lapse I gave the first four Ps only 15 runs. There was never more than one session per day.

Procedure. The procedure for the AC task was the same as for the baseline sessions, except that immediately following each quadrant hit Ps were presented subliminally with the "good" stimulus and after each square hit with the "good good" stimulus. After each miss Ps were presented with the silence stimulus. An encrypted file containing the AC results was stored on the host computer and a corresponding non-encrypted file was automatically sent to my email account. I did not access the file with the AC results until the session was over. Ps tested at home phoned me after completing each run and I presented the rating scale to them using a semi-structured interview format. The items were the same as in the scale used for the baseline sessions, with questions added about possible distractions during the session and whether they could tell whether they got a hit from the sound of the feedback stimulus. For Ps tested at my apartment, during the test I was in a room several feet down the hall with the door closed. Ps called me after the AC task was completed and I then conducted the rating scale interview face-to-face.

Post-training (Test) Sessions

After training was completed, Ps came to the RRC for two more sessions during each of which they complete one AC run. The sessions were on adjacent or nearly adjacent days. The procedure was identical to that for the baseline sessions, which means no auditory feedback stimuli were provided.

Debriefing. At the end of the second session I debriefed each P, explaining details about the protocol that I had not explained before (there was never any deception), summarized their AC results, and give them an opportunity to ask any questions they had about the study. I show them the AC results of the run they had just completed and offer to send them by email the results of all the runs they had completed during the experiment. All 5 Ps took me up on the offer. Finally, I paid them their $450 fee and had them fill out and sign the receipt.

Results and Discussion

Because location *z*-scores are not conventional *z*-scores, their statistical significance cannot be assessed by *z*-test. Thus, a Monte Carlo procedure was employed. Null distributions of location *z*-scores were created using a program I wrote in the R programming language, with random target and response sequences generated using the "Marsaglia-Multicarry" option in R. I generated distributions for a-60-trial test, a 120-trial test (corresponding to the *N*s for the combined baseline and combined test runs), and the difference between two 120-trial tests. The analysis was beset by what the error messages said was the occasional insertion of unwanted hidden characters in the distribution of generated scores when I attempted to convert it to a vector for processing. Through trial and error I discovered that the problem could usually be resolved by the insertion of carriage returns at the compromised locations, but this fix was quite tedious and not always effective. The larger the *N*, the greater the number of intrusions, and the greater the tedium and risk of failure. I found that for N = 4000 the mean of the scores was close enough to the expected mean of 0 (.0005 to .007) to be satisfactory. With N =1600, the deviations from 0 were an order of magnitude higher and some were negative. This evidence of convergence reassured me that my assumption that the theoretical mean is 0 was correct.

I calculated the *p*-value of each observed location *z* by finding where that value, or the next most extreme value, fell in the distribution after the *z*s had been ranked in ascending order using the "sort" command in R. In case of ties, the location closest to the midpoint of the distribution was chosen. Thus, if the observed *negative* z was at location 50, its *p*-value was 50/4000, or .0125. Likewise, if the observed *positive* z fell as location 3950, the *p*-value was (4000-3905)/4000, again .0125. Because I wanted the equivalent of a two-tailed test with alpha at .05, I performed the corresponding procedure on the opposite-signed value and added the two probabilities.

Individual Participants

Participant 1. P1 was a 38 year old female at the time of her participation. One of her professions is acting. Shortly after completing testing she gave a benefit performance for the RRC in which she did an improvisation of a character in which there was a profound change in her tone of voice. When I asked her, she said she enters a kind of trance state during these performances. She practices meditation and occasionally engages in automatic writing.

In Palmer (2013), her score on DPS detachment was 29. She was in the eyes-closed/left-hand condition. She claimed that she felt her hand was moved by an outside force 81-100% of the time during the AC task. Her location *z*-score was +1.57.

Her 15 training sessions covered a period of 24 days with an average interval between sessions of 1.64 days and the longest interval being 3 days.

She reported that during the training runs she experienced excess "water" in her eyes and mouth which she had never experienced before. She also frequently experienced a blue light.

She estimated her hand to be moved by an outside force 61-100% of the time (counting baseline, test, and training runs). Her mean location *z-score* in the two pooled baseline runs was 0.40. Her mean location *z*-score in the pooled test runs was a significantly negative -2.58 (p = .045). The difference between baseline and test approached significance (p = .082).

Participant 2. P2 was a 49 year old female at the time of her participation. She has practiced meditation in the past. She occasionally used the Ouija board as a child and occasionally practiced automatic writing as an adult but stopped about 10 years ago.

In Palmer (2013), her score on DPS detachment was 25. She was in the quotations/left-hand condition, which produced overall psi-missing in that study. She claimed that she felt her hand was moved by an outside force 41-60% of the time during the AC task. Her location *z*-score was -0.32.

Her 15 training sessions covered a period of 46 days with an average interval between sessions of 3.21 days and the longest interval being 9 days. The long intervals occurred early in the training.

The feedback stimulus seemed louder to her on some trials than others, especially on those that she independently expected to be a hit. During the task she would have a visual image of the pointer moving over a grid divided into quadrants. The grid was colored, mostly blue, but sometimes purple, light green or white, and the color sometimes varied depending on whether she expected a hit. Unlike the other Ps, she did not consistently expect a positive AC score and she was the only one to occasionally predict a below-chance score.

She was the only P to answer the outside force question "no" (on 6 runs) and on the other runs she estimated her hand being moved by an outside force 1-60% of the time. Her mean location z-score in the two pooled baseline runs was a nonsignificantly negative -1.63. Her mean location *z-score* in the pooled test runs was a nonsignificantly positive 1.35. The difference between baseline and test approached significance (p = .082).

Participant 3. P3 was a 76 year old male at the time of his participation. He practices meditation and hatha yoga.

In Palmer (2013), his score on DPS detachment was 21. He was in the quotations/right-hand condition. He claimed that he felt his hand was moved by an outside force 61-80% of the time during the AC task. His location *z*-score was 0.66.

His 15 training sessions covered a period of 30 days with an average interval between sessions of 2.07 days and the longest interval being 5 days.

He experienced his hand being moved by an outside force 61-80% of the time in the baseline runs and 81-100% of the time in all subsequent runs. As he described his experience during training, I came to the conclusion that he experienced be guiding more by an "inside force" rather than by an "outside force." He consistently expected to score "strongly above chance." He often commented that he was in an exceptionally deep altered state during the task and he consistently gave the highest rating (10) on the altered state question.

His mean location *z*-score in the two pooled baseline runs was a nonsignificantly positive 0.25. His mean location *z*-score in the pooled test runs was a nonsignificantly positive 0.57. The difference between baseline and test was not significant.

Participant 4. P4 was a 71 year old female at the time of her participation. She does relaxation exercises regularly.

In Palmer (2013), her score on DPS detachment was 22. She was in the quotations / left-hand condition, which produced overall below chance AC scores in the previous experiment. She claimed that she felt her hand was moved by an outside force 41-60% of the time during the AC task. Her location *z*-score was -1.98.

Her 15 training sessions covered a period of 41 days with an average interval between sessions of 2.86 days and the longest interval being 6 days.

She consistently heard a hiss superimposed on the feedback stimulus on about 80% of the trials, which she interpreted as an indication that her response was a hit.

She experienced her hand being moved by an outside force 41-100% of the time. Her mean location *z*-score in the two pooled baseline runs was 2.49, which was significant in the positive direction (p = .041). Her mean location *z*-score in the two pooled test runs was a nonsignificantly positive 1.08. The difference between baseline and test was not significant. The high baseline score was due to 29 quadrant hits in the first baseline run, a 48% hit rate where MCE is 25%. This result is highly significant (exact p = .00008). In contrast, she obtained only 4 square hits on the run, close to the MCE of 3.75. There was nothing unusual or distinctive about her rating scale responses compared to her other runs in the experiment.

Participant 5. P5 was a 74 year old female at the time of her participation. She used the Ouija board and occasionally practiced automatic writing many years ago.

In Palmer (2013), her score on DPS detachment was 20. She was in the eyes-closed/right-hand condition, the condition most similar to the present experiment. Her location *z*-score was -0.04.

Her 20 training sessions covered a period of 36 days with an average interval between sessions of 1.84 days and the longest interval being 4 days.

In many of the sessions, starting in the first baseline session, she saw a blue or lavender haze as if through her eyelids. Occasionally this began during the relaxation exercise. At the end of session 15 she mentioned that occasionally during this and past training sessions she had experienced small squares or dots within the larger square. I assumed she was thinking of the previous experiment in which the 16 squares were visible as such on the grid. This led me to review the scoring procedure for the experiment, especially the distinction between square and quadrant hits. Then during the debrief at the end of the study, she mentioned that she had not understood the scoring procedure until I had explained it this second time, and the explanation had made her self-conscious in subsequent sessions.

During training, she noticed that on some trials the feedback stimulus sometimes had a high pitch. After a few sessions this was replaced by hearing one or two breaks in the hiss of the feedback stimulus. I was concerned that she was detecting “good” or “good-good”, so after Session 5 I had her do two additional 20-trial threshold tests at home. I had put the test on her computer during the second baseline session. The first test was the standard one with 10 silent stimuli and 10 “good-good” stimuli presented in random order. She was told to respond “yes” if she heard one or more breaks in the hiss. She responded yes 9 times and 12 of her detections were correct. I then emailed her another file labeled “good-good” and asked her to replace the old file with the new one. The new file was actually a “silent” file but I did not tell her that, only that it differed from the original in a way I didn’t specify. Thus, all 20 trials were silent trials. She made 10 yes responses and only 7 of the detections were correct. I then explained what I had done and told her that I now had evidence that the breaks she was hearing most likely were her imagination and should not be interpreted as a valid indicator of whether she had gotten a hit.

She experienced her hand being moved by an outside force 61-100% of the time. Her mean location *z*-score in the two pooled baseline runs was -2.19, which was close to significant in the negative direction (p = .069). Her mean location *z*-score in the two pooled test runs was 2.30, which was close to significant in the positive direction (p = .055). The difference between baseline and test was significant (p = .011).

Group Results and Hypothesis Tests

The experimental hypothesis was that the participants, collectively and individually, will score significantly differently (p <. 05, two-tailed) on the post-training test trials than on the pre-training baseline trials. The hypothesis was significantly supported for one participant (P5), although the baseline-test difference approached significance for two others (P1 and P2).

The plan was to test the hypothesis for the group by a paired *t* test. This test implicitly assumes that the direction of scoring is consistent across Ps, which it clearly was not: for 2 of the 5 Ps, including one of those for whom the pre to post difference was suggestively significant (P1), scoring was more positive in the baseline runs. Thus, not surprisingly, the *t* test produced chance results. The mean baseline *z* was -0.14 (SD = 1.86) and the mean test *z* was +0.59 (SD = 1.86 also), $t(4)$ = 0.53, ns. To determine if the unusually high variability across the five results was significant, a post hoc variance test was performed on the location *z* difference scores using the formula $\chi^2 = (n-1)\, s^2/\sigma^2$, where n is the number of observations (5), s^2 is the empirical variance of the five scores (9.38), and σ^2 is the population variance, estimated from the Monte Carlo analysis of the distribution of null location *z* difference scores. The analysis demonstrated statistically significant variability: $\chi^2(4) = 12.59$, p = .013. The results are summarized in Table 1.

Table 1. *Location z Results*

	Baseline		Test		Difference		Training	
	z	*p*	*z*	*p*	*z*	*p*	*M(SD)*	r_s [a]
P1	+0.40	ns	-2.58	.045	-2.98	.082	+0.13 (1.23)	-.02
P2	-1.63	ns	+1.35	ns	+2.98	.082	-0.10 (1.15)	-.34
P3	+0.25	ns	+0.82	ns	+0.57	ns	+0.23 (1.14)	+.20
P4	+2.49	.041	+1.08	ns	-1.41	ns	+0.06 (0.68)	-.34
P5	-2-19	.069	+2.30	.055	+4.49	.011	-0.15 (1.51)	+.12

[a] Spearman correlations between trial numbers and location *z-score*s. All are ns.

There was little variability in rating scale responses either between or within Ps. Except as noted above, Ps consistently gave a relaxation rating of 7 or 8, with a smattering of 9s, on the 10-point scale, and they consistently expected to score “somewhat [or] strongly above chance” on the AC task.

However, a learning interpretation of the difference scores requires evidence of improvement of scores across the training runs in the direction of the test session means. As can be seen from Figure 1, there was no evidence of such improvement in the training sessions for any of the Ps. None of these trends approached significance, although four of the five were in the direction expected by the learning hypothesis for what little that is worth. Finally, the learning hypothesis would lead one to expect that the baseline *z* would be close to 0 and noticeably closer to 0 than the test *z*. That was the case only for P1.

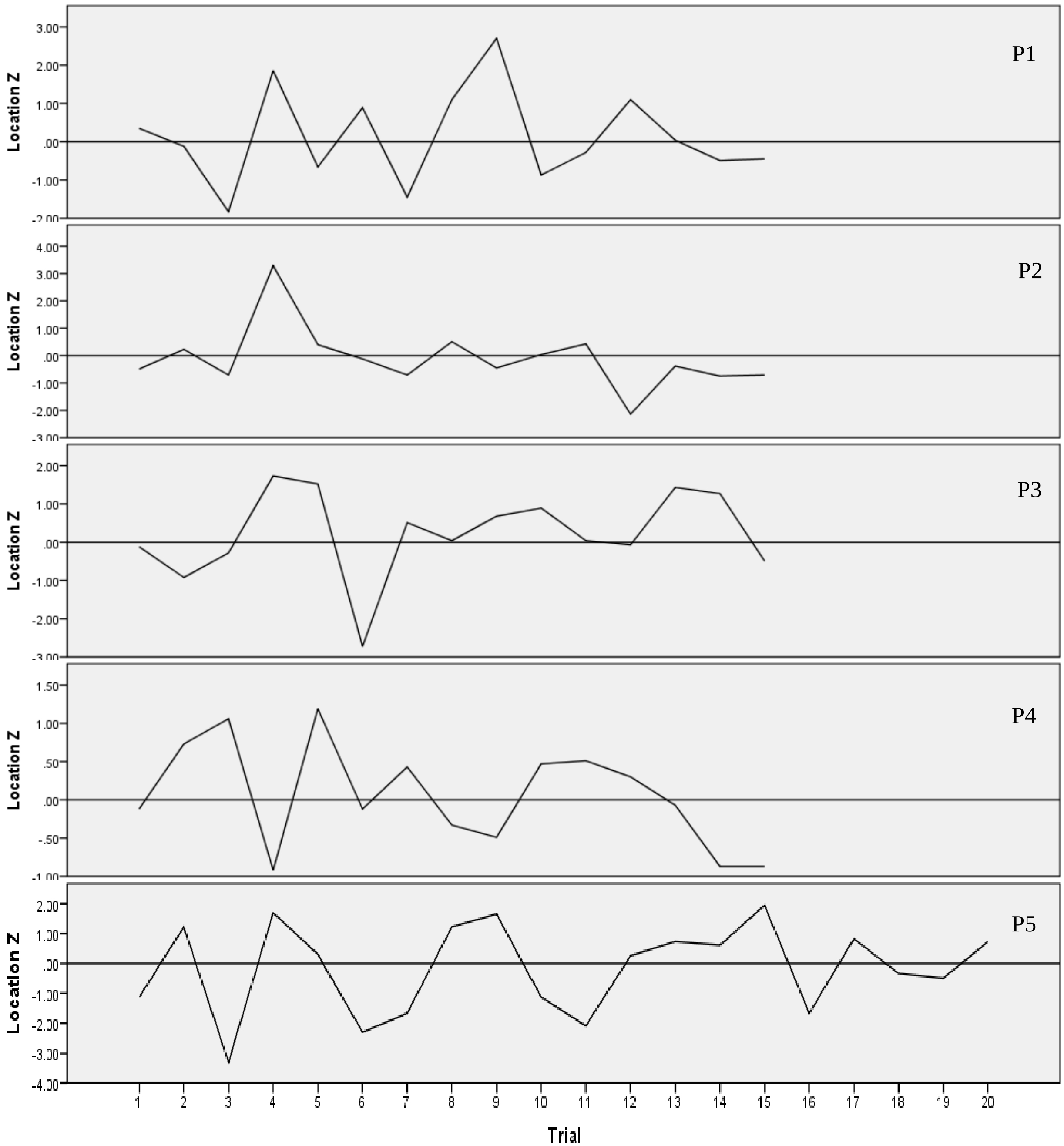

Figure 1. *Scoring trends across training sessions*.

Discussion

Although there was at least suggestive evidence of psi in the results of four of the five participants, none of it appeared during the training sessions. I had always considered the learning component of the study to be “high-risk/high-reward.” On the one hand, I believe strongly that it is important for parapsychology that we find ways to increase the strength and especially the reliability of psi performance in the laboratory (Palmer, 2009). Feedback training has always seemed to me the best way to achieve this objective. On the other hand, there is little evidence in the literature that such efforts are likely to succeed, although most studies have been marked by too few trials for success to realistically be expected. Although this experiment employed more trials than previous endeavors, it still was probably not enough. Participants must not only detect the subtle internal cues associated with operation of the psi process (assuming such cues exist – a big “if”) but they must also filter out the false feedback they get from chance hits. This is not easy to do. My failure to give the last five training runs to four of the Ps didn’t help in this regard. I’m sure my forgetfulness was encouraged by the failure to see any signs of learning in the first three Ps in the runs they did complete. There was an encouraging trend in P4’s sessions, but if it was real one would expect it to show up in her test runs, which was not the case. Most importantly, there was no evidence of learning in runs 16-20 of P5, the one P whose baseline and test scores confirmed the original hypothesis.

A major purpose of the altered state induction and the request to blank the mind was to make it easier for Ps to detect internal cues by eliminating the mental noise from their thoughts and imagery as well as from bodily sensations. This effort obviously was not successful. These involuntary intrusions were particularly unfortunate because the great majority were task relevant and often used by Ps to assess or worry about how they were doing. I had hoped to avoid this problem by making the feedback subliminal, but the feedback was distracting in very much the same way that I believe supraliminal feedback is distracting and why I am biased against its use despite its potential information value. Thus, my meta-hypothesis that a pure motor task should be especially psi-conducive was not tested in this experiment, because a condition for testing it was not met.

On a more positive note, I was encouraged by the fact that there was at least suggestive evidence of psi in the results of four of the five Ps. The fact that they were selected based on their capacity to respond in a dissociative manner on the AC task in the previous experiment (i.e., by their high scores on both state and trait measures of dissociation) lends a modicum of indirect support to my other meta-hypothesis, that psi is facilitated by dissociation.

Conclusions and Recommendations

Four of the five Ps provided at least suggestive evidence of AC in the baseline and test sessions, and one significantly confirmed the hypothesis of significantly higher scoring in the test sessions. Further suggestive evidence of psi in these runs is provided by the significant variability of the difference scores. However, the lack of improvement in the training sessions indicate that whatever genuine AC occurred was not due to learning, and there was no evidence of learning in any of the Ps’ data. As noted above, this lack of learning could be partly attributable to Ps paying too much conscious attention to the feedback stimuli, rendering them ineffective. This problem might be mitigated in a future study by using the quotations rather than the eyes-closed procedure to facilitate dissociation. Because P’s attention would be on the quotations, it would not be on the feedback stimuli.

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