Affect in Learning and Memory
The Process of Tying Affect-Data Knots along Memory Stages

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Summary:

The psychology of the foreign language learner has been evidenced to affect say condition all learning activity. The present paper is an attempt to investigate the way learner affect intervenes in learning through its different phases: exposure to the instructional material, the processing of perceived data, and the storage and retrieval of the processed data in the long-term memory. It has been concluded that learner affect is of a paramount importance in learning; it either eases or thwarts data intake, enhances or impedes data processing, and inculcates or hastens the loss of data stores. The insights attained through the study could help foreign language teachers to attend to learner affect and incorporate it in every course design to optimize his acquisitions and ensure his smooth and effective use of the language.

Keywords: affect; learning; memory; foreign language; data processing

1. Introduction

It is no surprise to find 'learning' among the most redundant terms, perhaps the most of them all, in the literature that focuses on the psychological, sociological and cognitive characteristics of the learner, language learner in particular. Learning has been thoroughly investigated by experts of the different fields of research which are directly or indirectly concerned with education. The main findings concertedly attained are that learning does not take place pell-mell; it is rather a process, that this process involves change, and that this change is marked by permanence.

Learning consists in the transfer of images of reality into the brain. The transfer goes through a series of activities which characterize the steps of the interaction of the learner with the environment and which end up with the elaboration and storage of new units of knowledge in the brain,

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hence the process nature of learning. The second characteristic of learning is change. A learner approaches reality with a want to know, to know more about it, or to acquire a skill to interact with it duly. When a new item is added to one's knowledge, or a sort of refinement is brought to one's conception of an already known item, or a new skill is acquired, this implies change at the level of memory. Such change, however, should last for a relatively adequate time; otherwise, it is not considered learning. Permanence is integral to learning.

Thorough exploration of the phenomenon of learning by the latest humanistic educational psychologists led to the conclusion that it is a twofold process. On the one hand, learning takes place in the form of change that consists in an enhancement of knowledge in quantity or quality or an acquisition of a skill, which pertains to the cognitive aspect of learning; on the other hand, change involves also the learner's emotional reactions to the item that is being learnt. Learning occurs through the transfer of cognitive items together with affective pulses that accompany them, a process that constitutes the focus of the present paper, but before the learning process is pursued in details, the key concepts which are fully involved in it, namely learning, affect, and memory, are surveyed hereafter.

2. Learning

The very essence of learning consists in change. It occurs when one acquires knowledge about some thing, event, person, or situation he did not know about, or when one's knowledge about something receives some refining through the addition of details or the adjustment of others; learning also occurs when one acquires a skill that adds up to his adeptness in interacting with reality. The acquisition of knowledge or skill shows on the learner's interaction with reality. In this vein, Richards and Schmidth (2002) define learning as "The process by which change in behaviour, knowledge, skill, ect, comes about through practice, instruction, or experience and the result of such a process."(p.298)

The term 'learning' in the definition above means, beside change in knowledge and skills, a change in the way we react to a particular thing, action, situation or experience. Change means difference between previous knowledge of something and one's subsequent reaction to it on the one hand, and one's improved knowledge of it and one's resulting reaction to it on the other. To illustrate this, Stevick (1999) relates about his first visit to England. He says, "My first step off the curb into the streets of England in 1954 was almost the last, because I looked to my left instead of to my right." (p.45) His previous knowledge of common traffic patterns was about to cause him the loss of his life. He knew only of the system in which cars move on the right side of the road; only after did he realize the particularity of the British traffic system and refrained from stepping into the road: a change in knowledge followed by a change in reaction which saved his life.

Our reaction to some thing, event, situation or experience draws on our knowledge of it. Stevick (1999) explains "How I am likely to react to language or to traffic patterns, or to whatever, depends on a vast and incredibly complex collection of resources that have built up over the years inside my brain."(ibid) Learning takes place in the form of a change that touches the innate resources of knowledge already available at the level of the brain. The innate resources are partially or completely altered or simply enriched with more details. The outcome is learning.

One's exposure to a new event, person, situation, or experience, however, does not spawn change in knowledge and skills uniquely. Up to Stevick (1999) the perception of an object, person, or experience is accompanied by the recognition of the way the item perceived fits in with one's needs and purposes. The perception of the item provokes one's emotions and involves them in the overall process of change. This kind of reaction bears on learner affect, the concern of the following section.

3. Affect

Educational psychologists have given different definitions to the word affect, but all the definitions converge on the same concern. To serve the cause of the present paper, the term affect will be taken particularly through Stevick's view (1999): "One's affect towards a particular thing or action or situation or experience is how that thing or that situation or that experience fits in with one's needs or purposes, and its resulting effect on one's emotions." (p. 44)

In this view, affect seems to mean the impression left by a particular thing, action, situation or experience in the individual. The impression could take the form of satisfaction that ensues the feeling that one's needs and purposes have been met; as it may take the form of discomfort that follows the feeling that they have not. Affect, then, has the nature of a feeling that scales up and down from negative to positive and vice versa in response to the different stimuli which fall within the individual's field of perception.

The different feelings which result from the individual-item encounter actually show on the psychical as well as on the physical states of the individual. The feeling of comfort towards a person, object, or experience is interpreted in a positive psychical state that usually takes the form of satisfaction and elation; conversely, the feeling of dissatisfaction is evinced in a negative state that manifests in boredom, disgust, or anger. On the other hand, the positive physical outcome may show conspicuously in a smile or a meek look, while the negative may appear in a change of the colour of the face, sweating or shiver.

The affective reaction of the individual towards a person, object, or experience tends to last as long as the perception or the cognizance of the item. The mere heed or recall of the item even in fortuitous circumstances revives the emotions which were conceived right at the individual-item encounter. This

makes evidence of the thought that the emotions and the item that instigated them are concomitantly stored in memory, the concern of the following section.

4. Memory

The term memory has been commonly and simply used to refer mainly to two things: the information that one retrieves from his brain about certain past experience, thing or person i.e. the product of remembering, on the one hand, and the duration along which some person, object or experience is kept in one's brain i.e. not forgotten, on the other. However more specialized views see memory as a whole complex active system that is responsible for attending to, taking in, processing, organizing, storing and retrieving information. In this view, the meaning of memory is expanded to encapsulate the different steps which information goes through to reach the state of brain store ready for retrieval and use.

The different phases that constitute the memory system led experts to distinguish three types of memory, each with a delimited function. Schmidth (1990) says in this vein: "Most multistore theories of memory specify three components: a bank of buffer stores or sensory registers…, a crucial second component, variously known as primary memory, short-term store and a final store, secondary or long-term memory." (p. 135) The three phases of memory are approached with some details hereafter.

4.1 Sensory memory

The sensory memory, the buffer store or sensory register constitutes the memory that is, as its two denotations suggest, the first exposed to the sight, hearing, taste, smell or the touch of a particular person, object, situation or experience. It is the immediate records of the data of the object seen, heard, tasted, smelled or touched. It is the initial recording of sensory information in memory system immediately following perception. Julie Lancaster explains the work of this memory briefly saying

Input from the environment registers in the sensory memory where it is held for a brief time, approximately two seconds according to Klatzky (1980). There is a sensory register for each sense. As the holding time is so brief, most of what enters simply fades away because it is not attended to. (Lancaster, 2004: 46)

Experts distinguish within the sensory register two major sub-memories: the "iconic" and the "echoic"[1]. The iconic stands for the visual sensory memory and the echoic means the auditory sensory memory system. It has been found out that both of these sensory sub-memories have very limited spans. "Iconic storage appears to have limit of about 0.5 second. This is extended to about 5 seconds with a bright stimulus." Baddelley (1976, p. 191), while the auditory retains data for "up to 10 seconds…" (ibid: 237)

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1 Neisser's terms 1967

To be kept longer in the memory system, the data recorded in the sensory memory must be transferred into the short-term memory.

4.2 Short-term memory

The short-term memory, the short-term store, the primary memory, the working memory or the worktable is the part of memory that receives the salient data that come through the senses and proceeds in the processing of the items which constitute them. According to Bialystock (1990), this processing consists in finding the "methods of storage" (In Ellis, 1995: 297) of those items and the "means of accessing" (ibid) them after they are stored in the long-term memory. Dörnyei (2005) highlights the crucial role of the working memory saying:

Working memory is more than a passive transitional storage stage preceding long-term memory: it has a more active system, comprising an independent cognitive workspace or 'computational arena' with on-going processing functions, used for sequential cognitive processes, such as the comprehension and production of language.   (Dörnyei, 2005: 56)

The methods of processing which operate on the language intake that reaches the worktable past the sensory memory include reordering such as from-small-to-big pattern or the opposite, restructuring such as using the basic sentence patterns, or mnemonics to reduce long items into short statements easier to keep, or chunking i.e. grouping items which are in association with one another such as presenting a long phone number that is difficult to retain into two-number meaningful chunks each of which means something like a code of a wilaya, a date of birth or important event or anything of this kind. These methods are basically meant to ease both storage and access to information in the long-term memory.

The different types of processing constitute a prerequisite for the data to be kept, not lost, for it has been proved that the items that come into the worktable may remain available there for a short period of time, "something like 20 seconds." (ibid: 48) The short-term memory receives the intake, hosts the different processing operations on the intake but for just a span of seconds. The items which are processed are, then, transferred into the long-term memory; those which are not are dropped.

4.3 Long-term memory

The long-term memory or the secondary memory is the data store. It is the "storehouse of the information that is assumed to be relatively permanent."(ibid) Long-term memory can store much larger quantities of information for potentially unlimited duration, sometimes lifelong as compared to the buffer or the worktable. It is the store of processed data that come from the worktable.

It had long been thought that long-term memory keeps data in the form of whole pictures, sounds, smells, tastes, touches, mechanical skills, rules, and so on, till researchers found evidence of a far more complex structure and subsequently

far more intricate processes within memory. Stevick (1999) shows this complexity saying:

In fact, research is showing more and more clearly that the data that come in through the senses are generally not stored as whole pictures or whole sentences or whole words or whatever. Rather– and from the point of view of common sense this is hard to believe, hard to understand, even hard to think about– the new experience is broken up into an incredibly large number of incredibly small, incredibly detailed items,

(Stevick, 1999: 45- 46)

A picture that we have about something in our memory is not kept as a whole in some site of the brain. Rather, it is distributed in bits all over it. The bits constituting the whole are, up to Damasio (1994), interconnected in "networks, subnetworks and subsubnetworks." (ibid) Remembering something does not mean strictly retrieving a whole picture as it was stored for the first time; it rather means recalling its different constituents from all over the brain and getting a "newly reconstructed version of the original." (ibid)

The relatively new conceptions of affect, learning and memory held in this section will hopefully be useful for the understanding of the role of affect in both processes: learning and memory. The following section will consider the instruction input right since its exposure to the learner's perception where affect functions as a filter, then take up Stevick's model of learning and memory, in which affect is given vital roles as a conditioner or a catalyst in the different phases of the two broad processes.

5. Affect in language input

Language input is the language which the learner hears or reads with the intent to learn from. Krashen (1982) put forth a hypothesis that posits language input as an indispensable promising source of learning. The gist of the hypothesis is, "The idea that exposure to comprehensible input which contains structures that are slightly in advance of a learner's current level of competence is the necessary and sufficient cause of second language acquisition." (Richards and Schmidth, 2002:16)

At least three points can be inferred from Richards' and Schmidth's definition of language input. The first is its very indispensability for learning to take place; the two other points consist in two affective characteristics that it must bear to omen well for the learning activity: comprehensibility and challenge.

5.1 Necessity of language input

It stands to reason that a human individual is borne destitute of language faculty, and that he gradually acquires language as he grows up in a social environment, generally the family, where he imitates the individuals around him as they communicate with one another. Language acquisition takes place through the child's imitation of the patterns produced by the speakers around him. The patterns which he is exposed to, actually form the input that he cannot do

without. The indispensability of the language input is confirmed by Annoussamy (2006) when he says: "Children without exposure to language, for instance, those who are brought up by animals or in isolation, do not have any language."(p. 84)

Annoussamy clearly implies the existence of humans already having a mastery of the language around the learner. These are of great importance since they are to provide for the availability of the language input. They constitute the source from which the learner can acquire language either in a formal context where language teaching is explicitly conducted or in an informal context where language transmission is naturally used for immediate communication purposes in everyday interaction with other people. The success of communication remains contingent on the Comprehensibility of the input.

5.2 Comprehensibility of language input

This aspect of language input bears directly on the learner affect. Comprehensibility means accessibility, which entails a sense of worth, in the learner, to try to decipher the input aspiring to understand it and acquire it as a model for later personal production.

An input that appears unintelligible right at the first sight or hearing would spawn a feeling of jitters that could mount to despair and subsequently vitiate any of the learner's willpower to pursue the learning activity. This case ranges among other cases described by Richards and Schmidth (2002) who say, "When faced with classroom tasks that are much higher than their level of skills, language learners feel anxious and frustrated." (p.16) Language input should, then, be within the learner's reach to ensure his first feeling of his ability to access it. Such feeling is necessary, empowering, and very likely to involve him in the learning activity.

An input that is overly beyond the learner's potential presents difficulty and inaccessibility and, therefore, engenders in him feelings such as anxiety and frustration. These are the worst affective states that could catch the learner because of their destructive effects on the learning enterprise. On the other hand, a too simple input will not arouse interest in the learner nor will it tempt him to go about it. An input that bears some challenge is rightly the one likely to instigate the learner's interest and will to pursue it.

5.3 The challenging nature of language input

Being slightly in advance of a learner's current level of competence, the language input is meant to present a certain degree of challenge that is intended to encapsulate and embolden him to take up the task of decoding it. An input should be designed according to the capacities of the learner. It has to be neither drably below his potential nor detachedly above it. If the learner finds the input too simple, he will not give it damn consideration; he will undoubtedly disdain it and leave it. If, on the other hand, the learner finds the input too difficult and sees no way to go through it, he will also get desperate and cease dealing with it. Exercising in the task must not be a mere activity of iteration and reiteration, nor

a discouraging toil. It should rather appear to promise feasibility and, at the same time, make appeal for bold confrontation. Any language input devoid of these characteristics is bound to boredom and promise no advance on the course of language learning. Prabhu (1987) asserts this saying:

> **…It is therefore important for the teacher to regulate the challenge offered by tasks and operate generally with some notion of what represents reasonable challenge for a given class. The concept of reasonable challenge implies that the learners should not be able to meet the challenge too easily but should be able to meet it with some effort.**
> **(In Wright, 2005:174)**

Krashen's innovation of language input, its necessity, intelligibility and challenging nature has proved of invaluable utility in language education; in addition, he makes other contributions to the field language education. A step further through Krashen's works leads us to another one of his innovations in educational psychology. Being well set in a comprehensible and positively challenging form, the input is not totally sure to find its way in as an intake. Language input must go through a further stage that consists in an affective filter that the learner posits at the very forefront of his perception. So what is the nature of this filter? And what is its function?

6. The affective filter

Stephen Krashen (1982) puts forth evidence of the existence of such a filter to find explanation to intricate questions as why not all the target language input is acquired; why acquisition is, in particular circumstances, partial or even nil. Krashen theorizes that partial or utter failure of input acquisition is due to unfavorable learning circumstances which spawn negative emotions which, on their turn, trigger a mental block that obstructs the way in of the language input and prevents it from reaching the short-term memory.

The up position of the affective filter means the impossibility of the input to be converted into intake i.e. the part of the input attended to through perception and let into the short-term memory to be processed. The down position of the affective filter means easiness of the conversion of the input into intake for processing.

The affective variables affecting the position of the affective filter are emotional states which vary from negative, causing the filter block, to positive, favoring a free flow in of the language data. It has been demonstrated that learners with low self-esteem, low motivation, and debilitating anxiety have raised affective filter and do not, consequently, get profit from the language input they are exposed to. The filter takes this position when the learner is overwhelmed by worries, fear, and demotivation. On the other hand, learners with high self-esteem, high motivation and a certain degree of facilitating anxiety are better equipped for success in language learning since they have the affective filter generally lowered to favorable positions. The filter takes this position when

the learner feels at ease and is motivated to approach the input with will and concern. This is borne out by Richards and Schmidth (2002) who confirm that:

> **… successful second language acquisition depends on the learner's feelings. Negative attitudes (including a lack of motivation or self-confidence and anxiety) are said to act as a filter, preventing the learner from making use of input and thus hindering success in language learning.**
> **(p.16)**

To sum up what has been reached hitherto, language input has been proved to constitute an ineluctable prerequisite for language learning. Moreover, the designer of the input is to heed and provide for the affective aspects that it must bear to ensure accessibility, interest and ultimately promiing start towards success. Second, the learner is to be made feel secure and at ease, in a safe and positive learning context where feelings like self-esteem, motivation and anxiety are brought to positive levels lowering his affective filter and allowing him to take risks and boldly take up his learning enterprise.

Assuming that the conditions stated just above have been provided for, and that the language input has successfully passed through the affective filter, we shall track the language data further to see how the learner affect still accompanies it. To this end, we will follow Stevick's model of learning and memory[1]. It attaches great concern to affect and considers it as a condition for successful language learning.

7. Roles of affect in learning and memory

Learning cannot be realized at once. It is rather a process that starts at a particular point then goes through many stages to take the form of that ultimate positive change that the teacher would like to bring about in the learner. Humanistic educationalists make evidence that learner affect attends the various phases of learning and affects it in different ways. Hereafter shall we examine the way it does.

7.1 Affect as data stored in memory

When exposed to a particular thing, action, situation, or experience with the intent of learning, the learner stands with a set of needs and purposes as well as very rich and complex networks of innate resources already established in the brain. Learning ultimately means strengthening, weakening or altering the connections within the networks of the innate resources as seen somewhere earlier. The first outcome of the learner's exposure to the new experience is partly affective. The first realization the learner makes is how the new experience fits in with his needs and purposes. It may fit positively and consequently engender positive emotions of satisfaction or even of elation; as it may fit negatively and engender negative emotions of disgust and repulsion.

Stevick's titles wordly kept

The processing of the elements of the new experience that come in through the senses as a brain intake is done on basis of the already existing innate resources called upon from the long-term memory. The processing is done at the level of the worktable. The worktable is the midway venue where the elements of the intake and the data called upon from the long-term storehouse meet for processing. Among the processing operations that take place in this phase are associations established between the cognitive data to be stored and the affective impressions they have generated as Stevick (1999) confirms:

We get a glimpse of the first of the five ways in which affect– in which purposes and emotions– can participate in the process of learning, in the process of changing what is in the lasting resources of the brain: namely, that affective data are themselves stored along with the other kinds of data, including visual or verbal, auditory or olfactory data.   (p. 47)

Therefore, the ulterior retrieval of the data from the long-term memory for some use ineluctably results in affect-laden reconstructed versions of the items in store. This explains, for example, the feeling of anxiety that a learner finds at the announcement of a test in a subject which he found difficult to assimilate in class and against which he developed some fear and rejection. Sarason (1984) defines this as "the tendency to become alarmed about the consequences of inadequate performance on a test or other evaluation." (In Arnold 1999:64) or the feeling of ease that he finds in the case he is confident in his mastery of the items he is to be tested in.

A very significant deduction can be made after what has been reached up to this point: language learners' needs should constitute the first cornerstone in the teacher's planning of the language course. A preliminary survey of learner's needs could be elicited explicitly through direct questions or indirectly through some questionnaire that is implicitly well-designed to diagnose their intents. The design of the teaching material in the way that fits in positively with the learners' needs is likely to arouse them emotionally and to involve them effectively in the learning tasks.

The positive affect that will be stored along with the teaching data will ensure longer lasting for those data in the long-term memory and easy and pleasing retrieval in moments of use. Positive affect-laden language experiences will make language classes enjoyable and engrossing. This is a fact perpetuated by Stevick (1999) who sees that both the learner's needs and feelings should be accounted for in every educational activity plan for "without [this] needs part, the feeling part is mere sentimental manipulation. On the other hand, the needs part without the feeling part is mechanical manipulation." (p. 56)

7.2 The role of Affect at the level of the worktable

The worktable is the intermediary phase between sensory memory and long-term stores. Although it has been found to keep the data for no more than twenty seconds, Baddeley (2003) it is still the space where the most important

phase of learning takes place: data processing. The data that come in through the sensory memory in the form of intake and reach the worktable start the process first by stimulating an appeal for corresponding elements from the long-term memory. The worktable is, thus, the meeting place of the new intake elements and the corresponding data that is retrieved from the long-term store. Intricate interaction between the two-source elements takes place at the level of the worktable, ranging from analyzing and comparing, to synthesizing, which are all meant to produce new data.

The items of the learning experience come in through the senses affect-ladden, and "the new data somehow activate corresponding items in the networks of long-term memory" Stevick (1999, p. 56) This activation spread all through the brain and triggers the reconstructive retrieval of verbal and nonverbal images already stored with accompanying affective impressions at the level of the long-term memory. The items of the new experience and the retrieved data meet in the worktable and the processing is immediately instigated. The processing includes phenomena like comparing the elements of the intake to those which they activate in the long-term memory, restructuring the connections in the already existing networks, elaborating: the process of establishing links between the newly encountered information and the previously stored, and finally, categorization: the process of establishing links among the resulting data to be stored in the long-term memory as lasting but changeable innate resources. Storage and retrieval of data is referred to as "a constant two-way traffic between the inner resources of the long-term memory and the worktable." (ibid: 48) The two-way traffic conveys not only cognitive information but also lavish accompanying affect.

The role of affect at the level of the two-way traffic is that of a catalyst or a clutter resulting in a connection between, as in Macintyre and Gardner's example (1989), "the French language or the Korean language on the one hand, and feelings of elation and enjoyment or of frustration, defeat and humiliation on the other hand." (ibid: 49) As a catalyst, affect eases processing and ensures more lasting storage of positive affect-laden data. As a clutter it lessens the worktable capacity for interfering with the process of learning.

What can be inferred from the data processing phase at the level of the worktable is a necessity of exploring the previous impressions that the learners already have as tightly stored beliefs about the teaching material in the long-term memory. Those impressions may consist of negative affect that would function as a clutter impeding the flow-in of the new learning experience and thus minimize learning. In this case, the teacher would better leave aside the planned teaching material and devote his first endeavour to the alteration of the learners' negative affective dispositions. The neglect of these and the perverse pursue of teaching per se will lead the learning course nowhere. It will conversely exacerbate the

learners' repugnance to what will go on around them in the classroom even though they may ostensibly acquiesce to perform the tasks they will be assigned.

On the other hand, the teacher may discover positive affective dispositions among learners to what he has planned. In this case, he will have to foster those impressions and perpetuate them all to the benefit of their learning. Those impressions will accommodate the components of the new learning experience and will ease elaboration and categorization, the two important steps in knowledge internalization. They will ensure firm and lasting storage of the processed data, in short, richer knowledge among learners.

7.3 The role of affect at the level of the long-term memory

The long-term memory is the storehouse of innumerable pieces of knowledge that the individual learner draws on to understand the world around him and to meet new learning experiences. Though its name may suggest stability and soundness, this store of knowledge is subject to constant change, affect accompanies the different changes that occur at the level of the long-term memory.

8. Demonstrations of affect

Research about the role of affect in learning and memory, evidences that affective data are stored in the long-term memory all along with cognitive data and that, as Stevick (1999) mentions, "these same items of purpose and emotion are not merely just some more parts of the networks of memory: they may actually be the parts that those networks are organized around." (p.47) Moreover, affect, both experience-triggered and memory-retrieved, has been proved to affect data processing positively as an incentive as well as negatively as a clutter; in a third way, affect is evidenced to influence learning with a constant presence in the categorization of data in the long-term memory networks.

8.1 The role of feedback-generated affect

Affect that is said to have a conditioning effect on the storage or the removal of information in long-term memory is exactly that affect which is generated by the feedback that the learner receives for his performance in the target language. Stevick (1999) asserts that feedback can be cognitive or affective, external or internal, positive or negative. The multi-combination of these features gives us eight varieties of feedback.

The importance attached to the cognitive feedback stems from the learner's desire to be effectively communicative, his desire to efficiently transmit his own ideas and assimilate the others'. This type of feedback directly targeted at the message-bearing features of the language is meant for redressing or perpetuating the appropriateness and adequacy of the linguistic forms for the message to be carried. Cognitive feedback can be either external or internal. It can be external betting a lot on the listener's verbal or non-verbal response to one's language. The listener's comprehension of the message carried through one's utterances is itself a positive cognitive feedback so encouraging for further

linguistic production. But if part of the message seems to be misunderstood, missing or deteriorated, the feedback is then negative. Internal cognitive feedback, on the other hand, results from the worktable. The data of the new experience that comes in through the sensory memory triggers the corresponding data stored in the long-term memory networks so that both meet at the worktable where they are compared. Positive internal feedback means agreement between the two. In other words, the new data does not deny the validity nor the correctness of the already stored information. The latter is, then, perpetuated and even enriched with new elements from the input. The negative internal cognitive feedback is, conversely, the result of disparity between the input and the long-term memory networks. This type of feedback leads to the revision of the data in store, its correction, or, maybe, its total removal and therefore substitution.

Cognitive feedback– with its two types: external or internal, and its two qualities: positive and negative– is concomitantly accompanied by affective feedback having the same types and with the same qualities. Attention paid to the external affective feedback by the speaker stems from his desire to please the listener, to get a positive echo in the listener for his utterances. Thus, if the person the learner is talking to shows acceptance and interest in the exchange, a feeling of positive feedback will rise in him and encourage him to dwell longer on it. Lawler (2001) supports this saying, "if the interaction is successfully accomplished and generates a positive result for actors, they are likely to feel good. This will motivate each to interact with the same actors in the future, expecting another enjoyable result." (p. 348)

Besides, there is the internal affective feedback that is no less important. This concurs the cognitive processing of data that takes place in the worktable. It has been evidenced that the elements of the new learning experience are affect-laden. Affect in this phase results from the way the new experience fits in with the learners' needs and purposes. The connections established in the long-term memory networks have also been proved to be affect-laden.

Affective impressions are stored all along with the cognitive data which triggered them. Hence the affect having newly come in and the affect retrieved from the long-term memory networks are compared. Internal affective feedback results from positive answers to questions that the learner asks himself as "Do I sound like a member of the community?" (question suggested by Stevick 1999) or "do my utterances sound natural language?" Natural language means the "language which has native speakers." (Richard and Schmidth, 1985, p.352) Negative internal affective feedback is the unsatisfactory resolution that the learner attains after this type of questions. Positive and negative affective feedbacks respectively accompany the establishment and perpetuation of agreed long-term memory connections or the correction or removal of the inappropriate ones.

The important role affective feedback plays in the process of learning and memory formation makes it incumbent on teachers to heed their feedback to learners' performance. In this vein, researchers often distinguish two types of foreign language learning settings which generally spawn two broadly distinct types of feedback. In an accuracy-oriented course, the learner often receives cognitive feedback that seeks to refine his linguistic production in the direction of that of the teacher. The feedback is commonly judgmental redressing of students' mistakes. Although some teachers may be unaware of it, such kind of feedback is a source of abundant affect which is very likely to impede learning. Stevick (1999) makes this very clear saying,

…the student-learner frequently receives external affective feedback that is negative: correction, mechanical tasks, evident impatience and the like. This reduces the learner's readiness to engage in any unnecessary further interaction. This reduced frequency and degree of interaction in turn inevitably mean a relatively slow-growing basis for internal cognitive feedback. The result of this is poorer performance…

(Stevick, 1999: 53)

In a communication-oriented language class, far less emphasis is placed on accuracy. The learner, still, receives cognitive feedback, but this is rather meant to keep the learner's language stretches as natural-language sounding as possible. He may be adjusted to say "make a mistake" instead of "do a mistake", but not stopped to correct a mistake like" he make a mistake." As a result, Stevick says, **"the affective feedback is overwhelmingly positive, and so it ensures that interaction will continue." (ibid)**

Such non-judgmental settings that the teacher provides for in the language classroom is likely to encourage the learners to take further and further initiative in the foreign language. External affective feedback is positive and so is internal affective tension reduced to a restful degree allowing for further interest and involvement in linguistic production. The result is a learner who "speaks comfortably and fluently but not natively, with resident errors of grammar, pronunciation and so on." (In Arnold, 1999 p.53)

8.2 Affect and playback from others' use of the language

It happens to a foreign language learner to voluntarily or involuntarily play back bits of the language that he happened to be exposed to some time before. Murphy (1995) illustrates this phenomenon with a Japanese woman whose English, she found, was "so good" (In Arnold 1999: 54) though she had never left Japan. The woman explained her success in learning English language by an eagerness that led her to simply expose herself to the language at every opportunity, and replayed it in her mind between exposures. Murphey says that "she was English-hungry."(In Stevick 1999: 54) The woman's voluntary playback of the language stretches she got to be exposed to through some channel or any source was driven forth by a strong affect; a tenacious will to achieve a purpose

(learning English in this case) and an emotional easiness engrossed her in the process.

The playback of some language bits can also be involuntary. It happens that a learner being exposed to the target language from some source gets impressed by some utterances that are processed and ultimately stored in his memory. Later, the learner involuntarily plays back those utterances either verbally or simply in his memory. Barber (1980) calls this phenomenon a "din in the head." (In Arnold, 1999:56) Those bits of the language are so positive-affect laden that they force themselves into the learner's unconsciousness. The result is that he plays them involuntarily.

Voluntary and involuntary playback of utterances means fruitful practice. It is very advisable among educationists to design the teaching material in such way that it affectively appeals to their learners' emotions and purposes. Some chunks may find way into their beatitude and so get redundantly played back voluntarily or involuntarily. It is all to the good of the learner. For language teachers, it is worth fostering.

8.3 Affect and use of one's language

Tracked all through the learning and storage process, affect has been proved to play decisive roles in the selection, processing and categorization of data. To go further in the matter, affect has been evidenced to interfere with one's use of the data even after they have been well stored in the long-term memory.

Stevick conducted an experiment on language learners to get to the effect of affect on one's use of what one already knows. He started by placing a Cuisenaire rod on a table top. He then called for two volunteers, one at a time, and asked them to visualize the rod as some sort of building and tell him about it. With one volunteer, he played the role of an interested non-judgmental conversation partner; with the second, he showed a polite but tolerated no nonsense. He played the role of an evaluator of learners' linguistic output. He repeated the experiment with many couples of volunteers. The results of the experiment were consistent. "Without exception, the first volunteer talks more fluently, talks longer, and comes up with a richer, more interesting, more personal image." (Stevick, ibid) After the experiment, Stevick invited the learner-subjects to report about their affective states in retrospect. The results were always the same. The volunteer in front of the tolerant conversation partner said the experience was enjoyable; the volunteer in front of the intolerant evaluator found it embarrassing, frustrating and irritating.

The most likely inference that could be made at this stage is that by proclaiming the status of a single non-judgmental conversation partner, the researcher comforted the learner-subject, and thus, allowed him to find positive affect in the experience; therefore, he found much ease to speak out lavishly and fluently. The successful production of a language that seemed, to the subject

himself, agreed and appreciated by the listener has engendered a remarkable sense of ease and willpower to make further linguistic productions. This affective feeling derives from and, at the same time, enhances successful language production. By proclaiming the status of an intolerant evaluator, however, the researcher led the learner-subject to focus too much on linguistic form to avoid committing mistakes to the detriment of productivity. What logically follow are too much hesitation, too long selection of one's words, and much frustrating use of one's monitor (Krashen's term 1982) which means "listening to one's own utterances to compare what was said with what was intended, and to make corrections if necessary." (Richard and Schmidth, 1985:339) The situation has instigated negative affect in the learner and led him to take a somewhat defensive stance instead of engaging in free linguistic production. This negative affect impeded the free flow out of the stored knowledge. The learner has been led to lose confidence in his own knowledge resources and, thus, monitor it scrupulously before uttering it.

9- Conclusion

Below is an attempt to illustrate the way affect interferes in the language learning process through the different roles that it assumes during the three main stages of memory. The illustration starts with a set of twofold arrows. The red side of the arrow represents the cognitive items of the intake while the green stands for the affective charge that the item carries.The conclusion of a research paper needs to summarize the content and purpose of the article.

himself, agreed and appreciated by the listener has engendered a remarkable
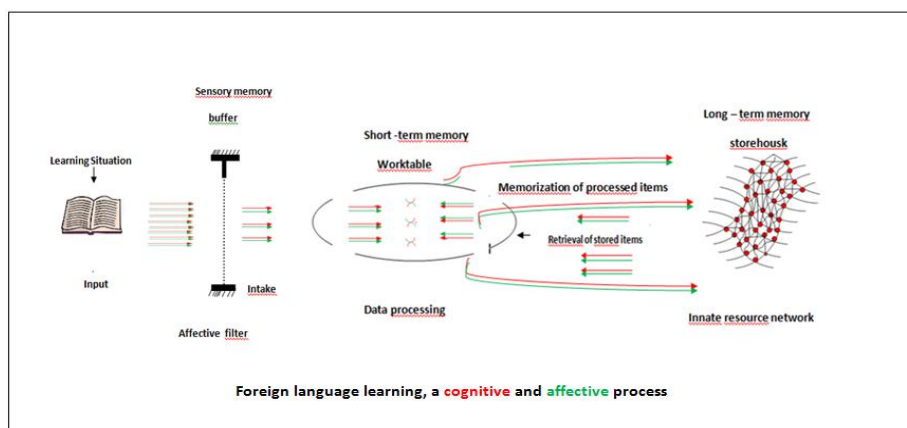
Arrows representing items of the intake go into the worktable through the buffer when the filter is sufficiently lowered, and others representing items called upon from the long-term store meet in the short-term memory. In the worktable, an operation that is analogous to mitosis, is launched. Mitosis is a type of cell division in which chromosomes duplicate to give rise to two genetically identical daughter cells which remain attached to each other in the middle of the parent cell. Analogically, data processing comprises the analysis of the two-facet items

(cognitive and affective) coming in through the sensory memory as well as the corresponding items called upon from long-term store at the short-term memory. The incoming items with the ones recalled are dismantled, dissociated, compared, rearranged, and then reconstructed in new paired items still cognitive on one side (marked red in the illustration) and affective on the other (marked green in the illustration). The resulting items are represented as cognitive sticks joined with the affective charge associated with it, as illustrated in the form that is similar to that of a chromosome. They are stored in the long-term memory but are always shuttering between the worktable and the permanent store whenever new learning experiences necessitate that.

Stevick's insight is of a promising direct service to language teachers' cause. Language teachers' are, in a humanistic logic, advised to take a positive, tolerant, and non-judgmental stance in front of their learners so as to provide for positive settings in which learners feel free to draw on their knowledge and take part in the fruitful interaction that takes place in the language classroom.

Besides providing for favorable learning conditions, language teachers should know and admit the fact that learners do have preferences in learning styles; they should heed that closely. In learning a foreign language, each learner would adhere to a certain learning style that he finds himself inherently disposed to. The learning strategies that are spawned from the style give the learner some ease in pursuing the language material. Language teachers should recognize every learner's style and foster it.

Researchers' insights in language education have revealed that language learning is not a so simple process as it had been so long believed. The laws of causality and determinism which had been once adopted to establish firm relations between mere data provision and the learner with his cognitive system came to be strongly refuted. Evidence put forward that research has to be broadened to account for another facet of the human construct: affect. The target language material could be well arranged, mistake-free and believed likely to be effortlessly assimilated by learners, and yet leads to none of the aspired results. However, once the affective considerations are incorporated in the target language material and in the learning context, things begin to take a different tendency, a positive and promising one.

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