

# Learning theories in relation to corpus-informed language pedagogy: Looking for a sound ground

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## **Abstract**

This theoretical study is based on the observation that literature lacks an appropriate framework on which corpus-informed language pedagogy will be safely built. Most of the language teaching practitioners are familiar with learning theories in general and second language learning theories in specific. However, too much technicality about corpus linguistics could be putting them off from making use of the facilities that corpus linguistics has to offer. This study aims at helping language teachers to construct a pedagogical rationale for corpus-informed language instruction without getting involved with too much technicality. Bearing in mind that there are very few studies focusing on this issue, this study tries to tackle the concern questioning the theoretical background underpinning corpus-informed language pedagogy. The discussion reveals a parallelism between corpus-informed language pedagogy and constructivist approach to human learning.

**Key words:** corpus linguistics, language pedagogy, learning theories

## Öğrenme teorileri çerçevesinde derleme dayalı dil eğitimi:

### Sağlam bir teorik zemin arayışı

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## **Özet**

Bu teorik çalışma, ilgili literatürün derleme dayalı dil eğitiminin dayandırılabilceği uygun bir bilimsel çerçevenin eksikliğinden yola çıkmaktadır. Dil eğitimi uygulayıcıları, yabancı dil edinimiyle ilgili teorilerle ilgili az çok fikir yürütebilirler. Ancak, aşırı teknik içeriğinden dolayı, dil eğitimcileri derlem dilbiliminin sunduğu olanaklardan uzak duruyor olabilir. Bu çalışma, çok fazla teknik detaya girmeden, derleme dayalı dil eğitimi için pedagojik bir çerçeve oluşturarak dil eğitimcilerine yardımcı olmayı amaçlamaktadır. Bu konuda çok az sayıda çalışma olduğunu dikkate alarak, derleme dayalı dil eğitiminin pedagojik altyapısıyla ilgili sorular cevaplanmaya çalışılmıştır. Tartışmalar, derleme dayalı dil eğitimi ile yapılandırmacı öğrenme yaklaşımı arasında paralellikler olduğunu ortaya koymaktadır.

**Anahtar kelimeler:** derlem dilbilimi, dil eğitimi, öğrenme teorileri

## Introduction

It is quite clear that any kind of learning or teaching should be based on a well-established theory. The underlying learning theory of corpus-informed or corpus-based language instruction has to be discussed and agreed upon if we want to make use of what corpus linguistics has to offer. However, it is only in a few accounts in the related literature where this issue is discussed in depth (e.g., Flowerdew, 2010). In order to do so, in this review article, first of all, learning theories in general will be (discussed. Next, some insights about corpus linguistics in the context of language pedagogy will be mentioned. Finally, a theoretical framework for corpus linguistics in terms of general learning theories will be considered.

## Learning in general

Generally speaking, it is very hard to come to an agreement on definitions of concepts that are directly related to human beings. When it comes to define learning, which is innate in human nature, it is even harder to come up with one universally accepted definition (Shuell, 1986). However, there are common points in the statements trying to define human learning. First of all, learning involves some sort of change in behavior that result from experience (Taylor & MacKenney, 2008) and that endures over time (Schunk, 2012). Lafrancois (2000) restricts the definition by claiming that we can talk about learning if a relatively permanent change is not the result of fatigue, maturation, drugs, or physical injury. From these different perspectives we could deduce that learning is a relatively permanent change in human behavior that happens over time as a result of natural experience that people go through. One important dualism in terms of learning is deductive and inductive reasoning. Deductive begins with a general rule and the learner moves from general to specific. On the other hand, inductive reasoning begins with a specific part of knowledge and the learner tries to reach the bigger picture.

## General learning theories

It is a traditional approach to dissect human learning theories into conflicting sides. Its integrity set aside, issues related to teaching and learning are generally discussed in a dichotomous, action-reaction approach. With this paradigm, learning theories in general can be classified into three main perspectives namely;

- behaviorism
- cognitivist approach
- constructivism

## Behaviorism

The major principle behind the behaviorist theory lies in the analyses of human behavior based on a stimulus-response interaction which is generally regarded as something *observable*. The roots of this paradigm date back to early twentieth century when mentalistic

perspectives were falling short to come up with tangible explanations concerning human behavior. Edward Thorndike, B. F. Skinner and John B. Watson could be counted as the pioneers of this paradigm.

Skinner (1984) supported the idea that psychology should be concerned with people's observable behaviors but not with what is going on in their minds. *Operant conditioning*, a type of learning which determines whether a behavior will be repeated in the future or not, is at the heart of his learning theory. This kind of conditioning is different from the classical conditioning in that classical conditioning focuses on reflexive behaviors whereas operant conditioning dwells on voluntary behaviors which are mostly shaped by the environment and their outcomes.

Thorndike (1913) studied on animal behavior and in the experiments that he carried out on cats he observed the process of stimulus-response during problem solving. He concluded that trial-and-error learning created neural connections, and the more often a response is given to a stimulus the stronger the response was attached to the stimulus. From this perspective, it would be meaningless to talk about insightful or clever animals; individual differences set aside, all animals learn the same way. Human learning, on the other hand, is a much more complex system involving a variety of skills and factors. One of these factors, *law of effect* is the focal point of his learning theory. According to this principle (Thorndike 1913: 4):

When a modifiable connection between a situation and a response is made and is accompanied or followed by a satisfying state of affairs, that connection's strength is increased: When made and accompanied or followed by an annoying state of affairs, its strength is decreased.

As is clear from the above statement, the critical point is actually the consequence of the behavior. Learning most probably occurs as a result of a positive response to stimulus; otherwise, when the result of a response creates negative associations, we are bound to forget.

Watson (1919) rejected the mind to an extent and the introspective method all together. To him, introspection is not an essential part of learning. Psychology, in general terms, is an objective and experimental method. Through this method, we can predict and control human behavior. As a diversion from behaviorists, Watson rejected Thorndike's *law of effect* claiming it to be subjective.

### **Cognitivist Perspective**

In the second half of the twentieth century, behaviorism was beginning to be sidelined by cognitive revolution; all the *animal business* mentioned before were being questioned. Could tests carried out on animals really help us understand the complexity of human learning? Maybe human learning was unique with its own parameters. Cognitivists developed the idea that human behavior is a result of human cognition; therefore, cognition

cannot be regarded as behavior. This way of thinking led to the claim that cognition, which is unique to humans, should be studied separately from human behaviors.

Human learning, from this perspective, is simply recalling the data stored in the brain. This recalling, of course, needs a sort of storing beforehand. As long as this storing process is meaningful, recalling is also supposed to be as effective. From this terminology one can conclude that human brain is seen as a processing unit like a computer.

The first traces of cognitivist approach can be traced back to the studies of Lev Vygotsky (1886-1934) whose ideas and studies were, mostly for political reasons, restricted during his lifetime. Western scholars could only become aware of his ideas after the second half of the twentieth century through late translations of his studies. He regarded psychological development as an ongoing process which is limited with a person's lifetime and into which cultural mediation is highly embedded. In his terms, cultural mediation and interpersonal mediation play a significant role especially in a child's psychological development. For a child, even the slightest action is beyond his/her reach. Child learning actually follows his/her actions in a society. Once the child gets the control over what he/she has learned and starts using them mostly for his/her needs, the related knowledge is internalized. At this stage, the concept of internalization was re-interpreted with the introduction of the term *zone of proximal development (ZPD)*. ZPD is the range of tasks which a child can complete on his/her own. The child can reach beyond this range with the help of a better-knowing adult. The relationship between learning and a child's cognitive development is highlighted with this new (then) concept.

One of the figures whose ideas deeply influenced the discussions over the nature of the learning process was Jean Piaget (1896-1980). To him, cognitive development depends on four factors: biological maturation, experience with the physical environment, experience with the social environment, and equilibration (Schunk, 2012). The last factor, equilibration, is the most critical one because the consistency of other three depends on it. In other words, equilibration is like an adaptation between cognition and the environment. The conflicts coming from the outside world can be settled through *assimilation* or *accommodation*. Assimilation refers to the process of fitting the outside reality into the existing cognitive structure; accommodation, on the other hand, refers to a deliberate change in this structure to welcome the outside reality.

Piaget also emphasized that learning a new concept is only possible at a corresponding developmental stage. In terms of development, children go through four main fixed stages namely sensorimotor, preoperational, concrete operational and formal operational stages respectively. At the early stages children start realizing the outside world through actions and their effects. By the age two, egocentrism begins and, in time, it weakens. Abstraction is out of reach at this stage. As children move from egocentrism to sociocentrism, their actions take socially acceptable forms, and by and from the age of twelve, they start to develop abstract reasoning. After this period, they can easily think logically.

Another significant figure who has proposed a theory of cognitive growth is Jerome Bruner. He tried to develop a cognitive learning theory from a functional perspective. Generally, knowledge is represented in three ways: enactive, iconic and symbolic. Enactive representation (action based) involves ways of manipulating the environment. For example,

infants interact with their environment and manipulate it as much as possible because this is the means by which they can become part of the environment. This limited action based development is substituted (or transferred into) with the iconic representation. This replacement shouldn't be regarded as something linear or a neat age-related stage because adults might make use this kind of representation from time to time. For example, it would be very hard to teach an adult how to play a drum just by using iconic or symbolic presentations. The adult learner will also try to manipulate the instrument in order to get action based representations. Iconic representation is related to the ability of visualizing of the objects that aren't present in the vicinity. Through this kind of representation, objects are transferred into the thinking process. The development of this stage progressively leads to abstract concepts, a stage which involves symbolic representations. At this stage, abstract concepts, like those of mathematics, are transferred into the thinking process.

As can be deduced from the above mentioned ideas and theories, cognitivist approaches put cognition in the center of the learning process, and this sort of paradigm anticipates a somewhat progressive development which involves stages and corresponding abilities.

### **Constructivism**

The classical learning theories mentioned so far has put too much emphasis on learning in general. According to these theories, there are certain stages that all human beings have to pass to move on to the next ones. It was no surprise that this point of view was criticized for disregarding the individual differences. According to this criticizing perspective, no two people are the same even if they are identical twins. Every individual actually has a unique context or social environment and needs which are shaped by them.

Constructivism is actually a theory about epistemology i.e. how people learn and the nature of learning. However, it has been used widely in educational terms. John Dewey (1859 - 1952), one of the pioneers of constructivist theory of learning, proposed the idea that education and learning are social and interactive processes. The purpose of education shouldn't be to focus on a precise set of conditions but rather to help individuals realize their powers and capabilities. Preparing a child for the future life should mean to give him command of himself by training him to have the full and ready use of all his capacities (Dewey, 1897).

Constructivist approach to learning was mostly shaped by the line of thoughts created by Vygotsky and Piaget. Affected by their opinions about human learning, many researchers began to criticize classical assumptions about learning which had been created by the mainstream school of thoughts. These assumptions were (Greeno, 1989):

- Thinking resides in the mind rather than in interaction with persons and situations.
- Processes of learning and thinking are relatively uniform across persons, and some situations foster higher-order thinking better than others.
- Thinking derives from knowledge and skills developed in formal instructional settings more than on general conceptual competencies that result from one's experiences and innate abilities.

As opposed to these assumptions, constructivists have mainly discussed that learners are active in the learning process and they actually build knowledge through interaction with the environment (Geary, 1995). Furthermore, learning is not regarded as a linear process but as a cyclic one. Kolb (1984) illustrates this process as in Figure 1.

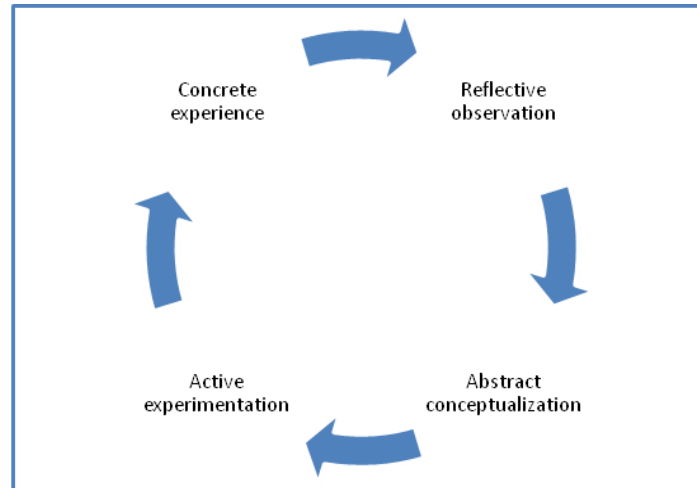


Figure 1. The cycle of learning

The cycle of learning, which is the central principle of Kolb's experiential learning theory, is presented in Figure 1. It is clear from the figure that the learning cycle has no beginning point in the strict sense; learning can begin at any point. Think of a child learning to ride bicycle. Say, the child enters the cycle from the *concrete experience* point. S/he will be involved in a new experience and observe other people riding bicycles and think about the action itself (*reflective observation*). Next, s/he will try to grasp the concept of riding and bicycles in theory (*abstract conceptualization*). When ready, the child will get on the bike and give it a try, and may fall off the bike in the first attempt (*active experimentation*), then may enter the learning cycle from a different point. Therefore, as was mentioned before, every individual constructs his/her own knowledge depending on his/her unique context.

In recent decades, constructivism has been discussed in terms of learning with a bolder emphasis on its social aspect (see Palinscar, 1998 or Yuksel, 2009 for detailed reviews). It was claimed that a sort of sociocultural revolution had been taking place and the focus of learning was moving towards out-of-school contexts and social interactions (Voss et al., 1995).

Its emphasis being on individual differences, constructivism also gave way to more learner-centered approaches to learning. Howard Gardner's multiple intelligence theory was one of these approaches. According to Gardner (1983), each individual has his/her own strong and weak points. The aim of education should be to highlight the strengths of each individual. Gardner (1983) categorized intelligences into eight major types.

**Linguistic** intelligence: sensitivity to the meaning and order of words.

**Logical-mathematical** intelligence: ability in mathematics and other complex logical systems.

**Musical** intelligence: the ability to understand and create music.

**Spatial** intelligence: the ability to "think in pictures," to perceive the visual world accurately, and recreate (or alter) it in the mind or on paper.

**Bodily-kinesthetic** intelligence: the ability to use one's body in a skilled way, for self-expression or toward a goal.

**Interpersonal** intelligence: an ability to perceive and understand other individuals -- their moods, desires, and motivations.

**Intrapersonal** intelligence: an understanding of one's own emotions.

**Naturalistic** intelligence (added later): refers to the ability to connect with the natural environment like animals and plants.

It is not a weak assumption that every individual, one way or another, relates strongly with one of these intelligences with no clear-cut boundaries with the rest. This point of view might be criticized for seeing the mental processes as linear and steady because when the issue at hand is human, fluctuations are bound to occur and this might put the whole packaging and labeling business in peril.

### **Corpus linguistics**

In linguistics terms, corpus (*pl. corpora*) refers to systematically collected and digitally stored written or spoken language samples. From a historical point of view, the first of such compilations was for the Vulgate Bible in the 13<sup>th</sup> century (Aston, 2011) when the Christian Bible was indexed in order to understand it better by looking for patterns or hidden meanings; it was a kind of *exegesis* in other words. In the modern era, with the help of digitalized technology, corpus databases all around the world have reached millions of words with the Brown corpus (1960s) as the first example. With more than 450 million words in its database, COCA (Corpus of American English) is one of the most valuable modern corpora of our time.

On the other hand, the picture has not always been that of a bright one for corpus linguistics. Chomsky, for example, criticized this endeavor harshly because no matter how many millions of words you collect, it would still be insufficient to understand the human language system. That's why corpus data was much of a *junk* (Aarts, 2001, p. 6). However, the value of corpora in language pedagogy is rarely questioned these days as much of what we have in terms of English lexicon is built on corpora which are composed of immense collections of words.

When the scientific aspect of corpus linguistics is considered, although some scholars share the idea that it is a methodology not a discipline on its own (McEnery and Wilson, 2001: p. 2), some others suggest that corpus linguistics is both a methodology and science at the same time (Aston, 2011: p. 2). In terms of language pedagogy, it seems that corpus linguistics provides language teaching practitioners with valuable materials as a methodology. It has now become quite easy for language teachers and learners to access immense amount of language samples. However, this situation have created a need to reframe the concept of language pedagogy. Data Driven Learning (DDL) was a result of this need.

DDL, also known as *discovery learning*, is an approach and a technique which involves exploitation of authentic language materials by learners rather than ready-made ones and learner-centered activities. The term was used by Tim Johns (1991) for the first time to put an emphasis on pro-active language learners who can analyze sets of concordances extracted from a corpus. In his study he used concordancing printouts instead of simple fill-in-the-gaps activities. During these activities he realized important lexical or grammatical points that he had himself overlooked before (Johns, 1986). He refers to Krashen's *comprehensible input hypothesis* (1986) by stating that concordancing activities are in line with this hypothesis and they only lack the simplified aspect of the target language. The most important point that he stresses is the multiple contexts that the learners observe through concordancing lines. In addition to his positive remarks about DDL, Bernardini (2004, p. 22) also suggests that data-driven language learning is in line with exploratory and discovery learning because the learners are provided with nearly endless possibilities to discover the target language.

According to Fligelstone (1993) there are three aims of corpus-based linguistics in teaching: teaching about the principles behind corpora, teaching the learners how to exploit corpora and exploiting corpora to teach. Teaching about the principals of corpora is actually about the core reality and richness of language. Showing learners that the target language is actually a system working on individual but deeply related parts rather than a kind of idiosyncrasy is one of the most important gains that corpus linguistics can offer. For example, in terms of English lexicon, there words do not seem to have equal importance. O'Keeffe et al. (2007: p. 32) illustrates this point with a corpus-informed perspective.

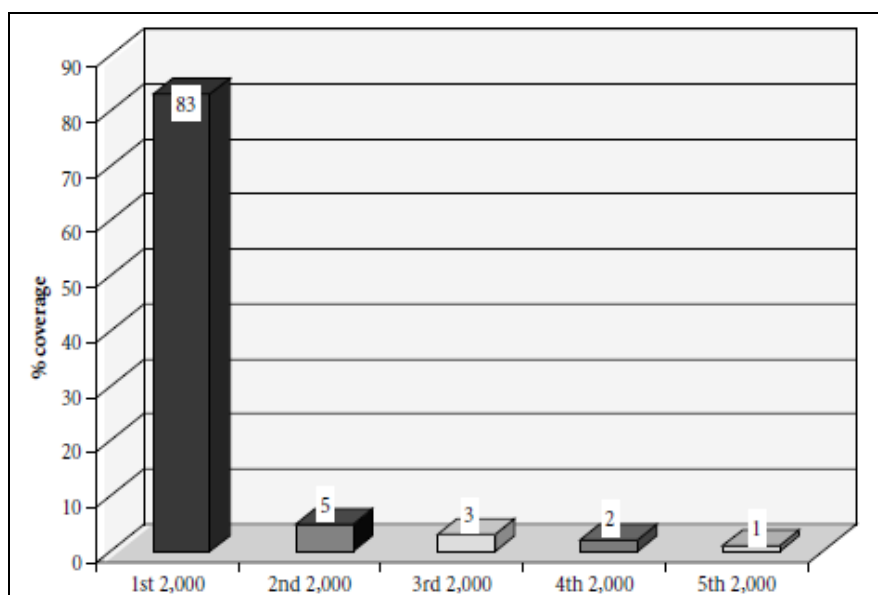


Figure 2. Text coverage in a 10 million-word corpus of spoken and written English

In Figure 2, the text coverage in a 10 million-word corpus of spoken and written English is presented. The first bar in the figure represents the most frequent 2000 words in the database with a percentage of 83 %. The second bar represents the second 2000 words in the corpus and its percentage is, with a dramatic decrease, 5%. This pattern alone might be enough for many language learners by pointing at a lexical pattern thus telling them where to start.



The second aim, which is to teach learners exploit corpora, is related to encouraging language learners take advantage of the real language on their own throughout the process of learning. Few individuals learn the same way; their needs, motivations and interests all make up a sliding scale, so when learners are given a chance to explore lexical or grammatical aspects of a given language they will try to dwell on different issues. Many corpora available online now make it possible for language learners to explore language structure to the point where it would be impossible through other means.

The third point, exploiting corpora to teach, is the aspect focusing on the language teacher. Most of the time, corpora-related software provide users with a statistical tool called *concordancing* (see Figure 3). Flowerdew (1996) defines the term as follows:

Concordancing is a means of accessing a corpus of text to show how any given word or phrase in the text is used in the immediate contexts in which it appears. By grouping the uses of a particular word or phrase on the computer screen or in printed form, the concordancer shows the patterns in which the given word or phrase is typically used.

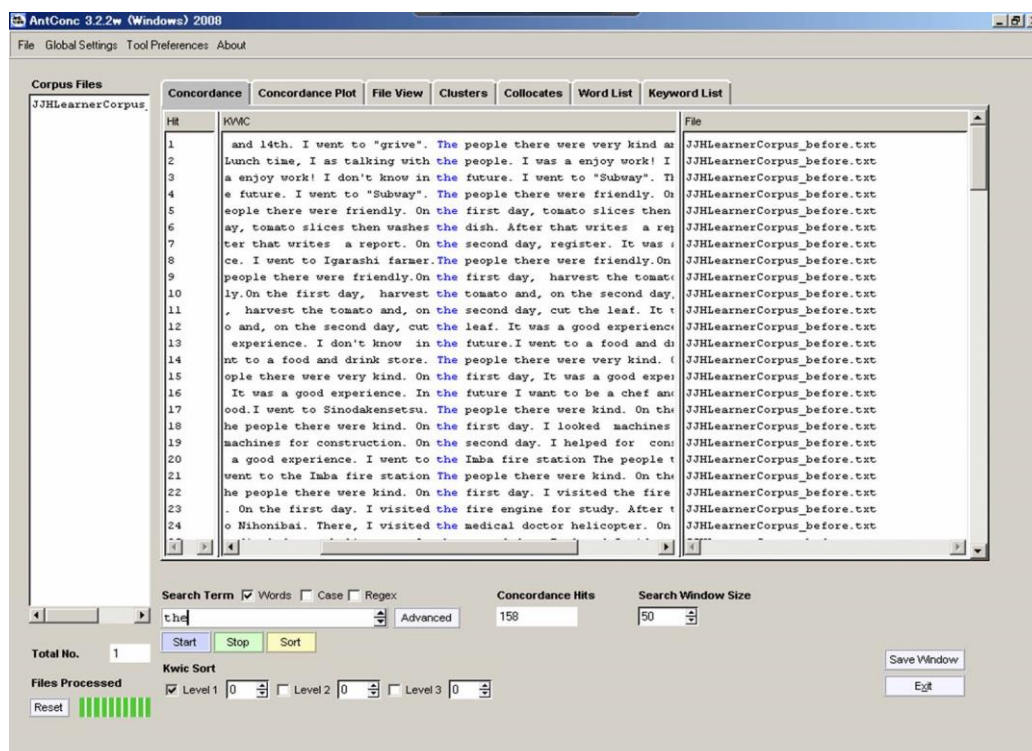


Figure 3. A concordancing screen from AntConc, Version 3.2.2 (Anthony, 2008)

Above is a screenshot from the software package AntConc. The immediate context of the article *the* can be explored by using hundreds or thousands of concordancing lines. By clicking on the options provided at the top, it is possible to analyze the clusters or high-frequency collocates of the target word. As was mentioned before, concordancing activities are actually supposed to convey a *sense* about the immediate context of a given word. How this facility can promote language learning is a point of discussion. Basically, language learners might use a concordancer in the following ways (Levy, 1990).

1. checking meaning
2. checking general syntax
3. checking usage
4. exploring special lexis especially ESP vocabulary
5. checking derived forms
6. checking collocates of words
7. exploring set pieces, e.g. phrasal verbs, clichés

It could be discussed that some of the items mentioned above can be achieved through conventional means like books or dictionaries. However, the most important point here is that through concordancing lines the learner will always be able to see the target structure in multiple contexts. The following figure will help us to visualize how concordancing activities could be used in this way (Schmitt and Schmitt, 2005, p. 196).

brief	chart	implement	monitor
channel	component	integrity	option
1. _____	2. _____	3. _____	4. _____
~ money	~ history	~ progress	~ policy
~ resources	~ mention	~ performance	~ recommendations
~ funds	~ sojourn	~ compliance	~ strategy
~ energy	~ introduction	~ standards	~ reforms

Figure 4. A sample concordancing activity to teach vocabulary

In the figure above, the target words are presented at the top with four options below them. The learners are asked to guess which of these alternatives are most likely to occur with the target words. Through this kind of activities, language learners progressively become aware of the networks among vocabulary items and might free themselves from simplistic views of words. With a similar approach Honeyfield (1989) suggested an exercise typology based on concordance material,

1. Filling blanks in concordance material
2. Completing, or guessing the wider context of concordance material,
3. Using concordance materials as a reference tool for various exercises focusing on grammar, usage, vocabulary, etc.
4. Discourse-oriented exercises involving the use of concordance material, e.g., the use of discourse markers.
5. Comparing the meanings or uses of given expressions in different types or samples of writing.

6. Exploring emotional tone or style, e.g., comparing the tone of certain concordanced items between different genres.

7. Freely using a concordancing program to assist writing, correction, or comprehension.

The point that needs to be highlighted in the list above should be the discourse-oriented exercises. Seemingly meaningless and free from syntax, discourse markers (words or phrases like *well, then, you know etc.*) are actually indispensable parts of naturally occurring language. They help in building up “the connection between what is being said and the wider context” (Swan, 2005: p. xviii). Again, language learners get the chance to analyze different contexts of a discourse marker only through concordancing tools.

The theoretical framework for corpus-informed language pedagogy has been discussed before. Flowerdew (2010) demonstrated theories underpinning corpus-based pedagogy with a bold emphasis on second language learning theories and came up with a parallelism between corpus-based pedagogy and constructivist theories of language learning. In order to further discuss the issue, based on the general learning theories and the outline of corpus linguistics mentioned thus far, the following research question becomes a concern: What is the theoretical background for corpus-informed language pedagogy in relation to general learning theories?

## Results and discussion

It has now become a kind of common sense that human beings aren't born as blank slates (*tabula rasa*) as once was thought. People are not born without a built-in mental content to be filled in time but rather bring with them innate mechanisms that are ready to make connections with the outside world. After all, concepts about human learning boil down to making up and fortifying neural connections. Theories and applications that fail to catch this point are to be eliminated in the natural course of human development. Behaviorism is a good example of this elimination, because proponents of this approach failed to understand human cognition and embraced a rather simplistic perception by claiming that all human learning is based on a stimulus-response interaction. Before long, cognitivist approach appeared and rejected the main principles proposed by the behaviorists. To them, learning was the mere business of storing and recalling data like a computer processor. A more *humanly* perspective, constructivism, considered learning as an outcome of social interaction and this outcome appeared to differ from one individual to another. Learners do not receive and store knowledge but they build their own reality through deeply personal processes.

Language pedagogy hasn't been free from these on-again-off-again discussions. This domain has also been shaped and reshaped by these developments. In addition to this, in a world which is digitalizing more and more in the blink of an eye, computers, along with all digitalized technology, claimed a considerable terrain in the domain of language pedagogy, and corpus linguistics was probably among the most influential factors, because after its introduction to the field of language learning and teaching, lexicography has changed never to be the same again. However, Chomsky (1965) criticized not only behaviorist approaches to language but also regarded corpus data useless because the terms *observable* and *inductive reasoning* as he tried to attribute humans' knowledge and ability concerning language to an unconscious system which could enable utterances in any language, and the model he was proposing was based on human *competence* but not *performance*.

In order to deal with the main concern of this study whether corpus-informed language learning teaching practice could be integrated into general learning theories Kolb's experiential learning cycle will be used. To make things easier, the steps supposed to be taken by a language learner while making use of corpora to solve a performance related problem will be demonstrated.

Imagine a B1 level student in English whose main field of study is Biology. As an assignment she is to write an essay concerning environmental problems in developed parts of the world. Somewhere in her essay she realizes this sentence: *Plastic is being a threat to the environment all over the world.* She feels that this sentence doesn't look like the ones in her textbooks, or she gets a similar feedback from her instructor. The learning cycle begins at this point. She has started writing her essay by using her existing knowledge about the topic and the process of writing (*concrete experience*). While writing, she notices that this sentence doesn't look right. She feels that this sentence could look more academic (*reflective observation*) and logs onto COCA, the free online corpus of American English mentioned before, and looks for the collocations of the word *threat* in academic contexts and gets the following output screen.

The screenshot shows the COCA interface with the word 'threat' entered in the search field. The 'CONTEXT' column lists the following collocates:

	CONTEXT
1	[POSE]
2	[SECURITY]
3	[SERIOUS]
4	[POTENTIAL]
5	[PERCEIVED]
6	[SOVIET]
7	[FACE]
8	[PERCEPTION]
9	[NUCLEAR]
10	[PERCEIVE]

Figure 5. Top collocates for the word *threat*

At this stage, she notices that the word *pose* at the top of the list is the strongest collocation of the target word *threat* (*abstract conceptualization*). In order to get further information about this collocational structure she goes on to click on *threat* to get the next output screen as follows:

The screenshot shows concordancing lines for the words 'pose' and 'threat'. The text includes the following examples:

...e-related population movement, like migration more generally, **poses a threat** to the integrity of stat  
diseases. But germs did not **pose** the only **threat**. Concerned physicians and schoolteachers believed  
gained a more comprehensive understanding of the magnitude of the **threat posed** by the disease. Fu  
erficial and/or flawed evaluation. This shortcoming **poses** a serious **threat** to the tool's inter-rater reli  
bya, and North Korea -- do **pose a threat**. But international nuclear technology transfers often fail be  
ate has developed over how to respond to the **threat posed** by Iran's nuclear activities, which most e  
ar. # Outside analysts have also overstated the **threat posed** by Iraq's " crash program, " which was  
Global Risks report, these diseases **pose** a greater **threat** to global economic development than fisca  
e can not declare with certainty that CWD **poses** no **threat** to humans, and CWD is continuing its und  
ese organisms. # ESBLE infections may **pose** a particularly serious **threat** in profoundly immunosupp  
ainly resting assured that the cowboys' touching story **poses** no **threat** to their heterosexual privileg  
iliar if it was to **pose** a believable **threat**. Jews and the other outsiders were stereotyped as evil kind  
te of the Jordan River **pose** any greater security **threat** to Israel than one in Judea and Samaria? # M

Figure 6. Concordancing lines for the words *pose* and *threat*

Figure 6 provides only a small section of the output; scrolling down will reveal about 337 more concordancing lines containing the words *pose* and *threat*. These concordancing lines provided by the database show that the word *pose* is actually a verb and it is used in simple present form most of the time. At this stage (*active experimentation*), the learner modifies her sentence as:

*Plastic poses a threat to the environment all over the world.*

According to Kolb's experiential learning theory, as was explained before, another cycle for the learner could start at this point, or she could enter the cycle from another point. From this demonstration, from a perspective of general learning theories, it could be discussed that the learner in this scenario goes through inductive learning steps which are parallel to those proposed by Kolb (1984), and a claim stating that corpus-informed language pedagogy is in line with the principles proposed by constructivist approach.

## Conclusion

This theoretical study tries to seek a parallelism between corpus-informed language pedagogy and learning theories in general. As a result, it has become quite clear that corpus-informed language activities are inductive by nature and learner centered. They promote exploring and thus building up knowledge at personal level. Almost all of these concepts are directly related with constructivist learning theory. Therefore the findings are in line with the related literature (Flowerdew, 2010).

Another point worth mentioning is that the obvious need to train language learners about the rationale behind corpus linguistics and the ways to exploit large datasets is consistent with the literature arguing that efficiency is only possible through serious corpus training (Cobb, 1997; Flowerdew, 1996; Kennedy & Miceli, 2001; Yoon & Hirvela, 2004).

Last but not least, in terms of multiple intelligences, corpus linguistics in language pedagogy could be rightly criticized for having the potential of being little use to learners with intelligence types such as bodily-kinesthetic, who will find sitting in front of a PC screen extremely boring; interpersonal, who will constantly be in need of peers; and naturalistic, who might consider trying to interact with a computer as meaningless. Further studies could question this point and inspect the effects of corpus-informed language instruction on different intelligence types.

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