



INTERACTION AND SECOND LANGUAGE ACQUISITION: AN ECOLOGICAL PERSPECTIVE¹

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Abstract: This article discusses interaction with the support of applied linguistics, ecology and ecosystemic linguistics. It defines interaction and presents the basic types of interaction in the light of different second language acquisition perspectives, presents an ecological perspective and then compares interaction in the classroom to five types of interaction between the species in a biome. It proposes a sixth type, the mediated interaction, by arguing that man is the only species able to develop technologies to improve his interaction within and outside his own biome. It concludes that students' biomes should be enlarged by interaction in other environments mediated by technology.

Key words: Interaction, second language acquisition, ecology

Resumo: Este artigo discute a interação com o suporte da linguística aplicada, da ecologia e da linguística ecossistêmica. Define interação e apresenta os tipos básicos de interação à luz de diferentes perspectivas da aquisição de segunda língua, apresenta uma perspectiva ecológica e, em seguida, compara a interação na sala de aula com cinco tipos de interação entre as espécies em um bioma. Propõe um sexto tipo, a interação mediada, ao argumentar que o homem é a única espécie capaz de desenvolver tecnologias para melhorar sua interação dentro e fora de seu próprio bioma. Conclui que os biomas dos alunos devem ser ampliados pela interação em outros ambientes com a mediação da tecnologia.

Palavras-chave: interação, aquisição de segunda língua, ecologia

0 Introduction

Haugen (1972) was the first one to talk about the ecology of language defined as “the study of interactions between any given language and its environment” (p.325).

¹ This article is an updated and edited version of a paper presented in a conference (Congresso Internacional Linguagem e Interação II) in 2010 at Unisinos, Rio Grande do Sul, Brazil and previously published in Portuguese as book chapter (PAIVA, 2013).

In the words of Haugen (1972, p. 325):

Language exists only in the minds of its users, and it only functions in relating these users to one another and to nature, i.e. their social and natural environment. Part of its ecology is therefore psychological: its interaction with other languages in the minds of bi- and multilingual speakers. Another part of its ecology is sociological: its interaction with the society in which it functions as a medium of communication. The ecology of a language is determined primarily by the people who learn it, use it, and transmit it to others.

In Brazil, Couto (2007, 2015) has opted to name this perspective of language study as ecosystemic linguistics (EL). He also acknowledges the importance of interaction by stating that “the kern of EL is the ecology of communicative interaction (dialogue)” (COUTO, 2015, p.47).

No one denies the role of interaction in first and second language acquisition environment. Through interaction, one enters into communion with others. The concept of communion was also developed by Couto (2007, 2017) who hypothesizes that “communal predisposition may be more important than language”²(COUTO, 2007, p.118).

In this article I will make an attempt to discuss interaction with the support of applied linguistics, ecology and ecosystemic linguistics. My first task is to define interaction and that will be done in the next section.

1 Interaction

The word interaction is formed by the prefix **inter**, which implies togetherness, reciprocity, and the noun **action**. So, interaction is a mutual activity which requires at least the involvement of two persons and which causes mutual effect. Ellis (1999, p.1) defines interaction as “the social behavior that occurs when one person communicates with another”. He also says that it “can occur inside our minds, both when we engage in the kind of ‘private speech’ discussed by Vygotsky (1978), and, more covertly, when different modules of the mind interact to construct an understanding of or a response to some phenomenon”. Ellis reflections on interaction also embrace the psychological and sociological dimensions of human behavior.

Ellis focuses on interaction as an interpersonal and intrapersonal phenomenon, but Chapelle (2003, p.56) proposes the addition of interaction “between person and computer”. She synthesizes, in a table, the basic types of interaction in the light of three different SLA theoretical perspectives discussed by Ellis (1999): interaction hypothesis (HATCH 1978; LONG, 1996; PICA 1994), sociocultural theory (LANTOLF and APPEL 1994) and the depth of processing theory (CRAIK and LOCKHART, 1972).

Table 1. Benefits of three types of interaction from three perspectives

² I am responsible for all the translations of quotations in Portuguese.

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Basic types of interactions		Perspectives on the value of interaction		
		Interaction hypothesis	Sociocultural theory	Depth of processing theory
Inter-	between people	Negotiation of meaning	Co-constructing meaning	Prompting attention to language
	<i>between person and computer</i>	<i>Obtaining enhanced input</i>	<i>Obtaining help for using language</i>	<i>Prompting attention to language</i>
Intra-	within the person's mind	Attending to linguistic form	Stimulating internal mental voice	Cognitive processing of input

Source: Table 2.2 in Chapelle (2003, p.56)

Chapelle (2003, p.56) explains that

The cells in the table suggest the hypothesized benefits to be attained through interaction from each of the theoretical perspectives. For example, from the perspective of the interaction hypothesis, interaction between people is expected to promote negotiation of meaning, and if it does so, this should be beneficial for language acquisition. Since the three theories do not specifically address learner-computer interactions, I have filled in the logical predictions in italics.

Other benefits of interaction can probably be added to Chapelle's table, such as identity construction and motivation, but no matter how many the benefits are, the fact is that interaction is a basic human instinct as posed by Lee at all (2009) and it occurs in a multimodal way and not only through oral or written media.

1.2 Interaction as an instinct

According to Lee et al (2009, p. 5) "crucial for language acquisition is what we call an "interactional instinct. This instinct is an innate drive among human infants to interact with conspecific caregivers." Ellis (1999) also sees interaction as "the primary purpose for our species-specific language capacity" and Tomasello (2003: 2), reminds us that it "takes many years of daily interaction with mature language users for children to attain adult-like skills, which is a longer period of learning with more things to be learned—by many orders of magnitude—than is required of any other species on the planet".

It is well known that interaction is a characteristic of any living species. Most of us have already seen small dogs teasing big ones, birds making sounds to call their mates or even to warn each other of enemies, or plants moving themselves to meet the sunlight. I was astonished when once I heard two birds' terrified sounds in my garden. Their desperate sounds called my attention, and I decided to find out what was happening and then, from my bedroom window, I could spot a cat on the wall between my garden and my neighbor's house. It seemed that the cat was eating

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something among the leaves of a climbing plant, probably bird babies in their nest. As soon as I made the cat jump off the wall, the birds stopped crying. It is just an example of interaction among a human being (myself) with two birds and a cat. I am not saying that the birds had the intention to call a human being attention. But I understood their sounds as a cry for help and I acted. I could mention several examples of interaction in nature, but my purpose in here is to talk about human interaction.

Going back to the thesis that interaction is an innate drive, one can find on the Web several videos showing parents interacting with very young babies. One example is *Noah De Leon First Interaction caught on camera* (FIG. 1), available at Youtube. An explanation was added under the video screen saying that “This is the first time that Noah’s interaction with us was caught on camera. He is so eager to talk and socialize.”

FIG. 1. Noah De Leon First Interaction caught on camera



Source: screen print from video available at <http://www.youtube.com/watch?v=2KdzybMp7ck>

In fact, this video shows Noah’s eagerness to socialize and his gladness while interacting with his mother. As only Noah is shown on the video, one can infer mother and son have made eye contact, which is also a form of interaction. In a multimodal interaction, Noah reacts to his mother’s attempt to interact with him by making vocal sounds, smiling, and making different movements with his arms and head. Although Noah cannot speak any language, we can see that mother and son enter into communion. They are interconnected in the same space and they both show, what Couto (2007) calls predisposition to communicate. Couto (2007, p.118) assumes that “... the existence of a common code is not necessary for communion. The most important thing is sharing, no matter what”.

Another video, FIG 2, also found at Youtube, shows two children interacting and reinforces Couto’s thesis that when human beings are together, they interact.

FIG. 2. Scenes from babies’ Interaction

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Source: screen prints from the video available at
<http://www.youtube.com/watch?v=qcQsR1FdmBo>

This video, exemplifies Couto's statement;

The most common mode of interaction is communion, that is, accepting the coexistence, being satisfied with the simple act of being together. If there is something to communicate, this is very good and welcome. If there isn't, it does not matter. What matters is the solidarity, the predisposition for the coexistence. This applies *in totum* in the case of a child acquiring the language of its environment (COUTO, 2007, 119)

The two screen prints show how happy the children are by making touch contact, by smiling, by voicing sounds and making different body movements. A third partner, probably the mother, is acknowledged by the girl's eye contact and one can also hear an adult's voice in a short passage of the video.

Another example is provided by an experiment entitled "Still Face Experiment" which shows how babies react when they do not manage to interact with their mothers. A video of this experiment, narrated by Tronick, is also available at Youtube. Some screen prints of scenes from the video are reproduced in FIG. 3.

FIG.3. Still Face Experiment

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Source: screen prints from the video available at <http://www.youtube.com/watch?v=apzXGEbZht0>

Dr. Tronick says in the video that young children are extremely responsive to the emotions and reacts to social interaction. In the video experiment, a mother sits down and plays with her baby. They are in perfect communion. The child points at different parts of the room while her mother tries to engage with her by looking at those places. One can observe the coordination of emotions while both interact by using eye contact, smiles and vocal sounds, but all of a sudden, the mother stops responding and communion is lost.

The baby very quickly picks upon this unusual situation and uses all her abilities to try to restore communion with her mother. She smiles at her, she points because the mother is used to look at where she points, she puts both hands before the mother, she screams and as she does not get her mother's attention. She reacts with negative emotion, turns away, feels distressed, loses control of her postures and cries. Without communion, there was lack of communication, rejection, friction between mother and child, and repulsion, as predicted in Couto (2017, 117). Finally, mother gives attention to her and communion is restored.

Lee et al (2009, p. 167) explain that "the social bond that develops early between a child and a mother (facilitated by oxytocin and other hormones) rewards and thus motivates social behavior".

Another example of human need to interact is our behavior in front of a computer, as discussed by Paiva (2003). The same way silence or a still face disturbs the participant in an interaction, as shown in Tronick's experiment, computers also disturb their users if the machine does not give them any hint in response to their actions. Computer specialists took interactional

instinct into account when they devised semiotic clues to calm us down. To mention just a few, an hour-glass tells us that it is worth the wait for saving a file, or opening a program; a specific sound gives us feedback about wrong actions, and a green bar informs us about the progression of a file downloading. The bar usually shows different information pieces: percentage of downloading, the representation of the percentage in a bar, the amount of megabytes downloaded, the rate of the transference speed, and the amount of time expected for the conclusion of that task.

Semiotic signals to facilitate our interaction with cellular phones were also developed. When dealing with an I-phone, for instance, a green bar informs us about the progress of the I-phone recharging, and a special sound warns us that a texting message has just arrived.

All those signals are necessary for us to wait for the machine response without stress or useless repetition of similar actions. Who has not repeatedly pushed the elevator button just because there were no light indicators working? Or who has never resent a message because he or she missed a message saying that “your message was successfully sent”?

In human biomes, we interact not only with people, animals and plants but also with machines and their semiotic devices work to appease our drive for interaction.

Interaction is also a key element in second language acquisition as we will see in section 3.

2 Second Language Classroom Interaction

As Lee et al (2009, p.9) point out “the interactional drive essentially motivates infants to achieve attachment and social affiliation with their caregivers” (p.9). I assume that affiliation can also be interpreted as communion, a kind of pleasure of being together (COUTO, 2007, 2017). Lee et al (2009, p.9) consider “conversation is the primordial form of language and as a form of language that first evolved in the environment of evolutionary adaptation” (p.56).

They also explain that it is out of social interactions that grammatical patterns emerge and language is acquired. In the preface, they argue that “interaction produces grammatical structure in evolutionary time”. They assume that “innate mechanisms for bonding, attachment, and affiliation ensure that children engage in sufficient and appropriate interactions to guarantee language acquisition” (LEE et al, 2009, preface). The authors acknowledge that “whereas primary-language acquisition is inevitable in all normal children, adult second-language acquisition (SLA) is never guaranteed” (p.170). Nevertheless, they agree that,

under conditions where social and emotional affiliation with target language speakers is sufficiently strong, aspects of the mechanisms underlying the interactional instinct may be activated in ways that facilitate second-language learning. (p. 8).

Applied Linguistics has been emphasizing the importance of interaction for second language acquisition (SLA). Hatch (1978) and Long (1981, 1996), for instance, consider that interaction is essential for SLA. Hatch disagrees that learners first learn structures and then use them in discourse. She considers the reverse possibility. “One learns how to do conversation, one learns how to interact verbally, and out of this interaction syntactic structures are developed. (p. 404)”.

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Based on an empirical study, Long (1981) observed that, in conversations between native speakers (NS) and nonnative, there are more modifications in interaction than in the input provided by the native speakers. He does not reject the positive role of modified input, but claims that modifications in interactions are consistently found in successful SLA. Long (1996, p. 451-2) suggests that

negotiation for meaning, especially negotiation work that triggers *interactional* adjustments by the NS or more competent interlocutor, facilitates acquisition because it connects input, internal learner capacities, particularly selective attention, and output in productive ways.

In a joint work, Larsen-Freeman and Long (1991, p.266) argue that the interactionist views are more powerful than other theories “because they invoke both innate and environmental factors to explain language learning”. It is also worth mentioning that the interactionist hypothesis conceives language not only as a set of syntactic structure but also as discourse.

Many other researchers must be mentioned when we focus on interaction and SLA, such as Pica, (1987), Tsui (1995), Ellis (1999) and his collaborators, van Lier (1996) Hall and Verplaetse (2000) and collaborators, Kelly Hall (2004, 2007, 2009, 2010), to mention just a few. In Brazil, we can list many works, always running the risk of ignoring relevant ones. Leffa (2003) organized a book on this theme with several Brazilian researchers. Among them, I would like to mention the works of Consolo and Vani (2003) focusing on interaction in the classroom; Figueiredo (2003) discussing the benefits of peer correction in oral interactions, and Leffa’s own work on virtual interactions. Other works are Consolo, in Kelly Hall and Verplaetse Kelly (2000), Consolo (2006), Lima (2000), Lima and Fontana (2003); Sturm and Lima (2008) and many others.

All those works emphasize how important interaction is for SLA. Kelly Hall (2000, p. 292) concludes that the works in her book offer persuasive findings on classroom interaction. One can learn about “the consequential roles of repetition, paraphrasing, recasting, and revoicing by class participants of their own and each other’s utterances in fostering cohesive and effectual communities of language learners and users”. Kelly Hall (2004, p. 611) explains that the role of interaction is not just a matter of gathering “individuals to work toward a common goal that leads to transformation”. She adds that “rather, it is the actual interactional relationships that are developed, with the methods – the interactional procedures – by which talk is accomplished in these relationships creating the object of knowledge and, at the same time, the tools by which that knowledge is known”.

In spite of the paramount importance of the studies in classroom interaction, I would like to propose an ecological view of interaction. As highlighted by Trampe (2016, p.42), processes of language, communication and information are also ecological processes. In an ecological perspective, interaction is understood as “the relation between species that live together in a community; specifically, the effect an individual of one species may exert on an individual of another species”³.

³ <http://encyclopedia2.thefreedictionary.com/ecological+interaction>

3 Interaction in an ecological perspective

An ecological approach, as pointed out by van Lier (2004) takes into consideration what is happening in the environment. He explains that “things are happening all the time, in schools, classrooms, at desks and around computers” (p. 11). In fact, learning might happen anywhere the learner is likely to have interpersonal or intrapersonal linguistic experiences.

We live in biomes, in ecological communities. According to the New South Wales Office of Environment Heritage, “an ecological community is a naturally occurring group of native plants, animals and other organisms living in a unique habitat”. In order to grow and reproduce in their biomes, human beings need some resources. They also need language to get into communion with others.

Language is a powerful resource for language learners who need linguistic input and interaction to acquire the language. A Chinese student of English, in a corpus of learning narratives collected by Alice Chick in Hong Kong, illustrates this point, by saying: (...) as my mom often said, “language is as vital as water and oxygen because human cannot live alone without any interaction with the outside world. Human needs to communicate with each other by language...”.

Second language learners in a poor linguistic environment encounter difficulties acquiring the language. Similarly, plants grown in a habitat with limited resources or competing with other plants for nutrients will not develop as well as the ones grown in a rich-resource environment. Some may die or have a limited growth and their stronger neighbors may survive. As pointed out by Weiner (1993, p.100) “while positive neighbor effects exist and may be important in specific situations, neighbor effects are usually negative and most often due to resource utilization and limitation”.

We can also predict that learning a language in poor environments, with lack of input and interaction and hostile classmates (neighbors), will also lead to minimal evolution.

There are five types of interaction between the species in a biome, according to Ryczkowski (2017): predation, competition, mutualism, commensalism and amensalism.

“Predation includes any interaction between two species in which one species benefits by obtaining resources from and to the detriment of the other” (RYCZKOWSKI, 2017). In predation, one’s benefit represents disadvantage for the other. One example is the grasshopper eating the crops. In the words of Ryczkowski (2017) “one wins, one loses.

“Competition exists when multiple organisms vie for the same, limiting resource” (RYCZKOWSKI, 2017). For example, if lots of plants grow very close together, they will compete for sunlight, for water and nutrients otherwise they will not survive. These plants do not grow as well as the ones growing farther apart from each other. In addition, some of them are better at the struggle than others.

“Mutualism describes an interaction that benefits both species” (RYCZKOWSKI, 2017). An example of mutualism is the interaction between humming-birds and flowers and the consequent pollination process. Both humming-birds and flowers benefit from this association. Commensalism can be illustrated by orchids and mosses and their commensal relationship with trees. Although orchids and mosses are benefited by the hosting tree, the latter is not affected.

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“Amensalism describes an interaction in which the presence of one species has a negative effect on another, but the first species is unaffected” (RYCZKOWSKI, 2017). That is the case of big trees whose shadows kill the grass under them or of dogs killing plants by peeing on them.

In a classroom interaction, we can also find similar types of interaction: predation when mockery and bullying silence less proficient learners; competition when the extroverts steal the floor from the shy ones; mutualism, when both partners benefit from interaction; commensalism, when less proficient ones benefit from the interaction without no benefit for the most competent partners; and amensalism when the very presence of a more proficient pair inhibits the verbal behavior of another or when some students do not manage to get into communion to the others.

In addition to these five kinds of interaction, another must be included in the list: the mediated interaction. Man is the only species able to develop technology to improve his interaction within and outside his own biome. Books, mail, telegraph, telephone, TV, radio, cinema, and the Internet are some of the examples. Most of those cultural artifacts have been employed by education to improve interaction in the classroom, mainly in language classes.

I would like to go further with the ecological perspective and claim that classroom interaction is not enough for SLA. Language learning narrative research (MURPHEY, 1997, 1998; MENEZES, 2008; MURRAY, 2009) has shown the importance of interaction in natural environments for SLA.

The same Chinese student who talked about language as a vital resource also said that “we cannot only use Chinese to communicate with people whose backgrounds are similar to ours for the rest of our lives”. Another Chinese student highlighted the importance of interaction with native speakers and said “I make some friends with classmates who are native speakers of English and those who have been studying overseas, and I have more chance to speak English. Through the interactions with them, I can speak more fluently”. This student seems to understand that men are not enclosed in a biome as certain species are.

In fact, humans can live in every known biome on Earth and are making attempts to live in other spaces in the universe. As language is our main communicative resource, it is necessary to learn other languages to interact within our native biome or in other biomes with which we have contact. Empowered by new technologies learners can enlarge their interactional experiences beyond the schools.

We all know that classroom interaction has not received the attention it deserves in our schools. In my own narrative research (PAIVA, 2007 and MENEZES, 2008), narrators repeatedly complain about the lack of interaction in the classroom. One of them said “I do not think that my course was communicative enough. It lacked more interaction, functional language, role-playings and dynamism. Its focus was more on grammar and correct structures” (Available at <http://www.veramenezes.com/i028.htm>). Few narrators talk about positive interactive experiences in regular schools, but we can find positive remarks when they talk about language schools, such as the following experience:

Classes were very communicative and student-centered; varied materials were applied; there was a lot of interaction - we were usually encouraged to express our point of view and give personal exemplification; the purpose of the course and activities used were definitely very well clarified; we learned variations of the language- accents, British x American

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English, slangs etc. Another good point was the number of students in class: not more than eight.
(Available at <http://www.veramenezes.com/i018.htm>)

What calls my attention when I read the narratives in my corpus is how experiences outside school contribute for language acquisition. A representative example is given by a student who is also a skateboard competitor. See what he says:

In fact, skateboard has been a ‘catapult’ to my English learning process. It is common to meet native English speakers in skateboard contests, so I had to communicate with them in order comment the contest, or even about my turn in it, for instance. This first steps were then, related to communicative learning process, since real use of language was required in order to communicate. Slangs and jargons were used all the time, and I did not know what exactly they meant, but I could get their meaning through the context we were in. After that, my interest has increased in many aspects of English, such as music, art and sports, what is just the continuity of the process that I began with when I was a child. (Available at <http://www.veramenezes.com/i001.htm>)

Another significant example is told by a Spanish language learner⁴ who is fond of soccer and started looking for more information about South American teams in different countries. He says that, on doing research about that, he got in touch with the songs the fans used to sing during the competitions. He then decided to learn the language to understand the lyrics.

Many other examples can be found in our data bank, but the ones reported here are enough for our understanding that the interactional affordances for language learners are not the same for every learner. As I have argued in another work (MENEZES, 2011),

Affordances are directly linked to the idea of perception and action. Perception is seen not as a mental capacity, but as an ecological phenomenon, the result of the animal’s interaction in the environment. Animals, including humans, perceive what the niche offers them (substances, medium, objects, etc.), interpret the affordances and act upon them. Some actions are done automatically (e.g. drinking water) and others require complex cognitive processes (e.g. finding the solution for a problem). As far as language is concerned, we can say it affords uses restricted by the user’s perceptions.

It is not my intention to minimize the role of interaction in the classroom, but, in my corpus of language learning narratives, learners with interactional opportunities beyond the classroom report that those experiences were turning points in their SLA. Those stories indicate that learners will only become fluent if they have the chance to broaden their perceptions as language users and engage themselves in authentic linguistic social practices.

4 Concluding remarks

My assumption is that we teachers can collaborate to enlarge our students’ biomes by putting them in touch with learners or speakers in other environments mediated by technology. Several examples could be mentioned here. One is the International Writing Exchange (<http://www.writeit.to/>), coordinated by Ruth Vilmi, in Helsinki. Another example is *Teletandem*

⁴ His story in Portuguese is available at <http://www.veramenezes.com/audio06e.htm>

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Brasil (<http://www.teletandembrasil.org/>), coordinated by João Telles at UNESP, where pairs of students work together by teaching his or her own language and learning the partner's language at the same time. A third example is the project coordinated by Watanabe in Japan, *Ibunka*⁵ (<https://apvea.org/mod/wiki/view.php?pageid=15>). This project gathers together classes in different parts of the world to exchange their views about different cultural issues. The activities involve a bulletin board discussion, chat sessions, and a video letter exchange.

I would like to close this discussion using the film Avatar as a metaphor. In that story a paraplegic marine, is able to control his Alien body with the help of technology and interact with a new world, Pandora. I invite teachers to empower their students to abandon their classroom desks and explore other worlds full of interactional opportunities with the help of technology.

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⁵ "Ibunka" means "different cultures" in Japanese

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