

A LOOK UPON THE EMERGENCE OF CONTEMPORARY APPLIED LINGUISTICS THROUGH COMPLEX SYSTEMS PERSPECTIVE

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- **ABSTRACT:** This paper, product of meta-research associated with some documental analysis, aims to revisit the history of Applied Linguistics (AL) in the light of Complex Systems: systems with different types of elements which connect and interact in different and changing ways. This history is approached in relation to change, upon the notion that AL is a system of living agents and in ongoing processes of coadaptation to the environment, be it within or outside the associations to which they adhere. For such, five characteristics are identified in AL trajectory: a) adaptive; b) non-linear; c) open; d) dynamic(al); e) having heterogeneous agents. Therefore, we intend to corroborate the historical perspective about the emergence of autonomous AL as a system in ongoing and incessant process of change.
- **KEYWORDS:** Contemporary AL. Complex systems. Change.

Introduction

How much straw is needed to break a camel's hump? Which particle must drop from a rock in order to cause a landslide? We do not know. The answer for these questions would depend on the length and weight of the straw line, the camel, the rock, the terrain conditions, body resistance, the strength of the wind, humidity, temperature, how an organism adapts to new conditions, etc. Therefore, it seems impossible to give linear and deterministic responses to these questions, for they imply so many variables, that any type of single-routed answer would be easily falsified.

In comparison, determining the factor that has led to the emergence of contemporary Applied Linguistics seems impossible – this Applied Linguistics characterized by being dissident from pure and theoretical Linguistics, and later dissident from an Applied Linguistics deemed hegemonic and primarily devoted to language learning and teaching. Contemporary Applied Linguistics (AL), seen as critical (PENNYCOOK,

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2001), transgressive (PENNYCOOK, 2004, 2006) and interdisciplinary (MOITALOPES, 2006, 2009), though far from being a consensus to linguists worldwide, finds important centers of reference in Brazil, where the Federal University of Rio de Janeiro stands out amongst others. Being impregnated by hybridism and transience, we believe that contemporary AL may be viewed as a Complex Adaptive System (CAS), i.e., a system with elements that connect and interact in different and changing ways (LARSEN-FREEMAN; CAMERON, 2008a), which we aim to demonstrate in this article. As a CAS, contemporary AL emerges from different adaptive processes throughout the history of Linguistics, unveiling its dynamic(al) nature.

Through Complexity Theory, we believe we can shed light upon the history of contemporary AL, showing how it has emerged dissociated from Linguistics and even mainstream Applied Linguistics. For such, we will build our argument based on the assumption that the interaction among the elements of a system provokes the emergence of a collective behavior, which simultaneously interacts with the environment. The collective behavior is non-linear, thus not proportional to its causal factors; and its agents change and adapt in response to feedback, heading towards self-organization and the emergence of a new behavior.

The present article aims to promote an understanding about the processes that contributed to the emergence of contemporary AL in the light of Complexity Theory. As contemporary AL is understood as a Complex Adaptive System, it should cater for some pillar requirements. To operationalize the data collection of the factors that favored the history of contemporary AL, we developed a document research compiling academic articles acknowledged as seminal to Brazilian Applied Linguistics (CELANI, 1992; MOITA LOPES, 1996), articles that revisit the history of Applied Linguistics (MENEZES; SILVA; GOMES, 2009; DAVIES; ELDER, 2004), and online websites of widely respected scientific associations in Brazil and around the world.

Requirements of a CAS

A system needs to involve multiple agents in order to be considered a CAS. These agents adapt amidst the action of other agents through trajectories over time. Thus, it needs to encompass heterogeneous agents, and it needs to be dynamic(al), open, nonlinear and adaptive.

Encompassing heterogeneous agents: a non-complex system involves a small group of similar agents that connect in a predictable and immutable way. A traffic light system is an example of a “simple” system (LARSEN-FREEMAN; CAMERON, 2008a), as it consists of three bulbs of different colors whose lights turn on and off in a fixed sequence. On the other hand, a Complex System should involve different types of agents or processes that are complex systems themselves, or subsystems of a major system. A speech community may be considered to be an example of this type of system, for it is comprised of sociocultural groups and subgroups, and individuals

that may be seen as Complex Systems, as they gather in discursive, interactional, psychological and neurological groups (LARSEN-FREEMAN; CAMERON, 2008a, p.28-29). According to the authors, “[...] the complexity of a complex system arises from components and subsystems being interdependent and interacting with each other in a variety of different ways.”

Being dynamic(al): a Dynamical System evolves throughout time, realistically or conceptually, and moves along a trajectory, i.e., a sequence of states (GROGONO, 2005), the future of which depends on the present state (LARSEN-FREEMAN; CAMERON, 2008a). To be dynamic(al), a system is supposed to go through state transition, evolving from an initial state to a subsequent state, thanks to a change triggered by perturbation. The perturbation provokes different levels of disaggregation to all states of the system. These states altogether are called state space, and it gives way to a new organization, called attractor.

Fleischer (2011) and Larsen-Freeman and Cameron (2008a) explore the concept of attractor as “states of high-frequency occurrence”, “[observable] states that the system statistically tend to assume”, “modes of behavior the system ‘prefers’”, “a region of the system state space within which the systems tend to move”. In practice, according to the authors, an attractor may correspond to either the forces that act upon a chaotic system “flag in the wind” (FLEISCHER, 2011, p.75), or a cultural artifact such as a “milk jug”, whose overall shape has stabilized over time (pour-enabling lip and handle), though allows for a range of varieties in terms of material, size, proportion and interaction – it is possible to use it as a container of liquids other than milk (LARSEN-FREEMAN; CAMERON, 2008a, p.55). The latter authors also classify an attractor as strong, weak, stable or unstable, according to the variations in the system behavior, be it a horse gait, a person’s attitude in his new job, or an athlete’s susceptibility to an ankle injury at the top of his physical fitness (LARSEN-FREEMAN; CAMERON, 2008a).

Grogono (2005) shows that a dynamic system develops by means of a transient response followed by a stable state. Far from being static or paralyzed, the author highlights that the stable state may present a stationary, an oscillatory or chaotic reaction, for the changes go on occurring within. When the reaction is stationary, the system evolves to a given state and remains therein. When it is oscillatory, the system goes through a set of fixed states. When chaotic, it moves through states with no apparent organization.

Hollenstein ([2012]) advances Grogono’s (2005) theorizations adding that dynamic systems are self-organizing, have nested and hierarchically organizing structures, and are comprised of elements that interact reciprocally and circularly. Hollenstein ([2012]) states that complex interactions amongst lower-order system elements cause novel forms to emerge spontaneously, so that the state of a system is not pre-determined. Therefore, when organized, elements of a certain state form more complex nested structures (attractors) that transit and evolve to a following state.

Being open: a Dynamical System should be open and keep developing indefinitely (GROGONO, 2005). Consequently, it should also be continuous, non-deterministic and dissipative. It should be continuous because its state space ought to appear like a *continuum*, wherein the intervals between state transitions are continuous or discrete, turning the system unpredictable. It should be non-deterministic because its formation ought to result from joining its predecessors. And it should be dissipative because it ought to reach organization by means of its successors' fork. Hence, a CAS is characterized by forks and joins that make its agents go through new trajectories, promoting state transitions that result in unstable equilibrium.

Being non-linear: non-linearity refers to the idea that the whole does not correspond to the sum of its parts (SMITH, 2007), which means that change is not proportional to input in a non-linear system (LARSEN-FREEMAN; CAMERON, 2008a). As the agents are independent and the interactions among them are not fixed, changes may occur within themselves, as well as the habits of a driver may change because of modifications in road networks.

Being adaptive: adaptation is the process through which an organism fits an environment owing to experience, which is responsible for guiding the structural changes in the organism over time (HOLLAND, 1995). This is thus the *sine qua non* condition for Complex Systems to be adaptive.

Holland (1995) suggests that such systems be those whose agents undergo aggregation and diversity processes. These properties connect by means of a mechanism called label.

The aggregation is the emergence point of complex behaviors on a large scale, starting from aggregate interactions of lower-order agents. When system agents aggregate, they form a new nested structures in system hierarchy, serving as force of attraction or repulsion to higher or lower-order agents. Yet, diversity refers to a system capacity to co-adapt in case a given type of agent is removed, which will result in a new agent that will occupy a new niche and perform most of same functions. Aggregation also emerges by opening new interaction opportunities. Thus, each new adaptation gives opportunity to the emergence of other interactions and new niches.

The label facilitates aggregate formation and its boundaries: a mechanism that identifies aggregate hierarchical organizations through which system properties may be observed and acted upon. According to Holland (1995), the labels persist even when the system agents are in continuous change.

Interaction amongst agents is a two-way street wherein “not only X cause Y but Y also cause X” (HOLLENSTEIN, [2012]). Hence, “lower-order elements create the macro structure, but the macro structure constrains interactions among lower-order elements”. This phenomenon leads the agents to co-adapt, on a mutual causality mode (LARSEN-FREEMAN; CAMERON, 2008a).

On the grounds of these requirements, we believe contemporary AL may possibly be described as a CAS because it emerges from an ideological framework of an academic community (label) who integrates a hegemonic complex system organized

under the denomination of Applied Linguistics. Such communities are comprised of individuals (agents) that complexify as discourse, interactional, psychological, neurologic systems, whose behaviors put the system in motion, throughout unstable equilibriums, theoretical and epistemological reorganizations over time. These are the perturbations that make the system transit through different moments and turning points (attractors) towards autonomy as science (in relation to mainstream Linguistics and Applied Linguistics) – once its independence is not unanimously acknowledged¹. Therefore, new theorizations lead the agents of both systems (Linguistics and Applied Linguistics) to regroup in new schools of thinking (labels that aggregate agents), which may even temporarily head between labels, making the system adapt and transit to another attractor or state space.

That said, contemporary AL is also an open system. Upon claiming apt to receive influences from other sciences (defining itself as interdisciplinary and transdisciplinary), contemporary AL develops continuously, aggregating and dissipating theoretical postures that gather new meanings inasmuch as its agents and labels change their behaviors within new attractors. Contemporary AL is non-linear because it is susceptible to agents' change. It is adaptive, for new conceptualizations and practices inaugurate new modes of carrying out research, which motivate the aggregation of other agents that trigger the elaboration of other concepts and new ways of integration, on a mutual causality relationship.

Therefore, if contemporary AL may be regarded as a CAS, we believe that we are able to revisit its history and propose another interpretative line, which will be done in the next section. For such, we will take the linguistic shifts as attractors, the researchers as agents, and the schools of thinking as labels. Such elements drive the system towards change.

Methodology

Raúl Fuentes Navarro (2007, p.166), social scientist in the field of Communication, defines meta-research as “the research about research”. Despite the risk of being regarded a lower-order research type, he defends that meta-research is vital for recognizing legitimation processes in science, which implies “the use of the best resources of a science for analyzing itself”. This perspective applies to the present paper for it aims to revisit the history of Applied Linguistics, retelling it based on the standpoint of change from the complexity point of view.

¹ In several universities, unlike UFRJ, quoted elsewhere, Linguistics and Applied Linguistics integrate the same graduation program. The latter is commonly regarded as a branch of the former, and several courses still feature “Linguistics Applied to Teaching”, thus addressing an old dichotomy (WIDDOWSON, 1979a) between Applied Linguistics versus Linguistics Applied, wherein Applied Linguistics is understood as nothing but the application of theories provided by Linguistics.

In order to reinforce the use of “better resources” to analyze the history of Applied Linguistics, we associated this meta-research to a document research, which allowed for raising data about the history of AL from seminal texts including articles, chapters of books and AL association websites acknowledged in Brazil and worldwide. Such sources have been organized in Table 1, in alphabetical order, by author’s name and publication date. The complete references are disclosed in the References section.

Table 1 – Documental sources related to the history of Applied Linguistics

ARTICLES	Rampton (1997) Moita Lopes (2010)
CHAPTERS OF BOOKS	Allen and Corder (1973, 1974, 1975) Allen and Davies (1977) Celani (1992) Davies and Elder (2004) Fabrício (2006) Menezes, Silva and Gomes (2009) Moita Lopes (1996, 2006, 2009, 2013) Pennycook (2001, 2004, 2006) Rajagopalan (2004) Rampton (2006) Widdowson (1979a, 1979b)
SCIENTIFIC ASSOCIATION WEBSITES	AILA: http://www.aila.info/en/about/history.html ALAB: http://www.alab.org.br/pt/a-alab BAAL: http://www.baal.org.uk/dox/history_of_baal.pdf LAEL: http://www.pucsp.br/pos-graduacao/mestrado-e-doutorado/linguistica-aplicada-e-estudos-da-linguagem#historia LSA: http://www.linguisticsociety.org/resource/linguistics-profession

Source: Author’s elaboration.

Upon delving into this database (Table 1), we looked for information that signals the idea of change within the thoughts, analyses and narratives disclosed the selected texts. In addition, we have looked for evidence of changes in behavior and reorganization of ideological frameworks in the institutions by comparing their historical journeys (addressed in the articles and book chapters) with their current statuses (reported in the very websites). Finally, we analyzed the journey of contemporary AL by means of the following concepts defined in section 2: CAS, agent, attractor, label, nested structure, perturbation, unstable equilibrium, coadaptation, mutual causality and adaptation, as will be developed below.

The emergence of contemporary AL from the perspective of change

Here is an advantage of ageing and having memory: to know how stories begin and go on, and [...] how the modes of producing knowledge modify. (MOITA LOPES, 2009, p.14).

Theorizations about CAS allow us to see individuals in motion as system agents, which occur because individuals trigger changes, and changes produce reactions that cause mobility to the system. In this respect, we believe Moita Lopes's words (2009), regarding the historical journey of Applied Linguistics, put such dynamism on spot without overlooking the existence of initial conditions; and that knowledge production triggered by these agents is mutable and develops throughout time. Hence, observing movement and change seems to be pivotal in order to comprehend how contemporary AL emerges as a CAS. Therefore, its initial conditions (“[...] how stories begin [...]”), its trajectories, perturbations, co-adaptations and attractors (“[...] and go on [...]”), changes and reactions from the environment (“[...] how the modes of producing knowledge modify”) should be promptly identified.

Do we refer to changes from which initial conditions? Moita Lopes (2009) suggests modern education father Jan Amos Comenius (1985) is the first applied linguist, as he organized the first compendium with theorizations over language teaching in 1692. Yet, Celani (1992) affirms that the need to define Applied Linguistics starts to emerge by the end of 19th century. The publication of *Cours de Linguistique Générale* (SAUSSURE, 1922) – materialized from Saussure's students' notes at Geneva University – should also be taken into account, for it institutionalized the emergence of mainstream Linguistics as a discipline.

In view of these possibilities, we assume saussurean Linguistics as the initial condition. Such choice owes to the fact that its determinist, objectivist and structuralist episteme has been the focus of criticism throughout history, leading Linguistics to transit and reorganize as a science in the form of Linguistics Applied, Applied Linguistics and contemporary AL – the latter being understood as an umbrella term for critical AL, transgressive AL, INdisciplinary AL and mestizo AL.

On the one hand, we should ponder and be judicious to make a decision about which initial conditions to adopt in order to analyze the trajectory of Applied Linguistics as a CAS. On the other, mainstream Linguistics determinism, objectivism and structuralism may be interpreted as labels that trigger perturbations, and thus unstable equilibrium in the system, making it arrive at its current status. We make this claim based on various papers whose aim is to legitimate the AL agenda over structuralist assumptions, which put forward harsh criticism to objectivism and determinism (FABRÍCIO, 2006; RAMPTON, 2006; PENNYCOOK, 2006; MOITA LOPES, 2006, 2009; amongst others). Through criticism, new theoretical propositions emerge, new labels are created, more unstable equilibrium is provoked, new agents are aggregated, and, thus, dynamism is promoted. As a result, open

attractors emerge owing to the influence of the environment by means of a continuous reorganization process.

Until the emergence of Applied Linguistics, some inner agents from mainstream Linguistics provoked disorder to the apparent stability of its system. By questioning determinism, scientism, and the quest for capital “t” Truth, these agents triggered the unstable equilibrium required to break with dominant theory, reframing the modes of carrying out research. Accordingly, AL aims to be an autonomous science² (though inherently transdisciplinary), and, thus, claims to be totally independent from mainstream Linguistics. The result of such a process is the emergence of a different theoretical framework – at times antagonizing mainstream theory –, which aims to dialogue with other Human and Social sciences, behaving as an open system.

This, however, does not necessarily imply that mainstream Linguistics is a closed system, since several labels have been gathering agents to their different niches throughout its history: from Moscow Linguistic Circle (1915) and Linguistic Society of America (LSA, 1924) to Prague (1928) and Copenhagen (1931) Linguistic Circles. Other labels have also emerged, such as Sociolinguistics and Generative Theory in the 1950’s, as well as most recent studies in the fields of Psycholinguistics, Cognitive Linguistics and Neurolinguistics. Hence, we believe that unstable equilibriums, nested structures and co-adaptations have been occurring in each one of these fields of science, making the system transit between different states over time.

Celani (1992) and Moita Lopes (2009) identify some historical milestones that contributed to the emergence of Applied Linguistics. In Hague 1928, the First International Conference devotes to Saussure’s teachings, consolidating structuralism. On the 20th century, the advances of structuralist philosophy in Linguistics lead to studies on teaching and learning in several disciplines, paving the way to the emergence of Applied Linguistics. And in 1940, World War II favored the development of learning materials for language teaching.

In the light of Complexity Theory, these factors are regarded as examples of perturbations that led mainstream Linguistics to move amidst labels and attractors and resulted in the emergence of contemporary AL. As it is an open system, co-adaptations occur due to pressures from inner and outer environments, making the system transit between a tradition that envisages problem-solving in the scope of learning-teaching (such as classroom practices and leaning materials), and other that seeks to raise intelligibility over matters of contemporary life (gender, sexuality, race, amongst other, according to Moita Lopes (2006)). The latter is now appreciated more holistically, extrapolating the investigations over language education, therefrom including various social themes, such as human identities followed by their subsequent ramifications and conflicts. Therefore, Applied Linguistics goes through a trajectory that implies agents’ co-adaptations and reorganizations amidst triggered disorder.

² It is important to highlight that characterizing AL as an autonomous science means acknowledging it as a field of knowledge, not as a subarea attached to a major area. Autonomous, herein, does not mean self-sufficient or disregarding other areas, for it would be inconsistent with AL inherently transdisciplinary in nature.

The authors also suggest the foundation of university departments and scientific associations as important milestones in the trajectory of Applied Linguistics. In 1957, Corder, Widdowson and Davies found the Department of Linguistics at the University of Edinburgh, and organize a series of books entitled *The Edinburgh Course in Applied Linguistics* (ALLEN; CORDER, 1973, 1974, 1975; ALLEN; DAVIES, 1977), later modified by Widdowson and colleagues. In 1964, the *Association Internationale de Linguistique Appliquée* (AILA)³ is founded during the International Colloquium of Applied Linguistics at Nancy University, in France. The event marked the climax of two years of preparation and discussion, wherein the membership was mainly comprised of linguists and language teachers in Europe, who represented the main research lines at that time: Second Language Learning Psychology, Sociolinguistics and Contrastive Linguistics. In 1965, Peter Strevens puts forward the first proposal for the creation of the *British Applied Linguistics Association* (BAAL)⁴, which consolidates amidst Western Europe political matters, in view of the necessity to promote learning English as a Foreign Language (EFL) in the United Kingdom, and professionalize English teachers to work on this field. During this period, Great Britain already counted on several Applied Linguistics departments in the universities since 1957. In July 1965, BAAL members meet up to construct the association objectives, reflecting upon the interests of theoretical Linguistics, English as a mother tongue and foreign language in UK, and of bilingualism. The resolutions are forwarded to another meeting in the same year, in Reading, where members decided for widening the scope of investigations beyond language teaching and translation. In 1974, BAAL finally includes in their agenda the study of language in use and encouraged interdisciplinary collaboration.

Upon reinterpreting these facts in the light of Complex Systems, we view the associations and departments as labels, which aggregate agents that have their own theoretical standpoints within schools of thinking. The aggregation of these agents in nested structures results from system co-adaptation to perturbations (clashes, debates, discussions, political pressures), provoking theoretical standpoint changes that interfere in the direction of the trajectory (the objectives of BAAL in 1965 and 1975 were different), thus creating new labels that aggregate new agents. The revisions that *The Edinburgh Course in Applied Linguistics* went through between 1973 and 1975, Davies substituting for Corder in 1977, and the later changes carried out by Widdowson are evidences of how this system adapted because of perturbations. In spite of accommodating similar schools of thinking, the system is susceptible to inner unstable equilibrium promoted by their agents, forcing it to reorganize over time. AILA's foundation and trajectory follows a similar path, as predominant theories in the past share place with other theories at present. The trajectory BAAL took demonstrates the adaptive capacity of this system as regards the pressures of the inner and outer environments, such as the inclusion of European political issues in the research agenda, and different

³ Available at: <<http://www.aila.info/en/about/history.html>>. Access on: 9 July 2014.

⁴ Available at: <http://www.baal.org.uk/dox/history_of_baal.pdf>. Access on: 9 July 2014.

theoretical-epistemological standpoints over a same analytical material, including the negotiation of investigation objectives. Hence, besides demonstrating that the system is open, a mutual causality relationship between inner and outer agents seems to take place, for both BAAL and political matters co-adapted amidst mutual pressures.

Another example of this phenomenon takes place in Brazil with the creation of the first Program of Graduate Studies in Applied Linguistics to Language Teaching (LAEL – Programa de Estudos Pós-Graduados em Linguística Aplicada ao Ensino de Línguas)⁵ at the Catholic Pontifical University in São Paulo. The following fragment, taken from LAEL website, demonstrates how its trajectory resembles the one taken by the above-mentioned associations, which includes (1) organization in nested structures, (2) inner and outer perturbations to the environment, (3) unstable equilibrium, (4) co-adaptations, (5) emergence of a new nested structure. These numbers were included in the fragment below in order to mark the referred processes. The change in numbering corresponds to the change in system behavior:

(1) [...] it was created in 1970, [...] **(2)** It was recognized as a center of excellence by CNPq on 03/31/1971, accredited by the Federal Council of Education on 09/23/1971 and reaccredited on 08/20/1978. **(1)** The Doctorate Program, created in 1980, **(2)** was accredited on 05/05/1983, together with the reaccreditation of the Master Program. In 1989, Master and Doctorate Programs were reaccredited once again. **(3)** In 1996, the Program acknowledged the need of restructuring its research definition and global organization, owing to an outburst of interests and changes in conceptions regarding the field of Applied Linguistics and Language Studies, **(4)** thus starting to include multiple fields of work. **(5)** As a result of this new perspective, from 1997 on, the Program kept its acronym LAEL, but changed its name to APPLIED LINGUISTICS AND LANGUAGE STUDIES [...]⁶ (PUC, [2015]).

The nested structures correspond to the research associations (LAEL) as well as the substructures within LAEL system (doctorate program). As an open system, it suffers pressures from the environment, materialized as the assessment of validating systems (CNPq), or as the acknowledgement of other registering systems (Federal Council of Education). These outer agents, i.e. the individuals who represent such institutions,

⁵ (PUC, [2015]).

⁶ The original text reads the following: [...] foi criado em 1970, [...] Foi reconhecido como centro de excelência pelo CNPq em 31/03/1971, credenciado pelo Conselho Federal de Educação em 23/09/1973 e recredenciado em 20/08/1978. O Programa de Doutorado, criado em 1980, foi credenciado em 05/05/1983, com concomitante recredenciamento do Mestrado. Em 1989, Mestrado e Doutorado foram novamente recredenciados. Em 1996, o Programa assumiu a necessidade de reestruturação de sua definição e organização global de pesquisa, dada a diversificação de interesses e mudanças de concepções a respeito do campo da Linguística Aplicada e dos Estudos da Linguagem, passando a incluir campos múltiplos de atuação. Como decorrência dessa nova perspectiva, a partir de 1997, mantendo a sigla LAEL, o Programa passou a denominar-se LINGÜÍSTICA APLICADA E ESTUDOS DA LINGUAGEM [...]. (PUC, [2015]).

provoke unstable equilibrium and disorder to LAEL inner structure, leading its agents to make the system co-adapt by restructuring concepts while including others. Consequently, new nested structures emerge and the cycle restarts until another rupture to the initial system bursts out, which is similar to what occurred between LSA (1924) and Teachers of English to Speakers of Other Languages (TESOL), created in 1963.

Celani (1992) tells part of this story addressed hereby. The author mentions that, in May 1973, TESOL goes through several LSA meetings, which aimed to make Applied Linguistics be acknowledged as an autonomous science. In August of the same year, LSA proposes AL to be incorporated to its subsection provided that LSA quality standards were kept. This resolution was approved in San Diego in December. As this condition installed a climate of mistrust, TESOL members declined LSA proposal. In New York, 1976, TESOL creates a special-interests group named Applied Linguistics under the coordination of Bernard Spolsky, which has remained until nowadays. This is another example of complex system reorganization on account of outer environment perturbations. At present, LSA acknowledges TESOL as an entity that trains and accredits language teachers to work as linguists, which is an evidence of systems join, wholly or partially, times after going through fork:

Language educators may teach their native or a foreign language at any level. **A degree in linguistics is a good background for those pursuing English as a Second Language (ESL) or Teaching English as a Second or Other Language** (TESOL) credentials. ((LINGUISTIC SOCIETY OF AMERICA, 2012, emphasis in bold added).

Amongst the ruptures that have occurred in the Applied Linguistics trajectory heading towards autonomy, we believe that the so-called “shifts” (MOITA LOPES, 2009) may have been pivotal. By provoking major perturbations, the turns led the system to radically reorganize its inner structures, forcing them to move to another attractor state. Coined by Moita Lopes (2009) “from Linguistics Applied to Applied Linguistics”, the “first shift” was characterized by the application and devotion to Linguistics theories, which might have motivated Widdowson to inquire Applied Linguistics state-of-the-art in late 70’s. According to Widdowson (1979a, 1979b), Applied Linguistics as a branch of language teaching pedagogy should look for a model that serves its ends. Hence, relevant types of knowledge to the investigation of language teaching processes should go beyond the ones formulated by Linguistics, for there is no single theory bearing explanatory power to cover the processes involved in language teaching and learning in the classroom. Moita Lopes (2009, p.15) points out that Widdowson’s ideas imply “restricting AL to educational contexts” as well as “the need of a linguistic theory for AL that is not dependent on a single linguistic theory”, which paves the way for other fields of knowledge to dispute learning-teaching issues in a way that it is interdisciplinary and multidirectional. Consequently, Applied Linguistics breaks with the application and devotion to Linguistics theories.

Widdowson's standpoints favor a fork process in the system over research methods and theory thinking, imprinting dynamism until it reached new modes of organization. On the predecessor attractor state, Applied Linguistics was characterized by the application and devotion to Linguistics theory. After going through disorder, the system starts to admit being influenced by other theories, breaks with its devotion to linguistic theories, and starts to influence them, thus constituting an open system. However, it still remains bound to learning-teaching and translation issues (initial state). Probably, these other theories served as perturbing agents that led the system to transit to institutional contexts further to education, something Moita Lopes (2009) coins the "second shift".

Moita Lopes states that, in the second shift, research works over foreign language learning-teaching (especially English) and translation start to dwell with investigations devoted to mother tongue learning-teaching, literacies and institutionalized contexts, such as media, companies, etc. Hence, Applied Linguistics receives influence from Vygotsky and Bakhtin sociocultural theories, which favor the understanding of language as a building tool to knowledge and social life. Moita Lopes (2009, p.18) highlights that "AL goes under reformulation as a field of inquiry devoted to solving problems of language use inside and outside language classroom", bringing to the forefront the situated nature of action and studies about how social actors perform language. In view of this new perspective, interdisciplinarity becomes pivotal, especially because the transition to the 21st century was marked by the booming upsurge of ideas in the fields of Social and Human Sciences which forced them to "re-theorize their views over post-structuralism, feminism, racism, post-colonialism and queer theories" (MOITA LOPES, 2009, p.19). Consequently, the social subject starts to be rethought from the non-hegemonic standpoint. Not coincidentally, Brazil Applied Linguistics Association (ALAB – Associação de Linguística Aplicada do Brasil) is founded in 1990, whose aim is to

[...] (re)build an academic-scientific-dynamic-reflexive locus nurtured by studies and reflections from AL field, which is not regarded as the application of linguistic theories, but **as a field of inquiry of language situated uses in different spheres of the social milieu.**⁷ (ALAB, [2015], emphasis in bold added).

If for Celani (1992) the creation of ALAB is an evidence of development, since it imprints an identity mark to a research group that meets up to discuss a given corpus, in the eyes of Complexity Theory it represents the emergence of a new label in the adaptive trajectory of Applied Linguistics heading towards contemporaneity. We notice that the more Applied Linguistics system goes through unstable equilibrium, the more

⁷ The original fragment reads the following: [...] (re)construir um lócus acadêmico-científico dinâmico e reflexivo, fomentando, por sua vez, estudos e reflexões da área de LA, não concebida como aplicação de teorias linguísticas, mas como um campo de investigação de usos situados da linguagem nas diversas esferas do meio social. (ALAB, [2015]).

open it becomes, thus paving the way to the formation of new nested structures and, consequently, new aggregations with other sciences.

Pennycook (2006) labels another attractor within Applied Linguistics: “Transgressive Applied Linguistics”. By doing this he defends that Applied Linguistics should overcome disciplinary conceptions. As a result, debates over Linguistics Applied versus Applied Linguistics become peripheral, leading Applied Linguistics to widen its scope of knowledge to include political issues. Therefore, transgressive theories regard disciplines as dynamical spaces of intellectual investigations and criticize the general understanding of interdisciplinarity, for they view different disciplines as static entities. Interdisciplinarity, in transgressive sense, starts to mean “movement”, “fluidity” and “change”; as such, it has to “[...] cross conventional disciplinary boundaries as an end to develop a new research agenda which, while freely informed by an ample variety of disciplines, would stubbornly attempt not to be subaltern to any of them.”⁸ (RAJAGOPALAN, 2004, p.410).

If that is the case, transgressive AL starts to transit to an attractor state where the system is more open than its predecessor, since Pennycook (2006, p.77) accuses Applied Linguistics of trying to be “as scientific as Linguistics”. Here we identify a process of unstable equilibrium and disorder, which results in a fork process involving first shift and second shift AL, now regarded as “traditional”. Consequently, transgressive AL takes on a transdisciplinary and critical characteristic influenced by Michel Foucault’s epistemological skepticism (1980), Franz Fanon’s complex power relations, resistance and confrontation (1973), and Janks’s interrelations between domination, access, diversity and planning (2000). Once again it is possible to observe the formation of a label that aggregates new agents and ensures system dynamism.

Another aspect of this dynamism lies in Fabrício’s (2006) reflections over Applied Linguistics owing to its metamorphosis observed on a daily basis. In view of the current moment, depicted as late modernity (GIDDENS, 1991), liquid modernity (BAUMAN, 2000), recent modernity (CHOULIARAKI; FAIRCLOUGH, 1999), post-modernity (HALL, 1992) etc., new meanings emerge because of the transnationalization of the political, cultural and economical dimensions, the speed of images and discourses circulation, the mixture of discourses and practices, and the new modes of subjectivation. Such changes, according to Fabrício (2006), raise issues over all aspects of our lives and bring implications to Applied Linguistics, for it may be regarded as an “unlearning space”, which

[...] bets [...] the detours and the unlearning of any type of axiomatic position as a refinement of the knowledge process [...] that gets accomplished in the transit through different regimes of truth and different disciplinary areas, thus defamiliarizing the meanings disclosed

⁸ The original fragment reads the following: *atravessar fronteiras disciplinares convencionais como fim de desenvolver uma nova agenda de pesquisa que, enquanto livremente informada por uma ampla variedade de disciplinas, teimosamente procuraria não ser subalterna a nenhuma.*

therein, and changing the experience of its own field of knowledge⁹.
(FABRÍCIO, 2006, p.61).

Under this perspective, Applied Linguistics reviews its own epistemologies, thanks to the understanding that language is a social practice, and studying it implies delving into its society and culture (linguistic and cultural shift). It is also a theoretical framework wherein researcher's choices are not neutral, but guided by ideological and political beliefs, which take into account power relations (critical shift), and the pluri-semiotization of the construction of meaning in contemporary life (iconic shift) (FABRÍCIO, 2006). Because of these changes have pressed Applied Linguistics to reorganize its theoretical framework, Fabrício (2006) points out to the need to build an agenda that would be political, transformative and ethical. Fabrício agrees with Pennycook (2006) by stating that Applied Linguistics rules out the attempt to establish disciplinary boundaries or reach capital-“t” Truth, and defends that the truth is built within the world, from the discourses produced by its agents.

Upon putting forward Applied Linguistics as an unlearning space, Fabrício (2006) acknowledges its mutable nature and its mutual causality relationship with the environment. Throughout her paper, she makes use of terms that allude to idea of dynamism and transience – such as “world in motion” (FABRÍCIO, 2006, p.45), “mutations in course” (FABRÍCIO, 2006, p.48) and moving territory (FABRÍCIO, 2006, p.53) – which allows for the reinterpretations over the emergence of contemporary AL in the light of Complexity Theory, as we are carrying out herein. These evidences lead us to hypothesize that if fork processes started to occur within Applied Linguistics itself, its relationship with mainstream Linguistics has become peripheral. If that is the case, it marks the emergence of contemporary AL as a CAS, which inevitably goes through processes of perturbations, unstable equilibrium, disorder, coadaptation and nested structuring so that the system transits to other attractors: from “traditional” to “transgressive” AL, to “unlearning space” AL, to “indisciplinary” AL (next paragraph).

Finally, Moita Lopes (2006, 2009, 2010) evaluates AL processes of arriving at its current status. By resetting himself as a post-modern linguist, the author breaks with the applied linguists from whom he inherited knowledge, and starts to pave new ways to producing knowledge, now as a mode of politicizing social life. Moita Lopes starts to advocate for an “AL as a mode of creating intelligibility about social problems wherein language plays a central role” (MOITA LOPES, 2006, p.14), i.e., without attempting at finding solutions, thus rejecting being limited to mainstream Linguistics as an essential theory, as several understandings about language nowadays may originate from other fields of knowledge. Hence, he proposes an “Indisciplinary Applied Linguistics”, which, on the one hand, goes along with Fabrício's (2006) and Pennycook's (2006)

⁹ The original fragment reads the following: aposta [...] nos descaminhos e na desaprendizagem de qualquer tipo de posição axiomática como um refinamento do processo de conhecer [...] que se realiza no trânsito por diferentes regimes de verdade e diferentes áreas disciplinares, desfamiliarizando os sentidos neles presente e modificando a experiência da própria área de conhecimento na qual se insere.

proposals about the zero necessity of having AL as a unified discipline; and, on the other, takes shape

[...] as a mestizo and nomadic field, especially because it aims to dare think differently, beyond established paradigms proven useless and, thus, need to be unlearned (FABRÍCIO, 2006) so that we can understand the present world.¹⁰ (MOITA LOPES, 2009, p.19).

This use of language for understanding social problems starts to be possible inasmuch as the researcher bridges the gap between doing research and doing politics. For such, Moita Lopes situates his book “For an Indisciplinary Applied Linguistics” (Por Uma Linguística Aplicada Indisciplinar (MOITA LOPES, 2006)) “in the context of an ideological AL” (MOITA LOPES, 2006, p.21) in order to agree with Pennycook (2001) that “every knowledge is political”, and with Nagel (1986), so as to reaffirm that “politicizing research act and thinking alternatives to social life are intrinsic to the new modes of theorizing and doing AL” (MOITA LOPES, 2006, p.22). Moita Lopes confirms this view in 2010 by analyzing political activism disclosed in new digital literacies, typical of Web 2.0, wherein, together with Boaventura de Souza Santos (2004), he suggests:

Doing research may be seen as a mode of reinventing social life, which includes reinventing ways to produce knowledge as well as forms of life, since researching is a mode of constructing social life whilst trying to understanding it.¹¹ (MOITA LOPES, 2010, p.402).

Moita Lopes’s narrative leads us to some conclusions regarding Applied Linguistics as a CAS. Firstly, regarding the mutability and adaptability of its agents (from the most individual to the most collective levels), the author’s break with Applied Linguistics and Linguistics mainstream theories, and his adhesion to a more militant scientific practice categorizes him as an individual complex system, who undergoes ideological, discursive, psychological, neurological, etc. adaptations. This change reverberates in the system at all levels, for his change of posture brings the environment and other agents to a state of unstable equilibrium and disorder, provoking new aggregations and disaggregations that make the system co-adapt into other nested structures, new labels and new attractors. Moita Lopes is one of the agents that comprise the Applied Linguistics system. As a CAS is comprised of several heterogeneous agents, its apparent

¹⁰ The original fragment reads the following: como uma área mestiça e nômade, e principalmente porque deseja ousar pensar de forma diferente, para além de paradigmas consagrados, que se mostram inúteis e que precisam ser desaprendidos (FABRÍCIO, 2006) para compreender o mundo atual.

¹¹ The original fragment reads the following: Fazer pesquisa pode ser visto como um modo de re-inventar a vida social, o que inclui a re-invenção de formas de produzir conhecimento assim como formas de vida já que a pesquisa é uma maneira de construir a vida social ao passo que tenta compreendê-la.

stability is constantly threatened by imminent perturbations and unstable equilibriums that lead the system to transit between states.

Therefore, despite relating to the same theoretical framework wherein AL is revisited in this article as a CAS, Moita Lopes's (2006, 2009) "indisciplinary" AL, Fabrício's (2006) "unlearning space" AL, and Pennycook's (2006) "transgressive" AL are liable to undergo unstable equilibriums and break-ups throughout time, by aggregating new schools of thinking (labels) whereas repelling others. Accordingly, contemporary AL becomes free to interact with other sciences and social changes that occur worldwide (outer environment), besides facilitating the transit between agents, labels and attractor states, as it is an open system. In view of the processes listed in this section that contributed with the emergence of contemporary AL throughout time, we leave to the reader an observation by Moita Lopes (2009, p.20), in the light of Rampton (1997, 2006), which goes hand in hand with Complexity Theory assumptions that helps understand AL better: "AL is becoming an open space with multiple centers".

Implications

Revisiting the history of AL in the light of CAS brings some advantages, besides complementing the narratives found in books and articles about Applied Linguistics and Association sites. The first advantage is the understanding of Applied Linguistics as system in continuous process of change, even when it is in apparent stable state. This happens because its agents go through individual processes of change, which may be motivated by the mere contact with other Complex Systems, for instance, or by accumulating knowledge capitalized over time. To illustrate that, Moita Lopes's concerns published in his 1996 book *Applied Linguistics Workshop* (Oficina de Linguística Aplicada), regarded as one of the landmarks of Brazilian Applied Linguistics, are starkly different from what he published in his 2013 book *Recent Modernity Applied Linguistics* (Linguística Aplicada na Modernidade Recente) – although both pieces present the same field of inquiry, i.e., Applied Linguistics contributions to language teaching. Consequently, if a CAS is comprised of several heterogeneous agents, it may undergo perturbation even when apparently reached stability.

Another advantage of the CAS standpoint is that it reinforces the understanding of Applied Linguistics as a living organism, likely to interfere or be interfered by the inner and outer environments. Hence, AL is capable of adapting as a system over time, without necessarily becoming cocooned as a discipline.

One last advantage is the notion that open-system-contemporary AL will keep going through several adaptations and changes through state spaces over time. Nonetheless, if it is difficult to determine the initial conditions of AL as a CAS, it is impossible to be precise about its following trajectories, for, according to Larsen-Freeman and Cameron (2008b), the process of a changing system is "retrodiction" (or "retrocasting"), rather than "prediction". It remains heretofore for us to age and have memory, so that we

can witness how this story will go on and how the modes of producing knowledge will modify.

TILIO, R.; MULICO, L. Um olhar sobre a emergência da Linguística Aplicada contemporânea na perspectiva dos Sistemas Complexos. *Alfa*, São Paulo, v.60, n.3, p.463-482, 2016.

- *RESUMO: Este artigo, fruto de uma metapesquisa associada a uma pesquisa documental, pretende revisitar a história da Linguística Aplicada (LA) à luz dos Sistemas Complexos: sistemas com diferentes tipos de elementos que conectam-se e interagem de formas diferentes e mutáveis. Abordamos essa história pelo viés da mudança, a partir da noção de que a LA constitui-se um sistema de agentes vivos e em constante processo de coadaptação. Para tal, procuramos identificar cinco características na trajetória da LA: a) adaptativa; b) não-linear; c) aberta; d) dinâmica; e) com agentes heterogêneos. Com isso, pretendemos corroborar com o olhar histórico sobre a emergência da LA contemporânea, destacando a LA como sistema em constante e incessante processo de mudança.*
- *PALAVRAS-CHAVE: LA Contemporânea. Sistemas complexos. Mudança.*

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Received in September 2015

Approved in February 2016