Superglue in the Foreign Language Classroom

By David W. Gurney

Exploration of a variety of meaningful, natural, contexts (dimensions) for using foreign language has led me to examine a number of findings reported by researchers in diverse fields. These findings have supported the mechanism of "Superglue" which is described below. "Superglue," in essence, is using natural human functions of articulation, memory storage and association, while using new language patterns, to develop long lasting bonds.

In a 1980 SCOLT workshop, participants became aware of the potential meaningful connections they could make with new language patterns once students' consciousness levels are aroused by focussing on certain common stimuli. The participants, for example, quickly perceived a variety of experiences associated with a few questions concerning the details of their attendance at SCOLT: distance from home to the conference site, hours of travel, details of departure, meals in transit, etc. As participants related specific recollections of their experiences, others expressed related, as well as unique, episodes which came to mind. In short, all of these experiences were readily available given appropriate stimuli. In like manner, students enter our classes bringing with them a multitude of shared and unique experiences which can be the basis for developing meaningful communicative contexts for using the target language. For example, the distance from students' homes to school could be tapped by the question, "How many of you live within one mile of school?" As hands go up, the teacher can ask a volunteer to describe the difficulty of arriving at school on time, breakfast details, the conversations with family and acquaintances, and the distance to a friend's house, etc. Such meaningful connections can be pursued regardless of the patterns which have been learned or which are presented.

In the classroom, teachers constantly expose students to a variety of patterns for practice, memorization and generalization. Such occasions provide opportunities for students' consciousness to create images related to the meaning which has already been established for the pattern by pictures, objectives, explanations, etc. As repetitive examples are demonstrated, and meaning reinforced, students will perceive a variety of related experiences stored in their memories from millions available for recall. (When participants in one workshop were asked about the distance traveled to get there, some immediately thought of problems with traffic!) This sort of recall can become a mechanism for using new patterns in order to communicate personal experiences.

This sequence of language techniques illustrates the basis for the use of what I call, "Superglue." The normal sequence of learning new language patterns, more or less, is as follows: students repeat pattern sentences following the teacher's model (or use of taped version). Repetition is followed by simple substitution and, possibly, free substitution from the variants used by the teacher. A question and answer segment may follow to extend students' control and to lessen the artificiality of the drill format. At this point, by the fourth or fifth time the student has demonstrated phonological control of the pattern, the student could recall a personal experience stimulated by the attention phase of the drill that relates to the sentences, presumably, under control. By making a statement, and sticking a personal experience onto the foreign pattern, the student will have made it his/her own-temporarily. Doing this uses a kind of mental glue, "Superglue." The more this kind of experience with the target language is repeated, using the same pattern, the more the new pattern becomes part of the student's cognitive competence and it can be readily associated with myriad other meaningful, personal, experiences. Superglue doesn't come unstuck! Also, when students' experiences are connected with foreign patterns in this manner, continued use of any pattern will stimulate recall of the event to which it was originally linked. As some early research on memory shows, the two factors become frozen in association together. (Flash Frozen Fluency next?) "Superglue", as a possibly valid concept for developing meaningful connections in second language acquisition, is based on the confluence of a number of diverse studies on human behavior, language, memory and physiological operations. The specific research areas which combined to coalesce in this exciting concept are the brain, neurochemical processes, memory storage, breath mechanisms, aphasia and genetic engineering.

Let's start with the basic human function of breathing. A communication specialist once posed a seemingly simple question to me about how one learns a second language. The answer created a long search which is covered in the concept identified as "Superglue." He asked, "I am a 17 year old American who wants to learn to speak a foreign language. Where do I begin?" When I began talking about memorizing dialogues and creating motivating cross-cultural situations, he commented about my speaking too much like a teacher an urged me to consider the learner; "Where do I begin?"

The question, eventually, forced on me a new perception of language as a human behavior and what it means for a human being to change that behavior! This understanding creates new perceptions of how to help stimulate needed changes in the teaching process. Isn't it rather logical,

after all, that teaching techniques derive from the task of learning? Except, we foreign language teachers have not really been given an understanding of how the task takes place! This leads me to the breathing process.

In spite of our lack of empirical studies on the actual process of learning a second language or even concerning the thought-to-speech process, a few factors can be accepted about the basic functions of articulation. Given the human volition to speak, a number of physiological functions operate consistently, regardless of the language being spoken. The volition and accompanying conceptualization to be communicated create an impulse which is transmitted to the main breath control agent in the abdomen, the lower lungs. An intake of air occurs, called the abdominal pulse, which is pushed up through the windpipe as the steady flow need for the anticipated articulation. The length of this abdominal pulse, and the sequence of muscular manipulations which subsequently follow, is critical for adequate, fluent, articulation by the native speaker. The series of sounds produced during the length of this pulse of air through the voice box is called a breath group. (Since the boundaries which uniquely separate these sounds into meaningful units depend upon yet ill-comprehended linguistic rules, it should be evident that the breathing process is consistent with the language determination by the speaker in the brain where this control resides.)

A true bilingual, for example, seems to have dual (multiple) control of this mechanism, such that the language chosen for communication initiates a process of manipulations distinct from the other language(s) in which the bilingual is competent. Language can be partially defined as a physiological phenomenon whose patterning is distinct for each speech community. On this basis, the underlying difference between German, for instance, and French is a set of linguistically consistent breath rules. Becoming bilingual, then, is partially a process of learning a new way to breathe! It is this physiological patterning, this human behavior, which has to change in order for the 17 year old to truly speak a second language. The importance of breath control will be detailed following the description of a genetic engineering discovery which brought “Superglue” to mind in the first place.

The basic operation in genetic engineering is to transplant a piece of genetic information from one organism to another. The preliminary problem was getting the piece out of its natural setting, the DNA string, and sticking it into its target DNA string. Researchers discovered an enzyme which could wash away the walls of the DNA string, allowing the scientist to remove just the desired piece of genetic coding. By washing away the walls of the target string, a piece could be

removed and the transplant inserted. However, making it stay was not possible until the discovery of another enzyme that restored the original constitution of the DNA wall. The scientists dubbed this enzyme, "Superglue."

This discovery gave me an insight on the problem that we, as second language teachers, face in helping students "learn" a second language. It gave me, also, an insight to the solution for sticking the foreign particle –the new pattern- to the target organism, the human brain. What is needed is a powerful association mechanism. This, I determined, operates by use of the learner's unique experiences. When these experiences are utilized for communication with new language patterns, the potential of the experience exists, as described above. Repeating the procedure with a wide variety of stimuli (patterns and personal experiences), potentially, creates a permanent cohesion. (Kandel,1974.) As a chemical process, similar to the use of enzymes to reconstitute the walls of the DNA string, this leads to a discussion of chemical research on the brain as well as interest in hemispheric specialization and stimulation.

Extensive research on the neuro-electrical and neuro-chemical functions of the brain reveals some important perspectives. Although language functions are primarily located in one hemisphere of the brain (left for right-handed people), the other hemisphere contains functions interrelated with linguistic behavior in the dominant half. For example, the linguistic rule governing the comparative degree would be non-functional without the ability of the other side of the brain to perceive similarities between things, overall patterns, or spatial relationships. Many of the affective statements (wishes, intuitions, feelings) which exist in all languages depend on the intuitive competence of the non-dominant hemisphere. Clearly, with hemispheric specialization, cross-stimulation is apparent. The functions of the non-dominant hemisphere are important for understanding other research on memory, as well as the inferences to be drawn later concerning appropriate language acquisition situations in the classroom.

It has been found that long-term memory is laid down in the brain according to a form of chemical code. The chemical nature of memory is shown in research on pre-senile patients, for example, that revealed the existence of a chemical which partially restores recall powers of people suffering memory loss (such as in Alzheimer's Disease). Recall from long-term memory depends on the cholinergic system stimulated by the chemical, acetylcholine. In order to turn short-term memory into long term memory, it appears that a chemical messenger from another chemical system, using noradrenaline, converts impulses held in the brain for review-such as new information- into a code acceptable to the cholinergic system, for long-term storage.

The basic connection among these systems is the network of neurons that transmit minute impulses of electricity among the intricate sections of the brain. An interesting phenomenon appears from the study of the synaptic operations of these neurons, which make the system work, and illustrates the importance of the recent work on chemical correlates of human memory. A synapse can be understood if one considers the way electricity is wired into a home. The wires carrying the power to the house do not touch the wires inside. A transmitter –a switch – is activated allowing the electricity to be transferred by way of a metal conductor in the switch. Now, think of a muscle as the garage door opener and the wiring, which carries the power, as the nerve endings in the finger. The neurons, like the wires, do not touch. The switch allows the electrical impulse to cross over and fire the muscle's neuron and this is where the chemical process comes into play. The electrical current in the neuron is too weak to jump across the gap where the nerve endings terminate. The electric impulse, however, creates a reaction in a type of peptide which acts as a neurotransmitter and it reacts chemically with the nerve endings of the muscle, causing it to fire: (If you have kept in mind the abdominal pulse, you may begin to see where these lines of investigation will run together.)

This neuro-electrical/chemical action, obviously, takes place in the brain and is the basis for our ability to convert short-term memory into long-term memory, to retrieve experiences from stored memory, to make associations, and to fire all of the muscles in the articulatory aspects of language production. An insight on the brain's production and reproduction operations will be instructive relative to the above remarks on hemisphere stimulation and memory storage.

An interesting thesis on the apparent failure of pattern-practice to develop students' communicative competence is made by John Lamendella (1977) who, with Selinker, examined results of neurolinguistic investigations on the functional interactions between the two cortical systems. Basically, Lamendella suggested that the brain utilizes a highly efficient system which limits brain stimulation to the speech process circuit which does not require higher level language processing to accomplish its task. Simply put, as a student repeats and performs fundamental manipulative tasks, the language acquisition process is basically cut off since the copy function needs no reactions from any other part of the brain except that which is needed for this reproductive type of operation. Even previously learned rules governing such things as person-number substitution are automatized and do not stimulate higher cognitive process, potentially not even long-term memory. Referring to the learning process described in the opening section, it should be obvious that continuous reinforcement of the meaning of the pattern is essential and that students'

consciousness can stimulate higher order processes because of the mental involvement based on relating unique experiences.

A few more bits of brain research and we will draw some pedagogical inferences as well as relate a number of examples of how "Superglue" has worked. Wilder Penfield (1964) is famous for his brain mapping experiments. The importance in this context is the nature of memory storage, which his work revealed. He found that each time a certain spot on the brain was touched, the patient would begin relating a sequence of events. This led Penfield to conclude that events are stored in the brain in systematic ways, a series being one. Later research on memory shows that events recalled consciously can be associated with and related to each other at later times. It has even been shown that a foreign element can be inserted into a learned sequence and recalled just as if it had existed in the original experience. (Its called brainwashing!)

Other research shows that the brain, like the body, develops in spurts, or surges of growth and ability, and that this pattern differs between males and females. It is suggested that intensive and novel experiences during a growth spurt would be effective in enlarging a student's base of experiences. On the other hand, using and expanding on facts they already know is indicated for children in a plateau period. Spurts occur during the years 2, 4, 6, 8, 10 and 12 or 13, 14, and 16 or 17. The spurt for boys is twice that of girls at age 15. (Why do more girls take foreign language in high school???) The apparent sex difference in brain growth is found, also, in actual functions of the brain. Better understanding of these differences would seem to be crucial to adequate planning of language instruction for boys and girls.

A few examples will help to illustrate how "Superglue" has worked in the classroon. The examples come from situations where I had interns in public schools. The first episode is very important regarding the insights on students' inner consciousness described above and concerning the potential influence of language activities on one's state of consciousness

One of my interns had just finished a well-planned lesson on the comparative form in Spanish. The lesson had proceeded well: The overhead projector was used to reinforce meaning and provide variation of the pattern, the student teacher had developed a very adequate context for understanding the pattern and he had maintained good student involvement in the practice drills. Real objects and people were used for comparison purposes. "So far, so good," I thought, "now he'll get into the students' own experiences." But, the student teacher gave homework directions in the few minutes remaining before the bell. Just as I was thinking, wishing, that something else

could have been done, a very petite girl who was sitting close by remarked to some other students, "I'm the smallest one in my family." (!!) The magnitude of that statement still excites me as I perceive how that student's consciousness had been aroused during the concentrated attention given to the meaning of the comparative structure in Spanish. "That's the Superglue!" This thought came to me in that instant of revelation concerning what had been taking place in the perceptual areas of that girl's brain!

Indeed, that is the unique type of experience which can cause the new pattern to become meaningfully associated with the cognitive and linguistic processes of the human being. By using long-term memory bits, the new information is processed in a unique way for each student. The next two examples illustrate such unique associations and how immediately they can be stimulated in the classroom while students' attention is focussed on a specific pattern of the second language.

Another student teacher was working over (a good choice of words!) the pattern in Spanish meaning, to have just done (acabar de + infinitive). The students were struggling with a person-number drill, and the student teacher failed to reinforce the meaning of the pattern. She had begun the class on a positive note by pointing out that the students had just come from the annual Awards Assembly and that two students had just won prizes. She said it, not the students! With ten minutes left in the period, I was given permission to try something ("Superglue"). I turned attention again to the prizes and repeated the statement that the class had just come from the assembly and that some students had just won prizes. Then, I asked another student what the prize had been won for. The student responded with adequate use of the pattern. I, then, told the students how this structure could be used to describe something at home which had just begun or just been completed, and that this was what I wanted to hear in order to show them that they could speak in Spanish about their own experiences. A student raised her hand to ask what "rug" was in Spanish. It turned out that she had just made a hook rug. We worked out the Spanish together. From another student, I found out that her father had just gone off to Texas, to take some graduate courses. Immediately, I asked another one what that student's father had just done. (Each time, I modeled the pattern, so it was easy for them to use it confidently.) The first volunteer raised her hand again, and the bell was about to ring. I called on her, and she said in unhalting, although not rapid, Spanish: "My father has just painted the house." (!!!) Again, contemplating how this student was motivated and influenced to make such a statement, and to a stranger, substantially reinforced the concept that students' conscious levels can easily be stimulated if we teachers don't just drill away on patterns.

In addition, the unique experiences that are aroused in their memories while attending to the meaning of the structure can be used to make, potentially, permanent associations with the foreign patterns. That student, by the way, had normally been very unwilling to contribute or volunteer during language practice!

The following situation occurred while students were supposed to be learning Spanish words for occupations, which have common ending, ero/-era. The student teacher had the students pronounce the words, then asked if any parents worked in the occupations shown in pictures in the textbook (postman, hairdresser, shoe repairman, etc.). A student's hand flew up. The following dialogue, in English, ensued: "My mother's a hairdresser." (Student teacher) "Where does she work?" –Student: "She does it at home." Another student remarked: "My uncle is a doctor." The student teacher asked, still in English(!), "Where?" –The student: "He lives in Georgia." Needless to say, the student teacher did not successfully complete his professional preparation, but the episode is an example of the willingness of students to share their unique perceptions if we will provide for them to do so.

Now, let's tie together the various elements which have been described. When the student related that her father had painted the house, she was demonstrating a number of physiological functions were described earlier. She had control of the breath mechanism needed to articulate properly (the constant modeling had insured that she could use the pattern when she had something to say), the left and right brain were functioning in the appropriate ways, and stimulation of the higher brain processes was evident in the use of a unique reference. In addition, the synapses which fired off the muscles in the breathing and articulation process were stimulated by neuro-connections in the brain that were activated when she used her long-term memory. In other words, the combined neuro-chemical processes of memory retrieval, volition, linguistic processing, relationship of a model to a specific referent and the articulatory mechanisms produced a fluent second language utterance. The uniqueness of the utterance, given the classroom conditions, reinforces a perception that language teachers must draw on this essence of humanity, the communicative urge, in all of us if we intend to teach language as a human behavior.

When we consider how immediately available are the multitude of experiences sitting in a person's head, and the billions of personal referents represented by 20-30 students in our classes, we can see how language learning for meaningful communication can be exciting, fruitful, and relatively easy. Think of the cache of experiences stored in our students' minds as blackberry

bushes rich with fruit. The problem is, how does one get inside where all the berries are? A word, a picture, almost anything can trigger a recall. When that happens, you are inside. As students allow us to share these experiences, they give us keys to getting back in, touching and raising their consciousness.

In my 7th grade Spanish class, there was a student who owned a horse named Midnight. The student rarely spoke out in class. However, any time I related a pattern to Midnight, she could respond, and frequently did, with conviction and meaning. (During a drill on past participles, she told me that Midnight was prohibited –est< prohibido- in the house.) In short, she had supplied me with a means of re-entering her consciousness. Of course, statements made about the horse, or about other students' animals, friends, family, etc., became shared experiences for the rest of the class. These could, then, be recalled when new patterns were introduced and practiced. I seldom got through the exercises with a new structure before I realized how the patterns could be related to specific experiences of the students. Spontaneity became the key to success. As students recall experiences, it is almost impossible not to express some aspect of these experiences with the pattern being practiced. After all, there is a limited number of structures in any language. However, each human language takes care of all the possible experiences which can occur in the culture represented by the language, and then some.

Piaget and Gategno both indicate a need for the teacher to get out of the way in order for students' mental capacities to work on new learning situations and content. Too often, teachers become only presenters of drills and judges of correctness. Using the techniques I have outlined, you have the best of both worlds: the student uses his/her own unique experience and attaches it to a pattern that immediately beforehand he/she has shown the ability to articulate correctly. With minor adjustments of vocabulary, person or object agreement, etc., most utterances should be almost fluent.

A trigger mechanism I use frequently to demonstrate this recall was utilized in the 1980 SCOLT workshop. Participants were asked to look at the date of a coin taken from their change and to try to remember where they were or what they were doing in that year on the same day as the workshop, November 4, 1980. (Ex., November 4, 1962.) As the memories began to flow, I could see facial changes occur and, as a few people related their experiences, similar experiences were described by other participants, their own recall stimulated both by the date on the coin and the revelations being shared in the room. A little later, I could perceive, from the facial expressions of

some participants, that the memory continued to exhibit recall. This observation was confirmed in conversations with them after the workshop.

In like manner, students could be asked to respond to an open question: how many of you have lived in another state or country? Hands will rise. Pick out one or two (you are already inside their heads, don't you see?) and pursue the meaningful connections that are logically associated with such information. Other personal referents will become available. Then, other students can begin to relate information. This interaction stimulates students' consciousness levels. As students perceive that personal information in being used by the teacher, rather than hearing the same question being asked all around the room, they will be even more willing to use the language to express their own experiences.

A final example of the human context of learning provides an appropriate conclusion to this discussion. A television program on autism gave me another dimension on the perspectives I have developed about foreign languages and human experiences. The program related the story of parents of an autistic child and the difficulties they had faced trying to find appropriate treatment for him. They learned that the general attitude of professionals was to treat autistic children as abnormal and to force them out of their autistic tendencies, although they were not expected to become normal. The parents could not accept a permanent autistic, or severely handicapped, status for their child. They, finally, perceived that their child was all right inside of his head but had shut out the world for some reason. With this thought in mind, and motivated by their devotion and love for the child, they attempted to show him that he was all right, that they loved him and wanted to share <u>his</u> world. After months of intensive, fruitless, devotion and actually trying to imitate the child's unusual behavior, the parents were rewarded by seeing the child come out of this shell.

Consider, then, the autistic-like reticence of your foreign language students, especially in the first few months of Level One. We try to get them to enter the new, strange, world of the foreign language, to come out of their shell of monolingualism and to accept a new vocabulary, new structures and cultural patterns. Let's try, instead, to get into **their** heads, using the knowledge that there are so many experiences there which can be attached to the outside, foreign, stimuli. It does work! Like Superglue!!