A survey of individuals who have used sleep learning, both in and out of laboratories, reveals the most popular subject is the learning of a foreign language. Language learning is easily adapted to sleep learning since there's no need for visual aids in teaching a language. Repetition is the best way to learn the conversational aspects of any language and, as we've seen, repetition is a key factor in successful sleep learning.

For best results, it is wise to use a language course that is printed in a book or pamphlet. Night time lessons should be reviewed during the day. This allows you to use the daily review to reinforce what has been learned during sleep. For maximum results, your nocturnal lessons must follow the structured format of a formal course.

Dr. Brian Dutton of Birbeck College, University of London, offers the following advice for structuring a sleep learning language course:

"...the best method would be to present the roots of words to be used in a given sequence first, with their native equivalents. Next the meaning of the structure could be presented in the native language, and then the two interpreted, possibly with the structure and root meanings also integrated and presented via the native equivalent."

These suggestions should receive serious consideration from anyone seeking to use sleep learning to acquire a complete knowledge of a foreign language. This kind of language learning can best be accomplished through a combination of sleep learning and regular day sessions. It is not readily adaptable to sleep learning alone. Since sleep learning is a do-it-yourself teaching method, the task of learning is compounded when dealing with complex grammatical construction. Due to the absence of an instructor's supervision, it's advisable for sleep learners to emphasize the conversational use of a language.

Professor Gagne, whose book, The Condition of Learning, we referred to earlier, favours learning a foreign language on a conversational level. He recommends that one begin learning a language by first learning common expressions of courtesy and convenience, such as good morning, how are you, good evening, etc. He says that learning simple phrases will increase a person's confidence and will enhance the learning of longer sentences and phrases later, and will "serve as excellent models from which spontaneous speech can be derived." This applies to learning a language by use of sleep learning, and by more traditional methods.

If you're currently attending language classes, sleep learning can enhance your learning capacity and improve your recall. Soviet educators and linguists who have worked with sleep learning agree that combining sleep lessons with regular coursework will significantly accelerate learning.

At a secondary school in Moscow, a group of thirteen schoolchildren of "average intelligence" were selected to learn German using a combination of day and night lessons. For two months, the students received daily classroom instruction and nightly lessons via sleep learning. Each day and night lesson was forty-five to fifty minutes long. At the conclusion of the course, a group of German language experts examined the children and found "a high technical level of reading of the foreign texts, good pronunciation, fluent translation, the ability to speak quickly, and the correct use of the vocabulary."

During those two months, the group became fluent in 1,000 words, plus 1,900 word combinations of the German language. All this learning took place in a total of sixty-five hours. This compared favourably with Soviet schools that teach German. In a two-year period, a typical foreign language student attends 160 hours of conventional lessons and learns between 900 and 1,000 words.

Professor Bliznitchenko conducted a similar program at another language school. He taught English to four students in their early twenties. Before being introduced to sleep learning, they were attending English classes. One had achieved a rating slightly higher than "satisfactory," but the others were doing poorly. They did not understand any spoken English and were unable to construct a sentence in English without help.

Eighteen nights of sleep learning lessons were administered. Each six to eight minute lesson was played twenty-
five times a night. On the nineteenth day, the students were tested on the material used in the sleep learning lessons. One received a rating of "excellent," one a rating of "good," and two were "satisfactory." In addition, the head of the Faculty of Modern Languages said that all four had "acquired the habit of spoken language."

Before moving on, let's look at one final program conducted by Bliznitchenko. Once again, the language taught was English. The course was based on a Russian book titled Teach Yourself To Speak English, by S. S. Tolstoi and E. I. Khakina, and combined sleep learning with self-instruction. No instructors participated in the program.

For twenty-two nights, the students listened to tape recordings of English words and phrases. Each evening, two or three presentations of that night's lesson were played before the students went to sleep. Each student followed these presentations visually, using the text of the book and repeating phrases at certain intervals. After they fell asleep, the lessons were repeated twenty-three times per night. By the end of the course, they had learned and remembered an average of 700 English words and expressions, and were able to converse competently in English.

The Ladies Learn German

While it's true the Soviets are the most advanced in the study and use of sleep learning for teaching a new language, they're not alone in the field. A group at England's Sleep Learning Association devised a sleep learning course far different from anything the Soviets had done.

When Mrs. Phyllis Pilgrim and Miss Kirsteen Dark were asked what they thought of the possibility of learning a foreign language while they slept, Mrs. Pilgrim, a twenty-six-year-old schoolteacher, was sceptical of the idea. "I'm not sure whether it's likely to work." Miss Dark, an eighteen-year-old student, was more optimistic, "It seems a good idea," she said.

In spite of any reservations, both women plunged ahead with a program to learn German through sleep learning. Their lessons, which were conducted by the Sleep Learning Association, began on a Monday and ran into trouble the first night. Clark proved to be a restless sleeper who tossed and turned most of the night despite the use of a conditioning tape.

The conditioning tape was intended to help the women relax and induce a sound sleep. This is a method commonly used to calm anxiety that might result from sleeping in a strange environment. For the duration of their sleep training, both women were to sleep in the Association's dormitories, set up especially for sleep learning. Faint, gentle, classical background music was played whenever they entered the dormitories. Both women had previously indicated that they usually fell asleep by midnight, so when they had prepared themselves for bed and had listened to the forty-minute conditioning tape, the automatic timer on the tape player was set to play the lesson tape at midnight.

Ten minutes after the midnight tape began, Mrs. Pilgrim was fast asleep. The restless Miss dark wrestled with what felt like "an increase in mental activity" and didn't fall asleep until 1:15 a.m. The next night, the conditioning tape was set to start at 11:30. Pilgrim was asleep fifteen minutes later, and Dark in another twenty minutes. The following morning both said they had slept well, although Miss Dark was still apprehensive.

The third night went about the same as the second, with dark more relaxed than before. This continued the following night. The fifth, sixth, and seventh nights found both women sound asleep fifteen minutes after the conditioning tape began playing. Both reported a restful night's sleep each morning.

During the second week, both Mrs. Pilgrim and Miss Dark were sound asleep before they were presented with a second conditioning tape. They continued to spend restful nights.

On the first night of the third week of their program, the women began their German lessons. The taped lesson contained 185 German words and 219 German phrases. The tape was made in the Association's recording studio by Geoffrey Stocker, who holds teaching degrees in Drama and Speech, and is a native German linguist. The recording gave the German word first, followed by the English translation, followed by the German word again.

There was a short pause after each set of words, then the next set was given.

The lesson was played three times on each of the fourteen nights the training lasted. Each night it started at 12:15, turned off at 1:45, began again at 2:45, stopped at 4:00, and the final presentation ran from 6:30 to 7:50.

Both women awoke each morning at 8:00. There were a total of twelve repetitions of the lesson each of the fourteen nights.

In the sixth week, a team of examiners, including a representative from London University College, tested Mrs. Pilgrim's knowledge of the German words and phrases taught in the nocturnal lessons. Before the sleep learning course, neither woman knew any German. The test consisted of giving Mrs. Pilgrim the English word or phrase and having her respond with the German translation. The grading system used awarded one point for each completely correct answer and one-half point for an answer that, while perhaps not completely accurate, demonstrated a grasp of the phrase's meaning. Although Mrs. Pilgrim's exam took place at 9:00 p.m. and she was visibly tired, she achieved a recall rate of seventy percent.
Because Miss Dark was taking school exams, her test was delayed for three weeks. Although unplanned, the delay was actually an added benefit, because it served to test her recall of the sleep learning lessons following several weeks without lessons. She was tested in the identical manner as Mrs. Pilgrim. Dark's recall rate was an astonishing ninety-three and one-half percent. Asked what she now thought of learning a language while she slept, she exclaimed, "Sleep learning is a marvellous way to learn."

The significant aspect of this program that distinguishes it from the Soviet approach discussed earlier, is that all learning took place while the women slept. There were no corresponding daytime lessons or review, so that sleep learning was tested as a means of learning in itself rather than a method to increase or improve daytime learning.

A Course In Persian

Before looking at efforts to teach a language through sleep learning in the United States, we'll examine one more language course conducted in Great Britain, under the auspices of the Baling Technical College, in the dormitories of the Sleep Learning Association.

Four students were selected, two men and two women. The Persian language was used because the students were members of an honours course in applied language studies and Persian bore no resemblance to the languages they were already studying, which were German, Slavic, Italian, and Spanish. Ten lessons were recorded by a native Iranian woman. Each lesson lasted approximately five minutes and consisted of conversational phrases recorded first in English, then in Persian.

Each evening, the students listened to the night's lesson before they went to sleep. The lesson continued to play during the night while they slept. A second set of lessons was used to teach a different series of Persian expressions without the use of sleep learning. The same students served as both the experimental group (learning Persian through sleep learning) and the control group (learning different Persian phrases during the day). When tested on the material from these lessons, the four students had learned an average of over seventy-three percent of the expressions with sleep learning, and slightly less than seventy percent without sleep learning.

That all four were selected from a language honours course and had demonstrated an aptitude for learning through traditional teaching may account for the similarity in performance between day and sleep lessons. Even if the achievement of both forms of learning had been identical, it would still demonstrate that combining sleep learning with regular day lessons can result in learning twice as much in the time normally required for traditional teaching, or learning a comparable amount in half the time. All four students achieved a competent level of fluency in Persian, a good accent, and made few serious errors.

Language Learning In the United States

Although most sleep learning language programs have been conducted across the Atlantic, a few have taken place in America. One of these, conducted at the University of Florida, taught Russian nouns to twenty students while they slept. None of the students had a prior knowledge of Russian.

The sleeping students first heard a conditioning tape, followed by the Russian language lesson, for five consecutive nights. The conditioning message was intended to relax the students and capture their attention while asleep. The tape began:

"This is your Russian teacher; you are asleep and relaxed and you can hear my voice and you will not wake up....
You will remember these words forever."

When the students were tested for their knowledge of the nouns used in the lesson, they had an average recall of thirteen percent, with some as high as thirty percent accurate recall. Thirteen percent success rate is certainly not earthshaking, and although it does prove sleep learning can be used to learn a language, it compares unfavourably with many of the studies previously reviewed. This may be explained if we go back to the laboratory affect discussed earlier. In this program, the sleep learning took place in a laboratory while the sleepers were monitored by EEG. Whether this had an appreciable influence on the results is difficult to say, but it's possible the negative laboratory affect did cause considerable interference.

Two other doctors used a different approach in their sleep learning program. They sought to avoid the potentially distracting effects of both the EEG and the laboratory environment by permitting their sleep learners to remain at home.

Thirty people from the Washington, D.C. area, mostly college students in their early twenties, were selected to participate in this study. Eighteen were men, twelve were women. They were divided into three groups of ten: an experimental group, an interference group, and a control group. While they slept, each group heard a different recording. The experimental group heard twenty-five Chinese words and their English translations. The interference group heard the same Chinese words but with incorrect translations. The control group heard only soothing music.

The lessons were presented for thirty minutes, starting at 2:30 a.m. The participants went to bed at 11:30 p.m.
and were instructed to avoid reading, writing, or conversation when they awoke. During the half hour, the lesson was repeated fifteen times. Following is the list of Chinese words and their English translations as they were read to the experimental group.

```
tien—field      siano—small      rich—day
mu—eye        jia—home        jun—sir
li—strength    sheng—life      dung—east
ta—great       tu—ground       hao—good
ming—bright    ko—may          yen—talk
shao—few       dao—road        sue—snow
lin—grove      fen—knife        wu—five
lo—fall        ali—come         je—this
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The program ran for only one night. Although the participants were given a general idea of the purpose of the study, none knew what they would hear while they slept. The recordings were not played to them before they fell asleep.

The following morning, members of the research team visited each sleep learner’s home and asked questions concerning their previous night’s sleep. Ten subjects said they remembered hearing the tape recorder start; they were disqualified, as this indicated a strong possibility they may have been awakened. When the questioning was completed, each participant was told the researcher would play a tape recording that contained two lists of words.

"There has been recorded on this machine a list of Chinese words and their English equivalents. You are to listen very carefully as they are being played and try to remember the English translation of each of the Chinese words. After the list has been played once you will receive a rest period of several seconds followed by the Chinese words without their English equivalents. You are to try to recall the correct translation of each of these words as they are presented and say them aloud as soon as possible. After this, we will play the original record and continue the same procedure until you have learned the entire list correctly."

The number of times required to replay the list was used as a gauge to test the possibility that the members of the experimental group may have already begun learning the list during their single half hour sleep learning lesson. The Chinese words played during the night were the same for both the experimental and interference groups. The interference group however, heard incorrect English translations.

When the results were compiled, the control group, those who heard only Strauss waltzes, needed an average of almost eight full repetitions of the list before they could give the correct English equivalent to each Chinese word. The experimental group required just five and one-half repetitions before giving the correct answers. This showed that they not only heard what had been presented in that short period during the night, but the correct translations were “saved” in their memories.

But what of the interference group? How were they affected by hearing the wrong translations of the same words? As it turned out, they had to unlearn what they learned during their sleep and re-learn the correct translations of the Chinese words. They required over eleven repetitions to do this, proving that although the information was incorrect, they, too, had learned something during sleep.

Working at Stanford University under grants from the United States Public Health Service and the United States Air Force, Doctors Leslie M. Cooper and J. Hoskovec investigated the use of sleep learning during REM sleep to learn a foreign language. Eleven young men were selected to participate. Their ages ranged from sixteen to twenty-one. All were either high school or college students. Before their selection, they were tested to determine if they were susceptible to hypnosis. In addition, each said he had no knowledge of the Russian language.

The study required that the men sleep in the laboratory for two nights. The first night was to acclimate them to the lab environment. The actual sleep learning was scheduled for the second night, when each was connected to an EEG, eye movement gauges, and an electromyograph. The last was done by applying electrodes to each participant’s chin. They slept in a room separated from the researchers by a glass window so they could be visually observed while asleep.

Before being allowed to sleep, each man was hypnotized and given the following post-hypnotic instructions:

"During your sleep we shall speak to you and you will hear and understand what is said to you. You will hear some
Russian words and their English translations. You will remember them easily and they will be available to you whenever you wish to repeat them. Of course, you will sleep all the time, not awakening...."

However, the sleep itself was a natural sleep, not hypnotically induced. Hypnosis was used solely to create a suggestion for learning during sleep. While they slept, a list of ten Russian words, each followed by its English translation, was presented. The list was repeated eight times. Since each subject was monitored by EEG, it was possible for Cooper and Hoskovec to administer the lesson during REM sleep only, which they did. Following presentation of the list, the students were awakened. After a five-minute acclimation period, they were tested. Each was given a card listing ten English words and told to select the proper translation for each Russian word as it was pronounced by the researcher. The group achieved an accurate recall of only thirty percent.

The researchers were not impressed by the low scores. While they expressed the belief that the study demonstrated learning probably could take place during REM sleep, they felt it was "possible but not practical."

Although they accomplished only a slight degree of learning, obvious questions arise as to what the result might have been had there been more than eight repetitions of the list, had the list been presented in all stages of sleep, had the students not been wired to three separate monitors, and had they been allowed to sleep through the entire night instead of being awakened immediately after the information was presented to them. Each of these points is important individually, but taken collectively in one study it's questionable whether the results of that study have genuine validity and can be used to challenge the efficacy and practicality of sleep learning.

Repetition of material is essential to learning, and there's no way of knowing if eight repetitions are sufficient for learning the list that was used. Neither do we really know during what phase of sleep material can be presented most effectively. Studies such as this one have been made at most stages and levels of sleep. Overall, the results have been inconclusive in selecting one particular stage of sleep that's best for sleep learning.

Actually, it doesn't appear to matter if any phase of sleep is best. The practical use of sleep learning takes place in the home, not the laboratory. There's no way a sleep learning student can arrange the presentation of a lesson to correspond with a particular sleep stage.

As we know, information processing for memory takes place during sleep. Why then awaken subjects in a sleep learning experiment immediately after the material has been presented? Why not allow time for the information to be processed and test recall after the subjects have awakened naturally?

Another problem with this study is the psychological condition of the students used for sleep learning. The researchers themselves confirmed this when they admitted; "Some of the subjects in this study were anxious, apprehensive, and, in at least one case, rather disturbed by the procedures of sleep learning."

We don't know if these conditions were created by participation in sleep learning or by the inevitable laboratory affect. Whatever the cause, it appears obvious that outside influence had an effect on the results of the study. The major unanswered question with this, as with so many other sleep learning programs conducted in the United States, is: What would the results have been had the European approach been used instead of burdening the students with electronic equipment and the expectation of instant results.

Nothing has changed but my attitude.

Everything has changed.

- ANTHONY DE MELLO

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