

“WHAT LIES BENEATH”: FORTY YEARS LATER THE FIRST CRITICAL APPRAISAL OF JAMES ASHER’S TPR EXPERIMENTS

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ABSTRACT

The findings of the thorough analysis reported here, clearly show the importance of initiating a critical debate into James Asher’s experiments with TPR (Total Physical Response). The reason for this is that many of the aspects of TPR that have been taken for granted these last forty years do not now seem to be all that we thought they were. The experiments that Asher claimed to prove the viability of TPR may not be as reliable as we had assumed. Moreover, this article helps to explain what should now be done in order to move this research and teaching area forward. Further experiments into TPR need to be undertaken with the aim of righting the oversights committed, as well as making TPR more efficient. For certain, it will be the beginning of more dialogue on this issue.

KEY WORDS: TPR activities (Total Physical Response), experiments, original critical analysis, statistics, pre-tests, post-tests, research design.

RESUMEN

Los hallazgos del análisis riguroso expuestos aquí demuestran de manera clara la importancia de iniciar un debate sobre los experimentos de James Asher con la TPR (Reacción Física Total). El motivo es que muchos de los aspectos de estos experimentos los hemos aceptado sin cuestionar a lo largo de estos últimos cuarenta años. Sin embargo, parece que debemos someter estos experimentos a un nuevo escrutinio, ya que los experimentos que según Asher comprobaron la viabilidad de la TPR parecen no ser tan fiables como habíamos pensado. Adicionalmente, el presente artículo intenta explicar cómo podemos avanzar en este campo de la investigación y de la enseñanza. Necesitamos más experimentos con la TPR con el fin de corregir los deslices efectuados y adecuar la TPR como método de enseñanza más efectivo. Estamos seguros de que de esta manera entraremos en un dialogo fructífero.

PALABRAS CLAVES: actividades TPR (Reacción Física Total), experimentos, análisis crítico original, estadísticas, pre-tests, post-tests, diseño de investigación.



INTRODUCTION

Forty years have gone by since Asher wrote his first article in 1965 about the importance of TPR activities (Total Physical Response) in the learning of second or foreign language. Since then his TPR method of: “learning through actions” (Asher, *Learning Another 2*) has been incorporated into many activities for the teaching of English even if just into simple activities with movement. Many have accepted Asher’s finding unconditionally in comparison to the few who have tried to analyse, replicate experimentally, or renovate the admirable basis left by him. This means that the specialised literature abounds in descriptive studies on TPR or its incorporation into the classroom, but little else.

Until now, Beretta (1986) has been the only author to submit Asher’s work to critical scrutiny. However, the present author intends to give an original report on many of the aspects of Asher’s work that up to now have not been detected. In this way, from a totally new perspective, I hope to be able to help advance and extend the field. This will be done by going back to the source of his work, the source being his experiments and statistics, and submitting them to rigorous scrutiny in order to discover how solid the basis that underlies his famous teaching method is. Surprises are in store. Additionally, I point the way as to what should be done. More rigorous experiments still need to be carried out into TPR to right the errors made and also to make TPR even more effective. I am sure it will prove to be the start of an interesting debate.

A CRITICAL APPRAISAL OF ASHER’S ORIGINAL EXPERIMENTS INTO TPR

Over the years TPR has been used fairly widely in the teaching of languages. This, in effect, means an almost unconditional acceptance of Asher’s findings. In the specialised literature one can find many descriptions of the incorporation of TPR into the classroom, but few have stopped to look at the details of the trial experiments and therefore the basis and real efficiency of TPR.

Only one criticism of Asher has been found, the one by Beretta, which is included below. This lack of appraisal does not mean that the studies by Asher are beyond reproach. What is more, the study of any defects found supposes an improvement into the future use of TPR and also the future design of experiments into it. Additionally, this critical evaluation is encouraged in various works such as the manual of the American Psychological Association (7) or textbooks on the design of research (Brown 43).

In order to carry out any practical action which improves on another’s work, a critical evaluation of that original work, it helps to think of the original precepts before initialising it or putting it into action. Additionally, the critical reader may contribute enormously to the field of research by discovering in this way, new areas that are so far unexplored, as a result of that critical reading. All these reasons have led the present author to carry out her personal and original criticism of Asher’s experiments.



ASHER'S FIRST EXPERIMENT

In his first article on TPR (“Strategy”), Asher describes an experiment on learning Russian as a foreign language. Other articles by Asher himself employ the term ‘experiment’ and an instance of this can be found in this first article under debate, on page 299 for example. We are only going to consider articles by Asher that include experiments. Logically, articles of his which are purely theoretical will not come under scrutiny, not containing empirical evidence for TPR.

The hypothesis in this first TPR article (“Strategy”) was that: “listening comprehension of a foreign language can be accelerated if the student is asked to emit a response with his entire body” (299). Asher claimed that: “the results showed highly significant differences in retention (of Russian) favouring the experimental group” who had used TPR (293). Asher said that this demonstrated that TPR was more effective in helping students retain complex structures as exemplified by long utterances and novel utterances. He did this by contrasting the results with those of a control group of a similar number of participants ($n=19$, versus $n=18$ in the experimental group).

However, on closer inspection, at least a third of the times in each utterance category (and sometimes more) the results of the experimental group were not significantly higher than the control. It would therefore seem that his claim for the technique of TPR: “demonstrating the most power” (299) was exaggerated by Asher in the Discussion section of the experiment. Additionally, the probability level of $p < .10.$, is reported as being significant (297) when it is not. Traditionally, in linguistic research $p < .05.$, is considered the minimum, and this figure is even lower in other fields.

Another principal problem was that no data were taken, nor pre-tests nor post-tests given in order to help explain or discount any other influence other than TPR. It seems that errors were committed at the time of designing this experiment. By research tradition a control group can only justify results obtained in the experimental group about the intervention (in this case TPR), if the two groups start with the same level on this and all other variables.

Due to this total absence of any type of pre-test, we know almost nothing about the state of both the control and experimental group at the start of the research and the consequent influence of other factors, or not, on the alleged results. Neither was any test carried out on the psychomotor development of the participants, this is important to control for when using a method based on physical responses. All we know is that the participants had no other grounding or exposure in Russian and this is only according to Asher’s word.

Furthermore, an Otis Mental Ability Test was administered but “after” carrying out the experiment. Moreover, therefore this could in fact mean that the intervention used in the *control* group was what was successful in raising the level of mental ability. Neither is it possible to discover the degree of mental ability occurring in the experimental group at the start of the experiment. If the degree of mental ability in the experimental group was the highest at the beginning, this could be an alternative reason for explaining the better results of the experimental group in learning Russian.



Specifically, it seems that not all the success can be attributed to TPR and that other factors almost certainly existed and were probably mediating, without data having been collected on them.

ASHER'S SECOND EXPERIMENT

This second study, also dated 1965, was carried out by Kunihiro (a post-graduate student) in collaboration with Asher. It focused on the learning of Japanese through TPR. Kunihiro and Asher stated that: The retention of the experimental group, who responded physically to the Japanese cue...tended to be extremely high and significantly better than that of the control group(s)" (288).

This experiment seems better designed than the previous piece of research. A larger number of students participated (88 in total, divided into one experimental group and three control groups). The larger number of students adds more reliability to the sample and thus to the results, as it is nearer to being more representative of the population at large according to the mathematical principles inherent in the science of sampling.

Moreover and in a positive way, various tests were administered, this time before the intervention began. These were the Modern Language Aptitude Test and a mental ability test called the American College Testing Program. They showed that the groups were equal on these variables. In this way, subsequent progress by either of the groups can be clearly seen and contrasted. The experiment showed that after only two weeks the experimental group learning with TPR retained more Japanese during various periods of time; after two weeks, after 24 hours and immediately. Results for listening comprehension were high for long novel utterances through TPR.

All the same, the authors deem it important to comment that in the experimental group, the correlations between: a) the Modern Language Aptitude Test and b) the test of mental ability were extremely low and near to zero. They explained this by commenting that nearly all of the participants in the experimental group were clustered around the maximum mark on each of the criterion scores. However, traditionally there has always been correlation between these two types of variable. What the authors are perhaps trying not to say is that the low correlations are due to the fact that the experimental group constantly obtained top marks in all the language tests. An alert reader would probably ask him/herself the origin of these high language marks and one conclusion may be that there was something happening with the tests. Perhaps the method of completion affected the scores. In the same way, one realises that no pre-test was given for level of Japanese. Perhaps the experimental group began with the advantage in these tests, although Kunihiro and Asher assure us that the students had no fluency in any other language.

Moreover, no copies of the tests were included in the Appendix at the end of the article, neither were the psychometric properties or figures of reliability. Maybe the authors used tests of their own creation, a combination of characteristics that again throw doubt onto the validity, not only of the tests, but also the results obtained with these.



Additionally, the authors submitted the results to an analysis using Student's *t*-test statistic. Apart from not specifying which of the *t* tests were employed, the data is not presented with its degrees of freedom (*df*), which makes it very difficult for others to replicate the data.

The second control group first heard the utterances in Japanese and then the English translation. The participants were seated and did not carry out any physical actions. Nevertheless, the experimental group did not sometimes reach a significant retention of the utterances, when compared with this second control group in utterances comprised of a single word 24 hours and immediately after, for example.

Additionally, it was discovered that individual differences were reduced within the experimental group, as manifested in the retention measures. The results from members of the experimental group showed a tendency to group themselves compactly around the maximum score.

Effectively, we may see that it was not reported how the experimental group's tests were administered. It seems that all the experiment's participants did the tests altogether. Tests employing physical actions lend themselves to student copying even more so than tests with pen and paper, and thus, perhaps the higher score which may have not really been representative of the experimental group.

In conclusion, although the second experiment was better designed and carried out than the first, we may conclude that the tests and their realisation cast doubts on the validity and reliability of the results of students learning more Japanese with TPR.

ASHER'S THIRD AND FOURTH EXPERIMENTS

In the 1974 article Asher, Kusudo and de la Torre reported on two more experiments actually carried out in 1972, the first with German and the second with Spanish, both via TPR. The first experiment found that: "the experimental group, with only 32 hours training (at night school) had significantly better listening comprehension skills via TPR than college students (in two control groups) completing either 75 hours or 150 hours of college instruction in German" (26).

The second discovery was that the ability to listen to and understand German had positive transfer onto the reading skill. The experimental group had had no preparation given to them in the latter skill but their final level was comparable to the control group that did have preparation in the reading skill. The same happened with the speaking skill although there were some pronunciation and grammar errors.

Again it is difficult to really compare the control and experimental group participants. Neither in this article nor in the book (*Learning Another*) where Asher goes back to describe the same experiment, does he mention any other participant-characteristics of any of the groups. From what we can see, they were very different and we may ask ourselves how it was possible to compare university stu-



dents with night-school students, above all, when we are not informed about their similarities.

The only thing we know about the university control subjects is that they had probably studied German literature, in which case it would be perfectly normal for the experimental group, who were constantly listening to orders in German, to gain better marks on the listening comprehension via orders than the control groups.

The second experiment described in this same article relative to the skill of understanding stories, offers results describing a higher average mark of 16.63 for the experimental group (with 45 hours of preparation) against three control groups. Control group one (with 200 hours of preparation) only had an average mark of 14.43. This difference was significant at the $p < .01.$, probability level with a t statistic of 2.66 and 39 *df*.

Additionally, the same experimental group obtained higher marks than the second control group (with 75 hours of preparation) for the skill of listening to stories. The t statistic of 6.75 was significant at the $p < .001.$, level of probability with 69 *df*. The experimental group also surpassed on reading skills: t statistic 3.22, significant at the $p < .005.$, level of probability with 63 *df*.

Other results are as follows, still with the same experimental group, of 45 hours practice in the reading skill. These, when compared with the third control group of university students in their second semester learning Spanish for 150 hours. Again the experimental group was statistically significant better in listening (t statistic 3.21, significant at the $p < .005.$ level of probability with 53 *df*. However, they did not overtake the marks of the third control group in the reading tests. The t statistic of 0.60 was not significant with 47 *df*.

Additionally reported is the fact that without any direct preparation in reading or writing the experimental participants surpassed the 75th and 65th percentile of the level I and II of the Pimsleur Spanish Proficiency Tests.

However, the experimental group students do not seem to have been a reliable sample from the “normal population” as they were volunteers for the experiment especially taken from amongst university psychology students and they received credits in return for their participation in the experimental group. Again, neither in this experiment nor formerly, did they administer pre-tests to any of the three groups taking part. They did not previously determine aptitude nor ability in foreign languages, either. Additionally, all the groups contained differing amounts of participants without any statistical adjustment of the figures to balance the results in this sense. The experimental group had 27 subjects, the first control group $n=14$, the second $n=44$, and the third $n=28$.

The results of the Pimsleur Spanish Proficiency Tests are not given, as the control groups did not take them, a large omission in itself. The stories used in the tests were especially written for the tests and experiment and even Asher himself admits in this article, that this may have given the experimental group an advantage: “there may have been an unintentional bias in favor of the experimental training” (29). Additionally, the experimental group started out with 27 participants but finished with only 16 at the end of the first semester indicating an enormous amount of participant attrition.



The most censurable aspect that all the experiments designed by Asher have in common is that of not including any of these tests in the appendices of his articles in order to permit us to inspect them. Only a few examples of individual phrases been found. This lack of clarity means great difficulty in replicating the experiments—a principal goal of empirical research. Other aspects include the lack of a detailed teaching method description, and the results make it difficult for the modern reader to establish sound theories. The reliability figures for these experiments have not been given, nor the details of how the tests were corrected and by whom or how many (inter-rater reliability).

The only criticism found of Asher's experiments was that by Beretta (432) and it is specified that this latter author criticised this experiment. He explains in detail how one of the measurements used to compare the control and experimental groups was a story, as we have seen. Apparently, the story was exactly the same one which had been used formerly for a class to the experimental group. For Beretta, it is not surprising then that the experimental group took the lead with a drastic probability figure of $p < .0005$.

In his 1987 book, Krashen talks about TPR and finds support for many of his own theories. Nevertheless, he reveals that Asher demonstrated that the use of TPR is not essential for improved listening comprehension. Krashen relates that some of Asher's studies (Asher, "Strategy"; "Learning Startegy"; "Total"; Asher and Price; Kunihira and Asher) demonstrate that students who only observed TPR got identical results to those who participated in TPR. Both groups (those who observed TPR, and those who performed TPR) obtained better results than students who only wrote their answers on tests (Krashen 141).

This suggests that Asher's principle of understanding through imperatives may not be necessary. It may be important as the means of directing students attention to the input and the keeping it there in an active way. All in all, Krashen understands TPR to be a better method than the audio-lingual or grammar-translation method.

Now that we have re-looked at the experiments, the present author feels that these experiments connected to the name of Asher, in general inspire little confidence neither in the results, the tests used nor how the experiments were carried out. This in turn, the security of the results, throws them into doubt especially with control groups that were not comparable. From what we can see there was little complimentary data collected with the aim of excluding alternative explanations for the results, as well as many aspects of the learning and background of the participants left without being controlled for. The only genuine result seems to be the equality of the TPR students on the skills of reading and writing without having practised these skills in any specific way.

THE EXPERIMENTS OF OTHER RESEARCHERS INTO TPR

Woodruff depicted a course in German for students of the University of Texas via TPR. The results with TPR reached figures which were higher than na-





tional norms, pre-registration rates rose, as did motivation and absenteeism fell. Bearing this in mind, it must be said that again there was no control group, the results only being compared to former academic years. Moreover, perhaps a simple IQ test could have explained the improved results.

The experiment by Wolfe and Jones was carried out with high school students receiving Spanish classes via TPR for 20 minutes a day. Meanwhile, the control group learned Spanish in a more traditional way. The results showed higher marks on the tests and more satisfaction with their teacher and method with the experimental than with the control group.

A fairly sound experiment was carried out into the effect of TPR on children who were beginner pupils of English in the fifth year of a school in Germany (Thiele and Scheibner-Herzig). The control group learned English by a conventional method while the experimental was trained in listening comprehension, the oral production being replaced with TPR.

The pupils in the experimental group started with less linguistic ability as measured by the tests administered before teaching began. The tests were: section 1 of the version in German of the Foreign Language Aptitude Test; the Hamburg KJ Neuroticism y Extraversion Scale for Children; and finally the Attention Capacity Test.

The experimental group had more success in listening comprehension and “general command” of English after a first exam in English. The experimental group showed a positive effect with respect to their attitudes and anxiety, possibly due to the delay in oral production inherent in TPR. Altogether, the English results in both groups were similar.

The problems observed in this experiment were the lack of control of the teacher variable because it was not possible to have the same teacher give classes to both groups. This may have been an important source of differences in motivation and therefore the results.

Notwithstanding, there are some very positive details in the design of this experiment, such as the individual programme designed for each group in which the vocabulary and grammatical structures were identical for both. The tests were all carried out previous to the start of the teaching intervention and these were repeated regularly after 34 and 80 hours of class.

In this same article by Thiele and Scheibner-Hertzig there is an interesting observation:

...owing to the amount of physical activity involved, this method is a great help to pupils who have difficulty in concentrating. Social interaction in the foreign language conveys the feeling that one is acting with and in the language, and at the same time this interaction satisfies the children's urge to be active, an urge which is normally an interference factor during classes. (279)

Unfortunately, this comment is not backed up by any source and may be just the authors' personal non-empirical viewpoint.

In a study by Labarca and Khanji, it was observed that the use of communication strategies with French students through either TPR or the Strategic Interaction Method. One of the findings was that students learning with the latter

method and not TPR obtained higher ability measures but used fewer communication strategies.

An article by Parish supports TPR together with other methods and defends the validity of the psycholinguistic and sociolinguistic theories associated with them. However, much more relevant is the importance Parish attributes to, and the already described, highlighting of the affective component in contrast to the cognitive element of TPR.

Tomscha describes the limitations of TPR in a programme of English as a second language. It was found that TPR was only useful for the teaching of vocabulary and with pupils having a lower level of English. The language of orders and responses were not found to be useful in real interaction, plus the pupils felt frustrated at not having the opportunity to practise speaking. Despite this, some positive aspects of TPR were found, and these included the fact that action aided memory, movement added variety to the classes, a maximum number of students were able to participate at any one time, the paralinguistics were useful as cultural information and the activities were fun.

A project by Sano incorporated TPR into the teaching of English to Japanese students. Sano commented that with TPR the marks were better than former years. Nevertheless, the present author notes that again there was no control group, nor were the different tests described that could have shed light on alternative reasons for the higher results. Sano also described a more heightened motivation, as much for verbal expression, as for non verbal. In spite of this, he offers no evidence to support the claim. Additionally, Sano presents some correlations between the TPR exams and later exams when the students were following their studies with a text book. However, these correlations probably represent little. It could have been that the TPR tests, as in former years were measuring two similar aspects such as IQ and not the aid lent by TPR. None of the tests were attached to the article as neither was any description to explain with certainty what the tests were actually measuring. Other results included that the average mark in the tests grew in comparison to the IQ tests from the time TPR was introduced into the study, the number of students failing also diminished, plus there was an increase in motivation. Sano admits that his personal certainty is insufficient, as his article describes only a project not a rigorous experiment.

Other lines of research talk about the importance that physical movement has in the teaching of foreign languages to children as up to ten or eleven years old their capability for analytic study or sitting still for long periods of time is less good than in adults (Kantrowitz and Wingert).

Mangubhai studied the effects of TPR on the different types of mental heard language-processing with adults. It is not so much the results that interest us here as the fact of demonstrating the necessity of increasing systematic research into experiments on psychomotor activities in the teaching of languages.

Hewitt's experiment was an attempt to combine the aspects described as well as to control for the effects that psychomotor activities have on children's development. 42 children took part in an experiment in to her own teaching programmes called the *PEPA* (Programme of English with Psychomotor Activities).



This programme was systematically controlled in an attempt to improve the excellent basis left by Asher. It included a thorough psycho-pedagogic assessment carried out before the intervention began. Additionally, a psychomotor test was used plus the intervention included a classification of each of the sixty-two English language activities according to their motoric aims. The teacher was the same for each group, both experimental and control, thus lessening the influence of more teacher motivation in one group than the other. Each group used a different programme that however contained the same vocabulary, grammar and English language content—only the medium was different.

The principal conclusions arrived at, were that significant psychomotor development took place in the experimental group. The category having the most significant results was Segmental Control. In the field of psychology this skill is known to be important in the learning of writing as well as being related to a reduction in anxiety, a connection between emotional control and the observation of one's own body image, relaxation in general and the relaxation of body segments in particular. This understanding and dominance of the body affirms corporal behaviour and communication with others, of which the former is related directly to school learning as it is immediately related to hand-training.

Additionally in Hewitt's experiment, 100% of the experimental group preferred the psychomotor teaching method of the two used with them. With the academic achievement on the listening and writing tests, the experimental group obtained marks that were as good as, and even slightly superior to the control group even though the experimental group received less practice in writing than the control. The listening comprehension marks show a higher average for the experimental group after beginning the PEPA programme, but we must maintain a reserved outlook due to the fact that the statistics did not reach significance, but we can, however, place trust in the reliability of the experiment.

Many aspects of this experiment confirmed the results by Thiele and Scheibner-Herzig therefore strengthening reciprocally the reliability of Hewitt's results and in the same way attending to the tradition of empirical research by improving the experiments of others and in this way helping to advance the field.

CONCLUSIONS

Within the field of TPR there seems to be a lack of rigorous empirical studies to prove the effect of movement activities or TPR itself, in a conclusive way. We have seen how even the original experiments carried out by Asher leave something to be desired. It seems that many important aspects of rigorous experiment-design were forgotten by him. Thus, this makes a systematic verification difficult, of whether TPR really was the cause of improved academic achievement in Asher's experiments. On some occasions the tests appear doubtful, on others the control group can not really be compared to the experimental. These days, the field of educational experimental design is much more rigorous and well defined and so the arguments outlined here point to the fallibility of TPR.

After having seen the original experiments into TPR, we are surprised at the degree of acceptance that Asher found in his day. Beretta observed that one of the measurements Asher used, a story, was exactly the same one which had been used formerly for an experimental-group class. This, for Beretta, is more noteworthy than the TPR method in explaining how the experimental group took the lead with an extreme probability figure of $p < .0005$. Krashen remarked that Asher in fact showed that the use of TPR is not essential for improved listening comprehension, as students who only observed TPR got identical results to those who participated in TPR.

All the analyses carried out in the present article indicate that we should continue to carry out research into TPR as we cannot rely on the experiments carried out by Asher. The usefulness of TPR was recognised and used (and still is today) by teachers in their classrooms —a sign of its viability and value in practice. Nevertheless, it is now necessary to discover exactly how TPR is useful. We should do this and continue blending, within a global study, the positive aspects of all the experiments mentioned and apply them in a better way. Hewitt went some way towards this with her PEPA programme, created in a more systematic and detailed manner so as to offer certain advantages over TPR. She discovered that effectively, psychomotor activities are a method preferred by children, as well as giving more positive academic results than a more traditional method, plus the significant psychomotor variable of Segmental Control being a variable related to the writing skill. Other studies found similar equal achievement in the writing tests but with TPR and also without having practised this particular skill. Perhaps the reason for this, as revealed by Hewitt with the PEPA, is that both methods give indirect hand and finger exercise that shows up in academic achievement and in the writing tests. Additionally, the link with Segmental Control and the reduction of anxiety in children to its resulting improved written and academic achievement.

Many articles exist subsequent to Asher's, but most of these however, limit themselves to simply describing the incorporation of TPR activities into the classroom. With the exception of Asher, only 6 more experiments have been found over the 40 years of TPR's existence, even when employing the word "experiment" loosely.

However, TPR has survived and many teachers know by instinct that it has a "certain something" that is still useful today, even though the research done into it mostly reveals that it is not in fact related to significantly higher marks. One may take into account that movement for children is synonymous with fun and therefore represents a greater affinity with the psychology of a child that should be made the most of before applying other methods for the acquisition and development of a second or foreign language.

Nevertheless, more rigorous experiments still need to be carried out into TPR to right the errors made by Asher and also to make TPR even more effective. Alternatively, we may verify it as a waste of time, being only as effective, or less so, than any other method of learning foreign languages. It would be useful to find out exactly what TPR does and in what manner. In this way, we would be able to apply it to specific and correct circumstances and age-groups. Finally, we may be able to turn it into a truly effective teaching method, one that withstands all experiments into it and ultimately, really teaches languages more effectively.



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