

The Total Physical Response (TPR):

Review of the evidence

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Definition of the Total Physical Response (TPR)

This is an experience rather than a concept. The experience enables students of all ages including adults to understand any language in a few exposures. The experience differs from translation in three significant ways.

First, experience involves physical action as the student interacts with the target language. A simple example: When students hear "Waaif," they stand up and when they hear "Ooid," they sit down. With translation, students use repetition to associate a connection between their native language and the target language (i.e., "Waaif" means to stand up and "ooid" means to sit down.) Experimental studies, reviewed in this article, demonstrate that experience, often in only one exposure, results in long-term retention while translation after many exposures is most often limited to short-term retention.

Second, recent neuroscientific research by Melvyn Goodale and others (2008) suggest that experience is primary perception resulting in an accurate assessment of the external

world. School, a recent innovation from an evolutionary point of view, is secondary perception vulnerable to distortions. The reason: Students sit while someone called "the instructor" attempts to construct the world for them. Translation is a classic example of the instructor attempting to construct a language while the student "reads" or "listens" or "repeats." Further, neuroscientists using sophisticated magnetic imaging equipment have demonstrated that the primary perception of experience activates a different stream of brain cells compared with secondary perception. I will present a dramatic example of this phenomenon with the Müller-Lyer illusion at the end of this article.

Third, experiments by Asher and others (2009, 2008) demonstrate that experience with a target language is aptitude-free meaning that everyone in the normal range of intelligence can internalize any target language. Translation, by comparison, is aptitude-dependent. Only about five percent of the student population in the USA or other countries who translate will continue on into fluency (Lawson, 1971).

The evidence: Japanese

(Excerpted from Kunihiro, Shirou and Asher, James J. The strategy of the total physical response: An application to

learning Japanese. *International Review of Applied Linguistics*, 1965, Volume III/4, pages 277-289.)

Subjects

The subjects were 88 volunteer college students who (a) had no prior training or exposure to Japanese, (b) had no fluency in any language other than English, and (c) were not language majors in college. Ss were assigned randomly to one of four groups with about an equal number of males and females in each group.

The groups were about equal in "aptitude" for learning a foreign language as measured by The Modern Language Aptitude Test, a mental ability test, and the American College Testing Program (ACT). 67 of the 88 completed the experimental training.

The experimental group (N = 16)

They listened to a voice on a tape utter a one-word Japanese instruction such as "tate," and a student sitting on either side of the instructor stood up. Then "aruke" and all walked forward until they heard "tomare" and stopped. Other directions were: "maware" (turn), "kagame" (squat), "hashire" (run), "tobe" (jump) and "suware" (sit). Each pair of students listened and performed with the instructor for about eight

minutes. The one-word utterances were varied so that students could not predict the sequence.

Testing

Individually each student was given a retention test and they returned 24 hours later for another retention test followed by 10 1/2 minutes of TPR instruction that expanded the Japanese to forty short sentences like this:

Short Japanese sentences

To ni aruite ike. (Walk to the door.)

Isu ni hashitte ike. (Run to the chair.)

Tsukue ni hashitte ike. (Run to the desk.)

Then a retention test for each person who returned twenty- four hours later for another retention test and the third

TPR training session lasting 7 1/2 minutes with sixteen long sentences in Japanese like this:

Long Japanese sentences

Tsukue ni aruite itte enpitsu to hon o oke.

(Walk to the desk and put down the pencil and book.)

Kami to hon to enpitsu o motte isu ni suware.

(Pick up the paper, book, and pencil, and sit on the chair.)

Mado ni hashitte itte hono motte tsukue ni oite isu ni suware.

(Run to the window, pick up the book, put it on the desk, and then sit on the chair.)

Then a retention test and the students were invited back in two weeks for a final retention test.

The comparison groups

Control group I (N = 13). They listened to the same tape as the experimental group, but they sat and watched the instructor perform in response to each direction in Japanese.

Control group II (N = 15). They listened to the tape and heard a translation in English after each Japanese utterance.

Control group III (N = 18). They listened to the tape and silently read a translation in English after hearing each

Japanese utterance.

Scoring of the retention tests

The retention tests were scored in behavioral units. For example, if the student heard "Isu ni hashitte itte hon o mote," the person gets one point for running, another point for running to the chair, another point if the individual ran to the chair on which there was a book, and a point if the subject picked up the book on the chair. Therefore, the total number of points for "Isu ni hashitte itte hon o mote" was four points. The same scoring for the comparison groups except they wrote down the English translations of the Japanese utterances.

Results

The experimental group outperformed every comparison group on every measure of Japanese including single words, short sentences, long sentences and novel sentences.

Novel sentences recombine constituents to produce sentences in Japanese the subjects have never heard before which is perhaps the most important measure of fluency in a foreign language.

The experimental group not only outperformed the comparison groups in understanding Japanese immediately after training, but also 24 hours later, and even after two weeks. Most comparisons were statistically significant beyond the .001 level meaning there is only one chance in a thousand that

we made a mistake is saying that Japanese internalized with TPR "caused" a dramatic spike in retention for college age adults.

The evidence: Russian

(Synopsis of an article by Asher, James J. and Price, Ben S. The learning strategy of the total physical response: Some age differences, *Child Development*, December 1967, Volume 38, No. 4, pages 1219 - 1227.)

There is a common belief that children are better able than adults to learn a foreign language. This belief may be an illusion if children living in a foreign country learn the new language through play activity while their parents work at acquiring the new language by sitting in a classroom, memorizing vocabulary and grammar, and repeating utterances on cue from the instructor. In this research project, we explored what happens when children and adults have the same opportunity to acquire a new language of Russian through play rather than work.

Subjects

The children (N= 96) were drawn from the second, fourth, and eighth grades of a public school in San Jose, California. The adults were college students recruited from undergraduate general psychology courses at San Jose State University. None

of the children or adults had prior training or exposure to Russian.

Procedure

The subjects were in four different age groups (8 years-old, 10 years-old, 14 years-old, and adults). Each age group was divided into an Act-Act group and an Observe-Act group.

The Act-Act group acted with the model during training and later acted individually in the retention tests while the Observe-Act group sat and observed the model act after hearing a direction in Russian but acted individually in the retention tests. The two independent variables were (a) age of the subjects and (b) acting with a model or sitting and observing a model act during training.

The procedure was similar to the Japanese experiment. Subjects listened to a voice on tape give the directions in Russian starting with single words for "Stand," "Walk," "Stop," "Turn," and "Sit." As with the Japanese, the training in Russian proceeded with short sentences, long sentences and novel sentences (familiar constituents are recombined to create sentences in Russian the subjects have never heard before). Novel sentences are perhaps the most important measure of fluency in understanding or producing utterances in any language.

Results

When children and adults have the identical opportunity to acquire Russian through play rather than work, the spectacular finding is: Adults vastly outperform children of all ages. Every statistical comparison of adults with children of all ages showed a dramatic spike in the retention of Russian, which was near 100 percent retention, favoring adults: immediately after training, 24 hours later, 48 hours later, or two weeks later. The statistical significance was generally beyond the .001 level meaning there is only one chance in a thousand that we made a mistake in our conclusion that adults dramatically outperform children in understanding Russian when all enjoy Russian through the play activity of TPR.

Another interesting finding

With TPR, older children outperform younger children. Fourteen year-olds had better retention than ten year olds, and ten-year-olds were somewhat better than eight year-olds. Another stunning finding: There was no significant difference in retention for the Act-Act groups and the Observe-Act groups. Subjects of all ages who sat and observe a model act retained as much as subjects of all ages who acted with the model. The important difference is that these results may only happen when each subject acts independently in the retention

tests rather than "sit and write" translations. (This finding was verified in follow-up studies, see Asher (1969a, 1969b).

It is important to note

It should be pointed out that although adults will outperform children in understanding a new language when everyone learns in the context of play, which is the essence of TPR, children younger than puberty have a "biological" advantage in acquiring a native pronunciation of the new language. For details, see Asher and Garcia (1969c).

It is possible for a few adults to achieve a near-native pronunciation but it is almost certain they will have some accent even if they live in the foreign country for 50 years.

The evidence: Spanish

(Excerpted from an article by Asher, James J., Jo Anne Kusudo and Rita de la Torre. Learning a second language through commands: The second field test. *The Modern Language Journal*, Volume LVIII, No. 1-2, January-February 1974.)

In this study, some students experienced Spanish with TPR while other students enrolled in traditional courses where they sat in rows constructing Spanish in their heads with exercises such as:

- Please listen and repeat after me.

- Let's analyze this sentence to point out the grammar rule for the day.
- Open your books and complete the exercise on page 25.
- Memorize this list of vocabulary.
- Memorize this verb conjugation.
- Open your books to page 63 and translate the first paragraph.
- Let's practice putting the appropriate direct object in the correct place in this sentence.

Subjects (experimental group)

These were undergraduate students (N = 27) who enrolled in an experimental course for people without prior training in Spanish. They earned college credit for attending the class three hours one evening per week for two consecutive semesters with no homework. The students had an average aptitude for language learning on The Modern Language Aptitude Test (MLAT) that was similar to the average college male and female reported in the MLAT testing manual.

With a male and female seated on each side of the instructor, and the rest of the class watching, she said, "Levantesse," as she stood up and motioned the students seated on either side of her to stand. Then, "Sientese," and they sat down. Other one-word directions in Spanish were "Ande" (walk), "Parase" (stop) and "De la vuelta" (turn). This was

repeated three or four times until individual students indicated that they were ready to try it alone. Each repetition was varied so that students did not merely memorize a fixed routine.

It is important to get those watching to perform

The next step was to invite other members of the group who were watching to perform individually. Prior experiments in Russian (Asher, 1969a and 1969b) showed that adults can sit and observe a model act, but for long-term memory, each person should perform alone.

Expand the one-word directions into short sentences

Next, just as we did with adults learning Japanese and Russian, the one-word directions were expanded into short sentences like this:

Point to the door.

Point to the table.

Point to the chair.

Point to the chalkboard.

Point to the door. Walk to the door. Touch the door.

Point to the table. Walk to the table. Touch the table.

Point to the chair. Walk to the chair. Touch the chair.

Point to the chalkboard. Walk to the chalkboard. Touch the chalkboard.

Now for novel sentences

At this point, the instructor recombined constituents to utter novel sentences in Spanish, ones the students had not heard before. This is the most important feature that is exclusive with right brain instruction such as TPR. The right brain seems to be "fluid," that is, able to rearrange elements effortlessly to understand and produce new sentences never before introduced in training, which is the essence of fluency in any language. Examples,

Students experienced:

Stand up.

Walk.

Point to the table. Walk to the table. Touch the table.

Point to the chair. Walk to the chair. Touch the table.

Pick up the paper. Put the paper on the table.

But they have never experienced:

Eugene, stand up, walk to Claudine and touch her.

Claudine, walk to Norman and touch his chair.

Jaime, walk to the chair, pick it up and put it on the table.

Another benefit of novel sentences

Novel sentences in the target language have another exciting benefit. If the instructor is too predictable, students quickly adapt and become bored. Novel sentences surprise students and delight them because they instantly understand what is happening. Another twist in this course was sentences that are not only novel, but bizarre or crazy such as:

When Henry runs to the chalkboard and draws a funny picture of Molly, Molly will throw her purse at Henry.

Henry, would you prefer to serve a cold drink to Molly, or would you rather have Eugene throw your book out the window?

When the students began to speak Spanish

After ten hours of the TPR experience, students were invited to reverse roles with the instructor and give directions to the instructor and their classmates. From this time on, about 20 percent of class time was role reversal and then there were skits, which the students working in pairs wrote down in Spanish and performed for the class. You can see their performance on a documentary DVD entitled, "**A motivational strategy for language learning**" (Asher, 2009e).

Notice two things when you view the video: First, the adults morph into speaking, reading and writing without any awareness that they have made a transition to other skills.

We did not announce, "Now you will learn to read Spanish!"

When textbooks and the instructor in traditional classes announce, "Now let's try reading," immediately the leery analytic left brain may whisper to the students, "Hold it! This is something new and unfamiliar. It will probably be difficult. You can't do this. You can't read Spanish. See, I told you so. This is a mind bender."

The left brain seems to trigger warnings that other skills have suddenly appeared in the textbook such as reading and writing. The analytic and critical left brain is not comfortable with things that are unfamiliar.

But with TPR, we are operating on the right side of the brain where there is no evaluation. Students just slide quietly into other skills without comment. Unless the instructor makes an issue out of it, the right brain is not aware of "other skills," so there is nothing for the student to worry about.

Notice the creativity of the adults

When you view the documentary video, notice the creativity of the adults as they brainstorm with each other to

write a script that they will act out. You will see performances that are as entertaining as any professional stand-up comic.

Notice that students are actually "thinking" in the target language. Also, they are reading and writing "without awareness."

Results (Midway through TPR Training)

Listening skill of TPR students compared with high school students in traditional classes

Our experimental group with only 45 hours of TPR instruction was compared with high school students with 200 hours of traditional instruction in Spanish. Both groups listened to two stories in Spanish they had never heard before; the stories contained vocabulary that both groups had encountered in their training. Then they answered ten true-false questions about each story. Listening was followed by reading the stories in a printed booklet and they answered the identical true-false questions.

The TPR group with only 45 hours of instruction (and no homework) vastly outperformed the traditional group with 200 hours (and homework). (The t of 2.66 was statistically significant beyond the .01 level for 39 df.)

**Listening skill of TPR students
compared with college students in traditional classes**

When listening skill was compared with college students completing 75 hours of traditional instruction with homework, the results again favored the experimental group who had only 45 hours of TPR instruction. The TPR students with half the number of contact hours in the classroom excelled in both listening skill (t of 6.75, .001 level for 69 df) and in reading skill (t of 3.22, .001 level for 63 df). The dramatic advantage in reading Spanish was surprising because there was no "systematic training" in reading and writing for the TPR group. These skills were acquired as "incidental learning."

**Listening skill of TPR students
compared with advanced college students
in traditional classes**

Listening comprehension

We decided to "push the envelope" and compare the TPR students with advanced college students who had 150 hours of classroom Spanish. We were amazed that the TPR group's listening skill was far beyond the traditional group (t of 3.21, .001 level for 53 df). With only 1/3 the contact hours,

TPR enabled students to outperform traditional classes in listening comprehension of Spanish.

Reading

The TPR group, with only "incidental learning" in reading of Spanish, matched the reading skill of traditional students who experienced "systematic" instruction in reading (t of 0.60, p greater than .05 for 47 df).

Another surprise---Performance of TPR adults on standardized proficiency tests

We did not expect that adults in the TPR group would perform well on the Pimsleur Spanish Proficiency Tests--Form A because Paul Pimsleur designed the tests to measure the proficiency of students in a typical audio-lingual class.

We were surprised with the results: The average student in the TPR class performed at the 70th percentile rank for listening, the 85th percentile rank for reading, and the 76th percentile rank for writing. In speaking skill, our average TPR student was rated, "good."

Here is what happened at the end of TPR class (90 hours)

We "pushed the envelope" again by measuring the students in our TPR class with the Pimsleur Spanish Proficiency Test--Form C which was designed for audio-lingual students completing twice as many contact hours as our subjects. Nevertheless, the TPR class performed beyond the 50th percentile rank for Listening, Reading, Writing, and in the "good" category for Speaking Spanish.

The evidence: German

The San Jose State University Study

(Synopsis from the article by Asher, James J., "Children's first language as a model for second language learning," *The Modern Language Journal*, Volume LVI, No. 3, March 1972. The entire study was captured in a documentary DVD entitled, "**Strategy for Second Language Learning**" (Asher, 2009d).

Subjects

For a fee of \$30, eleven adults enrolled in an 8-week non-credit course in German at Cabrillo Community College in Santa Cruz, California. The adults who ranged in age from 17 to 60 met twice a week for two hours per evening.

Procedure

The adults experienced TPR instruction similar to our prior studies in Japanese, Russian, and Spanish. A student sat on either side of the instructor, who was a native speaker of German. Students were prepared by asking them to be silent, listen carefully to each German utterance and act immediately along with the instructor. Students listened to one-word utterances in German and followed the instructor by standing, sitting, walking, stopping, and turning.

Caution: Beware of over-modeling.

If your students seem to understand in one or two exposures, do not continue modeling. This will only exhaust everyone including the instructor. Sit down and ask whether either student would like to try it alone. The objective is minimum input from the instructor and maximum output from the students. Think of yourself as a director of a theatrical production rather than a teacher. The director of a play only shows the actors what to do once or twice. They get it. Students are intelligent. Do not underestimate them.

After 30 minutes

Within 30 minutes, the one-word utterances were expanded to short sentences such as:

Point to the table.

Touch the chair.

Go to the wall.

Pick up the money under the picture.

Point to the screwdriver on the chair.

An interesting innovation from the instructor

The instructor included vocabulary items from the pockets and purses of the adults such as money, keys, picture, post card, handkerchief, screwdriver, lipstick, chapstick, pocket knife, pen and glove. This personalized the vocabulary more than if the instructor just used the vocabulary from a textbook.

Reaction of the adult students

The adults were excited when they realized that almost immediately they understood everything the instructor was saying in German without memorization.

The second evening

Next, body parts were incorporated into the directions such as:

Touch your eyes.

Point to your toes.

Touch your right thumb.

Show us both elbows.

Pick up the newspaper with your left hand.

Point to the corner and touch your right hip.

In addition to body parts, the vocabulary included magazine, newspaper, floor, ceiling, light, large, small, bend, hear, see, partner, right, left, and both.

Another caution

As we would expect from contrastive linguistics, similar sounding German words confused the students. For example, they responded slowly to Zeitung (newspaper), and Zeitschrift (magazine) or Zehen (toes) and Zahne (teeth). For beginners, it is wise to select vocabulary with distinctly different sounds.

Expanding the confinement of the classroom

Since we were confined the classroom with limited resources available, many vocabulary items were printed on pieces of cardboard with a German word on one side and an English word on the other. The adults manipulated the cards like they would objects. For example, if the German instruction was "Put the egg on top of the plate!" the student placed the card printed with the word "egg" in German on top of the card printed with the German word for "plate." The adults used the cards to act out complex instructions in

German such as, "Give Charles a plate of scrambled eggs, bread, and butter, and if he likes it, sit down; but if he does not like scrambled eggs, then go back to the table and bring him a bowl of oatmeal."

Abstractions were manipulated as objects

The simple card technique seemed particularly effective with abstractions such as *love*, *government*, and *justice*. Abstractions were manipulated as objects. For example, the instructor said in German,

"Luke, hand *justice* to Edna."

"Edna take *justice* and put it on the chair next to *love*."

An important note about "translation"

I have stressed in other articles and books that an attractive feature of TPR is that "no translation is needed." Using cards with German on one side and English on the other seems to contradict the suggestion that we get better results when there is no translation.

Clarification of translation

Translation usually involves a large chunk of the target language as when we tell students, "Please open your book to page 46 and translate the first paragraph." This "large chunk" translation dramatically slows down learning for most people.

In the German class at the community college, the situation was unique because (a) translation was limited to single vocabulary items, and (b) those vocabulary items were internalized with motor behavior (i.e., They handle the cards as objects to be manipulated). This switches the learning from a slow-motion "sit and memorize" (on the left side of the brain) to fast-moving right brain learning---fast because the right hemisphere is not analyzing the experience.

Speaking German

After 16 hours of internalizing a map of how the German language works (i.e., Note: Every language may have its own unique map), the students pressed the instructor to let them speak in German. This is an important difference between students in a TPR class and a traditional class.

TPR students begin speaking only when each person is ready while students in a traditional class speak on cue, usually starting with the very first meeting of the class when the instructor says, "Listen and repeat after me." The collateral damage of speaking on cue from the instructor is: Students are not ready. Hence a well-meaning exercise works against the students and the instructor. Students struggle to please the instructor only to have their left brain evaluate the experience with, "See, I knew it! You can't do this! You have a thick tongue! You will never be able to do this!"

The instructor's left brain is also busy with messages like this: "They are having trouble with this. It shouldn't be difficult. After all, I did it. That's the way I learned German. They should be able to do it too. To me the German language is like glass. It is transparent. I can see right through it, like looking at the inside of a watch. Why can't they? I think they are not trying hard enough. I think I will encourage them to try harder."

The result in traditional classes is this: At the end of Level 1, half of the students "give up." After Level 2, only 14 percent are still in the class and after Level 3, only four percent of the students continue on. 96 percent of students who started with good intentions of learning another language, walk out saying, "I guess I can't learn German. I guess I'm no good at foreign languages" (Lawson, 1971).

The TPR community college students are ready to speak

The instructor explained: "Be ready at the next meeting to manipulate the behavior of anyone in this room including myself with these utterances in German. Be ready without looking at this paper."

Stehen Sie auf!

Setzen Sie sich!

Gehen Sie!

Halten Sie!
Drehen Sie sich um!
Zeigen Sie!
Berühren Sie den Tisch!
Berühren Sie die Wand!
Gehen Sie an die Tür!
Gehen Sie an die Wand!
Gehen Sie an die Ecke!
Gehen Sie an den Stuhl!
Gehen Sie an den Tisch!
Zeigen Sie uns die Tür!
Zeigen Sie uns den Stuhl!

At the next meeting, the instructor was surprised and in her words, "completely off balance," when her students not only could rattle off everything on the paper but gleefully innovated with zany combinations that had the instructor standing on a chair, on the table and in a corner. The instructor was thrilled because her students were able to recombine elements to produce novel sentences. Her students in her words were, "actually thinking in German."

Complexity of German understood at the end 90 hours

Towards the end of training, the instructor read a series of seven stories in German and then uttered ten statements in

German about the story which the students wrote A for "true," B for "false," or C for "I do not comprehend the statement." One of the stories will be presented next to illustrate the complexity of syntax:

Mr. Schmidt Goes To The Office

Mr. Schmidt goes at 8:00 in the morning to the office. He drives in his car. The office is in a large building. The building has an elevator and a staircase. He goes up the stairs. His secretary is sitting on the desk and is writing a letter with a pen. There lies a box of pencils, a newspaper, and a map on the desk. At 12 o'clock, he orders a sandwich with ham and cheese and a cup of coffee without milk and sugar. He eats his lunch in his office because he has a lot of work.

- F. 1) At 8:30 Mr. Schmidt goes into his office.
- F. 2) He goes by train.
- T. 3) His office is in a large building.
- T. 4) The building has an elevator.
- T. 5) Mr. Schmidt goes up the stairs.
- F. 6) His secretary sits by the typewriter.
- F. 7) There is a magazine and a picture postcard on the desk.
- T. 8) It is 12 noon when Mr. Schmidt orders his lunch.
- T. 9) He ordered his lunch in the office.

F. 10) He orders a sandwich and a bottle of apple juice.

Results for listening and reading:

Comparison with beginning students

in a traditional class

The TPR adults in the night class at Cabrillo College were compared with students at San Jose State University completing their first semester of college German.

The TPR adults with 35 percent fewer instructional hours excelled the traditional class in listening skill (t of 6.27, $p < .001$, $df = 22$), and with no systematic instruction in reading, matched the reading skill of the traditional class ($t = 0.12$, $p = NS$, $df = 22$).

Comparison with advanced students

in a traditional class

An advanced college class with 80 hours of traditional instruction in German was compared with the adults who had only 40 hours of TPR instruction. The TPR adults excelled in listening skill (t of 3.63, $p < .001$, $df = 24$) and matched the traditional class in reading.

Traditional students

in a beginning and the advanced class

As a check on these findings, we compared the traditional beginning students with traditional advanced students on each measure of listening and reading. We expect that the advanced students should perform significantly better on the listening and reading measures, and that is exactly what we found.

The role of language aptitude

Another interesting finding: John Carroll (1960) and others have reported that in traditional language classes (where the focus is on left brain instruction such as "listen and repeat after me, memorize this dialogue, and translate this paragraph"), about 50 percent of the results can be explained by individual differences between students such as aptitude for language learning. Training only accounts for 3 percent to 5 percent of the results.

In this study with Cabello adults learning with TPR (that plays to the right brain with students using motor behavior to interact with the German language), we find the reverse:

Language aptitude as measured with the Modern Language Aptitude Test accounted for only 5 percent of the learning and training explained about 30 percent.

The University of Texas study with German

This classic article published in *The Modern Language Journal* is entitled, Language for Comprehension: Focus on Reading A Report on the University of Texas German Program, Number 62, 1-2. 1978. For their research, the writers, Dr. Janet King Swaffar and Dr. Margaret S. Woodruff won the Paul Pimsleur Award.

The problem is attrition

The problem nationwide and at the University of Texas was a 45 percent drop in enrollment in the German program from the first to the second semester. One explanation: A University of Illinois survey revealed that 80 percent of foreign language students were spending more time in preparation for their foreign language classes than other courses. The result is a negative attitude especially when students conclude that for the enormous amount of work, they perceived only a meager gain. Based upon James Asher's TPR research, Swaffar and Woodruff decided to test Asher's hypothesis that it is counterproductive to demand speech in a foreign language on cue starting with the first meeting of a class.

Premises for the experimental classes in German

1. Delay production for a few weeks while students internalize a map of the German language through commands.
2. Keep corrections of speech and grammar to a minimum to encourage students not to be afraid to play with German. Fine-tuning can come later as students develop confidence that they can produce German.

Procedure

This was a massive effort involving 400 students, 22 teaching assistants, and 7 regular faculty members. Since the instruction was so novel and deviated from the traditional format in foreign language instruction, Swaffar and Woodruff were anxious that instructors and students might be resistant. However, after everyone viewed James Asher's documentary film, **Strategy for Second Language Learning**, showing the adults at Cabrillo College acquiring German with TPR, there was "... virtually no reluctance on the part of the classes to participate and instructors readily adapted to the approach" (Page 28).

Immersion into German

German was the exclusive language of instruction in the classroom and for all written directions, with this innovation: For five minutes at the end of each class period, students were invited to ask questions about anything that happened during the classroom experience. (For the Canadian experience of immersion into French, see the documentary DVD: **TPR with something extra: Demonstration of Tan-Gau [2009].**)

Evaluation of the program

A surprise: In the second semester after about 17 weeks of experiencing German with TPR, students requested the opportunity to memorize. "...classes expressed an independent desire to do regular memorization" of grammatical features in German (page 30). The key thought here is that students themselves decided upon the appropriate time to fine-tune with some memorization rather than the usual procedure in a traditional class where the instructor unilaterally makes this decision.

Enrollment

"The (German) department experienced an overall increase in the number of second semester students" with 72 percent of students instead of the usual 55 percent electing to continue their study of German.

Student attitude

More than 80 percent of the students in both the first and second semester felt that their interest in the German language and culture was enhanced in comparison with two large-scale studies reporting that "...one-third to one-half of the students taking a foreign language to fulfill a college requirement have no intrinsic interest in the particular language they are taking,..." 76 percent disapprove of the foreign language requirement and 40 percent feel that foreign language study in college has actually been detrimental to them (University of Illinois survey, 1968)."

Student rating of instructors

On a scale of - 2 to + 2 with 0 as average, ratings of instructors in both the first and second semester in the new TPR program was above average compared with the traditional program where students rated instructors below average.

Student achievement

In evaluating their own progress, here are the results: With reading proficiency in German as the goal, about 60 percent of first semester students and 80 percent of second semester said, "I feel I can now read German and grasp the main ideas." Even though speaking German was only "incidental

learning," About 30 percent of first semester and 50 percent of second semester students said, "I feel I would be able to understand spoken German in everyday usage."

Scores on the Modern Language Association German Test

Listening: 70th percentile rank (The National average is the 50th percentile rank)

Reading: 68th percentile rank (The National average is the 50th percentile rank)

Ancillary evidence from neuroscience

The power of motor behavior in learning should not be underestimated. It is only in the past ten years that research by neuroscientists in the USA and Canada such as Dr. Melvyn Goodale from the University of Western Ontario discovered a stunning finding about visual perception in the brain.

The discovery: There are two visual pathways

There is a dorsal stream of cells that move upward from the occipital lobe (in the back of the brain) and a ventral stream of cells that move downward. To understand how this works, here is an illustration:

The two visual pathways are transparent

in the visual illusions

There are dramatic difference in the two visual systems:
Figure 1 shows four horizontal lines of identical length
labeled A, B, C and D.

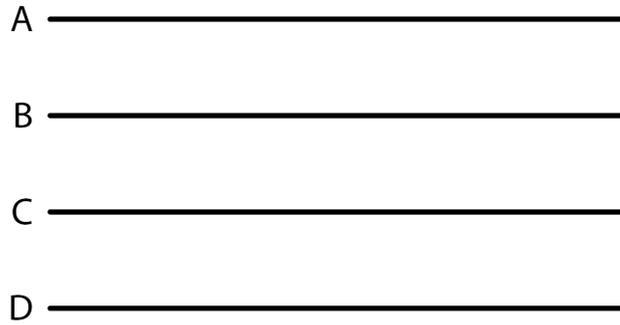


Figure 1

Notice what happens in Figure 2 when we add arrowheads at the ends of lines C and D. Line D appears shorter than Line C. This is the famous Müller-Lyer Illusion, one of many visual illusions that have fascinated psychologists for a hundred years. Just *looking* at the display in Figure 2 creates the Müller-Lyer illusion and lights up a stream of ventral brain cells in the secondary visual system.

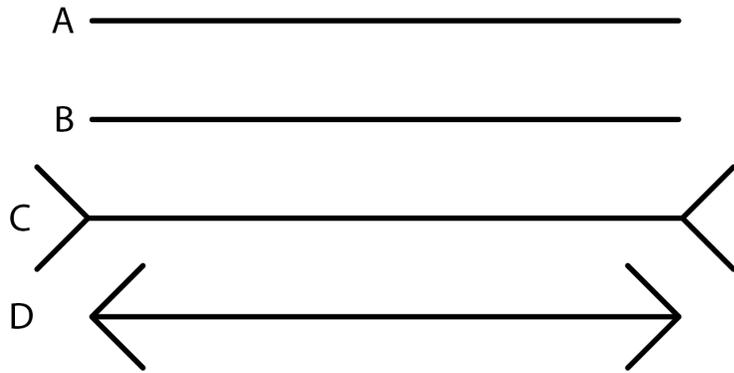


Figure 2

Now, what Goodale and others have demonstrated is this: When a subject's hand is wired with sensors as shown in Figure 3 and the person is asked to reach into a three-dimensional Müller-Lyer, the thumb and index finger extend the exact length of Line C and Line D.

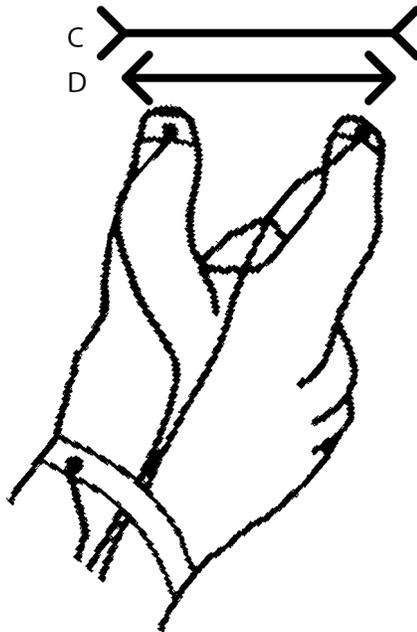


Figure 3

So, even though the subject reports *seeing* the lines as different in length, the person's fingers match the reality that A, B, C and D are the same length. This physical interaction with the display lights up the dorsal stream of the primary visual system and makes the illusion disappear. The thumb and index finger seem to activate the dorsal stream as the person deals with the "real" world. Subjects who sit and look at the display activate the ventral stream as they deal with a "constructed" world of visual perception.

Summary of the evidence

Gentilucci and his colleagues (1996), Ian Wishaw with the Ponzo Illusion, Richard Gregory (1997) with the Hollow Mask Illusion (1998), and Melvyn Goodale (1998) with the Ebbinghaus Illusion demonstrated that when you ask subjects to grasp, touch, or pick up something in the display, the illusion disappears. Their body makes a correct decision even though visual perception gives them a false conclusion, which is the illusion.

Implications for Second Language Learning

The neuroscientific evidence presented suggests that TPR, with students physically interacting with the target language, activates *primary visual perception*. Traditional

classes (where students sit while the instructor constructs the language for them) activate *secondary visual perception*.

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