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A Peircean Theory of Learning

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Abstract

I develop a theory of learning grounded in Charles Peirce's semiotics. This endeavour comes in the context of the iconic (phenomenological) turn in semiotics, which resulted in a Peircean renaissance, and of the growing semiotic trend in education.

Peirce's semiotics offers insights into the phenomenon of learning and contains an implicit philosophy of education. The application of Peirce's phenomenological categories to education reveals the semiosic character of education. Learning, education, and research constitute a triad, having the structure of a sign (phenomenon of signification). As such, they are correspondingly governed by Peirce's three criteria of evolution: chance, necessity, and love. Therefore, Peirce's theory of education can only be understood in the context of his theory of evolution.

I develop three central arguments: (1) that according to Peirce's taxonomy of signs, learning is the evolution of signification from the Icon sign type to the Argument sign type, (2) that learning is the Universe's way of discovering itself through life forms, thus being both an evolutionary factor and an explanation for the emergence of life and (3) that learning can only be fulfilled in self-denying love for the other. Using Peirce's taxonomy of signs I analyse the student/teacher relation, explaining how the passage from Icon to Argument proceeds and how learning is fulfilled in self-denying love.

Contents

Introduction

This thesis consists in a theory of learning grounded in the semiotics of Charles S. Peirce. It develops a teleological semiotic view of education, thus approaching learning and education in terms of signification phenomena. On the grounds of Peirce's pragmaticism and his semiotic terminology, the theory is a thoroughly philosophical expression of the critical common-sense opinion that only love is a purpose in itself. One of the central assumptions is that any growth can only be a going out of the self (an ecstasy). As such, the self has to focus on a non-self, on the other, in order to evolve. Therefore, to expand a self's knowledge by learning is to go out of the self, towards the other, towards the knowledge of the other and her intention of sharing her knowledge. Teaching is characterized by the same movement: going out of the self, reaching for the other's knowledge with the intention of giving, of offering, whatever the self has to offer (be it second degree equations, Kantian deontology, information about the weather, or chocolate). As such, learning, education, research and all other human endeavours are justified by and have solely this rationale: to fulfil the principle of love. The main argument of this theory is that learning, as well generally as in educational contexts, is only possible as a manifestation of love. This is supported on the ground that learning can only occur freely, being a phenomenon of discovery of similarities, and love is characterized by freedom. Following a Peircean argumentation, I explain that the learning-education-research continuity is an embodiment of signification that reflects its underpinning principles of cosmological and biological evolution.

I develop this theory in the context of the following epistemic trends of the late 20th and early 21st centuries: (1) the general reinvigoration of semiotics within philosophy and the proposal of semiotics as postmodern, non-dualist philosophy (Deely 2001), underpinned by (2) the recent "*Peirce renaissance*" in semiotics (Stjernfelt 2007), (3) the reception of semiotics in education and the coining of the *edusemiotics* branch of theoretical semiotics (Stables 2005, 2012, Semetsky ed. 2010, Stables and Semetsky 2015), and (4) the iconic (or phenomenological) turn of semiotics (Stjernfelt 2007, Stjernfelt in eds. Bundgaard and Stjernfelt 2009), which advantages (5) the retake of Jakob von Uexküll's *Theoretical Biology* (1926), on account of the co-extensiveness of life and signification phenomena and the further development of biosemiotics (eds. Sebeok, Umiker-Sebeok 1992, eds. Emmeche, Kull 2011, Hoffmeyer 2009, Kull 2003, 2005).

I approach learning and education as phenomena of a semiotic Universe. As developed by Peirce, semiotics is a relational logic with rich hermeneutic resources. Semiotics is not a binary logic, which would accept only two absolute values of truth. Value of truth is attributed to signs, the main semiotic concept, which are relational entities. As such, Peircean semiotics denies the possibility of expressing truth in its totality by a sign or a set of signs. Instead, signs tend to the truth. Their tendency to the truth is described by their mode of signification. Therefore, the

present approach to education is neither psychological, nor sociological. It does not explain educational issues in terms of cognitive capacities, social and cultural background, or power relations. Education and learning are approached as meaning phenomena, in all their complexity. As such, this Peircean Theory of Learning claims to bring a holistic perspective to education, as it is claimed that semiotics could (Gough and Stables, 2012).

Peirce is one of the two major logicians of his time to develop a thorough anti-psychologistic logic. The other one is Edmund Husserl. Both Peirce and Husserl develop phenomenological philosophies which go against noumenal ontology. The main difference between the two consists in Peirce's focus on triadic relations. Identifying the sign with the genuine triadic relation, Peirce developed a cosmology wherein the Universe is accounted for as populated by phenomena of signification. The core observation of Peirce's cosmology, not always evident in his texts, is that substitution, and therefore causality, is triadic, and not dyadic. Peirce's semiotics and Husserl's phenomenology bring logic into the domain of *life*. They do so not by subduing logic to cognition, but on the contrary: cognition, as well as life in general, occurs within real possibilities that have an inner logical coherence. Peirce's semiotics led to a semiotic life science, underpinned by metaphysics and underpinning in its turn social and cultural phenomena. These domains are not separated ontologically and the borders between them can only be observed vaguely, because they are vague.

Peirce presented semiosis, the cooperation of signs (CP 5.484), as an adequate explanation for the emergence of life, at least according to the metaphysical and scientific understanding of the age (CP 6.322). Therefore, logic is alive; it is embodied in life forms which best express it by re-cognizing the logical (meaningful) structures of the Universe. We re-cognize the Universe by observing it through the application of the Universe's own cyclical and continuous method of abduction, deduction, and induction. Through our re-cognition the Universe discovers itself. As such, Peirce developed a cosmology of meaning, to which Frederik Stjernfelt refers as *physiology of arguments* (2007). In the mature stage of his semiotics, in the 1890s, Peirce was led by his investigations on signification to develop a theory of cosmological evolution based on three principles: chance, necessity, and love. Following Peirce, these three principles are active in the Universe. The emergence of semiosis, practiced by life forms, is the embodied manifestation of these principles. While chance can be observed in the real existence of the necessary requirements sustaining life, these two (chance and necessary conditions) cannot fully account for the emergence and or sustainment of life. Peirce's argument is that signification is fulfilled by love, a principle that transcends chance and necessity. These principles of evolution are continuously distributed from cosmological to biological and to historical evolution. In the present thesis I explain education and learning as phenomena within such a cosmological evolution. Learning is a semiosis occurring on a biological timescale and education is a semiosis occurring on a historical timescale, organizing learning in a system which proves historically fit for human life. Learning is a life form's continuous adaptation

to an environment. As such, the difference between learning and teaching is only artificial. Learning concerns the self while teaching is simply an assistance to the learning performed by another. Teaching is learning another.

The cornerstone of this Peircean Theory of Learning is Peirce's doctrine of *agapasm* (evolution by the principle of love), where the tychistic (chance) and synechistic (necessity) principles of evolution lead to and are transcended by (see CP 6.302). To explain learning, I follow the evolution of meaning through continuous sequences of learning from basic iconicity (signification by similarity, occurring by chance) to argumentation (the fulfilment of general signification by love). As such, I define learning as the passage from the Icon sign type to the Argument sign type.

The recent and first semiotic account of the history of ideas, John Deely's *Four Ages of Understanding* (2001), calls the prospect of a semiotic history of education. The project of a semiotic history of education brings into awareness the strong historical connection between semiotics and the liberal curriculum. A scholarly semiotic consciousness first arose from the endeavour of justifying the curriculum of the seven liberal arts (Deely 2001, 2009, Olteanu 2014). Semiotics, being a hermeneutically reach account of logic, makes a strong stand for freedom as a condition for growth and development generally (Stjernfelt in Bundgaard and Stjernfelt, p. 232). Learning is understood as free discovery. This account of learning does not justify other forms of education except liberal education. I explain that Peirce's cosmological evolution does not support the systematic and institutionalized learning and teaching of a non-liberal curriculum because such an educational system does not follow the *telos* of the Universe to transcend chance and necessity by and into love. Non-liberal education, the teaching of skills and crafts, is driven by necessity and characterized by an instrumental perspective. It justifies teaching as instruction. Love is characterized by freedom. One can only engage freely in an act of love. Non-liberal education aims at satisfying social and cultural needs. It is characterized, if not by chance, then by necessity: the necessity of labour, production, consumption, ideology, generally any psychological, social, cultural, or anthropic necessity. Education, in order to be aligned with the tendency of the meaningful cosmos (semiotic Universe) within which it proceeds, can only point out to the learner general methods that proved generally useful on a historical timescale.

I shall use the term *cosmos* to refer to the semiotic Universe described by Peirce as *composed of signs* (CP 5.448), since Peirce describes semiosis as *cosmological*. In Peirce's work the term *cosmos* is preferred when referring to ontology and to evolution, while the term *world* is not employed when approaching semiosis (relational being). The term *world* shall be used here, coherently with Peirce's use, to refer to environmental worlds (*Innenwelt, Umwelt, Lebenswelt*).

The development of skills and attributes that qualify a person for a type of work, a particular job, should only be educational subjects if that is the result of the person's free choice and, therefore, coherent with the *agapic* principle. Only when a person, out of love for such a practice, freely decides to undertake such works as pluming, managing, accounting, knitting, and so on, she should follow institutional education that focuses on helping her acquire the particularly required skills. The

semiotic perspective holds that such crafts are only practically acquired and that there is not much to teach about them, apart from offering to the learner the possibility of practicing and observing practitioners at work. Otherwise, education is only justified as an environment for free discovery, where only liberal arts are taught, because of their universal applications and being approved by semiosis of historical dimension.

The theory, therefore, expresses in a thorough philosophical approach a belief to which common sense might adhere also: that love is the only possibility of growth. This immediately implies a strong connection between love and learning. Learning and education are evoked and enhanced by love. It is a spread, common sense, and folkloric idea that *we learn better from a teacher that we like*. More than a few times have we heard that a person decided to become a chemist because she *liked* her chemistry teacher for whatever reasons: perhaps the teacher was nice, gentle, young, manifested a mutual appreciation for her student, and perhaps she used to wear *cool* clothes. Appreciation for the chemistry teacher generates appreciation for chemistry. Of course, there is much more than a mere appreciation to the principle of agapism. The present thesis explains that the rationale of education is fulfilled when the student and teacher literally love each other. The Peircean Theory of Learning explains the phenomena of signification that occur in the teacher-student personal relation which result in the desire to learn and to learning. Thus, this theory offers a fertile conceptual ground for understanding learning as loving.

Therefore, this Peircean Theory of Learning should be of interest, besides to the general semiotic approach to education, to any approach to education that connects learning with loving and claims the importance of the inter-personal teacher-student relation as more important than the actual taught content. The implicit relation between learning and loving has been expressed by other scholars as well. Two such examples are Erich Fromm (1956) and Emmanuel Levinas (throughout all his work). For his phenomenological approach to the face-to-face encounter, the latter is particularly interesting for this Peircean approach to education. I argue that Levinas' work and the development of his lines of thought within philosophy of education can be a complementary support for the Peircean Theory of Learning for two reasons: (1) Levinas' Husserlian phenomenological and anti-psychologistic inheritance, and (2) the argument for love of the Other as the purpose of teaching stemming from his phenomenology of the face. If in the recent decades Levinas' philosophy gained serious popularity within philosophy of education, Peirce's semiotics is still underexplored in this field. Both Peirce and Levinas support the sine-qua-non character of love in teaching and learning. However, I consider that the Peircean work frame, semiotics, can offer an analysis that alone Levinas' phenomenology did not arrive at. Using Peirce's semiotics, new concepts bring new insights in approaching the teacher-student love relation. These concepts aim at the mereological analysis of this relation as a continuously evolving relation of signification.

To develop the argument I divide the thesis in three parts: Part I introduces the main concepts that are used to develop this Peircean Theory of Learning and explains its epistemological place within philosophy, Part II develops the core argument of the thesis, namely the application of agapic evolution to learning and education, and Part III contours the theory by answering to possible objections to it by comparing it with other mainstream philosophical approaches to education, such as phenomenology, pragmatism, humanism, and instructionalism.

Part I is divided in five chapters, starting with the second chapter of the thesis. In Chapter 1 I explain the epistemological need and position of a fully Peircean approach to learning and education. I briefly explain the common history of semiotics and liberal education and the relevance of a non-dualistic, biosemiotic awareness for education. I explain that the Peircean Theory of Learning is a postmodern, non-dualistic, phenomenological educational philosophy. Through the lens of biosemiotics it appears that learning, education, and science are results and stages of evolution.

In Chapter 2 I explain Peirce's concepts that I will use to develop the theory: his phenomenological categories, his concepts of sign, semiosis, and the classifications of signs. I insist on the concepts that describe iconic signification, the Icon and the Hypoicons. Iconic signification is signification by the criteria of similarity. This plays an important role in the Peircean theory of learning for two reasons: (1) the iconic turn in semiotics advances the hypothesis that reality is intelligible due to its inner similarities and, as such, the Icon is the only sign type through the contemplation of which learning more than what defines its constitution is possible and (2) the criteria of similarity proves essential for the possibility of agapic learning, in contrast with the criteria of difference and/or identity.

Iconic turn semiotics accounts reasoning as diagrammatic – recognition of similarities between parts and whole. As such, any reasoning is a mereological analysis – an analysis of the relations between parts and whole. This highlights a compatibility between Peircean semiotics and Husserlian phenomenology.

Difference does not evoke learning, understood in semiotic terms as use of predicates, which have to be iconic. Identity obscures the possibility of *compassion* between teacher and student because the teacher and the student will never be identical. Demanding identity from and with the other obscures the authenticity of the other, the real personality of the non-self. Self and non-self can be similar though, and engage with each other by a re-cognition of similarities. Such an engagement leads to knowing the other as a genuine web of signs evolving in her own right in time-space.

In Chapter 3 I explain Peirce's pragmaticism as a maxim of logic (CP 5.18) and doctrine of *critical common sense* (CP 5.494). I explain how Peirce's pragmaticism is different from mainstream pragmatism and in what consist the insights that pragmaticism offers to philosophy of education that the pragmatic approach to education (e.g. Dewey) did not touch upon so far. The advantage of pragmaticism stems from the approach to learning experiences as semiosis.

In Chapter 4 I discuss Peirce's Divisions of Sciences, explaining what are the implications of Peirce's consideration that pedagogy is a practical science. To understand Peirce's view on pedagogy I explain how, according to Peirce, knowledge acquisition happens generally, stemming from the Divisions of Sciences. Also, I explain that Peirce's branch of theoretical sciences, in his Divisions of Sciences, reflects the optimal liberal curriculum. Since learning is a matter of observation the sciences will be best learned in the way they were naturally observed. Educational learning inherits the Universe's abduction-deduction-induction structure, which was inherited by life forms in their general free discovery of the environment.

In Chapter 5 I focus on how Peircean semiotics unites ontology, phenomenology and epistemology. As such, it defines being as suprasubjective, denying ontological dichotomies between mind independency and mind dependency. I discuss the relevance of suprasubjective existence for education. This suprasubjective philosophy approaches the self as a continuously evolving sign. Therefore, it has many implications in what regards the relation between self and non-self. At this stage I explain the concepts of consciousness and personality according to Peirce. These concepts are essential for approaching the teacher-student relation.

Part II contains three chapters. Chapter 6 explains thoroughly the account of learning as passage from the Icon sign type to the Argument sign-type.

Chapter 7 explains how genuine predicates and metaphors are developed from a play on diagrams. Diagrammatic reasoning leads to free discovery, the learning experience that is justified by the Peircean Theory of Learning.

Chapter 8 develops the main claim of the theory, namely that learning is fulfilled by love. I explain Peirce's theory of evolution and how signification evolves from iconic to argumentation. Any life form learns, in a certain sense, by being engaged in semiosis, according to its own semiotic capabilities. Humans, like any other life forms, learn to survive. This learning is enjoyable and happens mostly by chance. The free abduction that any human being performs leads to an inductive state characterized by an imposed focus. The educational system is the mechanism which on an historical timescale proved to enhance learning by drawing the attention of learners to particular subjects. In a natural environment learning is characterized by chance. In society, particularly in educational environments learning proceeds by necessity. As such, education can be frustrating: free learning, which is paying off, is replaced by learning a curriculum of which the learner might be or might not be interested. Also, the learner has to adapt to the semiotic environment of the educational institution. This might require some efforts, as it assumes a shift of environment. Education, therefore, can inhibit learning. Historically, though, it proves useful. This is so because the purpose of education is not to restrict the freedom of chance to the aims of necessity. The purpose of education is disseminated from the purpose of cosmological evolution. By bringing the student and the learner face to face, having to teach and learn from one another, learning by chance and being educated by necessity are transcended into love: love for the teacher and love

for the student. The student, by loving the teacher genuinely loves the very subject the teacher is teaching. The teacher, by loving the student genuinely, loves the student's genuine and unique apprehension of what is taught, regardless of contradictions between their understandings. Therefore, life forms not only learn to survive, assuming a tychistic existence, but they learn to live, evolving an agapic existence. They learn their own life and the lives of those populating their environment.

Part III regards the position of the Peircean Theory of Learning in relation to other approaches to education. By this stage the main argument is fully explained and the theory is further developed by comparing its consequences to positions stemming from other approaches. This analogical analysis strengthens the theory by explaining its main arguments in contrast to potential critique. It is divided into two chapters: the first (Chapter 9) explains what the Peircean Theory of Learning has to offer to approaches with which it is not contradictory, and the second (Chapter 10) answers to possible objections coming from approaches that argue contradictorily.

Chapter 9 explains that the one school of thought which proves essentially coherent with this semiotic approach is the phenomenological school. In regard to semiotics, phenomenology lacks the perspective of a world of continuously evolving signification. As such, the development of phenomenological semiotics can inspire a semiotic turn in phenomenology. The chapter brings to light the relevance and necessity of a non-psychologistic philosophy in education that has as its cornerstone the real signification phenomena by which life proceeds, among which, most important is love.

Phenomenology has developed some themes that Peircean semiotics is engaged with as well: pure logic, in the case of Husserl; a philosophy of the body in the case of Merleau-Ponty; a notion of the self that is justified only through relations to non-self, in the case of Heidegger; the authenticity and impossibility of conceptualization of aspects of human life, such as love in the case of Levinas. Husserl's pure logic, Heidegger's approach to the self (Dasein), and Levinas' phenomenology of the face do not contradict in any essential point the Peircean Theory of Learning. However, semiotics would bring certain critique. For instance, Husserl's phenomenology might still be suspected of traces of a priorism (givenism) and Heidegger's metaphysics is anthropologically centred. Peirce's semiotics, and its application to education, does not present these obstacles by the hypothesis that all phenomena are phenomena of signification. On these lines, Levinas' apology for love as the purpose of learning (and of all human activity in general) can be justified without supposing an ontological distinction between human and non-human animals.

Chapter 10 explains what recommends the Peircean Theory of Learning in favour of other approaches to education that so far have been more broadly explored. I develop this argumentation by answering to the major objections that would stem from three paradigms: (1) pragmatism, (2) other brands of humanism (such as structuralism), and (3) instructionalism. By defending the position of the Peircean Theory of Learning in respect to such potential critique I explain several points that

entrench its epistemological relevance. These envisage the logocentric, but not hermeneutically narrow aspect of the theory, its non-dualistic character, the relevance of iconic learning, the importance of the focus on the personal relation between student and teacher over the focus on the taught content, and the understanding of human learning as continuous with the learning performed by all life forms, but species specific as well.

Within the Peircean semiotic paradigm, this theory explains rigorously the importance that actions of empathy, compassion, care and so on, have in the human environment. However, such actions, feelings, and attitudes are only signs evoked by the educational environment that this thesis proposes, not its rationale. Beyond feelings and attitudes of compassion, the rationale of the aimed educational environment is personal love. The teacher has to offer herself to the student and this can be only sustained as an immediate consequence of the teacher's love for her student. Viceversa, the student should love her teacher as well; their relation has to be symmetrical. The only thing that the teacher can do to inspire this in her student is to love her unconditionally. The teacher has to love the student *unconditionally*: regardless of her progress through schooling and her results. The student's success, failure, problems become a part of the teacher's life, her signifying environment. This deep compassion has to inspire the student to do likewise. The activity of teaching and learning is therefore not seen as a formal responsibility, but as a personal engagement, an apprenticeship. Not to care genuinely about the student, about the one whom I teach, is a refusal of life. To teach by imposing the self's knowledge on the other, without acknowledging the genuine other, the *life* of the other, her genuine personality, is useless and perhaps even harmful. Such a teaching attitude is not only sterile in offering new ideas to an other, but it can be traumatic: it closes the possibility of the other's expansion towards these ideas. Any dismissal of the student is a serious obstacle in learning. This semiotic theory explains what can be translated as a simple remark: *why would one speak to me if one is not interested in me?* Teaching and learning consist in an intimate act of love: the self is offered to the other. It supposes the re-cognition of *life*, in its uniqueness, standing in front of the self. The teacher stands before the student: what can she offer? If the teacher wants to offer a learning experience, the expansion of the signifying environment of the student, and as such, to irrevocably change the *life* of the student she has to give herself. The awareness that to offer the teaching of a curricular subject requires offering the self altogether: this is a fertile ground for learning.

Part I

In this part I investigate the theoretical background on which I will develop the Peircean Theroy of Learning.

I explain (1) that the disciplines of semiotics and education share a common history, (2) the semiotic approaches to education, and (3) the main concepts of Charles Peirce's semiotics. I argue that a contemporary semiotic approach to education has to take into account the insights of biosemiotic research.

I present Peirce's phenomenological categories, his concepts of sign and semiosis, and his taxonomy of signs. This semiotic foundation accounts for a suprasubjective reality, within which learning is understood as a suprasubjective phenomenon.

Chapter 1
Semiotics and Education

The purpose of this chapter is to point out the close connection between the disciplines of semiotics and education, in terms of a common history. The recent emergence of a body of literature that proposes semiotics as an educational philosophy does not come as a surprise. Initially, the development of semiotics constituted the rationale of the implementation of a liberal educational philosophy.

The rediscovery of semiotics that is occurring in the present age brings along a new wave of philosophy of education. In 2009 Frederik Stjernfelt remarked that "it is only in the ongoing interaction with other disciplines that semiotics finds its place as the non-skepticist mediator between formal and material, humanist and scientific, strands of academia." (Stjernfelt in Bundgaard and Stjernfelt, p. 233) Being so, this might tempt one to consider that it is just a convenience that semiotics has recently become an interesting approach for what used to be principally the business of psychology and sociology. The compatibility between semiotics and education is deeper than this, however.

About a century ago semiotics was rediscovered, in the last half of a century it gained serious popularity within academia but only in the last decade it has begun to be developed within philosophy of education. Education's delay in rediscovering semiotics comes as a surprise, as Marcel Danesi noticed (in Semetsky 2009). In the 1930s Vygotsky noticed what St Augustine noticed in the 4th century: "the very essence of human memory is that human beings actively remember with the help of signs." (Vygotsky 1978, p. 51) Danesi expressed his surprise that despite Vygotsky's popularity among pedagogues, and the rising interest that semiotics is currently enjoying, in philosophy of education semiotics is still not being given enough attention, particularly in relation to *learning*. In a psychologist, non-semiotic paradigm, it was acknowledged that signs play an important role in memory and learning, but such cognitive phenomena (memory, learning, etc.) were regarded only as using signs as tools and not being constituted exclusively of signs. Perhaps a part of the explanation for the delayed joining of semiotics and education consists in that such a psychologist approach as Vygotsky's would not stir the interest of semioticians or of philosophers looking for new approaches to education. For Vygotsky learning is only *aided* by signs, while a fully semiotic approach to education will explain learning and all the phenomena involved in education occurring exclusively as action of signs (also cf. Stables 2006).

A body of work, to which this thesis intends to be a part of, has started being developed recently. It frames semiotics of education epistemologically, outlining the general purpose of this research. Works belonging to this corpus include Stables (2005, 2006, 2008, 2012), Pikkarainen (2011), Pesce (in Semetsky, 2009, 2011) and

Winfried Nöth (in Semetsky, 2009, 2012). Semiotics approached particular educational matters such as: language learning, in Danesi (2000) and Nöth (2012), knowledge acquisition in Semetsky (in Semetsky 2005a), skematicism, iconicity and notation in Pigrum (2010, 2011a, 2011b), ethics in Semetsky (in Semetsky, 2009), rhetoric of education in Strand (2013a, 2013b, 2014), the teaching and learning of mathematics in Bakker and Hoffman (2005). In his Foreword to the 2009 *Semiotics, Education, Experience* volume, edited by Inna Semetsky, Marcel Danesi coined the term *edusemiotics*. Peirce's stand in relation to education was specifically explored in the 2005 volume *Peirce and Education*, edited by Inna Semetsky. However, this collection of essays only explores various aspects of Peirce's philosophy which are relevant for education, but does not develop a fully and systematic Peircean approach to education. As such, the volume justifies all the more the need for a fully Peircean approach to education.

I argue that philosophy of education's rediscovery of its semiotic foundation does not come as a surprise. Rather, the surprise consists in that so much time passed since the rediscovery of semiotics, in the late 19th century, until its implementation in education studies, in the early 21st century. This return of semiotics has already provided insights for education in several areas such as learning, adaptation, interpretation, the classroom and its phenomenology, skematism, iconicity, diagrammatic reasoning, and the student–teacher relation. Owing to this already existing work now it is possible to develop understandings of education more broadly in terms of meaning phenomena, in semiotic terms. This thesis develops a fully semiotic theory of learning and this chapter presents the epistemological foundation for the theory. The chapter has five stages. First I will use Charles Peirce's idea of a semiotic cosmological evolution and its biosemiotic applications to explain the theoretical background that allows education to be understood as a result of evolution. Secondly, I will explain the historically interwoven developments of liberal education and semiotics, which shows that a semiotic consciousness arose as the rationale of liberal education. In this framework the institution of University – the institutionalized form of liberal education – will be presented as a crystallization of signs to which natural and cultural evolution led. Thirdly, I will introduce the semiotic concept of Icon, the concept which constitutes the cornerstone of this learning theory. The fourth stage consists in explaining how this semiotic approach favours liberal education to instructional education, by defining learning as discovery. The chapter ends by explaining why such a semiotic perspective is preferred to traditional psychological or sociological approaches to education.

A. Learning the Semiotic Universe: Life and learning

Charles Peirce offers an understanding of the Universe as a teleologically expanding web of signs. This semiotic perspective replaces the idea of *being* as monad or object, or as a static entity in any sense, a perspective that has prevailed in both classical and modern philosophy. On a Peircean account being is the sign, the mediation. To exist means to be in relation and relation is the mode of being.

For Peirce the sign is a relation of three termini. Throughout his work Peirce offers many definitions of sign, one of the most synthetic and comprehensive being the following: "a sign is something, A, which denotes some fact or object, B, to some interpretant thought, C." (CP 1.346) One among the many examples of signification is language. Language use illustrates signs: the word "freedom" (A) denotes a fact, <<freedom>> (B) to the interpretant thought of a neoliberal (C). For the communist and the anarchist the sign is different, even though the signifier "freedom" might be the same. The signifier is only the perceptible ground for significaiton.

What is not in relation to the existing world, what is out of any possible interpretation, is not of this world; it does not exist. Signs are dynamic phenomena of meaning, always evolving according to their modes of relation within the web of signs. Peirce explained that this uninterrupted expansion of relations accounts that the whole Universe is constituted of signs:

"It seems a strange thing, when one comes to ponder over it, that a sign should leave its interpreter to supply a part of its meaning; but the explanation of the phenomenon lies in the fact that the entire universe -- not merely the universe of existents, but all that wider universe, embracing the universe of existents as a part, the universe which we are all accustomed to refer to as 'the truth' -- that all this universe is perfused with signs, if it is not composed exclusively of signs." (CP 5.448)

Thus, Peirce's semiotics implies not only an ontology of signs, but also a cosmology of signs – the world is the world of sign relations. If the idea of a relational ontology would suggest a certain idealism this explanation of universe as truth dismisses it. Being is not something belonging strictly to the realm of mind or strictly to a realm outside mind. Semiotician John Deely clearly explained that Peirce's semiotics does not make an ontological distinction between mind independent and mind dependent being (the medieval concepts of *ens reale* and *ens rationis*). The sign is suprasubjective (e.g. Deely 2001a, 2009, Bains 2006), it is neither strictly subjective, neither strictly objective. Thus, semiotics easily overcomes the typical dualism that modern philosophy preached since Locke and Descartes. The mind/body, ideal/material, mind-dependent/mind-independent dichotomies are unknown to semiotics[1]. Signs compose the world as a web of signs, linking things in their subjective existence and things in our apprehension as well as among themselves. The termini of the relations have their being only as part of the relation and if one were to focus on any of the three termini (A, B, or C) she would find nothing else but other such relations. Therefore semiotics dismisses any discussion on being as *pure ideas* or *things-in-themselves*. Stables explained that this semiotic non-dualism is an epistemological advantage for philosophy of education (2012).

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[1]It might be said that reality is ignorant of being's sweeping through mental and non-mental domains.

Being rooted in the scholastic realism of Duns Scotus, Peirce's semiotics opposes the relativism promoted by 20th century structural and post-structural semiology, with its deconstructive tendency. This understanding of being as relation does not consist in relativism, being rather a holistic ontology: *something* would be completely different than it is without or in a different relation to *something else*. Take the smallest, apparently insignificant constituting part of the Universe out of the Universe and the whole Universe crumbles into meaninglessness. This understanding of the Universe of existents as suprasubjective also accounts for the evolution of life forms as a particular result of a larger cosmological evolution. The evolution of life forms is continuous with the whole expansion of signs:

"In short, the problem of how genuine triadic relationships first arose in the world is a better, because more definite, formulation of the problem of how life first came about; and no explanation has ever been offered except that of pure chance, which we must suspect to be no explanation, owing to the suspicion that pure chance may itself be a vital phenomenon. In that case, life in the physiological sense would be due to life in the metaphysical sense." (CP 6.322)

Using the same argument, evolution on a cultural (historical) timescale is continuous with cosmological and natural evolution. Stjernfelt (2011) explained that natural selection adapted to signs, not the other way around. Evolution has been increasingly adapting to signs and, as such, learning is a semiotic result of evolution. Life forms adapted to signs: they learned to identify signs and to use them – I shall call this re-cognition, as it consists in the reinterpretation of being through cognition. The term 're-cognition' has been used in semiotic research, without being developed or insisted upon, by Peer Aage Brandt (2007). He used it in the same sense intended in the present work, as a phenomenon of categorisation, but he also ascribed to it the identification of sameness:

"[…] seeing something as something (and not something else) allows the Subject to retrieve it under the distinct category, remembered as attached to a location to where it should then orient its response. Object constancy, a fundamental property of perception, is of course not a gift of the 'given', but has to be mentally achieved as re-cognition of some cognized entity under a constant (and spatially localized) category: sameness of an individual as 'belonging to' a category remembered to appear at some location in the Subject's surround space." (p. 51)

In the present thesis the term is used without necessarily implying the identification of a semiotic object. Certainly, identification of sameness is a re-cognition in this sense.

Since along natural evolution learning was achieved, on a cultural timescale, adaptation led to education, the institutionalization of learning, the socially legitimated learning.

Learning happens within the signifying environment of a living being. The semiotic concept of environment, due to Thomas Sebeok's work, came to be Jakob von Uexküll's concept of *Umwelt*. At the beginning of the 20th century Jakob von Uexküll developed a Kantian biology which approaches life in terms of signs (von

Uexküll, 1926), classifying signification into perception and action. The difference between the (non-semiotic) environment and *Umwelt* consists in that by the concept of *Umwelt* it can be explained that two individuals might share apparently the same mind-independent environment, but actually live in different systems of signification. For example, a mosquito and a frog populating the same pond live, nevertheless, in different webs of signs, since their embodied modes of existence make them re-cognize different signs in the environment. The same can be argued about two individuals of the same species: since they are distinct and never coincide, their *Umwelten* will be different to some extent. In edusemiotics this perspective was recently investigated by Stables (2012).

In 1971 Stepanov coined the term *biosemiotics*, as a realization of the biological science's dependence of language stemming from linguistics, semiotics, logic, informatics, philosophy, and so on. Biology always approached life in specifically semiotic terms: *code*, *information*, *message,* etc. The biosemiotic project consists in developing biology by these metaphors. It bring the argument that life consists in such phenomena very similar to sign interaction (Stjernfelt 2011, 2014).

In educational circumstances, the knowledge of a student and that of a teacher will never coincide. Of course, living in different *Umwelten* does not suppose a schizophrenic reality: living beings still communicate and their knowledge has degrees of similarity. Concisely, the *Umwelt* is suprasubjective:

"We comfort ourselves all too easily with the illusion that the relations of another kind of subject to the things of its environment play out in the same space and time as the relations that link us to the things of our human environment. This illusion is fed by the belief in the existence of one and only one world, in which all living beings are encased. From this arises the widely held conviction that there must be one and only one space and time for all living beings. Only recently have physicists raised doubts as to the existence of one universe with one space valid for all beings. That there can be no such space comes already of the fact that every human being lives in three spaces, which interpenetrate and complete but also partially contradict each other." (von Uexküll 1926, p. 54)

At this point it becomes clear why Peircean semiotics is particularly favourable to offer conceptual tools for biosemiotics. The reason is that both Peircean semiotics and Uexküll's biology, besides its approach to life via signs, account for a suprasubjective being. Stables explained that on a semiotic account *phenomenal worlds overlap* (2012). This has implications for education (Stables 2012, more on this in Chapter 5 and Part II). Uexküll's account of *meaning* is suprasubjective and in accord with Peirce's maxim of pragmatism (Chapter 3) for explaining that the same sense-perceptible entity can be the ground for different signs. Thus the *Umwelt* is determined by the subjects' interpretation:

"An angry dog barks at me on a country road. In order to get rid of him, I grab a paving stone and chase the attacker away with a skillful throw. In this case, nobody who observed what happened and picked up the stone afterward would

doubt that this was the same object, "stone," which initially lay in the street and was then thrown at the dog. Neither the shape, nor the weight, nor the other physical and chemical properties of the stone have changed. Its color, its hardness, its crystal formations have all stayed the same— and yet it has undergone a fundamental transformation: it has changed its meaning. As long as the stone was integrated into the country road, it served as a support for the hiker's foot. Its meaning was in its participation in the function of the path. It had, we could say, a "path tone."[2] That changed fundamentally when I picked up the stone in order to throw it at the dog. The stone became a thrown projectile— a new meaning was impressed upon it. It received a "throwing tone." (1934, p. 140)

Like in the case of Peirce's semiotics, for Uexküll entities are meaningless if they are "relationless" (p. 140). Once a thing is *used* it becomes a *"carrier of meaning,"* shaping the user's *Umwelt*, as in the case of the stone, being either weapon, either part of the road:

"Only through the relationship is the object transformed into the carrier of a meaning that is impressed upon it by a subject." (p. 140)

Uexküll's *Umwelt* concept is a "functional cycle," (e.g., Uexküll, 1934, p. 49) which describes the suprasubjective reality of a living being in opposition to the linear functionality of a machine (see fig. 1). The *Umwelt* is the result of the action of senses by means of which a living being makes sense of the environment:

"If one further imagines that subjects are linked to the same objects or different ones by multiple functional cycles, one can thereby gain insight into the fundamental principle of the science of the environment: All animal subjects, from the simplest to the most complex, are inserted into their environments to the same degree of perfection. The simple animal has a simple environment; the multiform animal has an environment just as richly articulated as it is."(pp. 49-50)
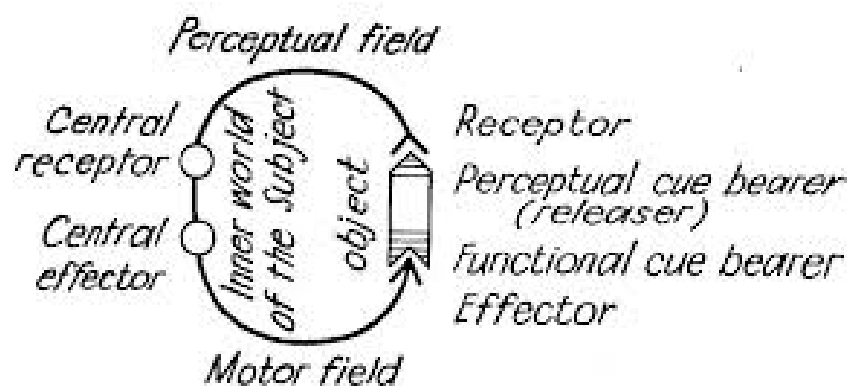
Figure 1 – *Umwelt* as functional cycle (in Uexküll, 1934, p. 49)

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[2]Without going further into the matter I mention that Uexküll's use of the term "tone" here is peculiarly interesting. Peirce would surely agree with this use of the term, since he uses the same term, *tone*, to designate a quality which is a sign (also Qualisign, in Peircean terminology). This is exactly what *tone* means here: it describes the emphasized quality that makes something belong to *path* or *throw*.

On this ground semiotics developed its own concept of *body* (see Nöth (ed.) 2006), distinct from the modern *body* concept which stands in opposition with that of *mind*: "the *Umwelt* concept furnishes semiotics with a basic idea of body as semiotically defined by the set of its perception and action sign possibilities" (Stjernfelt 2007, p. 262). The realization that semiotics brings is that the body is part of its own *Umwelt*. Moreover, the body is the central and essential feature of an *Umwelt* – the *Umwelt* takes the form of the organism's semiotic possibilities. Stjernfelt remarked that on this account an organism's life consists in both the internal and external parts of the functional cycle:

"This definition of the body is thus correlated with that of the environment it constitutes. In this conception the organism, the body per se is conceived as a semiotic device: it is an intrinsic property of a body that it is able to perceive the surroundings through signs and act correlatively through signs." (2007, p. 261)

This semiotic account of body dismisses any questions regarding *a priorism*, since it describes the life of the organism in terms of sign use. The modern *mind* and *body* complementary concepts are united and undistinguished in the semiotic body. On this account mind and body are to some extent synonymous, as mind is a phenomenon occurring in the semiotics capabilities of the embodied life form. The only distinction is that the mind extends into the whole *Umwelt* of the organism. Thus, if a *tree* becomes, in a semiosic way, part of the *mind* of a living creature, the body of the creature is still distinguishable from the tree. Nevertheless, that the *mind* incorporated the *tree* it means that the body is familiar in interacting with the tree (it can climb it, sit on it, feed from it, rest at its shade, etc.).

If the body determines the *Umwelt*, the very life of the organism, it immediately stems that the lives of two organisms are similar in respect to how their bodies are similar. A tick and a frog might be populating the same geographical place, e.g. a pond, but they live in essentially different worlds. Their worlds, however, overlap, because their bodies, no matter how different, still have some similarities. Even the basic fact that they are both embodied and have volume, shape and weight allows their worlds, however different, to overlap to some degree. The tick and the frog acknowledge each other and partake to each other's *Umwelt*. This is a simple way of explaining why inter-species communication is so radically more difficult than communication within the same species. The focus of this thesis is an *Umwelt* such as the classroom. Here the subjects involved belong to the same biological species. Nevertheless, their worlds are quite different, as their life experiences are different. Their bodies differ to some degree as well: they have different height, weight, pulse, skin and hair color, and so on.

The reality of living beings as *Umwelten* connected by common objects best is resonant with Peirce's semiotics and has implications for education that will be explored. As Fig. 1 suggests, Uexküll distinguished between perception signs and action signs which together constitute one circular and continuous life experience, as one of these modes of signification is the presupposition for the other which

becomes the purpose of the first and so on (see also Stjernfelt 2007, p. 226). This process has a structure of infinite iteration, like Peirce's abduction-deduction-induction process of logical inquiry (it will be investigated in the next chapters). Thus, like in Peirce's case, teleology does not need to be justified perennially, imposed from the outside, but it is rather set and continuously redefined from within the functional cycle. Induction sheds a new light on the understanding of the whole problem, thus producing a reshaping of hypothesis which consists in a new abduction and so on. This is one of the cornerstones of Peirce's pragmatism (explained in Chapter 3). According to Stjernfelt, Peirce's semiotics describes the existing world as a physiology of arguments since it supposes the Universe to be a continuous interaction of signs (this concept will be explained thoroughly in Chapters 2 and 5). The physiology of arguments, constituting the entire Universe, becomes a biology of arguments in the world of living beings. The present thesis investigates the classroom and the relation between teacher and student as a particular biological phenomenology of such kind, which takes into account, according to Uexküll's biology, that living beings and their interactions do not have the characteristic of functioning machines:

"Whosoever wants to hold to the conviction that all living things are only machines should abandon all hope of glimpsing at their environments.

Whosoever is not yet an adherent of the machine theory of living beings might, however, consider the following. All our utensils and machines are no more than aids for the human beings. Of course there are aids to producing effects [*Wirken*], which one calls tools [*Werkzeuge*], a class to which all large machines belong, such as those in our factories that process natural products and furthermore all trains, automobiles, and aircraft. But there are also aids to perception [*Merken*], which one might call perception tools [*Merkzeuge*]: telescopes, eye-glasses, microphones, radio devices, and so on." (1934, p. 41)

Developed on this ground, a semiotic theory of learning will prove to bring forth an anti-instrumentalist account of education[3]. Learning is not an instrument, an aid to our life, but an intrinsic and essential, sine-qua-non aspect of human life. This Stables' simple observation constitutes the nucleus of semiotics of education:

"If all living is semiotic engagement, then learning is semiotic engagement." (Stables, 2006, p. 6)

On this account, if learning is a mode of living to which evolution arrived in its adaptation to signs, through their physiology, learning is the Universe's way of discovering itself: throughout life forms the Universe can know itself. This is the conclusion of Peirce's semiotic explanation of life emergence. According to Gough and Stables (2012) learning itself is adaptation, which is, as explained above, interpretation. With such an argument coming from semiotics of education it becomes clear that biology might have a lot to offer to education. Biology and semiotics have already merged into one discipline, namely biosemiotics.

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[3]The instrumentalism semiotics opposes is not the pragmatic instrumentalism of Dewey, but mechanistic views of human behavior and education, such as instructionalism.

Thomas Sebeok has the main merit in the developing of biosemiotics. His development of biosemiotics, grounded in Peircean semiotics, was possible only because of and building upon the work of Jakob von Uexküll. Jakob von Uexküll, a biologist contemporary of Peirce, is the author of a theoretical biology which expresses life in terms of sign use (von Uexküll, 1926). For this epistemological compatibility, von Uexküll's biology proves some of the epistemological strengths of Peircean semiotics. Peirce has explicitly shown the central place of a biosemiotic project within his semiotics:

"Therefore, if botany and zoölogy must perforce rest upon metaphysics, by all means let this metaphysics be recognized as an explicit branch of those sciences, and be treated in a thoroughgoing and scientific manner." (CP 1.204)

Kull (2005) explained that so far there are mainly two approaches to biosemiotics, among which he adheres to the account eventually developed by Sebeok and inherited from von Uexküll:

"The intersection between semiotics and biology can be interpreted in two quite different ways.

Firstly, biosemiotics can be seen as a field that emerges in the periphery of general linguistics or communication science on the one hand, and of ethology on the other — thus covering a set of interdisciplinary problems arising in few cases when biology and semiotics intersect, for instance, when analysing the signaling behaviour of non-human animals. This is a view that can be applied when interpreting the early zoosemiotic works of Sebeok (1962; 1969).

Alternatively, biosemiotics is an approach to the whole living world, a semiotic biology, a field that has a scope and importance no less considerable than biology itself. This is a view espoused by Sebeok in most of his later works, at least since the late 1970s when he started to appraise Jakob von Uexküll's approach as one of a general semiotics." (p. 16)

Therefore, the present thesis brings an approach to education from the perspective that regards the whole living world as a biosemiotic system. Only within the Peircean branch of semiotics has so far emerged an influential approach to biology. Thisapproach is growing due to the works of, inter alia, Hoffmeyer (2009, 2013 in Brian Henning & Adam Scarfe), Kull (1998, 2001, 2003, 2005), Stjernfelt (2011, 2013 in Brian Henning & Adam Scarfe), Andersen (in Sebeok 1992). The title of the 2011 volume *Towards a semiotic biology: Life is the action of signs*, edited by Claus Emmeche and Kalevi Kull, declares the main statement of this biological trend. From the perspective of biosemiotics, Kalevi Kull describes life as *local plurality*, thus explaining complementarity. As such, biosemiotics embraces Peirce's observation that the interpreter supplies a part of the sign's meaning. Peirce also identified life with *diversity*, and therefore the boundaries of life are not as clear as we have been used to think. Peirce considered "that what we call matter is not completely dead, but is merely mind hidebound with habits. It still retains the element of diversification; and in that diversification there is life." Biosemiotics, therefore, brings a vitalist account, in contrast with modern dualist philosophy which

largely proved itself a mechanical philosophy. As such, semiotics offers an ecological understanding of education. That semiotics favours an ecological philosophical paradigm has been discussed by Andersen (i.e. Andersen in Sebeok 1992). The biosemiotic approach brings a strong awareness that a living organism is a part of the world in the sense that it cannot be isolated from the world. Modern dualist philosophy and science were not ready to embrace the "Gaia hypothesis," claiming that the Earth is a living organism, but rather only that the Earth is *like* a living organism:

"The strong metaphor form of the Gaia hypothesis – the earth is a living organism – can be distinguished from the weak form resting on analogy – the earth is *like* a living organism." (Andersen, p. 5)

As Andersen noticed, semiotics offers a new possibility. Semiotics teaches that to signify is to be and for being *like* something semiotics has a name: Icon[4] – the sign that signifies according to likeness. Thus, the earth, the whole of living nature, is an icon for a living organism[5]. From this perspective, human life and learning are implicit. Learning happens continuously wherever there is life and it proceeds according to the conditions of the environment, to the way in which sign action multiplies reality:

"A study of the nature of semiosis that includes its inevitable attributes (recognition, memory, feed-forward, code, emergence of absence, etc.) leads to a general model of the life process, a model that explains the emergence of complementarity. A most compact conclusion from this understanding states that *semiosis multiplies reality,* that mind means plurality. Or, synonymously, that life is the local plurality. This means that this "discovery" is also the answer to the question about the nature of life. Life is the phenomenon of the occurrence of plurality in the world. What thus turns to be locally plural is the reality itself. And this IS life, life itself (Kull 2007)." (Kull in Bundgaard and Stjernfelt 2009, p. 116)

These recent developments of biosemiotics have revealed the achievement of knowledge and the development of science to be the results of the semiosis[6] of all life forms including those commonly regarded as cultural constructs. Education is thus a semiosic structure *to which evolution itself has adapted* (see Stjernfelt, 2011), while learning is the semiotic phenomenon that determines the renewal of life itself. Learning is a result of semiosis prehistorically, occurring even since before the human species had appeared. By the time humans came about, learning was already a way of life for most species. Learning is our mode of being.

Such an ecological, biosemiotically grounded theory of learning immediately offers several advantages to education. For instance, Gough and Stables (2012)

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[4]The Icon concept will be introduced in section C and further developed throughout the thesis.

[5]In her article, Andersen explains that this is a metaphor. This does not contradict it being an Icon, on the contrary. The metaphor is a particular type of Icon (see Chapter 2, section D), thus, by naming it a metaphor, Andersen is simply being more precise.

[6]*Semiosis* is the action of signs. It will be explained later on in Chapter 2.

remark that, because of its non-dualist doctrine, a semiotic account of Darwinism does not present any more the danger of justifying racism, sexism or other discriminatory doctrines in philosophy of education, as a non-semiotic account of Darwinism used to:

"On a strict substance dualist account, Darwinism itself can be understood as construing 'reality' as brute mechanical physicality, devoid of mind or intention. By overcoming this dualism, a fully semiotic account effectively removes this objection to Darwinism. Darwinism on this account does not, therefore, endorse racism, sexism, imperialism or the triumph of might over right, forbid altruism or collaboration, or explain human aspirations in purely genetic or biological terms." (Gough and Stables 2012, p. 371)

The biosemiotic model of evolution is not arborescent, meaning that evolution is not simply a process leading from simple and dull to complex and knowing. Species are not better or worse, under-evolved or evolved, species are simply different, as each species (and actually every individual) is engaged in a different *Umwelt*. This is a way of expressing the fact that the lives of different species are different. Different signification means different being (to be embodied differently.

The point which Gough and Stables draw is that interpretation is a matter of adaptation, an argument also advanced within biosemiotics (e.g. Stjernfelt 2011). Such is the case of institutions and, generally, social life: these are the structures of meaning which biological and socio-cultural evolution (which, as argued above, are not separate, but continuous) have arrived at. They are not necessarily better or worse than previous or impending structures of meaning, but are the instant embodiments of a semiosis – an interpretation at a moment in time-space. Semiotics, in a Peircean tradition, easily accounts for the continuity of nature and culture, body and mind. This evolutionary approach to education accounts for the phenomenon of learning as discovery of one's own *Umwelt*. Human beings' mode of learning is strongly committed to our cultural mode of living. The concept of *Umwelt* does not describe cultural life. Nevertheless, since socio-cultural evolution and natural evolution are continuous, a particular case of human *Umwelt* can be inferred. John Deely names this concept *Lebenswelt*. The suprasubjectivity of the *Umwelt* is sustained by a psychological reality of each knowing subject, the *Innenwelt*:

"Two people have the same ideas, but these ideas as psychological realities are but the foundations for a relation to an object; and while each person may have his or her own idea, that which the idea is considered is the same between two people, they may well *feel differently* about that object. The *Innenwelt* gives rise to and sustains an *Umwelt*, and each *Umwelt* in turn gives rise to an indefinite number of possibilities for both communication and "misunderstanding". I put this last word in quotation marks, because it introduces us to the distinguishing feature of the human *Umwelt*, to what further makes of a simple *Umwelt* a linguistic *Lebenswelt*: the human animal is the only animal

which becomes aware of the difference between objects and things in terms of the difference between what is related to the knowing organism and what exists apart from or regardless of that relation." (Deely, 2001a, p. 8)

The concept of *Lebenswelt* is the semiotic equivalent of the relativist concept of paradigm (Kuhn 1970). The paradigm concept is descriptive of the specific socio-cultural and idiolectical characteristics of a (scientific) community. *Lebenswelt* consists in the system of relations of signification constituting the group.Because to be in the Universe means to be related to everything else the *Lebenswelt* concept, while describing the borders of systems, takes into consideration that no system is closed. Within the physiology of arguments there are some thresholds of signification, delineating *Lebenswelten*, but these thresholds do not block signification between *Lebenswelten*. Also, the margins of the *Lebenswelten* are vague. It is difficult to say where does a student stop being a student: at school she is a student, on her way from school towards home she is still a student in some sense, because she is coming from school, while studying at home she is still a student, in the pub she might still be a student, as the pub *Lebenswelt* might very well provide the inspiration for the student's assignments.

In the present thesis educational institutions (situations) will be treated as *Lebenswelt*. Stables (in Stables and Semetsky, 2015) explained the implications of the semiotic non-dualist approach for the understanding of a teaching environmnent:

"If living is a process of semiotic engagement, then what is real is both physical and humanly interpreted: there are not two sorts of reality, one external and one internal. A school, for example, is not determined solely either by a set of buildings nor by a mental interpretation. A school simply and really 'is' first and foremost a school: the same set of buildings could stop being a school, and a school could exist on the same site without the existing buildings. Whate makes a school a school is that it signifies such. It is not simply a matter of a human mind interpreting a non-human reality; it is simpler still than that." (p. 91)

While this section has identified learning as the main characteristic of the *Umwelten* of various species, in the next section of this chapter I explain the educational *Lebenswelt*, typical for humans. Thus, education is accounted for as continuous with the evolutionary realization of learning. The existence of human beings pertains to *Lebenswelt*, but learning is a characteristic belonging to the natural world of *Umwelt*, for both human and non-human animals. Of course, since humans live in a linguistic, socio-cultural *Umwelt*, such as *Lebenswelt*, learning will occur within this realm. Nevertheless, this does not impose defining learning as human specific. Learningis here approached as a biological characteristic, even if investigating a specific learningsuch as it takes place in a *Lebenswelt* such as a school. Also, learning is not strictly innate or acquired; it is, as explained above, a telos of evolution, set from within evolution – the result of evolution's adaptation to signs.

B. Liberal education and semiotics

John Deely is one of those to affirm and explain that Peirce did not develop a new philosophical system, but rather recovered and further developed an old, forgotten medieval philosophy, that modern philosophy has put aside (e.g. Deely 1982, 2001a). In this section I will explain that the sources from which Peirce rediscovered *Doctrina Signorum* (*the Doctrine of Signs*) constitute the main sources that developed and exercised liberal education, thus affirming that semiotics was initially developed to serve education. This tradition starts in the early Medieval Age. Of course, both semiotics and education are disciplines that have ancient origins. The interest that human beings have shown both towards signs and towards passing on what has been acquired are probably as old as humanity itself, or at least as old as humanity's conscious interest in knowledge in general. The conceptualisation of something standing for something else (what we now call *sign*) probably started in practices such as astrology or divination (Deely, 2001a). Both of these inquiries, the study of signs and the art of teaching and learning were developed in classical Greek philosophy, each usually independently one of the other, but they met in a moment that was crucial for the development of philosophy. In Ancient Greece, especially with Socrates, the consciousness of teaching that which is valuable *per-se* was entrenched. With Aristotle and Cicero the tradition of the *seven liberal arts* began and it was carried on later by authors such as Tertullian and Quintilian. The liberal arts have been broadly understood as those arts that are valuable *per-se*, in contrast to utilitarian arts (crafts) and the seven fine arts (architecture, instrumental music (playing technique), sculpture, painting, literature, drama, and dance), which were valuable throughout their production. The main argument for teaching the arts which are valuable *per-se*, immanent and intransitive that is, is that these generally prepare the intellect of a being for knowledge in general. The liberal arts make the understanding and practice of any craft possible. Whatsoever the object to be known is, the liberal arts, or rather the principle of the liberal arts, prepare the mind to grasp it. To put it simply, the liberal arts are universal.

The middle of the first millennium is an essential moment for the history of liberal education. At the time there was a certain cultural competition between Byzantium and Rome (see Mark Vessey's 2004 Introduction to Cassiodorus, p. 26-27), which fuelled a race for knowledge on both sides. From this situation a strong interest for education emerged. Among the Patristic authors of the time a general interest towards signs is evident. One of the most influential thinkers of the early Medieval Age, St Augustine, set the agenda not only for the education of his times, but for the eventual emergence of the institution of University. St Augustine's *De Doctrina Christiana* is recognized both as a crucial work for the further development of the liberal arts and also as the first theoretical development of the *Doctrine of Signs*. One of St Augustine's tasks was to justify the need of liberal education at the dawn of a Christian age. The issue that needed clarification was the relation between non-Christian and Christian teaching. St Augustine argued that that which is not directly, immediately Scriptural is not necessarily profane, but it can be regarded as

secular. The secular is valuable according to its use. Therefore, secular teachings are good for the Christian to learn, in service of the Christian mission of transfiguring the world.

This same work is considered to set, for the first time, a semiotic consciousness (Deely 2001a, 2009 and Marmo 2010). Deely explains that:

"Semiotic consciousness, thus, first arose in the time of Augustine, but its principal development as a theoretical theme did not occur until much later, beginning with Aquinas and Roger Bacon in the 13th century and continuing thereafter right down to the time of Galileo and Descartes, where it found its theoretical vindication in the work of John Poinsot. This main period of theoretical development occurred in two phases, both of which have been identified only in the most recent times and both of which have only begun to be explored in depth." (Deely, 2001a, p. 40)

St Augustine was the author of the time to approach and develop signs theoretically, but a semiotic thinking was common among the Patristic authors generally. Examples include St Ambrose (e.g. Hexaemeron, I.5), who particularly had a strong influence on St Augustine, and St Dionysius the Areopagite (e.g. On the Celestial Hierarchy, II.2). Their manner of regarding the world as *sign* is probably inherited from the apostolic method of allegoresis. This method cultivated a certain text analysis whereby fragments of text from one Scriptural Book would directly signify fragments from another Scriptural Book, thus broadening meaning by unlimited correlations of a type – image kind. The Patristics did not particularly need the development of a semiotic theory, their focus being that of having a spiritual life of prayer. Any theoretical developments were inquired only to serve this purpose. Their understanding of Scripture and its typologies, while having an implicit semiotic character, did not require the further development of a sign theory. Therefore, the question that arises is "what determined St Augustine to develop a theory of signs?" At the outset of *De Doctrina Christiana* St Augustine stated the reason for developing a theory of signs: "all teaching is teaching of either things or signs, but things are learnt through signs" (St Augustine, *On Christian Teaching*, I.4). Therefore, from its beginning, semiotics had the rationale of developing liberal education. In this same work, it is widely admitted, St Augustine gave the definition for the concept of *sign* that set the path for the further development of medieval semiotics, which in turn dominated medieval philosophy. From the start, he stated that the interest in the study of signs is not their *being,* but their *signification*. This is a first insight towards an ontology of relations that semiotics will later prove to be. Expressing the idea in a later terminology which semiotics will develop, Deely comments that St Augustine managed to explain that "signs make us aware of an objective world which includes but does not reduce to the things of the physical surroundings, and that it is only through and as part of that objective world that we become aware of objects and aspects of objects that do not reduce to our experience of them (do not reduce wholly to their objective being) but obtain also and at the

same time subjectively as existing *in their own right, and as well as, as known.*"
(2009, p. 36-37)

Introducing his definition of sign, which will remain a central reference for semiotics ever since, St Augustine expresses this suprasubjectivity of the sign by stating that regarding signs attention should be paid on their signification, not on their objective being:

"Now that I am discussing signs, I must say, conversely, that attention should not be paid to the fact that they exist, but rather to the fact that they are signs, or, in other words, that they signify. For a sign is a thing which of itself makes some other thing come into mind, besides the impression that it presents to the senses. So when we see a footprint we think that the animal whose footprint it is has passed by; when we see smoke we realize that there is fire beneath it; when we hear a voice of an animate being we observe its feeling; and when the trumpet sounds soldiers know they must advance or retreat or do whatever else the state of the battle demands." (Augustine, *De Doctrina Christiana,* II.1)

Thus, St Augustine brings a new perspective in philosophy by adding to the realm of signs phenomena which are not strictly natural. Deely expresses this in Greek philosophical language, by stating that the Augustinian "sign is a general mode of being that travels *between* φυσις and νομος, as well as *within* each." (2009, p. 37)

As already mentioned, it is agreed among semioticians today that *De Doctrina Christiana* set the theoretical premises for the development of the *Doctrine of Signs*:

"Medieval semiotics has developed along the path traced by Augustine in De Doctrina Christiana (I, 2, 1) and has conceived the sign as a res or a signifying quid, whose apprehension allows one to know something else (significatum)." (Marmo, 1987)

Deely reinforces this:

"With this definition, at a stroke, Augustine proposes the sign as superior to the division of being into natural and cultural: any material structure, whether from nature or art, which, on being perceived, conveys thought to something besides itself functions as a sign." (Deely, 2001a, p. 221)

Therefore, semiotics and liberal education fundamentally have the same root, the development of semiotics having the rationale of serving liberal education. *De Doctrina Christiana* is the source of the medieval curriculum, the curriculum of the liberal arts, which, in Western Europe, constituted the very reason for the emergence of the institution of University. Education and semiotics not only have the same root, therefore, but their historical evolution is interdependent. The main authors responsible for the practice of liberal education, as Deely identifies them, are St Augustine, Boethius, Cassiodorus and Isidore of Seville:

"The tradition of liberal arts education in the West is rooted in certain conceptions (and misconceptions) of Augustine, Boethius, Cassiodorus, and Isidore of Seville; but it was Cassiodorus (c. AD 480-573), a contemporary of and noble Roman like Boethius, who first pulled the sources together so as to initiate this great tradition." (2001, p. 183)

Hence, the beings that live in the *Lebenswelt* of liberal education live in the *Lebenswelt* of a semiotic consciousness. Scholastic philosophy was a genuinely semiotic paradigm. Deely considers scholasticism a second step in the development of semiotics, following Augustine (2009, p. 40). Semiotic consciousness has been alive throughout history, uninterruptedly, albeit at times silently. Deely, though he developed the most comprehensive history of ideas noticed with semiotic spectacles, nevertheless omitted a whole range of thinkers that have their place within the semiotic project. Such are the cases of St John of Damascus, St Theodore the Studite and Patriarch Nikephoros (8th – 9th centuries). These authors particularly developed the concept of Icon, which I will briefly introduce in section C. Taking these authors into consideration within the history of semiotics, or rather in the attempt to develop a semiotic history of ideas, results in acknowledging the importance of iconic signification for the whole semiotic tradition. However, this thesis is not the place to explain their views on signs thoroughly.

In the 13th century the sign constituted the main philosophical interest and debates on signs were common among the main figures of scholasticism, inter alia Thomas Aquinas, Roger Bacon, Bonaventura of Bagnoregio, Thomas of Erfurt, Henry of Ghent and other scholastics (Marmo, 2010).

In late scholasticism the semiotic paradigm was still fertile. Joao Poinsot (1589 – 1644) explains about the academic *Lebenswelt* of the Iberian peninsula of his time that the debates on sign and signification were "a matter of daily dispute in the schools" (Joao Poinsot1632: 680a38-39 in Deely 1982, p. 50). These semiotic disputes were kept alive in the Iberian Peninsula by scholastics such as Petrus Fonsecus, Francisco Suárez, and Ignatius of Loyola. Contemporary semioticians, such as Deely, regard Poinsot as one of the first to develop a fully suprasubjective ontology, a doctrine of signs peculiarly similar with Peirce's.

One of the earliest educational texts was Cassiodorus's 6th century work, *Institutiones divinarum et saecularium litterarum*, in which the most frequent Patristic reference is *De Doctrina Christiana*. If in *Institutiones* Cassiodorus does not explicitly offer any insights on signs it does not mean that the work lacks a semiotic consciousness, but rather that it is implicit. This can be inferred simply by looking at Cassiodorus' bibliographical references and scholarship. Cassiodorus was focused in explaining what subjects to study and where is the pedagogical material to be found, he did not focus on explaining methods of teaching and learning. These methods, that constitute the semiotic background of liberal education, were already developed, mostly by St Augustine, whom is Cassiodorus' main reference. Cassiodorus himself makes it explicit that he is not interested in making his own contribution to the matter of education, but rather that he wants to pass on the teachings of the Patristics

on education, which, as mentioned before, especially in the Latin world, were profoundly semiotic:

"I commend in them not my own teaching, but the words of earlier writers that we justly praise and gloriously herald to later generations." (*Institutiones*, I.1)

In an introduction to Cassiodorus' *Institutiones*, Mark Vessey notes that Cassiodorus inherited the division of knowledge into divine and secular, as well as the justification for the need of both, mostly from two Latin Patristic authors, Jerome and Augustine:

"His masters in this domain were the two greatest Latin fathers of the later fourth and early fifth centuries, Jerome and Augustine. Between them they supplied him with a rationale for distinguishing the categories of 'divine' and 'secular' knowledge and for combining their respective textual resources in a single pedagogy." (p. 28)

Thus, it is within a semiotic mind frame that liberal education sets off and it is in the *Lebenswelt* of western scholasticism that the institution of University emerges. Out of early scholasticism were developed the first universities: Bologna (1088), Paris (c. 1150), Oxford (1167), Palencia (1208), Cambridge (1209). The university appears as the institutionalized embodiment of liberal education, the instantiation of the rationale of the *Doctrine of Signs*. Note that in parts of the world where a semiotic consciousness was not entrenched the university did not emerge, such as in Eastern Europe, or did emerge but did not endure, such as in the Islamic world. These *Lebenswelten* developed their intellectual endeavours by different structures. The Byzantine world, however, had its own various impressive thinkers in between early Patristics and modernity, some of whose works are highly relevant for semiotics, but unfortunately bearly known at all to semioticians[7].

Starting with early modernity – Locke and Descartes – philosophy draws towards mind-dependent ontology, by identifying being with *idea* (e.g. Deely 2001a, 2009). This ontological stand reached its utmost expression with Kant. I argue that the absence of a semiotic consciousness in modern philosophy determined a gradual detachment from liberal education in favour of instructional education in the schooling institutions. The present thesis places liberal education in opposition to instructional education (such as presented in Davydov 2008). Modern society, driven by modern philosophy, tends to instruct its individuals, through its educational system, to support the society's means of production. Arguably, an example of the orientation of higher education away from liberal education and towards instruction is the growing similarity between university and corporation. Naomi Klein offers such an example, as she noticed that the University is adopting the *Lebenswelt* of a different institution – the corporation:

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[7]Literature that approaches the history of ideas via semiotics, including the most comprehensive work in this area, Deely's *Four Ages of Understanding*, lacks a thorough study of important authors for semiotics, such as St Basil the Great, St John of Damascus, St Theodore the Studite, St Patriarch Nikephoros.

"I had been doing some research on university campuses and had begun to notice that many of the students I was meeting were preoccupied with the inroads private corporations were making into their public schools. They were angry that adds were creeping into cafeterias, common rooms, even washrooms; that their schools were diving into exclusive distribution deals with soft-drink companies and computer manufacturers, and that academic studies were starting to look more and more like market research." (Klein 2000, p. xxxviii)

The corporation, arguably a postmodern institution, is, nevertheless built on a strong modern philosophy, being the inheritance of industrialization − a modern society per excellence. Therefore, such cases show the deviation away from liberal education that the University institution witnessed under modern philosophy. For his rediscovery of the pre-modern *Doctrina Signorum* and its systematization, Deely proposes Peirce as the first postmodern philosopher (Deely 2001a, 2009). From this perspective, a theory of learning developed on the basis of Peirce's semiotics will be a postmodern educational philosophy which should implicitly re-establish liberal education. University education has become more and more focused on teaching skills and crafts, generally preparing students for a job market − a particular semiosic structure of the capitalist *Lebenswelt*. This is a narrowly utilitarian education, not liberal. This turn in education can be understood as a result of the turn from a semiotic to a non-semiotic philosophy.

If liberal education endured for a while in the non-semiotic modernism, it was because of a conservatism that characterizes educational institutions. This conservatism is easily justified: capital was gained through the work of universities. The university was a vital organ and its research a vital function for the well-being of the state.

There are examples of liberal education projects during modernity. There is the case, for instance, of the British analytic school of philosophy of education, the main exponents of which are Richard S. Peters and Paul H. Hirst. Peters and Hirst mark the beginning of an analytic philosophy of education, starting in the late 1950s. Due mostly to their work the Philosophy of Education Society of Great Britain was founded in 1965. This school's core approach consists in the conceptual analysis of issues that are relevant for education. Their arguments aimed at developing a liberal curriculum (Hirst 1974, p. 35) as an endeavour of free thinking, in contrast to the mere achievement of skills:

"Whatever else an educated person is, he is one who has some understanding of something. He is not just a person who has know-how or a knack." (Peters in Peters, Hirst and Dearden (eds) 1972, p. 3-4).

As an attempt at developing a project of liberal education, this school has advanced some views which are similar to those which the present work is claiming. For instance, it brings an awareness of the importance of the personal character of educational activities, besides the brute delivering of established information:

"Teachers, it is argued should not regard their pupils just as potential recipients of knowledge and skill; they should enter into personal relationship with

them. […] Education is not just a matter of the meeting of minds; it is a process of personal encounter." (Hirst, Peters, p. 88)

That teaching and learning are a personal endeavour is one of the main claims of this monograph (see Chapters 5 and 7). However, there are some essential differences between Hirst and Peters' account of personality. From a Peircean perspective a "meeting of minds" is a 'personal encounter'. The *mind* is not a blackbox, but a phenomenon constituted of all the components of the self. All the more, at least in the case of humans, the self consists in a person (Chatper 5). This difference results in contradictory conclusions. For example, for Peters and Hirst a punishment imposed by the teacher on the pupils can be a justified conclusion safeguarding the learning process:

"The view which a teacher has of his pupils as learners should, therefore, provide a thread of unity which runs through a whole range of his dealings with them – varrying from conversations with them about their visit to the cinema to having to punish them in order to safeguard the conditions necessary for learning to proceed." (Hirst, Peters, p. 89-90)

No matter how this issue is further tackled, if punishment of this sort is understood as a justifiable act, an asymmetry in the teacher-student relation is assumed. The application of Peirce's theory of evolution to education completely excludes such asymmetry and the practice of punishment (Chapter 7, CP CP 5.51). On the Peircean account punishment is not educational. It is explained as an intermediary obstacle, a symptom of a semiosically immature personal relation (a matter of Secondness), perhaps oftenly occurring, but not as a conclusion (Interpretant). Also, it can be practiced by both teacher or student, not only by the teacher. The teacher-student relation should not be an assymetrical power relation.

There are also other fundamental differences to the educational philosophy of Hirst and Peters. Their attempt can be seen as the result of an academic institutional inertia demonstrated by the understanding of education as "knowledge industry" (p. 4), a typical view for modern western culture. It differs fundamentally from a semiotic account of liberal education and from the educational philosophy developed in the present work. Peters and Hirst's notion of *objective*, the concept that ought to offer perspective to education, is the outcome of modern dualist and essentialist philosophy. While, as I shall explain, Peirce's teleological semiotics accounts for an organic evolution of science and education (Chapter 4), where the system's *telos* is set and continuously, cyclically redefined from within, Peters and Hirst's notion of *objective* of education is underpinned by the givenist assumption that education has some universally established defining features.

Also, this analytical approach draws clear distinctions between knowledge, belief and understanding. They stem from the typically modern understanding of *concept* as something pertaining to *mind*, where *mind* is an inner psychological feature, detached from the external world of an organism, which can only reflect reality:

"Indeed there can be effective thinking only when the outcome of mental activity can be recognised and judged by those who have the appropriate skills and

knowledge, for otherwise the phrase has no significant application." (Hirst and Peters, 1970, p. 35)

On a semiotic account mental activity is a form of semiosis and, as such cannot be separated from non-mental; it is interpretation, which resulted from adaptation. This analytical approach is, not surprisingly, bounded to an anti-iconic philosophy by assuming a dichotomy between concept, the tool of the rational mind, and image:

"What is a concept? It obviously is not an image." (Peters in Peters, Hirst, Dearden (eds), p. 3)

Therefore, on this account, education is an endeavour suitable only in the realm of the concepts of mind, which can be analysed. Education would not apply to non-human animals or to "primitive tribes", cultures where no proper knowledge could be found (p. 4).

Nevertheless, even if this account of liberal education founded on modern analytical philosophy is dominated by dualism and essentialism, it has the merit of entrenching a tradition of British philosophy of education. As such, it led to research that detached from both modern dualism and analytic philosophy. Examples of contemporary researchers from the Philosophy of Education Society of Great Britain environment that prove that this school detached from modern solipsist thought and dualism are *inter alia* Paul Standish, Andrew Stables and Gert Biesta. Arguably, the present work was written within the influence of this academic environment.

Despite modern attempts at developing a liberal curriculum, once the semiotic consciousness faded away from the educational *Lebenswelt*, philosophy of education lost the rationale of its liberal principle and the university had to change its way of being. However, insofar as semiotics underpinned liberal education, a return to liberal education might be promoted through a re-emergence of semiotics. This is possible now, given education's recent rediscovery of semiotics. The present thesis will only develop a Peircean semiotic theory of learning and does not aim at analysing the *Lebenswelt* of university. Nevertheless, the development that it brings permits this possibility: a Peircean theory of learning should offer the conceptual apparatus to analyse educational institutions as *Lebenswelt*. It will be a mereological analysis method, comparing signifying parts (diagrams) of the *Lebenswelt* among themselves and with the whole system. This should prove to be an useful prognosis method: once the educational institution and system are understood as *Lebenswelt* then the direction of an educational institution can be predicted to some extent. Most important is that the intimate compatibility between philosophy of education and semiotics was rediscovered and developed, providing new insights that were not yet achieved in medieval semiotics. I will argue that the switch from the present dominating functionalist education to liberal education consists in a switch from an attitude to teaching and learning that is focused on instruction to an attitude which regards free discovery to be the essential element of teaching and learning. This switch can be generated by a semiotic philosophy of education. The semiotic concept of *icon* is necessary for a semiotic educational theory that regards learning as free

discovery. The *icon* is a central concept in Peirce's semiotics. The next section introduces the Icon concept.

C. The Icon in semiotics

In section B it was explained that semiotics was developed theoretically first by the Patristics, who had a certain inclination towards understanding the world as *sign*, a tendency inherited from the Apostolic method of allegoresis (e.g. the typological relations between Old Testament and New Testament texts). For example, the Patristics often shown an understanding of the unperceivable in a relation of *likeness* to the perceivable: these are the seeds of the semiotic consciousness. The Icon has been generally understood as the sign that signifies due to similarity (likeness) and it is therefore defined in contrast to purely conventional signs. In Peirce's semiotics the Icon has a central role in apprehension:

"For a great distinguishing property of the icon is that by the direct observation of it other truths concerning its object can be discovered than those which suffice to determine its construction. Thus, by means of two photographs a map can be drawn, etc. Given a conventional or other general sign of an object, to deduce any other truth than that which it explicitly signifies, it is necessary, in all cases, to replace that sign by an icon. This capacity of revealing unexpected truth is precisely that wherein the utility of algebraical formulae consists, so that the iconic character is the prevailing one." (CP 2.279)

The physiology of arguments itself is intelligible because it has an *iconic syntax* (further developed in Chapter 5). With this consideration, the Icon obviously plays a central role in a Peircean learning theory. In this section I will introduce the concept of signification by means of similarity that Peirce picked up from his semiotic forerunners.

Throughout the history of semiotics there are two principle foci that the discipline requires: defining the sign and classifying signs according to their criteria of signification. Classifying is necessary because once the criteria of signification and the relations among the criteria are established the way in which signs are used is elucidated. Among the many criteria and many classifications developed a certain dichotomy is often present: the dichotomy between natural and conventional signs. There are some signs which do not need convention (such as the case of the female firefly's mating signalization explained in Stjernfelt 2014) – be it cultural, political, juridical, technical, or other kinds of convention. There are other signs, essential for the life of many species, that are conventional. For instance, the first famous classification of signs, belonging to St Augustine, developed in *De Doctrina Christiana* divides signs into *natural* (*naturalia*) and *given* (*data*). The criterion for this division is intentionality. Natural signs are not intentional, such as the cases of smoke signifying fire or a footprint signifying the passing by of an animal. Given signs are intentional – such is the case of speech. The distinction between non-conventional and conventional is not clear here yet, but it is remarkable that natural

signs tend to be non-conventional while given signs tend to be conventional. This natural/given signs distinction does not necessarily qualify St Augustine's semiotics as dualist, since both of these modes of signification fall under the same category of phenomena – *the sign*, which is relational being. The dualism of St Augustine's semiotics is still debated (Deely 2009).

In Peirce's taxonomy of signs the signs that signify immediately, naturally, without convention pass by the name of *Icons*. The term is of Greek origin, *εικών* (*eikon*).

Perhaps Peirce was not even thoroughly knowledgeable about these authors in particular, but the moment in the development of semiotics when the term εικών was clearly used in this manner is the Iconoclast controversy (7th – 9th centuries). *Eikon* was defined as a representation by means of *likeness*, in contrast to symbol, and the acceptance of the possibility of purely iconic signification justifies a realist doctrine. As a text can signify a historical narrative because the text is *like* the narrative, in the same way a depiction can signify a historical narrative. Thus, since a text and an image can refer to the same object in the same way there is no semiotic distinction between text and image – they are both icons:

"A true "icon" claimed to be something essentially different from a "symbol." It had to be a representation of something real, and a true and accurate representation. A true icon had to be, in the last resort, a historic picture." (Florovsky, 1950, p. 92)

The main authors who accounted for this understanding of *εικών* are St John of Damascus, St Theodore the Studite, and Patriarch Nikephoros. Their adversaries, from a philosophical point of view, were the adversaries of Peirce: idealists. The arguments against the use of Icons came from neoplatonism, not Hebraic scholarship as it is often thought (cf. Florovsky 1950, Lock 1997). While Peirce labelled his own doctrine as *extreme scholastic realism*, the argument for the use of Icons was also "bound to be some sort of historic realism" (Florovsky 1950, p. 92). Therefore, the sides of this debate were nominalists – refuting the relevance of icons on account of their ontological uncertainty – and realists – embracing descriptions in terms of *likeness*. The semiotic main argument of the theologians of the time that defended the veneration of Icons in the Christian Church was that without an iconic form of signification not even conventional signification would be possible. For instance, Charles Lock sums up St John of Damascus' argument by paraphrasing him thus:

"Either accept these [icons], or get rid of those [Gospels]..." (1997, p. 10)

Conventional signification, such as speech and written text, is here argued possible only due to icons that offer the ground for intelligibility. This idea is built upon the earlier Fathers' explanation that reality itself would not be intelligible without analogy[8]. The same is stated clearly in Peirce:

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[8]Andreopoulos (2006) noticed a difference between two hermeneutical methods: (1) *anagogy*, employed in the Christian practice of veneration of icons on the basis of allegoresis, and (2) *analogy*, mere representation due to similarity, a parallelism. However, this distinction is not relevant for the present semiotic developments.

"The meanings of words ordinarily depend upon our tendencies to weld together qualities and our aptitudes to see resemblances, or, to use the received phrase, upon associations by *similarity;* while experience is bound together, and only recognisable, by forces acting upon us, or, to use an even worse chosen technical term, by means of associations by *contiguity.*" (CP 3.419)

Thus, in Peirce's case the concepts of similarity and continuity are inter-dependable. Together, similarity and continuity constitute reality – the reality of infinite possibilities, which is the ground for what is generally termed *reality*. This idea will be further explored in the next chapters.

It is already obvious that this account of Icon does not limit this sign type to sensory or mental images, as modality is not its defining character. The Icon is not simply an image of something. The image is rather a subtype of Icon. Another previous account that clearly posits the essential role of similarity in conceiving the intelligible world is the 16th century classification of signs of Petrus Fonsecus. Fonsecus distinguished between formal signs, which form cognition, and instrumental signs, which consist in the further use of formal signs. Fonsecus' formal signs mostly coincide with St Augustine's natural signs, but with his definition Fonsecus also stated that cognition is formed by similarity (*similitude*):

"Formal signs are similitudes or certain forms (species) of things signified inscribed within the cognitive powers, by means of which the things signified are perceived. Of this sort is the similitude which the spectacle of a mountain impresses upon the eyes, or the image which an absent friend leaves in another's memory, or again the picture one forms of something which he has never seen. These signs are called "formal," because they form and as it were structure the knowing power." (Petrus Fonsecus, 1564: lib I, cap VIII in Deely, 1982, p. 51)

Fonsecus' *instrumental sign* is St Augustine's concept of *given sign* – a sign conveying more than the formation of knowledge, a value such as aesthetic or scientific, a cultural, perhaps even linguistic sign. These signs can occur only on the basis of an existing *formal sign*:

"Instrumental signs are those which, having become objects for knowing powers, lead to cognition of something else. Of this sort is the track of an animal left in the ground, smoke, a statue, and the like. For a track is a sign of the animal which made it: smoke the sign of an unseen fire: a statue finally is a sign of Caesar or someone else." (Petrus Fonsecus, 1564: lib I, cap VIII in Deely, 1982, p. 51)

Thus, according to Fonsecus, similarity is the basis of cognition and representation. The formal and instrumental signs are not in a relation of dichotomy, but rather of co-extensiveness: the latter develop on the former. This is as well the crux of Peirce's semiotics and it is therefore of essential importance for a theory of learning. Signification is continuous: a symbol does not cease to be an icon, but rather it is a further development upon an icon. This further development makes it essentially more complex than the icon, but it does not do away with the basic iconic

character which evoked its possibility of signification in the first place. The icon, for Peirce, is the only sign that can be a predicate. To explain to someone is to predicate within her world of resemblances:

„The only way of directly communicating an idea is by means of an icon; and every indirect method of communicating an idea must depend for its establishment upon the use of an icon. Hence, every assertion must contain an icon or set of icons, or else must contain signs whose meaning is only explicable by icons. The idea which the set of icons (or the equivalent of a set of icons) contained in an assertion signifies may be termed the predicateof the assertion." (CP 2.278)

The concept of Icon plays a crucial role in Peirce's semiotics, therefore. Peircean scholars have only recently begun to understand the icon's place in Peirce's work. Actually, it is with a certain switch of attention from conventional signs to iconic signs that semiotics makes a step towards understanding Peirce's philosophy in its own terms, as a realist semiotics and not as a nominalist or linguistic semiotics. The hypothesis of Iconicity, consisting in that icons suffice for signification to occur and that more complex signification needs an iconic ground, also supports the doctrine of suprasubjective reality. Peirce gives a hint in this direction by proposing a *doctrine of physical-psychological parallelism*. This parallelism is iconic, namely the psychical is *like* the physical. A similar idea of parallelism, but applied only to text analysis was noted earlier in the method of allegoresis used in the interpretation of Scripture, which is here proposed as a theoretical starting point for iconicity grounded semiotics. This parallelism actually occurs between an *Innenwelt* and an *Umwelt* – the *Umwelt* serves as an iconic ground for the *Innenwelt*, the two being inseparable but distinguishable parts of a living organism. In the same way, while the psychical is different from the physical, the physical is the iconic ground for the psychical. The psychical is contained by the physical, but the two are nevertheless independent in some regard from the other:

"Yet as to there being nothing in the physical universe that corresponds to a given psychical phenomenon, the doctrine of parallelism itself disavows that opinion. Better let us say that in the present state of physical theory the peculiarity of redness finds no definite explanation. It would be an illogical presumption to say that it never can be explained. Redness, though a sensation, does not in the percept proclaim itself as such. At any rate, whether the psychical can be directly observed or not, no linguist, ethnologist, nor historian -- no psychologist, even, in an unguarded moment – but will agree that his science rests very largely, if not quite entirely, upon physical *facts.*" (CP 1.254)

Both conventional and iconic signs play a crucial role in the biological realm, the signifying structures of the Universe, but, from this point of view, it is strictly due to iconic signs that other types of signification become possible. Frederik Stjernfelt identified a certain 'iconic turn' within semiotics, taking place in the 1990s, marked by Umberto Eco's new take on Peirce in *Kant and the Platypus*:

"One of the results of the iconic or phenomenological turn of semiotics during the recent decades is that its close affiliation with the Linguistic Turn is weakening. Thus, linguistics ceases to be the model science of semiotics, even if language, as an object, of course, remains a core issue for semiotics. Language appears as the most central of many cognitive and communicative tools of man, and semiotics – as indicated by the predicate "cognitive" in cognitive semiotics – must base itself on the study [of] all such tools. This implies the empirical connection of semiotics to all aspects of cognitive science (from sociology over psychology to neuroscience) – and the conceptual connection of semiotics to epistemology, philosophy of science, and ontology." (in Bundgaard and Stjernfelt, p. 232)

Therefore, the iconic turn has a crucial role in the conceptualisation of semiotics as a discipline, an academic *Lebenswelt* in itself, distinct from, for instance, linguistics. The rationale of the present thesis is to develop an iconic turn semiotic educational theory.

Thus, if the foundation of any predication is similarity, the present Peircean Theory of Learning regards learning as a discovery of similarities.

D. Learning as discovery

If natural evolution had to adapt to structures of signification (see section A of the present chapter and Stjernfelt 2011, 2014) and living beings learned to re-cognize signs then culture is a semiosic result on the stage of evolution – evolution's interpretation of the natural world. Kull (in Bundgaard and Stjernfelt 2009 and Emmeche and Kull 2011) accounted that categorization, which is knowledge acquisition, or rather the integration of signification within a web of signs, is based on recognition. Living beings discover their *Umwelten* and within their *Umwelten* various signs that they could use, that they actually live by. This is the process which evokes the relation of similarity:

"Categorisation is what all living beings do and what organises them; categorisation is based on recognition processes that are inevitable for organisms; speciation and perceptual categorisation are analogical in their mechanism. This is in the nature and origin of species – that species is a self-keeping category *per se*; that species occur because the continuous variability in a communicative population is unstable; that biological species is the same kind of category as any semiosic category (Kull 1992). Thus, what we have here is an explanation of the origin of qualitative differences, or a general mechanism that makes differences, or a process from which the relation of similarity emerges. This leads also to a general definition of semiotics as a study of qualitative diversity." (Kull in Bundgaard and Stjernfelt, p. 116)

The Icon is the only sign that can be a predicate because it is the sign "from which information may be derived" (CP 1.309, see also CP 2.314). If the Icon,

signification by similarity that is, is the only sign that can be used as a predicate then learning consists in a discovery of similarities. The claim is, surprising as it may seem, that similarity evokes qualitative diversity.

The recent orientation that educational studies have taken towards semiotics is not a mere coincidence. The contemporary semiotician can now observe a structural coherency of this evolution of institutionalized liberal education, within the much longer, broader and general evolution of life: evolution itself had to come about with the phenomenon of *learning*. The discovery that life forms benefit from learning promoted systematized learning, first on a geological timescale and then on a historical timescale. Systematized learning on a historical timescale is called *education*. Living beings became better at re-cognizing their *Umwelt*, expanding the dimensions of their significant world, discovering new significations and predicating with them. *To predicate* is not merely *to use*, as explained by von Uexküll: our vital functions are distinct from our utensils (things that we use) that come to our aid. Semiosis is vital and predication is a form of semiois. Of course, using instruments is also a form of semiosis, but it is only a subcase of predication. Learning to use a hammer to hammer nails, a pen to write, to place a stone so as to build something consists in discovering certain predications of an icon or a set of icons. The type of semiosis that allows the use of a stone as a part of a building or a pavement is the same type of semiosis that allows the use of the stone as a weapon. The various uses of a carrier of meaning are different interpretations which stem from different adaptations to different environments. One discovers certain qualities of a potential carrier of meaning in certain conditions.

This explains creativity as well. Creative acts consist in discovering useful similarities which until their discovery were obscured, probably by the discoverer's own *Umwelt*. A new discovery of similarities triggers the reshaping of an entire *Umwelt*: this is a re-cognition. Thus biosemiotics proves to be very relevant for education studies. The account of learning as discovery of similarities has consequences in all important issues of education, such as creativity, intuition, and evaluation, generating an entire epistemology of education. Stjernfeltadds that banal remarks as well as the most impressive achievements of human knowledge consist in discoveries of similarities:

"The fact that it has never before been asserted that this orange on the table before me is similar in shape to the moon (given a certain granularity of similarity classes), might cause sensible souls to see me as a genius for creating metaphors, but, modestly, it seems strange that this similarity should be something created by me. I merely discover (no great effort) this similarity by applying a certain *tertium comparationis* (a circle, give or take a certain rate of deformation). In rare cases, of course, it may take great pains to establish a new complicated *tertium comparationis* to see a similarity (Newton discovering the similarity between the movement of the apple and of the heavenly bodies, Eliot discovering the similarity between cruelty and the growth of April flowers)" (Stjernfelt, 2007, p. 57)

Thus, if learning consists in discovery of similarities, the relation between semiosis in general and the semiosis that consists in the use of tools is the same as the relation between liberal education and instruction. Using tools is a particular case of discovery of similarities and instruction is a particular case of learning (discovery of similarities). Instruction proceeds much easier on the foundation of a genus: learning to play an instrument in a certain style is facilitated if the student knows musical theory (the liberal art classically understood as the application of arithmetic) and musical theory is easier to learn if the student knows arithmetic (the first liberal art of the quadrivium). Of course, semiotics aims at explaining much more: the learner will perform much better if that certain use of that particular instrument fits as signification in her web of signs. Signification (semiosis) is infinite and therefore this match (or mismatch) cannot be quantified, but up to a certain extent it can be described in terms of signification. A teacher can help the learning just in the way in which another fellow learner can help his colleague. Teaching is not instruction, but has the same semiosic structure as learning. This argument, that teaching is a form of learning is made by St Augustine in the previously mentioned *De Doctrina Christiana*, when he introduced to concept of sign and its necessity for educational philosophy. The teacher and the learner discover together, actually, discovering each other, or each others' structures of signification. Discovery is also a revelation, because by it not only is something unknown made known to a knowing subject, but the discovered object, being genuinely understood, can also be further on revealed to others. It is all part of the same learning process. When defining learning as free discovery of similarities a liberal account of education, where learning happens freely, is implied:

"Thus, I tend to think it is a duty for scientists to support free speech: the most liberal exchange of signs compatible with democracy." (Stjernfelt in Bundgaard and Stjernfelt, p. 232)

E. The relevance and aim of a semiotically grounded education

Thus, I argue that the switch from the present dominating modern, mechanical, education to liberal education consists in a switch from an attitude to teaching and learning that is focused on instruction to an attitude which regards free discovery to be the essential element of teaching and learning. This switch can be generated by a semiotic philosophy of education. This is possible now, given education's recent rediscovery of semiotics. The rediscovery of the intimate compatibility between philosophy of education and semiotics proves to be essential.

Approaching education in semiotic terms does not explain the lack of success of the student as a cognitive impediment (as psychology tended to) or social disfavouring, a lack of capital, a lack of social power, the belonging to certain social strata (as sociology tended to). Semiotics does not acknowledge such a crude account as the failure of the learner. What is taught by the teacher never coincides perfectly with what is learned by the student. On a semiotic account, learning is

interpreting. An immediate conclusion is that genuine learning, whatever might it be, is possible only in a free environment. If earning something new consists in a discovery of similarities it consists in the placing of a Subject in a newly discovered relation of signification with a Predicate, and this relation is always hidden for the teacher. This stand, that can set the direction of research in semiotics of education, can only be valid by accepting that the learner does not only learn to handle a language (a code), but she is learning the general doctrine of signs (logic), which occurs wherever there is life (Kull 2005). Thus, the teacher should offer the learner the optimal experiences for learning so that the learner develops her logical (semiotic) capacities for handling real-world events. The learning process of logic is immanent, occurring naturally, as evolution perfected it over time, being any human person's capability of predicating (discovering similarities). What it is not immanent and should be learned is that which is valued socio-culturally.

Two types of performances are therefore expected from the learner: (1) to discover the similarities that led to her understanding the web of signs evolving as society and (2) discovering similarities which society has not yet discovered, thus contributing to the continuous evolutionary progress. This is the previously mentioned concept of *re-cognition*: the learner has to re-cognize the similarity between her inherent web of signs (herself) and the yet unknown object (what is taught). By assuming these two performances from the students there is no more justification for a strict distinction between teaching and learning. Teaching and learning are bound together as a phenomenon of interpretation. Therefore there is only one phenomenon which we might divide into two concepts (teaching and learning), arguably for the sake of conceptual development; 'teaching and learning' can be more simply be called 'learning,' or 'life,' or 'local plurality.' On a semiotic account one necessarily implies the other. If learning is free interpretation under the form of discovery then the teacher does not know what the student is about to discover. Learning, in this semiotic sense, is a continuous abduction-deduction-induction phenomenon and it is in all cases unique and the chance of an identical repetition of the same learning phenomenon is impossible, since there are no chances of repeating an identical situation of sign relations. Every living organism is semiotically distinct (a biologist might argue that two zebras are physiologically equal, but semiotically they will never coincide). To be semiotically distinct is to be *unique* and being *unique* means learning in a *unique* way. If organisms are *unique* (despite their similarities and even partial coincidences of *Umwelt*) then it does not mean that reality is schizophrenic and communication impossible. The uniqueness of living organisms is possible in a local plurality. This is equivalent with saying that similarity makes communication possible. Nöth and Santaella (2011) explain that on a Peircean account the relation of identity would make communication superfluous or unnecessary. The relation of similarity implies a degree of difference. However, in the context of Peircean semiotics, the relation of similarity is relevant for learning, not that of difference. The student and the teacher are involved in the same phenomenon, the same local plurality, as they are both learning. Thus, the argument for learning that which is intrinsically valuable, the principle of liberal education,

flows naturally from a semiotic perspective. A craft cannot be taught at all, the skills of hammering, knitting or riding a bike are learned only in an accident of signification, due to an experience of the learner (this will be thoroughly explained in Part II).

To develop a semiotic framework that investigates the semiosic phenomenon of learning and the role of similarity in learning, in the next chapter I explain Peirce's list of phenomenological categories, his concept of sign, and his taxonomy of signs.

Chapter 2
Charles S. Peirce's list of categories and taxonomy of signs

In the previous chapter some concepts that are central for developing a Peircean Theory of Learning – such as iconicity, suprasubjectivity, biosemiotics and semiotic evolution – have been introduced. The present chapter looks at how Charles Peirce picked some of these concepts and built a semiotic philosophy at the center of which stands nothing else but what Peirce found to be the principle of learning, namely diagrammatic reasoning.

Peirce's work is vast and rich but still we do not possess an organized collection of it. Now, after a century since Peirce, the interpretation of his writings is still subject to controversy. I consider that a key for understanding Peirce's philosophy is acknowledging Peirce's own bibliographical sources, reason for which I considered the previous chapter necessary. The present thesis accepts a certain reading of Peirce that is found in Deely (2001) and Stjernfelt (2007). Seen through this perspective, Peirce's pragmaticistic philosophy appears as asuprasubjective realism, *an extreme scholastic realism*, to put it in Peirce's own terms (CP 5.470). This reading of Peirce fits in a large extent with the late Eco's re-reading of Peirce marked by *Kant and the Platypus* (1997). Since throughout Peirce's writings it can be noticed that for him education is a method with the only purpose of serving the evolution of science, which serves the evolution of signs in general, life in itself that is, I argue that in Peirce's semiotics there is an implicit philosophy of education. This implicit philosophy of education that Peircean semiotics implies is probably inherited from the scholastics' Doctrine of Signs, which, as it was argued in the previous chapter, had the rationale of developing liberal education. The purpose of the present thesis is to bring to light this philosophy of education so that, with its own semiotic means, to serve education explicitly. It will constitute, more focused than semiotics general, a Peircean Theory of Learning.

A. Peirce's categories

Peirce has the merit of rediscovering the doctrine of signs of the medievals in the second part of the 19th century (Deely, 2001). His philosophy can be called triadic, for the three categories that he discovered and used. Besides having proved that any graph of a higher degree than 3 can be reduced to a graph of the 3rd degree while a 3rd degree graph (a triad) is irreducible to 1st (monads) or 2nd (dyads) degree graphs, Peirce found three principles that seem to appear in most philosophical systems, three principles that he used to explain several aspects of the Universe:

"Three conceptions are perpetually turning up at every point in every theory of logic, and in the most rounded systems they occur in connection with one another. They are conceptions so very broad and consequently indefinite that they

are hard to seize and may be easily overlooked. I call them the conceptions of First, Second, Third. First is the conception of being or existing independent of anything else. Second is the conception of being relative to, the conception of reaction with, something else. Third is the conception of mediation, whereby a first and second are brought into relation." (CP 6.32)

On this three principles Peirce built his semiotics, a physiology of arguments as Stjernfelt described it (2007). Even though some are tempted to see in this the haste of following a somewhat naïve categorical schema, this physiology of arguments proves to be highly insightful and brings a revolution in philosophy by overcoming the typical dualisms that modern philosophy preached ever since Locke and Descartes (see Deely 2001, 2009). The physiology of arguments is the Universe suprasubjective – a Universe of mediations. It is a physiology because signs are natural phenomena, harmoniously interacting organically and it is a physiology of arguments because the argument is the fully developed sign, to which all signs tend[9] and contribute to, in their interaction. Even though living beings encounter many real arguments in their experience, and arguments cannot be incomplete, as they are *par excellence* the completely evolved signs, the fully developed argument is, nevertheless, probably infinitely distant on the continuum of evolution according to Peirce. Arguably a typical conclusion for a 19th century mathematician such as Peirce, this assumption justifies that since there is Truth and the search for Truth is not futile, but mandatory and beneficial, Truth will probably never be reached:

"At any time, however, an element of pure chance survives and will remain until the world becomes an absolutely perfect, rational, and symmetrical system, in which mind is at last crystallized in the infinitely distant future." (CP 6.33)

These words of Peirce encapsulate the rationale of education: education has the purpose of leading the mind towards this perfect system, to the point where perhaps mind and Truth coincide. The quintessence of Peirce' pragmaticism is that there is Absolute, Perennial Truth, the Truth that philosophy has been thinking about as ἀλήθεια, but while the achievement of it is impossible actually the search for it is mandatory, this search being evolution (growth) itself. The features of the physiology of arguments are infinitely developing towards Truth, with every moment closer, but always infinitely distant. Thus, Peircean philosophy is neither idealist – there are no universal ideas whose vague emanations we are – nor skeptikal – the pursuit of truth is not futile, but, on the contrary, mandatory – and nor material – ideal reality does not stem from material reality. Ideas, material objects, psychological states, every such entity is a signifying phenomenon with the same ontological statues. Ontologically nothing prevails, nothing is prior or posterior. Even while Peirce's semiotics can acknowledge that some phenomena are vague in themselves (Nöth & Santaella 2011), their ontological status is not diminished: they exist as vague as other things exist as clear. This evolution towards Truth is the principle that generates life, in the form of the manifestations of triadic relations, and

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[9] Chapter 5 will develop further on the notion of physiology of arguments.

it is the principle that constitutes the purpose of life as well. Life occurred so that itcan know, so that someone can know the Universe, arguably the Universe's way of knowing itself. Only in the service of this endeavor the idea of education first came about and at the service of this endeavor education has been institutionalized at a certain evolutionary stage. From this point of view, any other purpose, any other drive that education might have would corrupt it. The argument for liberal education it is thus clear.

Thus, if these three categories – Firstness, Secondness, Thirdness, as Peirce refers to them – best describe the Universe, there are three types of signs: the first, signifying a mere independent existence, the second, a signifying relation of two termini, and the third, a mediation, that is the habit connecting a mere independent existence and a dyadic relation. Any relation of signification consists in three termini – a First, a Second and a Third – or otherwise, if it would not contain three elements, it would be either a mere quality, either a mere individual existence, isolated from the physiology of arguments. The classification of signs does not stop at these three basic types, then, because a sign can signify in three different aspects: according to its First, according to its Second, and according to its Third. Peirce set the terminology for the First, the Second and the Third of a sign: the First of a sign is the Representamen, the Second is the Object and the Third is the Interpretant – the Interpretant is the result of the interpretation, of the action of signs, the conclusion namely. Hence, Peirce found nine (three times three) essential types of signs, three trichotomies:

"Signs are divisible by three trichotomies; first, according as the sign in itself is a mere quality, is an actual existent, or is a general law; secondly, according as the relation of the sign to its object consists in the sign's having some character in itself, or in some existential relation to that object, or in its relation to an interpretant; thirdly, according as its Interpretant represents it as a sign of possibility or as a sign of fact or a sign of reason." (CP 2.243)

This does not mean that a sign is strictly one of these nine types, but that these nine types of signification reveal aspects of the sign's signification. Stjernfelt remarked this:

"As the sign consists of three components it comes hardly as a surprise that it may be analysed in nine aspects – every one of the sign's three components may be viewed under each of the three fundamental phenomenological categories." (2007, p. 25)

The sign is the genuine triadic relation, that is, its three termini are irreducible and have their being only within the act of representation. The genuine triadic relation evokes an infinity of representation beyond itself; even if it is self-sufficient it inevitably produces signification *ad infinitum*:

"A *Sign,* or *Representamen,* is a First which stands in such a genuine triadic relation to a Second, called its *Object,* as to be capable of determining a Third, called its *Interpretant,* to assume the same triadic relation to its Object in which it

stands itself to the same Object. The triadic relation is *genuine,* that is its three members are bound together by it in a way that does not consist in any complexus of dyadic relations. That is the reason the Interpretant, or Third, cannot stand in a mere dyadic relation to the Object, but must stand in such a relation to it as the Representamen itself does. Nor can the triadic relation in which the Third stands be merely similar to that in which the First stands, for this would make the relation of the Third to the First a degenerate Secondness merely. The Third must indeed stand in such a relation, and thus must be capable of determining a Third of its own; but besides that, it must have a second triadic relation in which the Representamen, or rather the relation thereof to its Object, shall be its own (the Third's) Object, and must be capable of determining a Third to this relation. All this must equally be true of the Third's Thirds and so on endlessly; and this, and more, is involved in the familiar idea of a Sign; and as the term Representamen is here used, nothing more is implied. A *Sign* is a Representamen with a mental Interpretant. Possibly there may be Representamens that are not Signs." (CP 2.274)

Peirce names the action occurring among the Representamen, Object and Interpretant *semiosis:*

"All dynamical action, or action of brute force, physical or psychical, either takes place between two subjects [whether they react equally upon each other, or one is agent and the other patient, entirely or partially] or at any rate is a resultant of such actions between pairs. But by "semiosis" I mean, on the contrary, an action, or influence, which is, or involves, a coöperation of *three* subjects, such as a sign, its object, and its interpretant, this tri-relative influence not being in any way resolvable into actions between pairs." (CP 5.484)

B. Division's of signs

The first trichotomy of signs, according to First significance, is the Qualisign-Sinsign-Legisign triad, to which Peirce also refers as Tone-Token-Type. Peirce's, at least at a first glance, strange terminology suggests that these types have to do with a quality, a singularity and a law. Like each of the three triads of sign types, the qualisign, sinsign and legisign are situated on a continuum of signification – this is why they constitute a trichotomy. Therefore, to understand Peirce's divisions of signs it is needed to understand his controversial concept of continuity. The concept of continuity was a life-long concern for Peirce. After not being satisfied anymore with the broadly assumed continuity proposed by Cantor, and neither with the simple Kantian definition of continuity as "infinite divisibility" (CP 6.168), in the 1890s Peirce finally expressed his own account of continuity, the difference consisting in that according to Peirce a continuous set is never exhausted by its individual components (cf. Stjerfnel, 2007, Chapter I and Bellucci 2013, p. 186). A continuum does not diminish if constituting parts of it are extracted, because any constituent part of a continuum is indistinct within the continuum, and, therefore, something can

only be a part of a continuum potentially; if it were actually a part of a set, the set would cease to be a continuum, as interrupted by a component, by a "topical singularity":

"A continuum cannot be disarranged except to an insignificant extent. An instant cannot be removed. You can no more, by any decree, shorten a legal holiday by transferring its last instant to the work-day that follows that feast, than you can take away intensity from light, and keep the intensity on exhibition while the light is thrown into the ash-barrel. A limited line AB may be cut into two, AC and C'B, and its ends joined. C' to A and C to B. That is to say, all this may be done in the imagination." (CP 1.499)

Returning to the first trichotomy of signs, Peirce defines these sign types as follows:

"According to the first division, a Sign may be termed a *Qualisign,* a *Sinsign,* or a *Legisign.*
A *Qualisign* is a quality which is a Sign. It cannot actually act as a sign until it is embodied; but the embodiment has nothing to do with its character as a sign." (CP 2.245)

The Qualisign is a signifying quality. Such is the feeling of perceiving *redness*, or a noise. The Qualisign is vague and it is a limit case of signification. When such a sign is used it immediately evolves into a more complex sign, such as an Icon, or a Sinsign, which is the Second type of this trichotomy:

"A *Sinsign* (where the syllable *sin* is taken as meaning "being only once," as in *single, simple,* Latin *semel,*etc.) is an actual existent thing or event which is a sign. It can only be so through its qualities; so that it involves a qualisign, or rather, several qualisigns. But these qualisigns are of a peculiar kind and only form a sign through being actually embodied." (CP 2.246)

The Sinsign is an objectified dyad of qualities, such as perceiving *red* in contrast to *blue*. The Third of this trichotomy, termed *Legisign*, is a mediation of qualities. It embodies a convention:

"A *Legisign* is a law that is a Sign. This law is usually established by men. Every conventional sign is a legisign [but not conversely]. It is not a single object, but a general type which, it has been agreed, shall be significant. Every legisign signifies through an instance of its application, which may be termed a *Replica* of it. Thus, the word „the" will usually occur from fifteen to twenty-five times on a page. It is in all these occurrences one and the same word, the same legisign. Each single instance of it is a Replica. The Replica is a Sinsign. Thus, every Legisign requires Sinsigns. But these are not ordinary Sinsigns, such as are peculiar occurrences that are regarded as significant. Nor would the Replica be significant if it were not for the law which renders it so." (2.246)

The feeling evoked by the relation between *red* and *blue* within a painting is a *Legisign*.

Thus, the sign in itself is: (1) as a mere quality, a Qualisign, (2) as an actual existent, a Sinsign, and (3) as a general law, or habit, a Legisign.

The sign according to its Second, as according to its relation to its object, is: (1) as the sign's character in itself, an Icon, (2) in its existential relation to the object, an Index, and (3) in relation to its interpretant, a Symbol. It is an important remark for the effort of understanding the phenomenon of learning according to Peirce that the criterion which is continuous within this trichotomy, keeping the Icon-Index-Symbol trichotomy coherent, is similarity. The criteria which sets a trichotomy's continuity is set by the First type of the trichotomy, in this case the Icon, which signifies due to similarity (likeness), as it is clear from Peirce's own definitions:

"According to the second trichotomy, a Sign may be termed an *Icon,* an *Index,* or a *Symbol.*

An *Icon* is a sign which refers to the Object that it denotes merely by virtue of characters of its own, and which it possesses, just the same, whether any such Object actually exists or not. It is true that unless there really is such an Object, the Icon does not act as a sign; but this has nothing to do with its character as a sign. Anything whatever, be it quality, existent individual, or law, is an Icon of anything, in so far as it is like that thing and used as a sign of it." (CP 2.247)

A photograph can be an example of Icon: if somebody who has seen me before sees a photograph of me might think of me because of the resemblance between me and the colors imprinted on the paper constituting the photograph. If it has a reference, an Icon evolves into an Index:

"An *Index* is a sign which refers to the Object that it denotes by virtue of being really affected by that Object. It cannot, therefore, be a Qualisign, because qualities are whatever they are independently of anything else. In so far as the Index is affected by the Object, it necessarily has some Quality in common with the Object, and it is in respect to these that it refers to the Object. It does, therefore, involve a sort of Icon, although an Icon of a peculiar kind; and it is not the mere resemblance of its Object, even in these respects which makes it a sign, but it is the actual modification of it by the Object." (CP 2.248)

The photograph is a good example of Index as well, because the imprinted color on the paper is a direct effect of a real state of affairs: I was sitting such a way, like in the photograph, in a certain place at a certain time, when light was imprinted on the film.As when one notices a mark on the ground and concludes that an animal of a particular shape and size passed by, in a certain direction, with a velocity inferred from the characters of the imprinted trace, in the same way light is imprinted on the film in the case of photography, which makes the Sign emerging from a photograph be directly affected by its Object – this is an Index. From an Index a Symbol can evolve:

"A *Symbol* is a sign which refers to the Object that it denotes by virtue of a law, usually an association of general ideas, which operates to cause the Symbol to be interpreted as referring to that Object. It is thus itself a general type or law, that

is, is a Legisign. As such it acts through a Replica. Not only is it general itself, but the Object to which it refers is of a general nature. Now that which is general has its being in the instances which it will determine. There must, therefore, be existent instances of what the Symbol denotes, although we must here understand by "existent," existent in the possibly imaginary universe to which the Symbol refers. The Symbol will indirectly, through the association or other law, be affected by those instances; and thus the Symbol will involve a sort of Index, although an Index of a peculiar kind. It will not, however, be by any means true that the slight effect upon the Symbol of those instances accounts for the significant character of the Symbol." (2.249)

The photography can very well be a Symbol, like the photography taken by Alfred Eisenstaedt on Victory over Japan Day of a sailor kissing a woman, in our socio-cultural environment, in our *Lebenswelt*, became a symbol for freedom. That something signifies means that it is used in a certain way (to use is a relation). A photograph can be the sense perceptible ground for anything. Actually, a brute, singular entity such as a photograph is a non-existent abstraction. When things come into being, that is into the physiology of arguments, they are themselves phenomena of signification, interacting with other signs. As in Peirce's definition, anything can be an Icon of anything else as long as it is used in such a way according to a likeness. A photograph of me can very well be an Icon signifying, by means of similarity, a man, an animal, a feeling, stupidity, a rectangle, light, darkness, etc., all depending on how it is used. If a mathematics teacher grabs a photo of me to explain what a rectangle is, it works as a rectangle, if a photographer explains to his apprentice how light is imprinted on the film using a photograph of me, it signifies light and the natural phenomena involved. Of course, these exemplified signs work for the teacher in this way and the teacher can never know how the students are interpreting her examples. For instance, in the case of the mathematics teacher, one of the students might ignore the teacher's explanations and her finger pointing to the four edges of the photograph and notice the imprinted colors so as to recognize and think about the person in the photograph. This is one of the strong points that semiotics, particularly this Peircean approach to learning, brings in the service of education: a strong consciousness that the taught sign can never perfectly coincide with the learned sign.

As Peirce made it clear, the Symbol would not be possible without the Index, which in turn would not be possible without the Icon. Moreover, a less developed sign not only makes a more developed sign to be a real possibility, but, signs tend to develop: the web of signs evolves. Thus, Icons tend to become Indices, Symbols, etc.

In what regards the third trichotomy of signs, signification of Thirdness, which regards the Sign's relation to its Interpretant, the Sign can be (1) a *Rheme*, which is a sign of possibility, (3) a *Dicisign* (or *Proposition*), if it is a sign of fact, or (3) an *Argument*, if it is a sign of reason. Peirce developed his whole semiotics as a logic based on the maxim of pragmaticism (which is explained thoroughly in Chapter 3), but this third trichotomy is particularly the trichotomy of sign types that describes logical operations. The Rheme is an Icon which is used as a predicate.

According to Peirce only Icons can be and implicitly are predicates. The Rheme describes how a predicate signifies in relation to its conclusion, its Interpretant. The Dicisign (dicent sign) is Peirce's concept of proposition, the usual concept of proposition used in logic. Peirce's logic (semiotics), like that of Frege, developed a concept of proposition which accepts the application of multiple subjects to a single predicate (Stjernfelt, 2011). The Argument is the Interpretant *par excellence* – a Third signification in its Third dimension, the general conclusion. This trichotomy explainshow the Subject-Predicate (S-P) structure, the proposition, is constituted and how it leads to argumentation. The propositionis here regarded in a phenomenological manner, not as the subject of semantics or linguistic syntax. This is where it becomes clear that the philosophical school that resembles Peirce's semiotics in an essential way is phenomenology, particularly Husserl's phenomenology. As Husserl was clear in expressing that logic is much broader than psychological logic and that a holistic approach to pure logic would be phenomenology, so Peirce clearly expressed that the subject of logic is not the subject of psychology, but of phenomenology. Husserl expressed the rationale of his *Logical Investigations*:

"It [Logical Investigations] attempt[s] to show that the exclusively psychological grounding of logic, to which our age ascribes so great a value, rests on a confusion of essentially distinct classes of problems, on presuppositions erroneous in principle concerning the character and the goals of the two sciences which are involved here – empirical psychology and pure logic." (1913, p. 3)

Pure logic for Husserl is not restricted to the acquisition of knowledge by living organisms. Peirce assumes the same, a reason for which he is at times suspected of panpsychism, because logic supposes mind. Nevertheless, so stated Husserl as well:

"The most essential theoretical foundations of logical technique are not to be found in the psychology of knowledge – although this too comes under consideration – but in pure logic." (1913, p. 4)

When explaining his Rheme-Dicisign-Argument trichotomy, Peirce affirmed that logic is concerned with the concept of judgment while, like in Husserl's case, not reducing logic to psychological logic. For Peirce the subject of logic is meaning (signification), and this discipline, logic, here also called semiotics, is investigated distinctively from psychology, since signification is independent of it being cognized. The sign has its character of sign independently of its reception by a knowing subject, even though it becomes a real sign when it is *in actu*, in its use. Signs, things that signify, find most clearly their logical characteristic in their relation to their Interpretant, to their conclusion that is. Even though a judgment, the subject of logic, is embodied as a cognition, its character as cognition is not defining it and it is not the subject of logic:

"A judgment is the mental act by which the judger seeks to impress upon himself the truth of a proposition. It is much the same as an act of asserting the

proposition, or going before a notary and assuming formal responsibility for its truth, except that those acts are intended to affect others, while the judgment is only intended to affect oneself. However, the logician, as such, cares not what the psychological nature of the act of judging may be. The question for him is: What is the nature of the sort of sign of which a principal variety is called a proposition, which is the matter upon which the act of judging is exercised? The proposition need not be asserted or judged. It may be contemplated as a sign capable of being asserted or denied. This sign itself retains its full meaning whether it be actually asserted or not. The peculiarity of it, therefore, lies in its mode of meaning; and to say this is to say that its peculiarity lies in its relation to its interpretant." (CP 2.252)

That judgments require cognition is explained by the categorically phenomenological relation between cognition and judgement. A judgement is exercised through cognitions in the same way as any sign of Thirdness (e.g. Legisign) is exercised through Replicas which pertain to Secondness (e.g. Sinsigns). On this ground Peirce refuted Ribot's *physiological psychology*, an early detachment of psychology from metaphysics:

"Yet common sense will never admit that feeling can result from any mechanical contrivance; and sound logic refuses to accept the makeshift hypothesis that consciousness is an "ultimate" property of matter in general or of any chemical substance." (W 8:15)

Stjernfelt (2007) also approached and elaborated the compability between Peirce's semiotics and Husserl's phenomenology. In some of the following chapters this compatibility and its implications in education will be more closely investigated (Chapters 6 and 9). It is important to remark that phenomenology already is a popular approach to philosophy of education, while the same cannot be said about semiotics yet. The field of phenomenology of education has been broadly investigated (Peters, 2009) and both of Husserl's disciples, Heidegger and Levinas, are common references in educational philosophy.

Expressing it in Peircean terms, presented previously in this chapter, a cognition can be regarded as the Replica (or set of Replicas) of a judgment, if it were to regard the judgement as a Type. Thus, if the signification type that expresses logical operations is Thirdness, it is no surprise that the types that describe judgments, such is clearly the case of propositions and arguments, are to be found in the trichotomy which analyses the Sign in relation to its Interpretant. Below are Peirce's definitions for these three types:

"According to the third trichotomy, a Sign may be termed a *Rheme,* a *Dicisign* or *Dicent Sign* (that is, a proposition or quasi-proposition), or an Argument.

A *Rheme* is a Sign which, for its Interpretant, is a Sign of qualitative Possibility, that is, is understood as representing such and such a kind of possible Object. Any Rheme, perhaps, will afford some information; but it is not interpreted as doing so.

A *Dicent Sign* is a Sign, which, for its Interpretant, is a Sign of actual existence. It cannot, therefore, be an Icon, which affords no ground for an interpretation of it as referring to actual existence. A Dicisign necessarily involves, as a part of it, a Rheme, to describe the fact which it is interpreted as indicating. But this is a peculiar kind of Rheme; and while it is essential to the Dicisign, it by no means constitutes it.

An *Argument* is a Sign which, for its Interpretant, is a Sign of law. Or we may say that a Rheme is a sign which is understood to represent its object in its characters merely; that a Dicisign is a sign which is understood to represent its object in respect to actual existence; and that an Argument is a Sign which is understood to represent its Object in its character as Sign." (CP 2.250 – 2.252)

The Argument is a tendency of the world, since signs tend to evolve. This being the case, Peirce approached the knowing self as an evolving sign, a quest through labyrinths of meaning, having as *telos* the discovery of itself, or, more explicitly, the discovery of its own harmonious place within the web of signs. This account of the self has already been explored in edusemiotics by Stables who advanced a "sound understanding of living as *semiosis*" (2012, p. 1).

The three thricotomies can be represented as a bidimensional matrix, its two dimensions being the categories describing the mode of signification – as according to how the sign is used. The diagram below describes this matrix:

	Firstness	Secondness	Thirdness
Firstness	Qualisign	Icon	Rheme
Secondness	Sinsign	Index	Dicisign
Thirdness	Legisign	Symbol	Argument

Figure 2 – Peirce's taxonomy of signs

The columns describe how the sign signifies categorically in itself and the horizontal lines describe how the sign signifies in relation to its three termini. According to the matrix, the sign evolves from up to down and from left to right (from Qualisign to Argument). Thus, a sign includes signs that in the diagram are represented above and left of itself. For instance, the Index includes an Icon, which includes a Qualisign. The Dicisign includes an Index, which functions as a Subject, which needs to include an Icon, which functions as a Predicate, which needs to include a Qualisign. When deconstructing a sign in this way the tendency, as represented in this diagram, is to include firstly the sign situated above and then the sign situated to the left.

C. Signification and learning

Beholding these three trichotomies it is obvious that for Peirce Firstness is the domain of qualities, Secondness that of individuals (single, actual, brute existents), and Thirdness that of laws – also referred to as generals, universals, habits

or tendencies. Tendencies are general and laws are nothing else but tendencies, the same as habits. The fully developed sign, the Argument, is a tendency of the world, since signs tend to evolve.

This being the case, a Peircean Theory of Learning will approach the knowing self as an evolving sign (Chapter 5), a quest through labyrinths of meaning, having as *telos* the discovery of itself, or, more explicitly, the discovery of its own harmonious place within the web of signs. When one is learning astrophysics, or the Kantian categorical imperative, or learning to hammer nails, or wine tasting, and the same when one is learning to love, one is learning any of these in relation to the self, and thus in all these inquiries one is discovering herself, because what is occurring is the evolvement of the web of signs which the self is. The event of having learnt something integrates into the self a new web of significations, thus the self itself is restructured and redefined so as to fit the new meanings into a more comprehensive Interpretant. This expansion of the self towards a new Interpretant is the evolution of life, as it is the very diversification of quality, the realization of *local plurality*. In the present thesis this is termed re-cognition.

Self-discovery and the exploration of the outer world are thus implicit one with the other. When two different human individuals are studying what appears to be the same content, say mechanics, they are learning different things, because it is impossible (or at least the probability of a coincidence is so small that any reasoning being will regard it impossible) for two different selves to discover the same signs even in the same *Umwelt* or *Lebenswelt*. The concept of *force*, as it is elaborated in classical mechanics cannot signify in the same way for someone who knows how to swim and for someone who does not. What happens when learning is that structures of signification (what needs be apprehended) have to settle on already existing structures of signification: a learner. In their interaction, these signs will find their own compatibility and the probability for this to happen in the same manner in two different cases is too small to be considered. Replicas are unique and unrepeatable but this does not imply that learning or the effort of teaching are futile. In this suprasubjective acceptance of the world, namely semiotics, it is admitted that both individuals and universals exist, individuals constituting the subjects of Secondness and universals those of Thirdness.

Two physicians have two different understandings of *force*, but they understand each other's discourse regarding this concept. Peirce explained how modes of signification are mingled in real experience. Actually, it is not the nine types of signs that one will encounter in her life experience, but Peirce advances ten classes of signs, in which the nine are logically (compatibly) mingled that are experienced within the physiology of arguments. It might seem surprising that the combinations of nine sign types result in ten classes, but this is the case between some combinations would be either superfluous, or impossible, or require another type in their composition. This is not the place to elaborate in detail on these ten classes; just for achieving a general awareness of the actions of signs within their physiology mentioning them will suffice. These classes are: Qualisign (needs be also an Icon and a Rheme in order to signify, e.g. "a feeling of "red" (CP 2.254)), Iconic

Sinsign (needs to incorporate a rheme, e.g. "an individual diagram" (CP 2.255)), Rhematic Indexical Sign (e.g. "a spontaneous cry" (CP 2.256)), Dicent Sinsign (implicitly incorporates an Index, e.g. "a weathercock" (CP 2.257)), Iconic Legisign (needs to incorporate a Rheme, e.g. "a diagram, apart from its factual individuality" (CP 2.258)), Rhematic Indexical Legisign (e.g. "a demonstrative pronoun" (CP 2.259)), Dicent Indexical Legisign (e.g. "a street cry" (CP 2.260)), Rhematic Symbol (e.g. "a common noun" (CP 2.261)), Dicent Symbol (e.g. a proposition), and Argument. As I mentioned some sign type combinations would be either useless or impossible. For example, a Symbol contains a Legisign signification, so a Rhematic Symbolic Legisign coincides with the Rhematic Symbol. There are classes that are not considered, such as a Rhematic Iconic Legisign. This means that a Rhematic Iconic Legisign is useless without an Index, which makes it a Rhematic Indexical Legisign, unless it is diagrammatical (the next section approaches the concept of diagram) and signifies as an Iconic Legisign (a potential predicate).

D. Hypoicons in learning

So far it has been argued that icons are the signs that afford learning, all signification having an iconic ground. In the project of a Peircean Theory of Learning, therefore, this sign type has a central role and the iconic semiosis in learning will be investigated in more detail in the next chapters. For now, to develop the conceptual apparatus for this theory of learning, mentioning the hypoicon types and their way of signification suffices.

In accordance to how the Icon was presented so far, Peirce also describes it as "a Representamen whose Representative Quality is a Firstness of it as a First. That is, a quality that it has *qua* thing renders it fit to be a representamen. Thus, anything is fit to be a *Substitute* for anything that it is like. (The conception of 'substitute' involves that of a purpose, and thus of genuine thirdness.)" (CP 2.276) A sign is a genuine triad and the Icon signifies in its First; the Icon is a possibility that signifies. This leads Peirce to identify a subclass of Icons developing only within a dimension of Firstness, without taking aboard any Second or Third signification, thus being still pure Icons. *Hypoicons* is the term he chose for these pure Icons (CP 2.276). Pure Firstness is difficult to grasp, despite its obviousness in real signification. Peirce explained the impossibility of having a correct conception of it, since Firstness:

"[…] precedes all synthesis and all differentiation; it has no unity and no parts. It cannot be articulately thought: assert it, and it has already lost its characteristic innocence; for assertion always implies a denial of something else. Stop to think of it, and it has flown! What the world was to Adam on the day he opened his eyes to it, before he had drawn any distinctions, or had become conscious of his own existence -- that is first, present, immediate, fresh, new, initiative, original, spontaneous, free, vivid, conscious, and evanescent. Only, remember that every description of it must be false to it." (CP 1.357)

Thus, giving examples of hypoicons is a difficult task of imagination. When giving an example for a hypoicon Peirce makes an abstraction, explaining that to

identify the hypoicon we have to separate within the sign the similarity of qualities from other modes of signification (such as convention):

"Any material image, as a painting, is largely conventional in its mode of representation; but in itself, without legend or label it may be called a *hypoicon*." (CP 2.276)

Hence, hypoicons are a trichotomy of Firstness. Among them Peirce distinguishes the Image, Diagram and Metaphor types:

"Hypoicons may be roughly divided according to the mode of Firstness of which they partake. Those which partake of simple qualities, or First Firstnesses, are *images*; those which represent the relations, mainly dyadic, or so regarded, of the parts of one thing by analogous relations in their own parts, are *diagrams*; those which represent the representative character of a representamen by representing a parallelism in something else, are *metaphors*." (CP 2.277)

The diagram type is most important for learning. Diagrams are analogy *per excellence*. Since diagrams are icons that represent the relation of similarity between the parts of and a whole thing, diagrams are the signs that present the evidence of a thing as useful. Diagrams prescribe how a thing can be used. An equation may be completely useless for a pupil who does not *see* the similarity between the algebraic function and the (geometric) graph. The same is the situation where one does not see the similarity between a hammer and hitting: if the diagrammatic structure of knocking nails in a wall is not discovered the hammer cannot be used for it. For Peirce reasoning in general is mathematical (hence the analogy here between solving equations and knocking nails):

"Now all necessary reasoning, whether it be good or bad, is of the nature of mathematical reasoning." (CP 5.147)

Mathematical reasoning is essentially diagrammatic:

"Now mathematical reasoning is diagrammatic. This is as true of algebra as of geometry. But in order to discern the features of diagrammatic reasoning, it is requisite to begin with examples that are not too simple. In simple cases, the essential features are so nearly obliterated that they can only be discerned when one knows what to look for. But beginning with suitable examples and thence proceeding to others, one finds that the diagram itself, in its individuality, is not what the reasoning is concerned with." (CP 5.148)

Diagrams are the tools of reasoning, things become intelligible, they are *learned*, that is, by discovering their inner iconicity. The inner iconicity of a signifying possibility is its diagrammatic structure. Things are useful when comprehended as diagrams. To illustrate this Peirce used the example of a pupil learning to calculate the sum of two complementary angles: the key here is that the pupil essentially needs to *see* the inner similarities of the lines which build the angles. There is a diagrammatic structure which has to be *seen* and makes the measure of angles obvious, besides what might be regarded as the rigorous demonstration that algebraically accounts for it:

"A line abuts upon an ordinary point of another line forming two angles. The sum of these angles is proved by Legendre to be equal to the sum of two right angles by erecting a perpendicular to the second line in the plane of the two and through the point of abuttal. This perpendicular must lie in the one angle or the other. The pupil is supposed to *see* that. He sees it only in a special case, but he is supposed to perceive that it will be so in any case. The more careful logician may demonstrate that it must fall in one angle or the other; but this demonstration will only consist in substituting a different diagram in place of Legendre's figure. But in any case, either in the new diagram or else, and more usually, in passing from one diagram to the other, the interpreter of the argumentation will be supposed to *see* something, which will present this little difficulty for the theory of vision, that it is of a *general nature."* (CP 5.148)

Legendre's demonstration, Peirce explained, is possible as well by understanding the diagrammatic structure of algebraic expressions. If there were no similarities perceived (*seen*) between the algebraic expression and the geometric figure the demonstration would not have been possible. All these composing parts resemble the whole phenomenon – they act diagrammatically. The diagram might be a difficult concept to grasp immediately, like the concepts of Icon and similarity, because its simplicity makes it difficult to conceptualize. A possible misleading fact is that similarity, as obvious as it is, is not necessarily something formal. Peirce warned his reader about this, explaining that similarity, as the criteria for diagrams, is a matter or relation:

"Many diagrams resemble their objects not at all in looks; it is only in respect to the relations of their parts that their likeness consists." (CP 2.282)

Peirce considered that a thorough understanding of diagrammatic reasoning would be supporting his anti-psychologist logic and would generate relevant insights in all sciences:

"Diagrammatic reasoning is the only really fertile reasoning. If logicians would only embrace this method, we should no longer see attempts to base their science on the fragile foundations of metaphysics or a psychology not based on logical theory; and there would soon be such an advance in logic that every science would feel the benefit of it." (CP 4.571)

This thesis applies Peirce's idea about diagrammatic reasoning to education. This results in more than merely positing a desired educational practice. The outcome is a fully semiotic philosophy of education with cosmological underpinnings and consequences. The next two chapters explain two important aspects of this educational semiotics: how a Peircean approach to education is a logical and non-psyhcologistic approach and what is the place that education, as a science, took in Peirce's thinking.

Chapter 3
Semiotics as Pragmatic Logic

In the previous two chapters I explained the conceptual apparatus that this thesis uses to develop a semiotic theory of learning, namely some key concepts in Peirce's semiotics and its background. It occurred that Peirce's pragmaticism is different from the more popular pragmatism of William James and John Dewey. In this chapter I will explain the authenticity of Peirce's pragmaticism and its particular significance for education. The accounts of pragmatism that have been mostly used to approach education have not developed semiotics. While semiotics is being applied to education (see Chapter 1) there still is no thoroughly pragmatic semiotics of education. A Peircean Theory of Learning is a pragmatic semiotic educational philosophy.

I will explain that the main reason for the broader horizon of pragmaticism over pragmatism in education consists in the account of experience as semiosis. However, between these two accounts there are some essential similarities, after all Dewey and James inherited their idea of pragmatic philosophy directly from Peirce and supposed, perhaps until Peirce signalized the difference, that Peirce's doctrine is the same as theirs. It was pragmatism, in conformity to a large extent to Peirce's doctrine, but still different in some aspects, that gave the proper ground for Dewey's experience based philosophy of education.

William James marked the dawn of pragmatic philosophy, especially with his famous book entitled *Pragmatism*. It is often overlooked that James himself attributed the title of *father of pragmatism* to Peirce. John Dewey is the second most popular early pragmatist, after James. Dewey's merits consists in applying pragmatism to philosophy of education and political philosophy.

The main difference between Peirce's pragmaticism and the later pragmatism stands in that Peirce meant pragmaticism as a principle of logic while his followers developed it as a theory of knowledge or a richer account of empiricism. Despite this essential difference and its profound implications contemporary pragmatists who inherited the Jamesian account still seem to understand Peirce as a pragmatist in the same sense as James. I shall discuss the example of Colin Koopman and distinguish between two contemporary schools: Koopman's third wave of Jamesian pragmatism as *meliorism* (the first wave being the account of Peircean pragmatism as a still *givenist* philosophy and the second wave being that of Rorty and Putnam) and the new revival of Peircean pragmaticism, linked with the iconic turn.

A. Experience and continuity

James acknowledged and promoted Peirce as the founder of the pragmatist doctrine. In the famous 1907 *Pragmatism* James clearly pointed to Peirce's first use of the term from 1878 as marking a philosophical paradigm as well as to Peirce's etymological motivation for choosing this term:

"A glance at the history of the idea will show you still better what pragmatism means. The term is derived from the same Greek word πράγμα, meaning action, from which our words 'practice' and 'practical' come. It was first introduced into philosophy by Mr. Charles Peirce in 1878. In an article entitled 'How to Make Our Ideas Clear,' in the 'Popular Science Monthly' for January of that year[10] Mr. Peirce, after pointing out that our beliefs are really rules for action, said that, to develop a thought's meaning, we need only determine what conduct it is fitted to produce: that conduct is for us its sole significance." (1907, p. 46-47)

James appreciated Peirce's pragmatism for one of the main reasons for which it still impresses philosophers today: it easily deals away with abstract distinctions that are estranged from practical use, acknowledging the value of truth of judgements by inquiring on the conducts they produce:

"The pragmatic method is primarily a method of settling metaphysical disputes that otherwise might be interminable. Is the world one or many? — fated or free? — material or spiritual? — here are notions either of which may or may not hold good of the world; and disputes over such notions are unending. The pragmatic method in such cases is to try to interpret each notion by tracing its respective practical consequences. What difference would it practically make to any one if this notion rather than that notion were true?" (p. 45)

Similar reasoning underpins the recent semiotic turn in philosophy of education, which is above all an anti-dualist turn (Stables 2005, 2006, 2012). For instance, the typical modern mind/body dualism is not fruitful anymore for several branches of philosophy among which perhaps most of all philosophy of education.[11] Semiotics, by understanding reality as a physiology of arguments and learning as semiotic engagement (Stables 2005, 2012) does not encounter such, eventually artificial, distinctions.

As he stated, for James pragmatism was an efficient method for knowledge theory. The value of truth, from this perspective, resides in the consequences of an action:

"You must bring out of each word its practical cash-value, set it at work within the stream of your experience. It appears less as a solution, then, than as a program for more work, and more particularly as an indication of the ways in which existing realities may be *changed.*" (p. 53)

This same concept of experiencethat James uses is the cornerstone of Dewey's philosophy of education. This is a more developed notion of experiencethan the mainstream empiricist concept, not framing experience as strictly the product of sense-perception. However, this pragmatic account of experience did not lead to an understanding of life in terms of phenomena of signification. For Peirce, experience

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[10]Translated in the *Revue Philosophique* January, 1879 (vol. vii).

[11]In Chapter 1 I have discussed the advantages that semiotics brings to education in contrast to modern dualist philosophy.

is semiosis. While a Peircean approach to education would agree with Dewey's philosophy of education, being as well experience based, it would be a semioticphilosophy of education because of the concept of experience as semiosis. Dewey brought a strong awareness of the continuity of learning, due to the continuity of experience:

"The two principles of continuity and interaction are not separate from each other." (1938, p. 44)

This application of continuity is certainly inherited from Peirce (Chapter 2). It is such an inner continuity that keeps a knowing subject together:

"A divided world, a world whose parts and aspects do not hang together, is at once a sign and a cause of a divided personality. When the splitting-up reaches a certain point we call the person insane. A fully integrated personality, on the other hand, exists only when successive experiences are integrated with one another. It can be built up only as a world of related objects is constructed." (p. 44)

This is Peirce's concept of diagrammatic signification applied to cognition: in the case of a cognitive system, if the parts do not resemble each other and do not resemble the whole then the system is not coherent – such is the case of an *insane* person, in Dewey's terms. The sane mind lives in a continuous flow of experiences. This can be described as the diagrammatic character of the inner self – a world of related objects. That cognitions are compatible it translates that among them there is iconic syntax (see Chapter 1, section C). This stands both for the cognitions of oneself as for cognitions belonging to various persons. This being the case, an educational system has to provide the free environment where the learner can experience such experiences that will integrate harmoniously within herself and evoke the acquisition of knowledge. Also, the system has to be careful not to provoke experiences that would obscure learning possibilities for the learner. This is one of the main observations that Dewey brought to philosophy of education:

"What avail is it to win prescribed amounts of information about geography and history, to win ability to read and write, if in the process the individual loses his own soul: loses his appreciation of things worth while, of the values to which these things are relative; if he loses desire to apply what he has learned and, above all, loses the ability to extract meaning from his future experiences as they occur?" (Dewey, p. 49)

As in Peirce's case, Dewey's experience based educational philosophy brings a strong argument for liberal education, refuting both conservatism and progressivism as educational trends (even though Dewey is generally recognized as the father of progressive education). Peirce, while acknowledging experience as the central phenomenon that makes learning possible, explicitly distanced himself from the notion of experienceof the empiricists by clearly refuting the *tabula rasa* hypothesis. When stating the central role that experience has in learning Peirce immediately feels the need to mention that his concept of experience is not that of the empiricists:

"Experience is our only teacher. Far be it from me to enunciate any doctrine of a *tabula rasa.*" (CP 5.50)

Since Peirce admits experience as the "only teacher" while rejecting the idea of *tabula rasa* it is clear that his concept of experience is not the mainstream modern concept. The key to understanding Peirce's notion of experience stands in the semiotic account of the Universe, the Universe as physiology of arguments. As Peirce expressed it, the Universe is "all of a piece," by this intending precisely its diagrammatic coherence – the compatibility between the constituting parts of the Universe due to their resemblance with the whole. Learning occurs via experiences, but not upon a *tabula rasa*, and neither upon innate ideas that rationalism would promote. Experience is the action of signs, which are constituting the Universe. Learning is a characteristic of semiosis typical for certain beings that are part of the same Universe and came to be as a result of natural and cosmological evolution. Human beings, who are discovering the Universe, are part of the Universe and are, therefore, in diagrammatic coherence with the Universe as whole and with its other parts – we resemble it to a certain degree:

"The idea of the word 'experience' was to refer to that which is forced upon a man's recognition, will-he nill-he, and shapes his thoughts to something quite different from what they naturally would have been. But the philosophers of experience, like many of other schools, forget to how great a degree it is true that the universe is all of a piece, and that we are all of us natural products, naturally partaking of the characteristics that are found everywhere through nature. It is in some measure nonsensical to talk of a man's nature as opposed to what perceptions force him to think. True, man continually finds himself resisted, both in his active desires and in that passive inertia of thought which causes any new phenomenon to give him a shock of surprise. You may think of an element of knowledge which thus resists his superficial tendencies; but to express precisely that idea you must have a new word: it will not answer the purpose to call it *experience.* You may also reflect that everyman's environment is in some measure unfavorable to his development; and so far as this affects his cognitive development, you have there an element that is opposed to the man's nature. But surely the word *experience* would be ill-chosen to express that." (CP 5.613)

Therefore, Peirce's notion of experience as action of signs is equivalent with the biosemiotic account of life as *local plurality* (Chapter 1). Living beings are engaged in the evolution of the universe, because they are a part of it. Knowing and learning are suprasubjective phenomena which do not characterize the isolated action of any isolated individual. A new born human being shares already several qualities with the universe in general (it has a form, a consistency), with many living beings (it needs to feed, it has eyes, it is covered in skin, it has hands, it has a mouth, a nervous system etc.) and particularly with other human beings (it cries, it developed as a fetus in the womb of a woman out of which it was born, etc.). Experience is an unceasing continuous phenomenon to which one partakes already as a part of the physiology of arguments. As such, the value of truth of a proposition does not

simply stand in its consequences, because there is no separation between the proposition and its consequences. Value of truth is something shared and diffused through the continuity of experience: *value of truth* is synonymous with *meaning*. The effort to which James advises, that of setting words at work within the stream of our experience is superfluous from a Peircean point of view, as *words* are part of our experience (as semiosis). Experience, "our only teacher" (CP 5.50), is different from the pragmatic (Jamesian) notion.

Peirce placed mental acts (imagination, judgement, etc.), under the category of experience (semiosis), avoiding the assumption of *tabula rasa*. The particularity of Peirce's pragmatic logic is that it does not make an ontological distinction between mind-dependent and mind-independent being, reality being suprasubjective. Therefore, *mind* has to be understood as part of this suprasubjective real existence. As such, this approach is coextensive with the embodiment philosophy hypothesis that mindis a phenomenon for which the whole body is responsible, not only an organ, such as the brain (e.g. Lakoff and Johnson 1999). Semiotics goes even further, because the body is nothing else but the centre of an *Umwelt* and therefore, the entire *Umwelt* is responsible for mind. If re-cognition is a result of evolution, which itself had to adapt to semiosic structures (Chapter 1) then the whole environment of a living being is responsible for mind (Jakob von Uexküll 1926, 1934, 1940). The generation of pragmatists after Peirce, such as James and Dewey, certainly inherited the importance of the concept of experience from Peirce, but their account of pragmatism did not make such a strong case against an ontological mind/non-mind dualism. The reason is that since they did not take pragmatism as a maxim of logic and did not busy themselves with the logic that might occur from it, they did not account for experience as the action of logical phenomena. For Peirce this is precisely what experience is, semiosis: the action (cooperation) of signs.

The explanation of the continuous experience that determines a living organism will give new insights in what regards the coincidence between self and mind, a new horizon for philosophy of education. It is an often overlooked curious accident that the consciousness referred to as *self* coincides with a certain *mind* evoked by an organism. I consider that the biosemiotic account sheds light on this, thus bringing new insights in what regards the development of the *self*. It can bring new directions into the attention of educational philosophy.

Thus, semiotics advances an ecological philosophy of education[12], raising the awareness that we are a constituting part of the natural (semiotic) Universe.

B. Pragmaticism

This difference between Peirce's account of experience and that of James and Dewey is due to their different understanding of pragmatism. Upon the pragmatic maxim of logic Peirce could develop semiotics. This was for Peirce the rationale of

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[12] On the ecological position of semiotics see Chapter 1 and Andersen in Sebeok and Umiker-Sebeok 1992.

the maxim of pragmatism. He had several attempts at defining it, proving it to be quite a difficult principle to grasp in a definition. The first attempt (from *Revue philosophique*) is the following:

"Considérer quells sont les effets pratiquesque nous pensons pouvoir être produits parl'objet de notre conception. La conception de tous ces effets est la conception complète de l'objet. [p. 48.]

Pour développer le sens d'unepensée, ilfautdoncsimplement determiner quelles habitudes elle produit, car le sens d'une chose consistes implement dans les habitudes qu'elle implique. Le caractère d'une habitude dépend de la façon don't elle peut nous faire agir non pas seulement dans telle circonstance probable, mais dans toute circonstance possible, si improbable qu'elle puisse être. Ce qu'est une habitude dépend de ces deux points: quandet comment elle fait agir. Pour le premier point: quand? tout stimulant à l'action dérived'une perception; pour le second point: comment? le but de toute action est d'amener au résultat sensible. Nous atteignon sainsi le tangible et le pratique comme base de toute différence de pensée, si subtile qu'elle puis se être. [p. 47.]"[13] (CP 5.18)

A later formulation, easier to grasp but otherwise equivalent, to which Peirce himself seemed to be more committed is the following:

"Pragmatism is the principle that every theoretical judgment expressible in a sentence in the indicative mood is a confused form of thought whose only meaning, if it has any, lies in its tendency to enforce a corresponding practical maxim expressible as a conditional sentence having its apodosis in the imperative mood." (CP 5.18)

Putting it plainly, but reducing the edifying rigour of Peirce's language, pragmatism is the assertion that what is named is called: there is no pure affirmative statement, things are understood as imperatives. Pure constatives are useless abstractions. Pragmatism, as mentioned previously, easily eliminates useless abstractions that do not correspond to obvious states of affairs. Peirce also described it as *critical common-sense*:

"I have myself called pragmatism 'critical common-sensism'; but, of course, I do not mean this for a strict definition." (CP 5.494)

This is what James found particularly interesting about pragmatism, its naturalism and immediate practicality as a common-sense doctrine. Coextensive with Peirce's semiotic Universe, whereas more complex forms of signification are developed upon

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[13]"Consider what are the practical effects that we expect to be produced by the object of our conception. The design of all these effects is the complete design of the object.

To develop a sense of a thought, we must simply determine what habits it produces, because the meaning of something consists simply within the habits it involves. The natureof a habit depends on how it can make us act not only in such probable circumstances, but in all possible circumstances, however unlikely theymay be. That which is a habit depends on these two points: when and how it makes act. For the first point: when? All stimulating of the action derives from a perception; for the second point: how? the purpose of all action is conveying to sensitive result. We thus reach the tangible and the practice like basis for all difference of thought, as subtle as it can be." (CP 5.18)

and in continuity with basic forms of signification, James emphasized the importance of common-sense as a first, and therefore essential, stage of reasoning:

"My thesis now is this, that *our fundamental ways of thinking about things are discoveries of exceedingly remote ancestors, which have been able to preserve themselves throughout the experience of all subsequent time.* They form one great stage of equilibrium in the human mind's development, the stage of *common sense.* Other stages have grafted themselves upon this stage, but have never succeeded in displacing it. Let us consider this *common sense* stage first, as if it might be final." (p. 170)

Thus, James correctly noticed that pragmatism was not a new doctrine, but a refined philosophical method, used before by various philosophers in various ages:

"There is absolutely nothing new in the pragmatic method. Socrates was an adept at it. Aristotle used it methodically. Locke, Berkeley, and Hume made momentous contributions to truth by its means. Shadworth Hodgson keeps insisting that realities are only what they are 'known as.' But these forerunners of pragmatism used it in fragments: they were a prelude only." (p. 50)

James is right in assuming that pragmatism had its pre-paradigmatic stages. As *critical common sense*, pragmatism was certainly present in the Socratic method, in Aristotelian logic and in the thought of the modern philosophers James mentioned. Nevertheless, James's reference to the modern philosophers as precursors of pragmatism is not coherent with Peirce's line of arguments. Though his intention was to align himself with Peirce, James here proved that something essential about Peirce's pragmatism evaded him. Peirce would not consider Locke, Berkeley, and Hume as forerunners of his doctrine, but rather a detour. Deely considers that philosophy deviated from the medievals' path towards a strand of semiotic realism such as Peirce's once with the development of modern mind-dependent accounts of ontology (2001, 2009). Explaining his readings, Peirce reveals the history of semiotics. He informs his reader that a critical point in his intellectual formation was his dissatisfaction with modern philosophy which pushed him to a thorough study of the medievals:

"Before I came to man's estate, being greatly impressed with Kant's Critic of the Pure Reason, my father, who was an eminent mathematician, pointed out to me lacunæ in Kant's reasoning which I should probably not otherwise have discovered. From Kant, I was led to an admiring study of Locke, Berkeley, and Hume and to that of Aristotle's Organon, Metaphysics, and psychological treatises, and somewhat later derived the greatest advantage from a deeply pondering perusal of some of the works of medieval thinkers, St. Augustine, Abelard, and John of Salisbury, with related fragments from St. Thomas Aquinas, most especially from John of Duns, the Scot (Duns being the name of a then not unimportant place in East Lothian), and from William of Ockham." (CP 1.560)

While showing awareness of these modern philosophers' importance along the history of ideas, on a Peircean account *Locke, Berkeley, and Hume* along with the other modern philosophers, culminating with Kant obscured the development of pragmaticism. In Deely's terms, modern philosophy deviated the focus from the "Path of Signs," set by Augustine to the "Path of Ideas" (2009). On a Peircean account philosophy "took a wrong turn in the work of Descartes and slightly later with John Locke as well." (2009, p. v) If this is the case, Peirce's pragmatism is delivered from accusations of dualism. Deely explained thus that Peirce's semiotics is not a form of empiricism because, like rationalism, empiricism places epistemology and ontology in a dichotomic relation:

"For even though Locke chastised Descartes for separating ideas of reason from the sense experience, yet more fundamentally he agreed with Descartes that ideas, mental representations formed by the human mind in its interiority (albeit of sense first rather than of reason), wholly constitute the direct and immediate object of human experience. Thus arose the modern distinction between "Empiricism" attending to sense and "Rationalism" touting the primacy of reason. But both alike distinguished "epistemology", concerned with human knowledge in its direct immediacy, from "ontology", which concerns rather the world beyond the appearances – a "beyond" which (modern science to the contrary notwithstanding) the philosophers, ignorant of the Latin semiotic development and sceptical in any case (since Ockham) of the reality of relation, slyly came to consider as unknowable. (Such at least was the ineluctable consequence of their epistemology.)" (2009, p. vi)

From this perspective, since it is a suprasubjective doctrine, Peirce's pragmatism has to be distinct from both rationalism and empiricism. Both Peirce and James were aware that until James' use of the term in 1898 pragmatism was not popular enough to generate a trend in philosophy:

"This is the principle of Peirce, the principle of pragmatism. It lay entirely unnoticed by any one for twenty years, until I, in an address before Professor Howison's philosophical union at the university of California, brought it forward again and made a special application of it to religion. By that date (1898) the times seemed ripe for its reception. The word 'pragmatism' spread, and at present it fairly spots the pages of the philosophic journals. On all hands we find the 'pragmatic movement' spoken of, sometimes with respect, sometimes with contumely, seldom with clear understanding. It is evident that the term applies itself conveniently to a number of tendencies that hitherto have lacked a collective name, and that it has 'come to stay.'" (1907, p. 47)

Emerson, James, and Dewey are the first authors to raise a wide interest for pragmatism. As Peirce himself noticed, he had to rename his own coinage, as his own term became popular as something different from what he meant. The disciples of pragmatism did not spread their mentor's pragmatism. Peirce labelled James as *psychologist*, and his use of the term pragmatism as "radical empiricism." (CP 3.414)

Also, Peirce found it used as a form of "humanism" by Ferdinand Schiller. These developments of pragmatism, genuine in their own right and philosophically fertile as they proved to be, differ from what Peirce intended pragmatism to be. These uses of the term would be accepted, Peirce commented, unless this terminological confusion would not have triggered a series of critics to Peirce's coinage that were wrongly addressed to it:

"But at present, the word begins to be met with occasionally in the literary journals, where it gets abused in the merciless way that words have to expect when they fall into literary clutches. Sometimes the manners of the British have effloresced in scolding at the word as ill-chosen -- ill-chosen, that is, to express some meaning that it was rather designed to exclude. So then, the writer, finding his bantling "pragmatism" so promoted, feels that it is time to kiss his child good-by and relinquish it to its higher destiny; while to serve the precise purpose of expressing the original definition, he begs to announce the birth of the word "pragmaticism," which is ugly enough to be safe from kidnappers." (CP 3.414)

For Peirce it was clear that the misunderstanding comes from the difficulty of the "new pragmatists" to understand pragmatism simply as a principle of logic:

"[…] one of the faults that I think they might find with me is that I make pragmatism to be a mere maxim of logic instead of a sublime principle of speculative philosophy. In order to be admitted to better philosophical standing I have endeavored to put pragmatism as I understand it into the same form of a philosophical theorem." (CP 5.18)

Once semiotics was developed, upon the principle of pragmatism, the principle itself could be much clearly expressed with the new semiotic terms. Thus, the clear expression of the pragmatic maxim in pragmatic logic (semiotics) is that "A sign is only a sign *in actu* by virtue of its receiving an interpretation, that is, by virtue of its determining another sign of the same object." (CP 5.569) This could be easily misinterpreted as being the foundation of a relativist paradigm. Actually, James and Dewey's pragmatism is strongly relativist, as it was mentioned that James saw a precursor of pragmatism in Hodgson's assumption that "realities are only what they are 'known as'." Peirce's pragmaticism is different in this regard. The pragmaticist semiotic claim is that relations are real existing phenomena and so are the termini partaking to the relations, but the termini only have being as parts of relations. This is to say that the physiology of arguments accepts being only as gathering all the three phenomenological categories (Firstness, Secondness, Thirdness) together. Relations only have being in relation as well. In Chapter 2 I have explained that according to Peirce, in our scientific inquiries and not only, we are asymptotically approaching Absolute Truth. This Truth, however, will never be reached: we have to draw near to it while we always remain infinitely distant to it. In the circumstances of a relational ontology, this pragmatic understanding of Truth dismisses the perspective of relativism in favour of realism.

C. Two accounts of pragmatism: *transitionalism* and the *iconic turn*

Despite Charles Peirce's renaming of his principle of logic from pragmatism to pragmaticism the version of pragmatism as theory of knowledge is still attributed to him. Such an example, I argue is that of Koopman (2009). While offering a fresh and fertile take on pragmatism, Koopman still misinterpreted Peirce's account in precisely this manner. Koopman approached Peirce's pragmatism without taking into consideration its *telos*: semiotics. On most accounts pragmatism implied a hermeneutic method, such as critic cultural analysis, but not a system of logic.

i. Pragmatism as transitionalism

Colin Koopman aimed to bring pragmatism to a new stage with his 2009 *Pragmatism as transition: historicity and hope in James, Dewey and Rorty*. Koopman argued that pragmatism is a *transitionalist* stream of thought, concerned with the issue of process, the transition from something to something else. To put it simply, pragmatism is focused on how to "get from here to there." (Koopman 2009, p. 2) This holds true, I argue, as much for Peirce's account as for the further accounts of pragmatism. Peirce's pragmatism brought forth a relational logic (semiotics), which might be described as transitional in this sense. Pragmatic logic directly implied for Peirce a cosmology of sign evolution (Chapters 1, 2, and 7). Also, the present thesis, consisting in a fully Peircean account, brings a theory of learning as *passage* (*a transition*) from one type of signification, through other types of signification, to another type of signification.

Koopman remarks three stages in the history of pragmatic philosophy. The first two stages of pragmatism according to Koopman are: "the classical pragmatisms of William James, John Dewey, and Charles Santiago Peirce, and the contemporary neopragmatists of Richard Rorty and such of his interlocutors as Hilary Putnam and Robert Brandom." (p. 2)

I argue that this is an example which proves that the error of reading Peirce as a pragmatist in the same sense as James is still lingering. Koopman's effort consists in that of polishing the lines on which a third way of pragmatism would occur, synthesizing and transcending the previous two stages into a more comprehensive philosophy. A pragmatist himself, Koopman, while recognizing the importance of the first two stages of pragmatism, also saw some limitations in both. He proposes a third wave of pragmatism which would overcome these limitations through a typically pragmatic method: that of meliorism, the transition towards *better*. The proof of the limitations of both of these accounts of pragmatism, for Koopman, is their failure to collaborate. He noticed that classicopragmatism is an experience focused philosophy, while neopragmatism is language centred. As such, classicopragmatism is a philosophical doctrine of the past, not belonging to a linguistic age, to which the naturally occurring *linguistic turn* brought philosophy. This is so, but I argue that while this critique can be applied to James and Dewey, it does not hold in the case of Peirce. Koopman suspects classicopragmatism of still

inheriting traces of the modern fallacy which he termed *givenism*. I argue that Peirce's pragmaticism is absolved of *givenism*. The reason is that, as argued in sections *A* and *B* of the present chapter, while Peirce's philosophy is experience focused, his notion of experience is not the modern idea of experience, but, instead, for Peirce experience is semiosis. Peirce explicitly rejected both accounts of modern *givenism*, rationalism and empiricsm. He also showed an aspect in which his pragmatism differs from Mill's utilitarianism, besides the difference of focus on logic of the former and ethics of the latter. The difference stands in that according to Peirce both mental and non-mental acts pertain to experience in the same way:

"If Mill wishes me to admit that *experience* is the only source of any kind of knowledge, I grant it at once, provided only that by experience he means *personal history*, life. But if he wants me to admit that inner experience is nothing, and that nothing of moment is found out by diagrams, he asks what cannot be granted." (CP 4.91)

Experience is life and, at least in the case of humans, it has a *personal* dimension (Peirce's notion of *person* will be discussed in Chapter 5). This remark is the stepping-stone of biosemiotics: semiosis characterizes life. Experience, as semiosis, entertains an *Umwelt* and, in the case of an assumed personal life, involving intra-personal relations, a *Lebenswelt*.

As to what regards rationalism, Peirce clearly denies the *a priori* stakes:

"The very word *a priori* involves the mistaken notion that the operations of demonstrative reasoning are nothing but applications of plain rules to plain cases." (CP 4.92)

Signs (the agents of semiosis) are suprasubjective relations that do not imply any *given* hypothesis from outside the system. For James and Dewey semiotics was never a concern. Reading Peirce as a pragmatist of the same strand with James and Dewey makes him a subject of this same anti-givenism critique. Koopman clearly applies this critic to all three of them:

"Unfortunately the classicopragmatists prove frustratingly ambiguous about givenism. In certain moments, they appear theoretically committed to avoiding the pernicious errors of givenism. Yet in certain other moments, they warmly invite subtle forms of givenism that exhibit pernicious connections to representationalist foundationalism. This ambiguity is present throughout much of the work of Dewey, James, and Peirce." (p. 77-78)

Koopman mentioned the account of a perspective according to which Peirce is spared from the anti-givenism critic, but eventually found Peirce indefensible against it. He noticed that the early Peirce started off his philosophy with an attack to 'given' hypotheses (p.80-81), but states that Peirce eventually assumes transcendental assumptions because of his account of experiencing qualities (Firstness). Koopman's critique to Peirce envisages a certain givenism on which Peirce's phenomenological categories function, since, according to him, experience starts with Firstness in an *a priori* manner (2009, p. 81). Koopman considers that Peirce thought that there is a

mental correspondent to the non-mental reality of quality. He quotes Peirce that "the quality of feeling is the true psychical representative of the first category of the immediate as it is in its immediacy, of the present in its direct positive presentness." (CP 5.44) What Koopman did not observe here is that this descprition of experience does not allow the possibility of isolated experiences. His account ignores Peirce's concept of continuity. Any experience is integrated, as a constituting part, to an infinite set of experiences which is rightly called *experience*. What Peirce explained in the above citation is that experience is mediation (semiosis) and it cannot be decomposed (deconstructed) into Firstness, Secondness and Thirdness. It is the essential character of the sign that it is not reducible to its three relata. Third degree graphs are not reducible, there is nothing prior to relations of signification in their fullness. Koopman did not take into account that *mediation* is Thirdness per excellence according to Peirce. The sign-relation (mediation) is being and therefore nothing can exist subjectively or objectively, but only suprasubjectively. Things outside of minddo not have correspondents in the mind, but their status of real entities expands into mindas the sign itself always provides a part of its meaning (Interpretant). Experienceis the shaping of an *Umwelt*. Peirce was very clear that Firstness per se cannot be experienced, as any thought about it, the slight mentioning of it, is false to it:

"The idea of the absolutely first must be entirely separated from all conception of or reference to anything else; for what involves a second is itself a second to that second. The first must therefore be present and immediate, so as not to be second to a representation. It must be fresh and new, for if old it is second to its former state. It must be initiative, original, spontaneous, and free; otherwise it is second to a determining cause. It is also something vivid and conscious; so only it avoids being the object of some sensation. It precedes all synthesis and all differentiation; it has no unity and no parts. It cannot be articulately thought: assert it, and it has already lost its characteristic innocence; for assertion always implies a denial of something else. Stop to think of it, and it has flown! What the world was to Adam on the day he opened his eyes to it, before he had drawn any distinctions, or had become conscious of his own existence -- that is first, present, immediate, fresh,new, initiative, original, spontaneous, free, vivid, conscious, and evanescent. Only, remember that every description of it must be false to it." (CP 1.357)

Signs are phenomena populating and constituting the world. Firstness *per se* cannot be experienced, like no category *per se* cannot be experienced isolated. To think of a Peircean syncategoremata of Firstness, Secondness and Thirdenss is useless because, as explained in Chapter 2, Secondness supposes and incorporates Firstness, and Thirdness supposes and incorporates both Secondness and Firstness. Thirdness incorporates Firstness as well, implicitly through Secondness as directly

mediating it to a matter of Secondness.[14] Thirdness is a form of syncategoremata. The reading of Peirce offered by Koopman does not take into account this important aspect of Peircean philosophy when stating that the dilema of *givenness* in Peirce's philosophy stands in that "Quality prescinded is either directly experienced or is always already mediated by relation and representation." (p. 81) The first objection to this is that *direct experience* is mediation. Mediation does not make something be less *direct*, as the three termini of a sign are not separable (see Chapter 2). As explained in Chapter 1, to be un-mediated is not to be part of the physiology of arguments. By *relation* Koopman refers to *dyadic relation* (strictly Secondness), which brings the second objection: that, according to Peirce, dyadic relations do not mediate. Only signs are mediators, linking the Universe all together. The idea that needs to be stressed is that termini of signs only have being as in the relation. The three categories, while we can observe them, cannot be separated from each other.

Also, signification is dynamic, never static. The physiology of arguments is continuously evolving, as signification develops in time (this argument will be investigated in Chapter 5), or, rather reality takes on a temporal dimension because this is how signification develops − gradually and continuously. The temporal dimension of signification necessarily implies a form of mediation, from past to present and to future. The passing of time, or, generally, the passing from a basic to a more complex sign type, requires all three phenomenological categories. Koopman finds one philosophical inssuficiency in all three, Peirce, James and Dewey, namely that they still inherit modern dualism:

"Subsequent commentators who have wrestled with Dewey's discussions of primary experience, James's of pure experience, and Peirce's of qualitative firstness have found it extraordinarily difficult to say just how it is that we can deploy these conceptions of experience without specifying them in terms of the outworn metaphysical dualisms of mind and reality or subject and object that pragmatism was meant to help us overcome." (p. 82-83)

In the case of Peirce this is not so. Koopman does not consider in his analysis the major characteristic of Peirce's philosophy, namely that it consists in a relational logic (semiotics). The notion of experience as semiosis is indeed suprasubjective and non-dual. I consider that the arguments presented in sections *A* and *B* (the present Chapter) suffice to prove this.

Koopman, therefore, brought a critique of Peirce comming from a pragmatism that does not lead to semiotics. If the classicopragmatism of James and the neopragmatism of Rorty proved valuable, their synthetic overcoming into Koopman's meliorism is a pragmatic philosophy of this kind in its own right. The only inconsistency is the account of Peircean pragmaticism as dualist philosophy.

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[14]For example, a Rhematic IndexicalLegisign (e.g. a demonstrative pronoun used as a predicate) contains an Iconic Sinsign (unsaturated predicate), which contains a Qualisign, but it also contains an Iconic Legisign, different then the one that contains the first mentioned Iconic Sinsign. The copulation of this Sinsign (Secondness) and Legisign (Thirdness) constructed by different Icons brings about the Rhematic Indexical Legisign.

Perhaps a second possible critique to Koopman is whether his *meliorism* overcomes dualism, as he pretends. While Koopman saw in the early Peirce a good intuition against dualism and in the late Peirce a failure to overcome it fundamentally, I argue that it is actually in the late Peirce's mature semiotics that dualism is clearly overcome. This is seen in the iconicity hypothesis, the idea that the Universe is diagrammatic, that is, its inner coherency is due to its *iconic syntax*. If a cognitive being is living in this world it will experience this world because, as part of it, it presents similarities to the non-self part of the world. The borders between self and non-self are vague and as such they exist (vaguely).

As for the neopragmatists, for Koopman their only epistemic advantage to classicopragmatism is that of being able to benefit from the linguistic turn. As well, the only excuse that the classicopragmatists have in defence of their dualism is that their work was exhausted before 20th century philosophy was maturated by the linguistic turn.

ii. The iconic (schematic) turn

Koopman therefore brought a critique of Peirce from a pragmatic but non-semiotic stand. The non-pragmatic but semiotic attacks to Peirce have been more frequent. Such is the case of Umberto Eco's 1979 *A theory of semiotics* which is a poststructuralist attempt to develop a fully semiotic theory of communication. In this work Eco clearly delimitated the borders of semiosis within socio-cultural human activity. Evidently, this is not so according to Peirce.

The semiotic scene of the 20th century was dominated by structuralism and post-structuralism which did not advance the hypothesis of Iconicity (cf. Stjernfelt 2007, p. 51). The structuralist philosophical tradition was extrapolated from Ferdinand de Saussure's linguistics. De Saussure applied the concept of sign (*signe*) in linguistics (1915), thus developing semiology (*semiologie*). As de Saussure uses the signconcept, it is a psycho-linguistic entity. Peirce's concept of sign is not bound strictly to linguistic use, but, as explained (Chapter 2), it is a matter of ontology as well as of epistemology: an unification of these two by the claim that being is the phenomenon of relation. While Peirce's semiotics cannot and would not bring any critique to de Saussure's semio-linguistic project, Peirce's philosophy presents some incompatibilities with the structuralist philosophy developed after de Saussure (Stjernfelt 2007, p. 51). In the context of the linguistic turn, de Saussure's linguistics was a strong ground for philosophy. Several continental philosophical schools picked up and developed saussurean semiology into proper semiotic philosophy. The Prague (Roman Jakobson), Moscow-Tartu (Yuri Lotman) and Copenhagen[15](Hjelmselv, Uldall) schools were the first to develop semiology in a

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[15]It is interesting that the Copenhagen and the Tartu schools of semiotics, presently at the third generation, underwent a conversion from semiology to Peircean biosemiotics. Hjelmslev's student, Per Aag Brandt, initially a structuralist thinker, developing cognitive semiotics, gradually found a stronger foundation in Peirce (about Per Aag Brandt's conversion see Per Aag Brandt in Bundgaard and Stjernfelt, 2009). Once with thinkers such as Frederik Stjernfelt and Jesper Hoffmeyer, the third

philosophical frame. Starting with Claude Lévi-Strauss and Roland Barthes the structuralist movement became popular among French philosophers. This is where structuralist philosophy, arguably detaching from its link to linguistics, made a next step towards poststructuralism, with Derrida explaining the non-static and indefinite character of structures and Deleuze accounting for the structures' rhizomatic (and not strictly arborescent) formation. Even though structuralism eventually brings de Saussure's *signe* into a broad philosophical use, independent of linguistics, an essential difference still makes Peircean semiotics and structuralism incompatible in some regards. The basic reason for the essential difference between these accounts of semiotics (or semiology) and Peirce's semiotics can be noticed in Peirce's semiotics' seeds in medieval scholastic realism. This inheritance is foreign to structuralism. The tendency of some scholastics, such as Aquinas and Duns Scotus, of developing a relational logic was inherited and fulfilled by Peirce (Deely, 2001, see also Stjernfelt, 2011 on relational logic). Structuralism is rather a relativist epistemology (not relational logic).

Peircean semiotics is not favoured by and does not favour the linguistic turn of philosophy. In the strictly psycho-linguistic use of the sign concept, iconicity is not an issue: it is irrelevant if the word 'dog' is familiar with the four legged, barking animal (the very object it describes). Iconicity becomes a relevant matter when the sign concept is applied to investigate any possible suprasubjective relation. In Chapter 1 I mentioned that Stjernfelt observed an iconic turn, to which he also referred as phenomenological turn, which semiotics has been taking since recently (Stjernfelt in Bundgaard and Stjernfelt, p. 232)[16]. The problem for embracing a fully Peicean account of semiotics consists in "the preference for a purely symbolic calculus at the expense of iconicity" (Stjernfelt 2007, p. 60) which dominated 20th century. This tendency which, in different ways, was present in both structuralism and analytic philosophy did not allow room for the iconicity hypothesis (introduced in Chapter 1, section C).

The early Umberto Eco is an exponent of 20th century semiotics marked by the linguistic turn. In Eco's rejection of iconicity, arguably coherent with the general

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generation of the Copenhagen school already assumed a thorough Peircean approach. Peircean biosemiotics, via Thomas Sebeok, proved to be a better ground for the cognitive and experimental semiotics research proceeding at the Universities of Copenhagen, Aarhus and Lund. In the same time, the breakthrough of biosemiotics led to the Tartu's school rediscovery of Jakob von Uexküll, its own legacy. Thus, there can now be observed a Copenhagen-Tartu biosemiotic school, being represented by authors such as Kalevi Kull, Claus Emmeche, Timo Maran, Frederik Stjernfelt, Jesper Hoffmeyer.

[16] See Bundgaard and Stjernfelt in Chapter 1: "One of the results of the iconic or phenomenological turn of semiotics during the recent decades is that its close affiliation with the Linguistic Turn is weakening. Thus, linguistics ceases to be the model science of semiotics, even if language, as an object, of course, remains a core issue for semiotics. Language appears as the most central of many cognitive and communicative tools of man, and semiotics – as indicated by the predicate "cognitive" in cognitive semiotics – must base itself on the study [of] all such tools. This implies the empirical connection of semiotics to all aspects of cognitive science (from sociology over psychology to neuroscience) – and the conceptual connection of semiotics to epistemology, philosophy of science, and ontology." (Stjernfelt in Bundgaard & Stjernfelt, p. 232)

culturalist view of structuralism, the argument is that similarity occurs only as *stimulus* in the *physiology of the nervous system*. This excludes it from being the syntax of a *physiology* of the Universe. Thus, even similarity is something taught and learnt culturally. Stjernfelt explained that if this is the case "it would be impossible to teach anybody anything if one were not allowed to say 'Now, do like I do …' and thereby presuppose similarity." (2007, p. 63-64) I argue that this early Econian account confuses similarity with identity. Following a Peircean account similarity is not subject to culture. Perhaps the way in which similarities are discovered is cultural. As an example, while Romanians see the similarity between *easiness* and *flowers*[17], British see the similarity between *easiness* and *a piece of cake*. This does not mean that a Romanian would never see the *easiness* of a *piece of cake* or that a British person would not see the *easiness* of a *flower*. Indeed *easiness* and a *piece of cake* share qualities: the piece of cake is easy to handle, easy to eat, it is obvious what I can do with it and if it is only a piece I will not feel *heavy* after I eat it. There surely are other similarities between *easiness* and *pieces of cake*, but one only needs to discover a couple of them. In the same way, one shall find similarities between *easiness* and *flowers* worn, or hanging, by someone's ear. Having discovered a similarity between *x* and *y* does not imply that the similarity between *x* and *z* is obscured, but only unfamiliar until discovered.

It is important to notice that the iconicity assuming strand of semiotics (or, generally, of pragmatism) impetuously implies a liberal educational view, since learning is a discovery of similarities and similarity is not something taught and learnt. Similarity is discovered and in this phenomenon of discovery the teacher does not have much to teach her student. In Part II of this thesis I shall explain that the teacher has rather something to learn from the way in which her student learns a similarity. The anti-iconic strands propose instructional education, for the claim that similarity is a cultural construct which is learnt and taught through imitation. In this case, repeated imitation accounts for the building up of a cultural understanding of similarity.

Umberto Eco, as an exponential figure of 20th century semiotics, has been an emblematic figure for the 60s and 70s anti-iconic philosophy. It is Eco as well that becomes an emblematic figure for the *schematic turn* of semiotics, consisting in the proper rediscovery of Peirce's icon concept and its stake for semiotics generally. Stjernfelt describes Eco's 1997 *Kant and the platypus* as a confession of conversion from anti-iconic structuralism to Peircean (iconic) pragmatism. In this work Eco admits the impossibility of a semantic of everyday concepts (e.g. 'platypus') without an iconic ground. There needs be a *schema*, in the Kantian sense, inherent in semiosis which makes it possible. The Peircean equivalent of Kantian *schema* is the *diagram* (particular hypoicon). This is not the place for an analysis of the late Eco and his *Kant and the platypus*, what matters here is the schematic turn of semiotics, the shift of focus to icons. This explains the growing interest for Peirce's semiotics

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[17] It would be safe to suppose that the English idiom "piece of cake" is almost equivalent with the Romanian "floare la ureche" (lit. *flower by the ear*).

in the humanities and not only in the past two decades. This return of focus to icons immediately invited the understanding of signs as physiological phenomena, and not just cultural constructs. It imposes the take of semiotics as logic instead of cultural analysis method. The *iconic* (or *schematic* or *phenomenological*) *turn* of semiotics is richly manifesting. The semiotic works of the late Eco are its confirmation. John Deely's realist semiotic accounts of history of philosophy, placing Peirce as the pivot from modernism to postmodernism are a manifestation of this turn (e.g. Deely 2001). From Deely's perspective the non-pragmatic semiotics (semiology) of the 20th century are late versions of modernism that did not solve the dualist modern fallacies. Frederik Stjernfelt's 2007 *Diagrammatology* is the strong declaration of the iconic turn, where this shift of focus was first systematized theoretically.

Both Deely and Stjernfelt have commented on the compatibility between pragmatic semiotics and phenomenology. Stjernfelt explained the similarities between Peirce's pragmaticism and Husserl's phenomenology: they both advance an anti-psychologistic logic. Deely remarked the similarities between Peircean and Heideggerian ontology. These are justified in virtue of Peirce's and Heidegger's common medieval philosophical sources (e.g. their appreciation of Duns Scotus, see Deely 2000a and 2001a). Biosemiotics flourishedwithin pragmatic semiotics once with the iconic turn. If signs are regarded as cultural constructs biosemiotics is, of course, problematic: either it is absurd, or it will discuss non-human cultures, which is a dangerous enterprise for philosophical speculation. Accounting for signs as strictly cultural assumes a nature/culture dichotomy. The consequence, either way, would be the reduction of biosemiosis to anthroposemiosis and perhaps anthroposemiosis of a peculiar kind, that happening strictly within the borders of culturally regulated conventions. Once that iconicity is asssumed, particularly the idea of the *iconic syntax* of the *physiology of arguments*, biosemiotics can be developed. Biosemiotics has been the only version of pragmatic semiotics that endured through the second half of the 20th century. It has always been regarded with suspicion by the semioticians of the time, its adepts being in an overwhelming proportion biologists, not semioticians or any strand of scholars of the humanities until the 90s. Taking into account a semiotics detached from linguistics, the issue of semiosis in the biological realm is not problematic anymore.

Thus, Peircean semiotics of the dawn of the third millennium is a newly thriving strand of pragmaticism. It is being embraced in several fields, the present thesis bringing a full account of it, transposed and applied to education. If in phenomenology and history of philosophy this pragmatic semiotics has proved its compatibility with Husserl and Heidegger in philosophy of education it will find an ally in the third Husserlian phenomenologist whom is already popular in this philosophical area, namely Emmanuel Levinas (I explain this in Chapter 9).

Peircean pragmaticist semiotics is finally becoming a popular philosophical trend. The fertility of pragmaticism once with the iconic turn of semiotics marks all the more the essential difference between Peirce's pragmaticism and the pragmatism of these mentioned. The effect of the iconic turn is that it reunited pragmatism and semiotics. The pragmatism of the 20th century was not interested in semiotics, being

in its initial stage a new experience based philosophy, "radical empiricism" as both James and Peirce agreed in describing it, and a linguistic pragmatism once with the linguistic turn. Koopman's history of pragmatism is accurate, apart from framing Peirce as a part of this non-semiotic pragmatic tradition. The reunification of semiotics and pragmatism inevitably drew the attention of researchers back to Peirce.

The next two chapters build on the account of experience as semiosis explained in this chapter. In Chapter 4 I shall discuss the place of education and pedagogy in Peirce's division of sciences. Peircean semiotics as philosophy of education is an experience focused education and can only be understood in its own terms by taking into account that experience is semiosis. In Chapter 5 I shall explain that Peirce's philosophy, semiotics that is, is a suprasubjective and non-dual philosophy, contrary to Koopman's argument, and I shall discuss the implications of a suprasubjective philosophy for education.

Chapter 4
Education in Peirce's Divisions of Science

In the previous chapter Peirce's semiotics has been presented as a logic founded on the maxim of pragmatism (see Chapter 3 and CP 5.18). I argued that this pragmatic (or rather pragmaticist) approach has more to offer to education than the more popular pragmatic approaches of James and Dewey. The main reason for this is the richer account of experience that pragmatic logic brings along, namely experience as semiosis. The present chapter investigates some epistemological and ethical aspects of education in Peirce's semiotics. Explaining Peirce's understanding of science and its branches, in this chapter I argue that he implicitly proposed a curriculum. On a Peircean account the ideal curriculum would be identical to the divisions of science, because the various branches of science are similar amongst each other, meaning that they stand in iconic relations. The way in which the divisions of science stem from each other has an implicit diagrammatic coherence, and, thus, the most iconically operational curriculum would be precisely the way in which the sciences have evolved.

Peirce's classification of the divisions of science is a cornerstone in understanding Peirce's thought generally. His divisions of science are directly inherited from the medieval classification of philosophy, originating in Aristotle. Of course, due to the discoveries and developments of modern science taking place in the meantime, particularly modernity's focus on the quadrivium (mathematics), Peirce's divisions differ from the medieval classifications.

In Chapter 1 it was explained that semiosis is evolutionary while evolution is as well a semiosic phenomenon. The purpose of evolution is pursuing the infinitely distant identification between Mind and Truth. While being a *teleological* phenomenon, evolution sets its *telos* from within. It does not follow an externally imposed *telos*; since the identification of Mind and Truth is always infinitely distant (see Chapter 1) it cannot be pursued systematically, based on a prognosis. Evolution in general, and particularly the evolution of science, cannot be subject to project management. Instead, evolution sets the direction of its next step from within, according to the realizations (Interpretant) of the present stage. Education is a stage which resulted within this evolution. As such, there can be no project of planning ahead the path of education. The organizational management of educational institutions is the denial of liberal education, of freedom of evolution, and of these institutions' rationale.

This hypothesis, that evolution itself adapted to signification, already outlined by Peirce, found its proper place in biosemiotics (e.g. Stjernfelt 2011, 2014). This leads to the project of analysing learning practices, such as classroom phenomena, as *Lebenswelt*. Science is a typically human endeavour. When engaging in explaining his division of sciences, Peirce first mentions "that science is a pursuit of living men, and that its most marked characteristic is that when it is genuine, it is in an incessant state of metabolism and growth." (CP 1.232) This is a clear expression of what pragmaticism mainly stands for, namely the assumption that things can only be in

the way in which they make sense, that is *in actu*. There can be no science without the scientist practicing it. The same argument applies to education: there is no education without the learners. This simple observation tends to be overlooked. Science is practised by the living, because the living are learning. As such, science can be studied as a biological phenomenon. Surely, biology is only a branch of science in its turn, but if biology is to investigate phenomena of the living then it is a science that *par excellence* can explain the phenomenon of science. Since in this thesis education is analysed as a path leading to science, as a method towards science (see Chapter 1), then education will be regarded as certain semiosic phenomena responsible for a *Lebenswelt*. If education is a method towards science then education can be labelled a meta-methodology: a method for a method of seeking truth. Since the rationale of education is that of serving the progress of science, education is strictly dependent on scientific life. Learning, education, and science stand in a First-Second-Third Peircean trichotomy. The previous makes the following possible and the latter regulates the former in an unending abduction-deduction-induction loop. Learning makes education possible, which makes science possible. As a Third (Interpretant), science makes the learning-education dyadic relation meaningful. Without science as *telos* learning and education could not be practiced; they would have been useless endeavours. The findings of science remodel learning and education and so on. The triadic system sets its own telos from within: education systematizes learning in order to take the direction that science points at, while the horizon and the path itself change according to every significant progress.

1. Divisions of Science

Peirce's divisions of science resemble the medieval classification of philosophy, inherited from Aristotle. The main medieval reference for the classification of philosophy and the curriculum is Cassiodorus' *Institutiones* (Deely 2001), a work of strong Augustinian descent. Figure 3 below illustrates the medieval divisions of philosophy from which Peirce's divisions evolved.
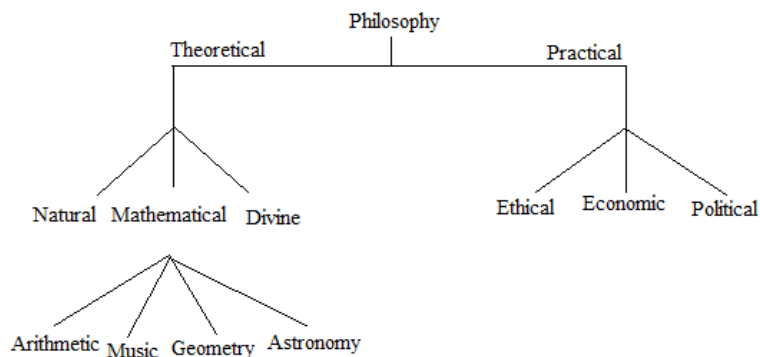

Figure 3 – The medieval divisions of Philosophy, according to Cassiodorus

Peirce divided science into theoretical and practical. Theoretical science is divided into retrospective sciences (sciences of review) and active sciences (sciences

of discovery). The sciences of discovery are Mathematics, Philosophy (Coenoscopic science), and Idioscopic science. The Idioscopic sciences are physical sciences (Physiognosy) and psychical sciences (Psychognosy). Physiognosy contains sciences such as physics, chemistry, biology, etc., and Psychognosy contains psychology, ethnology, linguistics, sociology, history, etc. (see CP 1.238 – 1.272). Figure 4 below illustrates Peirce's divisions of science.
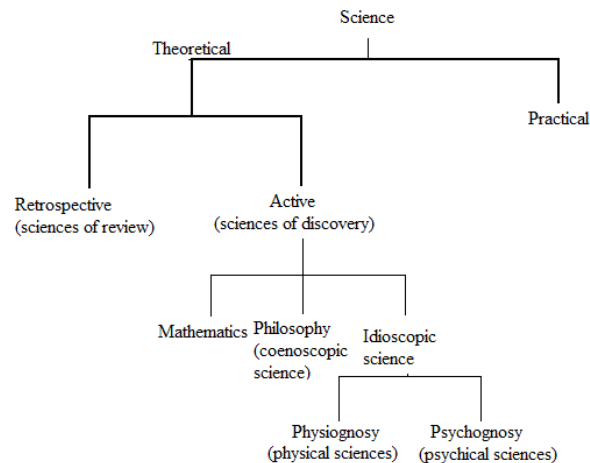

Figure 4 – The divisions of science, according to Peirce

Peirce was aware that these disciplines are usually mingled and make use of each other. This fact is illustrated by this division. That all these fields fall under the same category (science), it means that they share qualities, and thus a diagram of the sciences is possible. This is why Peirce never needed to propose a curriculum explicitly: if the sciences are diagrammatic among each other than the best way to learn them is exactly as they are. The curriculum is itself science, or a further diagrammatization of subdivisions of it. The curriculum, therefore, needs to be *like* the divisions of science, that is an Icon of the divisions of science. Peirce stated from the beginning what is the similarity among the sciences. Their shared quality is the fact that they are all observational:

"All knowledge whatever comes from observation; but different sciences are observational in such radically different ways that the kind of information derived from the observation of one department of science (say natural history) could not possibly afford the information required of observation by another branch (say mathematics)." (CP 1.238)

As a diagram, this curriculum proposal is schematic and flexible. It gives just a principle, as a backbone, for a curriculum. This principle is the history of ideas. The diagram shows how the sciences evolved. It proposes, therefore, the learning of the most basic principles of observation in the earliest years of schooling. On this account, education should start with the learning of semiotics. This consists in developing a semiotic consciousness by the children, who would simply become aware that they are learning. To realize that the self is in relation with others around

and that only by these relations it learns is to gain a semiotic consciousness. The first subject to be taught, therefore, is logic (semiotics). Once the learners can perform logical operations consciously, they can proceed to observing mathematics, which leads to philosophy, and which leads to idioscopy. Of course, the first stages of learning any new subject are abductive. When a learner, for example, engages in learning philosophy the first thing she learns is to discover the "philosophical" knowledge she already gained by her everyday casual observation. As such, at a more mature stage, when she will make the next step of inquiring into the psychical sciences she can choose if she prefers to start with sociology, psychology or anthropology, according to where her abductions, deductions and inductions led her. For instance, a child might prove to be more interested in an individual's behaviour, while another might find more interest in looking at group behaviour. The diagram of the curriculum contains general classes, such as 'philosophy', 'psychognosy' or 'physiognosy', without specifying particular and narrow pursuits. That a student choses to focus more on a tradition of philosophy than on others and prefers to read Durkheim rather than Freud is her own choice. The schooling system has to be flexible enough to allow and encourage this possibility. At the same time, it is not only the individual's choices and an individual path that sets the curriculum for the specific individual, but also the entire academic community and society. *Lebenswelt* particularities are not necessarily restrictive; they set the real possibilities of interpretation. The fact that we find ourselves in a certain moment within the history of ideas, within certain social, economic and cultural structures of signification, sets a space for signification to develop. If the *Lebenswelt* imposes, for some reason, the exploration of certain subjects, this should not be easily dismissed. It should all be done by allowing freedom for signification to grow in any direction (see Stjernfelt in Bundgaard and Stjernfelt, p. 232 and in Chapter 1). Semiotics is a hermeneutically rich logic that can only be practised freely. As such, the first statement it brings to education is that it needs to be a free system. Otherwise, the system would only bring forth Interpretants constrained by its inner structure. It would be diagrammatic, having inner coherency, but not metaphorical, that is, it would not expand by parallelism to something else, toward the yet unknown. As such, the proposed curriculum is not rigid; it will change in time, according to how signification evolves. Semiotics necessarily implies a liberal curriculum by the assertion that the first thing to be learned is observation itself.

All learning happens through observation, which is experience. Different varieties of observation generate the variety of sciences. Theoretical sciences are directed towards, in Peirce's words, "God's truth" (CP 1.239) while the practical sciences are "for the uses of life" (CP 1.239). Retrospective sciences and active sciences regulate and respectively orientate each other. Mathematics, Philosophy and the Idioscopic sciences are a Peircean trichotomy. Mathematics "merely posits hypotheses, and traces out their consequences," (CP 1.240), thus consisting in the abductive phase of the active sciences. As such, since the positing of hypotheses means discovery of predicates, mathematics is governed by icon manipulations. Peirce made it clear about mathematical observation that it is icon manipulation:

"The reasoning of mathematicians will be found to turn chiefly upon the use of likeness, which are the very hinges of the gates of their science. The utility of likeness to mathematicians consists in their suggesting in a very precise way, new aspects of supposed states of things." (CP 2.281)

Even more precise, in Chapter 2 it was shown that, according to Peirce, mathematical reasoning is diagrammatic, a particular type of iconicity. Mathematics "makes constructions in the imagination according to abstract precepts, and then observes these imaginary objects, finding in them relations of parts not specified in the precept of construction" (CP 1.240), Peirce explained. This proves that imagination is a part of experience, actually, the basic experience which makes all other experiences possible. We understand things because we can mentally manipulate tokens of them – this is an argument for the suprasubjectivity of reality. The signs we mentally manipulate are diagrams: they are icons, because they resemble the objects reconstructed, hypoicons because in the sign-relation constituted by the mental manipulation and its ground there is inner similarity, and, though signs of Firstness, by manipulating these signs, they manifest a degree of Secondness, because we can only manipulate Replicas of what we want to manipulate. Thus, mathematical observation finds in its objects *relations of parts not specified in the precept of construction*. (CP 1.240)

It is proven therefore, putting it in this semiotic language, that at least all theoretical sciences start with icon manipulation; even more precise, they start with diagrammatic reasoning (retrospective sciences come along only as general abduction of the active sciences). From this point of view even the positing of hypotheses requires a discovery. Mathematics, nevertheless the First of this trichotomy, "meddles with every other science without exception." (CP 1.245) Mathematical observation, just like icons generally in reasoning, is defused throughout all the divisions of science. A cornerstone for Peirce's semiotics is that mathematics is very close to logic, a class under philosophy (CP 1.245). The Second of the trichotomy, philosophy "deals with positive truth, indeed, yet contents itself with observations such as come within the range of every man's normal experience, and for the most part in every waking hour of his life," (CP 1.241), accounted Peirce, attributing the terminology that he inherited as *coenoscopic* to Bentham.

Philosophy is, therefore, experience in the most common sense, and in this stands its difficulty: it's objects of observation are so obvious that they are difficult to conceptualize. It implies a focus added to the hypotheses stemming from mathematics. If a London resident assumed the hypothesis that she lives in a space where the shortest distance between two points is the straight line uniting these points, she will infer that the quickest way between Oxford Circus and Covent Garden is via Oxford Street. She might change her mind, though, noticing the crowd on Oxford Circus. This is an example of philosophical obsevation. The Third, Idiscopic science, another terminology inherited from Bentham, consists in a special type of observation, an observation "which travel or other exploration, or some assistance to the senses, either instrumental or given by training, together with

unusual diligence, has put within the power of its students." (CP 1.242) This is the stage were the London rezident will take a look at statistics of demographics in London to figure out her walk from Oxford Circus to Covent Garden. It involves signification of Thirdness, being the class of science where Arguments are developed. Retrospective science starts when the Londoner starts to doubt whether in London the shortest path between two points is the straight line between the points.

The divisions of science form a sound diagram, being operational due to its strong inner similarities. This means that the learning and teaching of a subbranch is dependent on the teaching and learning of more primal branches. For example, philosophy cannot be inquired without logic (mathematical reasoning), or the psychical sciences are absurd without previous philosophical reflection. Indeed, psychology, sociology, linguistics and so on stem from philosophy. This is how they were historically developed as well. It does not make sense for a student to study psychology without any philosophical understanding. If it is possible for a student to understand Freud without having had studied Aristotle and Nietzsche it is because she had been going through her own coenoscopy. The student's own experience and reflection during *every waking hour of her life* might have made it interesting for her to study human behaviour. *Interesting* in this case means compatible to her web of signs. Surely, without the reasoning of philosophy, psychology would be pointless. For example, the desire of studying human behaviour is the result of a logically (mathematical, and, thus, diagrammatic) applied judgement possible only upon the observing of human behaviour. A human person will be interested in human behaviour once she has already noticed human behaviour and something made it interesting. If philosophical observation tends to happen naturally it does not mean that the curriculum should ignore it and count on the student's own idioscopy. What Peirce is telling through this diagram is precisely that Freud is better understood by someone familiar with Aristotle and Nietzsche.

Peirce gave a serious insight towards a theory of learning by explaining the practical sciences. The practical sciences are much like the medievals' utilitarian arts (crafts), distinct from the liberal arts. Here there is not so much a classification to be done, neither are there mechanisms of reasoning to be explained. They are "well-recognized sciences now *in* actu" (CP 1.243). Peirce gave an enumeration of examples of such practical sciences: "pedagogics, gold-beating, etiquette, pigeon-fancying, vulgar arithmetic, horology, surveying, navigation, telegraphy, printing, bookbinding, paper-making, deciphering, ink-making, librarian's work, engraving." (CP 1.243) The first important insight to be derived from here is that the first practical science that Peirce named is pedagogics. By pedagogics here he meant the art, the very practice of teaching. By placing pedagogics here Peirce informs the reader at least about two important considerations for a theory of learning. First of all, that pedagogics is not a subbranch of pscychology which is an Idioscopic (therefore theoretical) science. It was already mentioned that he considered that the scientific man might lack in popularity as a teacher. Pedagogy is not the subject of psychology, sociology or any other psychognosy, but it is developed by practice. The second observation which should not escape is that since pedagogics is a science it is

observational. It will be developed by practical observation. The teacher needs to teach in order to learn this science. Observing other teachers is also a good method of practical observation. As such, we inherit from Peirce two recommendations for teacher training: (1) teachers should observe other teachers and (2) teachers should teach.

Another observation stemming from this list of practical sciences regards what should be taught under a liberal system of education. The integration in a liberal curriculum of any of these crafts is problematic. Like any science, they should be taught in the situation where their teaching serves the hunger for and pursuit of truth. Perhaps a first hypothesis would be that they should be undertaken by these who find their use towards a scientific goal, such as a researcher undertaking teaching, as she might teach her research. There are examples of subjects that can be either a theoretical, either a practical science. For instance, music is an art of the quadrivium, while it was also approached as an utilitarian craft, in the case of playing techniques. Likewise, arithmetic is one of the four arts of the quadrivium, falling under *mathematics* in Peirce's divisions, but Peirce also mentioned a *vulgar arithmetic* as practical science, an arithmetic allowing the performance of what can be called *market place arithmetic*, which is not underpinned by the conceptualization of metric relations as a scientific endeavour *per se*. This shows that a science is legitimate to be taught in the perspective of liberal education according to how the learner understands this science. If within a learner's web of signs a certain discipline's scientific character is revealed, she can find the justification for studying this science, which, as such, is *interesting*.

However, the teaching of utilitarian crafts, arguably, might be necessary when individuals' life would be meliorated in this way. However, their "teaching" would be limited to practical observation, as any theory (in the strict sense) about the practicing of crafts cannot meet the purpose of the practice. Crafts need to be practised.

As for learning as a theoretical discipline, it occurs that it identifies with Mathematics, logic that is. Learning is nothing else, in this case, but pragmatic logic – semiotics. This brings us back to St Augustine's and the medievals' assumption that *things are learnt through signs* (Chapter 1). This is the first thing that St Augustine teaches in his pedagogical book (*De Doctrina Christiana*) and this is what semiotics teaches as the first thing that should be taught and learned.

2. The Learning-Education-Science trichotomy

Another argument presented in Chapter 1 is that the sole purpose, and, therefore the rationale, of education is the progress in knowledge *per se*. Any other objective besides this infinite progression which would deviate education from its path, starting with spontaneous learning and leading to scientific discovery, is an unjustifiable bias. Thus, an educational philosophy founded on pragmaticism is necessarily liberal education. The history of semiotics and educational philosophy supports this claim (see Chapter 1). In understanding the place of education in

Peircean philosophy the starting point is therefore this: education is a method of inducing from learning to science; it is a means by which spontaneous observations are systematized so as to serve science. It is essential to keep in mind that this method is not a rigid mechanism, but a critical part of human life. "Let us look upon science -- the science of today -- as a living thing," (CP 1.234) Peirce urged his readers. If it is an essential aspect of science that is practiced by human beings then to learn about science one must enquire on these scientists. The assumption that learning is discovery implies that the progress *in* knowledge is the progress *of* knowledge. Knowledge belongs to life forms – they have it, they perform it. To understand science, Peirce went not to an abstract discipline, but directly to its life, to the scientists:

"Now, did those men gradually become men of science as their stores of knowledge increased, or was there an epoch in their lives, before which they were amateurs and after which they were scientists? I believe that the answer is that, like any other regeneration, the metamorphosis is commonly sudden, though sometimes slow. When it is sudden, what is it that constitutes the transformation? It is their being seized with a great desire to learn the truth, and their going to work with all their might by a well-considered method to gratify that desire. The man who is working in the right way to learn something not already known is recognized by all men of science as one of themselves, no matter how little he is informed." (CP 1.235)

This already brings the focus on the issue of education. Science is best represented by those practicing it. One, therefore, grows to be a scientist, she undergoes an education towards it, be it the education offered by an external system, or her own endeavours, or a combination of both. The criteria for recognizing the scientist is her *great desire to learn the truth*. Hence, this is what education ought to cultivate, the desire to learn. Without the learner's own sincere will of pursuing truth education is pointless. Science will spring forth from this desire, as a gratification of it. This desire to learn assures the compatibility between the known and the unknown, between that which the learner is and that which she will become by an achievement of knowledge. To express this in the terminology that this Peircean theory of learning is advancing, the will to learn a certain unknown puts the unknown in an iconic relation to the known: the learner looks at the unknown as at a certain something that has to resemble what for her is known. What is being learned and what is known are diagrammatic to the teacher-learner whole web of signification – it is a part that resembles the whole. Of course, if the only meaning phenomenon that describes learning is that the unknown is seen in a light that makes it similar to the known, learning, as well as the object to be learned, are quite banal and useless. There is another meaning phenomenon, a characteristic of this semiosis, that makes the learning and the to-be-learned interesting, namely that also the known becomes similar to the unknown. When learning something new, the learner not only realizes that that which she did not know is not that strange to her signifying world, but also that her signifying world had some inherent *strangeness*. The very fact that

we are subject to change proves the strangeness of the self's own present state. Learning something new brings awareness of this strangeness and thus arouses a sense of wonder and thirst for knowledge. By developing a new Interpretant, the learner's whole world, the learner herself, changes. The achievement of knowledge is an expansion of the web of signs which constitutes a learning subject. "The life of science is in the desire to learn," (CP 1.235) considered Peirce. Science can therefore be practiced only if lived and, as such, cannot be done dishonestly, without a desire for learning the truth, whatever that may be and however it is thought of.

An educational system objectifies learning goals on the path of the learner. If learning is simply an immediate sign of life, education is problematic because it constrains it. A web of signs expands according to its own will, in the limits of its *Umwelt*. Education comes as an external restriction for a living organism, refraining the organism's natural wandering in its own *Umwelt* and focusing it upon objects which might not have been of interest beforehand. Perhaps a certain seven year old child is not interested in basic arithmetic, but would surely be interested in expanding its web of signs in the direction of geometry. Nevertheless, to survive in contemporary human *Lebenswelt* she will be taught arithmetic as well. Such are the cases where, according to Peirce's above argument, education becomes problematic. It is problematic because while the child might nourish a desire for knowing what is true, she fails to see that what the educational system is teaching her is a path towards truth. Such situations will be further investigated in Part II. What needs to be noted at this stage is that education, schooling, has to inspire the desire to know the truth. It occurs that according to Peirce it does not even matter much how a person pursues truth once she lives a certain desire for it. Simply being driven by this desire will imply a general tendency towards truth, even if a certain instantiation of learning is wrong (whatsoever *wrong* might mean – implying false conclusions from true premisses, using a superfluous method, etc.). In Chapter 2, where Peirce's sign types were introduced, it was explained that the fully developed sign to which all signs tend is the sign type that tends to the truth – the Argument. Therefore, the role of education is argumentation (developing arguments). For an Argument to serve as predicate an Icon is needed. This predicate is, in this case, the will (the desire, the interest) to learn – this is an icon, giving to the phenomenon of education diagrammatic coherency. The will to learn is similar to learning, it is an icon of it; as Peirce explained, it is almost *confused* with its object – once she wills to learn the learner is already engaged in learning. The educational system cannot offer this predicate (Icon) to the learner; it is for the learner alone to discover it. Each human being has its own personal reasons for learning and this is why for some it comes rather at hand to learn geology and for others painting.

The diagrammatic coherence between the semiosic structure of the motivation and that of the *unknown-to-be-learnt* determines the direction that learning will take. Once the learner contains these predicates she needs to apply subjects to them. This is something that education as schooling does: it shows the learner subjects for her predicates. Subjects need to be Indices, signs of direct affection that point a direction. Therefore, the action of the educational system is that

of pointing direction, it provides orientation, a focus. It is a simple and oftenly occurring mistake that the educational system even punishes the learner by marginalizing her place in the suprasubjective *Lebenswelt* (e.g. society) if she fails to apply predicates to the subjects that the educational system is presenting forth. When this happens the problem is that between the predicates which the learner discovered by herself and the subjects that schooling is brining into attention there is no diagrammatic relation. From the perspective of the learner the subjects of the curriculum are not interesting, and from the perspective of the educational system the predicates of the learner are idle: both regard each other's knowledge as useless and this obscures all possibilities of learning. Indices are unsaturated predicates (see also Part II and Bellucci 2013, p. 18) and, if the learner is to become able to apply to a subject one of her own predicates she needs to develop from this subject a predicate. For this she needs to discover the iconic character upon which that index was developed; after this is achieved it is simple – a simple play with an Icon will result in its use as a predicate (a rheme). Once she knows the rhematic potentiality of the index she can use it as well as a subject (unsaturated rheme) applied to a predicate. This is so because by discovering the rhematic potentiality of a sign (rhematic potentiality is iconic character), the sign becomes diagrammatically coherent with her own web of signs. This phenomenon is referred to as discovery.

The learner has to take pains to make discoveries herself. The educational system has two roles, therefore: (1) to provide to the learners a suitable amount of subjects worth pursuing – many, so that the chance that compatible subject-predicate structures occur is high, but not too many, as that would delude focus and obscure learning – and (2) to provide the adequate *Lebenswelt* for discovery to be happen – this is most of the time a negative endeavour, the educational system should be concerned with not obscuring the possibility of discovery. Living beings learn; they do so because they need to survive and grow. No matter what the explanation for this is they certainly learn: it was already taken as an assumption that living and learning, in this biosemiotic account, are equivalent. The only danger that might befall on an educational system is that of willing to pursue something else but truth:

"If this desire is not pure, but is mingled with a desire to prove the truth of a definite opinion, or of a general mode of conceiving of things, it will almost inevitably lead to the adoption of a faulty method; and *in so far* such men, among whom many have been looked upon in their day as great lights, are not genuine men of science; though it would be foul injustice to exclude them absolutely from that class. So if a man pursues a futile method through neglect to inform himself of effective methods, he is no scientific man; he has not been moved by an intelligently sincere and effective desire to learn. But if a man simply fails to inform himself of previous work which would have facilitated his own, although he is to blame, it would be too harsh to say that he has violated the essential principles of science." (CP 1.235)

Therefore, education has to be well aware of the temptations coming from other sectors of society: economic, social, political and other interests might mingle

and delude education from its pure liberal path. Such interventions obscure the very telos of scientific discovery away from education, depriving education of its sole rationale. If a knowing subject is to know, she has to strip her will for knowledge of any selfishness: seeking to prove the truth of a statement, proving one's own knowledge to be sufficient – these are pathological for education. Therefore, in her relation to a teacher, the learner's only duty is to be genuinely interested in what the teacher has to teach. The same is valid for the teacher: her only way of sharing knowledge on a particular subject is to desire to know the knowledge of her student. This mutual willingness to know that which the other knows makes learning possible. This is the argument on which this Peircean Theory of Learning is founded; it will be thoroughly explained in Part II. Since the present study does not prescribe methods for learning, but for teaching the focus does not come on the student's willingness to know the teacher, but on the teacher's willingness to know the student. I argue that, according to Peirce, the teacher's going out of herself, towards the student, embracing the knowledge of the student, is the mandatory condition for the student's possibility for a growth of knowledge towards the knowledge of the teacher, towards the structures of signification that the teacher is aiming at.

Science, and therefore education, as explained, belong to the world of human beings, to *Lebenswelt*. As such, they will lead to the production of very particular *Lebenswelten*. On what is a rather nominalist account, Thomas Kuhn referred to these different *Lebenswelten* as paradigms(Kuhn, 1970), a celebrated terminology. While Kuhn insisted on the strictly cultural aspect of science, a Peircean account subjects science to biology. Whether non-human animals live culturally and are capable or even perform science we cannot know. We simply cannot know what it means to be non-human (see also Stables 2012) and, fortunately, this we do not even need to know. Therefore, the question arises, is not Kuhn's account rather adequate, looking at scientific progress as a socio-cultural enterprise? To this I answer that the Peircean account, subjecting education and science to the biological is insightful because learning is a characteristic of life and education and science are only possible where learning happens. Peirce's semiotics does not place nature and culture in a relation of dichotomy, but instead they are regarded as continuous. Whether it is adequate or not to state that tigers educate their young is probably impossible to know, but surely tigers do learn. This learning is semiotically the same as learning in the human world – it is a discovery and use of predicates. Peirce's account is therefore holistic in respect to Kuhn's epistemology because it does not assume a nature/culture dichotomy. Nature and culture are continuous. Peirce stressed that having a different scientific direction implies living in a different world. Science, education, and learning are similar since they evolve one from the other. The *Lebenswelt* of scientific human beings, which goes under the name of *academia*, has its own peculiarities, but in the same time it is similar to more general *Lebenswelten* and to more basic *Umwelten*. Thus, it will be here studied as such. The web of signs constituting oneself is essentially captivated by a scientific endeavor, as the *scientific man* is taken over by the scientific growth of knowledge. A life of research is a certain, peculiar semiotic world:

"Such being the essence of science, it is obvious that its first offspring will be men -- men whose whole lives are devoted to it. By such devotion each of them acquires a training in making some particular kind of observations and experiments. (Unfortunately, his acquisition of books, instruments, laboratory, etc., depends upon qualifications in which the man of science is usually rather wanting -- as wealth, diplomacy, popularity as a teacher -- so that he is less likely to be provided with them than are men less qualified to use them for the advancement of science.) He will thus live in quite a different world -- quite a different aggregate of experience – from unscientific men and even from scientific men pursuing other lines of work than his. He naturally converses with and reads the writings of those who, having the same experience, have ideas interpretable into his own. This society develops conceptions of its own. Bring together two men from widely different departments -- say a bacteriologist and astronomer -- and they will hardly know what to say to one another; for neither has seen the world in which the other lives. True, both use optical instruments; but the qualities striven for in a telescopic objective are of no consequence in a microscopical objective; and all the subsidiary parts of telescope and microscope are constructed on principles utterly foreign to one another – except their stiffness." (CP 1.236)

Here it becomes clear that for Peirce education is directly connected and mutually dependent on science, raising a dilemma with which philosophy has struggled since Plato: the wealth of the scientist. According to Peirce it seems a safe assumption that the scientific man does not have the means to acquire not only abundant wealth, but the essential instruments for carrying out his research. Thus, providing these instruments is a role of the educational system. The educational system has to protect science, or rather the people pursuing science, from society – this falls under the previously mentioned role of education of providing the proper *Lebenswelt* for discovery: keeping education clear of any other purposes except the free pursuit of truth and providing the required means of research to the researchers (from access to bibliographical sources, to microscopes, offices, funding, etc.). It is a lonely *Lebenswelt* for the researcher: "*He will thus live in quite a different world,*" Peirce wrote.

In Kuhn's account as well the conversion from a paradigm to another is an uncontrollable act. This proves the seclusion of the scientist: who would claim to understand Socrates, or Newton, or Kant genuinely? In her *Lebenswelt*, the researcher shares with other researchers whose ideas are *"interpretable"* into her own.

Interpretable is something compatible with a Representamen in such a way as to constitute the Interpretant of a Sign together with the Representamen. If the Representamen is here the web of signs identical to the *Lebenswelt* of a researcher, then structures of signification from the *Lebenswelt* of another researcher are *interpretable* so as to lead to the expansion of the first researcher's *Lebenswelt*. An Interpretant has to be compatible (interpretable) with a

Representamen so as to constitute together one entity (one Sign). Being parts of a whole, the Interpretant and the Representamen need to be diagrammatically coherent. This means that they need to resemble as well each other as the whole (the Sign). The knowledge of a student has to resemble, therefore, what she is learning and both these semiosic structures have to resemble the learning phenomenon as a whole. It is up to the learner to discover the similarity between what she knows and what she does not know yet. For this she has to look into the knowledge of the teacher. The teacher, by knowing her student, can have an intuition about the knowledge of the student and anticipate possible similarities that she might try to reveal. In this endeavour the teacher has to be careful not to obstruct learning possibilities for her student, possibilities that the teacher herself cannot be aware of.

There are infinite learning possibilities for the student (anything can be similar to anything else) and the teacher will never be aware of many of them because the teacher is never identical with the student. The teacher and the student cannot be identical but they can be similar and to be similar, to be diagrammatically coherent in potentiality, in this case, is to have the possibility of learning one from the other. It is an intimate act, an access to the self of the other, the teacher and the student come know each other's knowledge, the other's intimate semiosic structure. Learning is a form of an erotic act. It is an act of longing for the other, longing for the teacher, longing for the student. The student wants the knowledge of the teacher, the teacher wants the knowledge of the student. The semiotics consciousness, as it is clear in Peirce, proves that one's knowledge cannot be separated from herself, as her knowledge is a determining aspect of her *Umwelt*. Learning is done with great care, so as not to traumatize – trauma is nothing else but the obscuring of learning possibilities. Being an intimate act, learning can cause violence and close learning possibilities. Teachers and students have favourites, they can get jealous, they get anxious, they are stressed, they have expectations from the other, they can also be surprised, they want to impress the other at times, at other times they want to show to the other that she has disappointed, they punish each other, they listen to each other, they teach each other – they have an erotic intimate relation. All these things are practised by one upon the other, an agent to a subject. It is erotic. The only thing that they do together is learn. Learning comes as erotic fulfilment, gratification – it is not the agency of one side towards the other, but it is a suprasubjective phenomenon *per excellence* where the two sides have reached diagrammatic harmony. This gratification, however, is not just sporadic and temporary. It cultivates intimacy and trust between the two. Learning is transcendence and it leads *eros* further into *agape*. This is the straightforward conclusion of Peirce's theory of evolution and, thus, this is the account of learning that the present theory advances; it will be explained thoroughly in Part II.

The next chapter explains the suprasubjectivity of Peirce's semiotics.

Chapter 5
Suprasubjective Being and Suprasubjective Learning

In this chapter I investigate the educational implications of a suprasubjective philosophy, such as the semiotics of Peirce is. I shall explain what suprasubjective reality is and what are the advantages and implications of a philosophy of suprasubjectivity for education. In Chapter 3 I explained that the account of learning as a suprasubjective phenomenon, since learning is semiosis (Stables 2006), is not an empiricist or pragmatic (in the Jamesian sense) account of learning. This chapter explores what the implications for learning are if experience is suprasubjective. This will help in realizing where a Peircean Theory of Education stands within contemporary philosophy.

A. Suprasubjective Being: non-dualist philosophy

In the previous chapters the concept of *sign*, the central concept for semiotics, has been introduced. The sign has been presented as a relation of three termini which Peirce termed Representamen, Object, and Interpretant. The first of the triadic sign, the Representamen, is also referred to in common language as *sign*, since it performs what Umberto Eco called the *sign-function* (Eco 1976). The object evoking the function inherited the denomination of *sign-vehicle* (Eco 1976). At times Peirce also used the word *sign* to refer to the Representamen of a triad, though, for him the sign *par excellence* is the triad. That he referred to the first of a sign also as *sign* and also the reason for this can be noticed in this following definition he gave, where the nature of *sign* as relation is clearly expressed:

"A Sign is anything which is related to a Second thing, its Object, in respect to a Quality, in such a way as to bring a Third thing, its Interpretant, into relation to the same Object, and that in such a way as to bring a Fourth into relation to that Object in the same form, ad infinitum." (CP 2.92)

Peirce also called the Representamen a *sign* because from the Representamen the relation begins. The Representamen cannot *be* at all unless in infinite relation. It evokes infinite semiosis. The fact that it leads to a *fourth* terminus and so on ad infinitum does not make the sign infinite in an incomprehensible way, because graphs are reducible to 3rd degree graphs. Nevertheless, semiosis is infinite and it could not be otherwise, as any terminus would bring about, into semiosis, an infinity of other relations. We can only think abstractly of the termini of a relation; only as termini of relations they have being. To acknowledge the relational character of being is a difficult task, since, as Christos Yannaras noticed:

"In the empirical logic expressed by our everyday language, something first *exists* and is then *related* to, or comes into relation with, something else – something that is already existent." (p. 1)

Our everyday language was shaped in this way being underpinned by our metaphysical language, developed along centuries of essentialist (non-relational)

ontology. Modern philosophy's dichotomies entrenched this all the more. However, there is a common sense way out of essentialism (givenism) and towards relational ontology. Yannaras observed that although we understand being as *given*, and thus preceding any relations "at the same time, common experience confirms that every being exists only as a coherent combination of relations, only as situated within a network of relations." (p. 2) This is the path of Peirce's critical common sense as well. If something does not *relate* to some *otherness* it does not exist – it is not in iconic syntax within the physiology of arguments. Meaning is always infinite and, unlike information, it is not quantifiable. This has deep implications for the way in which we understand teaching and learning. Information can be identified with the quantifiable part of meaning, which is often not relevant for the phenomenon of semiosis, especially in the case of learning. The quantifiable aspect of a structure of meaning which is being *learnt* might not be representative. It is impossible to quantify the *creativity* by which a student uses an Icon as a Predicate and it might often be irrelevant if the Icons a student is discovering are the Icons the teacher has in mind. This is why evaluation if problematic. Establishing a ranking of the students (e.g. by grading) entails quantifying the information that the students acquired in respect to what is expected. Adopting a semiotic philosophy of education, which supposes the hypothesis that meaning in its entirety is infinite and unquantifiable has to change this evaluation paradigm. To propose a method of evaluation that does not rely on quantification of information is not an easy task and it does not occur immediately. However, in the following chapters I explain that the crux of this matter stands in the personal relation between student and teacher and in the attitude with which the two engage in the relation. I argue that a suprasubjective account of reality implies a certain understanding of consciousness bounded to personality. Per Aage Brandt (2007) suggested that on a semiotic account consciousness and personality are at least intimately related. Personality is the Interpretant of the semiosis in which certain living beings (humans) are engaged.

The sign is triadic, as two termini can come into a stable circularity by being linked to a third. A dyadic relation *per se* is useless because of its redundancy: a relation in which two termini relate to each other back and forth can never be used for anything. Something (a first) leads to something else in some respect (a second), which leads to another thing (a third) which can very well relate back to the one of the previous two – this is a graspable and useful being, proper relation. It is infinite but comprehensible. With the above sign definition Peirce accounted that the key to the comprehensibility of the Universe is the possibility of *sharing*: a chain of relations at some point (with its third element) relates back to *the same Object* to which the relation led from the start. As well, to this Object shared by the Representamen and the Interpretant the relation was possible in the first place *in respect to a Quality*. The sign in itself, therefore, is diagrammatic – it has inner similarity. *Sharing of qualities* is the definition used here for *similarity* (Chapter 1, section C). Infinite semiosis has iconic syntax by relating back to a previous terminus which was brought about in the first place due to a *Quality*. As such, since it shares the terminus that was brought forth in respect to a *Quality*, signification has

inner similarity. This is an explanation for the intelligibility of the world. It does not explain why *things* (whatever they are or are not) are graspable by cognitive, living beings, but it explains why reality itself is intelligible. Because reality is intelligible, because it can *share*, it can support *local pluralities*, which, as explained in Chapter 1, is the very definition of life. This supports the claim from Chapter 1 that reality is not schizophrenic. This is where semiotics proves to be insightful for biology and viceversa: semiotic reality explains life as a growing urge of the cosmos to *share*. That life is *local plurality* is the biosemiotic formulation of the fact that phenomenal worlds overlap. The phenomenal worlds of living organisms (*Umwelten* and *Lebenswelten*) overlap but never coincide (Stables, 2012). If my experience of something (*this glass on the table*) is not identical with someone else's experience (*of the glass*) it does not mean that we cannot share in our experiences (*I can ask her to pass me the glass*). Phenomenal worlds can overlap, thus joining into a suprasubjective reality, by their inner similarities. Neither do we live in the same identical and essentially unaccessible *noumenal* world, nor do we live in completely separated realities. It clearly occurs that the hypothesis that a physiology of arguments is possible due to iconic syntax supports the assumption of suprasubjective reality. This proves the compatibility between, firstly the Peircean semiotics of Frederik Stjernfelt and John Deely, and, secondly, the compatibility of these Peircean frameworks with the educational semiotics proposed by Andrew Stables.

Being is suprasubjective because it shares, and, as such it is relation (mediation). The relation of a third to a previous is Peirce's notion of habit (universal, tendency, law, etc.): since more termini relate to one terminus, a pattern can be recognized. They tend to relate to it, so to say, because if a third relates to something there certainly is a second that relates to the same first element. As well, the second and the third relate to each other directly, besides their connection to the first. Notice that a second of signification (an Object shared within triadic signs) is not simply a bridge making the connection between Representamen and Interpretant possible, these two being directly connected as well. Within the triadic sign each terminus relates to the other two, that is why it is not redundant (e.g. pure convention), but useful: each relation has a shared third. The triadic sign can be termed the *sign-relation*. It can be represented by a tripod[18]:

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[18] The tripod is a structure that can serve as a good Icon to represent the sign-relation. The triangle has also been used to represent the sign-relation, but the tripod is preferred because by its intersecting three dyads in one point, unlike a triangle, it shows that the triadic relation is not merely a sum of three dyads, but a genuine triadic composition, irreducible to a sum of composing elements.
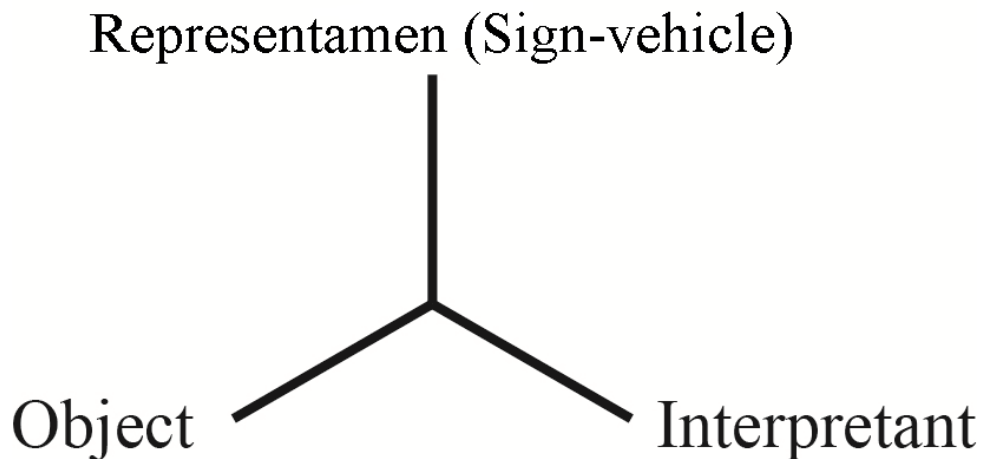
Figure 5 – The Sign-Relation

In Peircean semiotics the *sign-relation* is clearly identified with *being*. The three termini of the sign are not separable and do not have *being* in themselves. The Representamen's and the Interpretant's character as sign are implicit. None of them, like any sign, needs be mental, as it is often thought. The Object, the second of the sign, has its being within the sign. In itself it has the potentiality of evoking signs, but it is *nothing* except in relation. It is never a strictly mental or non-mental entity, as it is often thought. Since the sign is a 3rd degree graph it cannot be reduced to smaller degree graphs (see Chapter 2). By this assumption Peirce offered a way out of modern dualism, uniting ontology and epistemology. *Being* is *relation*, transcending the realm of mind or that of non-mind. Being sweeps through reality without having its status as *being* affected by the shift from the mental to the non-mental. Being, thus, is suprasubjective. In the words of Paul Bains, "relations do not respect any ontological Iron Curtain." (Bains 2006, p. 9)

If one tries to focus and grasp any of the three termini of a sign in isolation, to cut them away from the sign-relation, she will find other sign or signs constituting each of them. If one tries to isolate the Object of a Sign she will only think of the Object as a Sign. This is obvious, since we can only learn by signs – signs are the only things we can use. For example, we can think of a Representamen which can be described as the phenomenon of perceiving the changing of color into green at a traffic light, having as Object the impression this perception makes, and its Interpretant consisting in the consequences – the sense of traffic changes, a person can recall the smell of freshly cut grass (due to the shared quality of *greenness*), and another person is eased because she realizes she can *make it in time*. Together these three termini are a Sign (S1). The Object – the impression of a perception – can only be thought of as a Sign (S2); this Sign (S2), referring to another Sign's (S1) Object, does not coincide with the referred Object, but, nevertheless, it describes it. This is not so because the Object (or some terminus of the Sign) is in itself *noumenal*, but because, as a *real existing phenomenon*, it is not precisely delimitated. The Object (or any terminus of the sign-relation) has its unique, genuine being in relation, in a set of infinite relations. The same observation holds true applied to any of the three termini. Difficult perhaps to explain, it is simple: we can talk about signs, and, of

course, we use signs to talk about signs. This is why it is difficult to give examples of signs: applying this metasemiotic analysis we always refer to signs by means of signs, which are always *in actu*. The signs we refer to, we refer to in abstract, through the mediation of other signs (signs about signs), which are Replicas, and therefore, we do not access the *in actu* sign we refer to. Nevertheless, reference is possible, because the sign mediates. Signs *in actu,* as obvious as they appear and are maneuverable (due to their Iconicity), have vague delimitations. In practice I know how to start moving towards some direction when I see green at a traffic light, but to describe the semiotic phenomenon is difficult unless taken into account the inherent vagueness of semiosis (on *vagueness* in Peirce's semiotics see Nöth and Santaella 2011). This, the discovery of semiotics by semiotic beings, is called by Deely *semiotic consciousness* (2009, p. 3). It is an important evolutionary stage: semiotic beings (life forms) discover semiosis – the Universe is discovering itself. Hence, the vagueness we experience when learning is justified and it also explains why vagueness can at times be a rhetorical virtue. Signs, by which we live, are not clearly charted within the physiology of arguments.

An ontology of relations, a cosmology of signs, does not account for the typically modern dualisms from which philosophy still has a difficult time detaching: mind/body, mental/physical, objective/subjective. All strands of dualist philosophy have claimed the necessity of clarity in philosophy and, therefore, imposed clarity as a rhetorical virtue. As explained above, this is not the case of the suprasubjective account, which brings an awareness of the vagueness of (relational) being. The source for all these modern dichotomies is the *ens rationis/ens reale* ontological distinction (mind dependent/mind independent being, see Deely 1982, 2001a, 2009). By claiming that this distinction is not ontological, semiotics unites epistemology and ontology within itself. Purely mind dependent or purely mind independent signs are impossible to think of otherwise than abstractly. One cannot think separately of any of the three phenomenological categories (Firstness, Secondness, Thirdness, see CP 1.557)[19] as one cannot separate mind-dependency and mind-independency. They can be thought of only abstractly, while being aware that the object thought of is still semiotic, and, as such, suprasubjective. This does not have to do with a limit of cognition, but rather it proves that mind-dependent and mind-independent being are at least limit ontological cases, thresholds of being, if not actually impossible.

Semiotics unites ontology and epistemology, thus transcending what are strictly called realism and idealism into suprasubjectivism, or how Peirce described it, *extreme scholastic realism*. This characteristic of semiotics led some to see in Charles Peirce the first clear breakthrough from philosophical modernity to philosophical postmodernity. The first to proclaim this clearly is John Deely (e.g. 1982, 2001). One can now observe that philosophy, along its history, focused either on mind independent being, which is the case of Aristotle, or on mind dependent being, as in the case of modern philosophy, the exponent of which is Kant. Thus, Peirce's breakthrough from this either/or would announce the dawn of a new

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[19]" […] no one of the categories can be prescinded from those above it [...]." (CP 1.557)

philosophical age. There was a tendency towards such a suprasubjective ontology throughout medieval philosophy ever since St Augustine developed *Doctrina Signorum*. Deely argues that the tendency was fulfilled and a proper suprasubjective philosophy was reached in late scholasticism, particularly in the case of Joao Poinsot (1982, p. 59, 2001a, 2009). There are, as well, contradictory opinions; for instance Marmo considers Poinsot's philosophy to be no more than a mainstream Thomism in the age of Locke and Descartes (1987). According to Marmo, Poinsot achieved nothing new, but only used, in his understanding of signs, Thomas Aquinas's theory of analogy, while holding on to the Augustinian definition of sign and to the innovations (and critics) brought to it in the meantime, by, for instance, Roger Bacon, as many medieval scholastics did.

I consider that there is an important resemblance between Poinsot and Peirce's semiotics. This confirms the interdependency between liberal education and suprasubjective semiotics, since Poinsot, in the context of late Iberian scholasticism, was a student and a teacher of the mainstream medieval liberal curriculum. Like Peirce's definition of sign as relation, Poinsot's definition of sign is minimal and reveals three elements: "that which represents something other than itself to a cognitive power." (Poinsot 1631: [9al-30]) This definition recommends the sign as suprasubjective. It fits perfectly with Peirce's definition: "the triadic relation existing between a sign, its object, and the interpreting thought, itself a sign, considered as constituting the mode of being of a sign." (CP 8.332) The argument that Peirce indeed brings a breakthrough from modern dualism is strengthened by observing these similarities with Poinsot. That there was a non-modern, scholastic frame of mind which, by developing a logic of signs, gave an account of reality as suprasubjective proves that Peirce's philosophy is non-dualist as well. Poinsot is an exponent and a proof of this. Peirce, having plenty of scholastic sources, many of which the same as Poinsot, developed the relational logic of semiotics. If one of these accounts is an apology for proper suprasubjectivism, then, arguably, so is the other.

In both Peirce and Poinsot, ontology does not appear as an issue. This is so because they solved any possible dilemmas concerning by identifying logical phenomena (signs) with being. If triadic relations are suprasubjective nothing else can be more fitting to be considered *being* properly. Ontological status resides in the mode of *relation* and, as Deely comments about Poinsot's sign, sign-relations transcend the subjectivity of the non-mental realm and the objectivity of the mental realm:

"That form of being [the sign] is relation as suprasubjectively linking things in the environment among themselves, linking things to objects in apprehension, linking objects apprehended among themselves, and linking objects to the organisms doing that apprehending [...]." (Deely 2009, p. 73)

The striking similarity with Peirce's semiotics consists in the account of semiotics as logic: "the universal instrument of Logic is the sign." (Poinsot, 1631: [642a1-26]) This proves to be the semiotic account that underpins suprasubjective ontology. As

discussed in Chapter 3, James did not understand pragmatism as a principle of logic and was not concerned with developing logic, and thus he did not aim at an account for suprasubjectivity.

The structuralist and poststructuralist accounts of semiotics (de Saussure, the early Eco, Derrida) was not particularly concerned with suprasubjectivity either. Even though, arguably, in some of its instances, like Derrida and Deleuze, poststructuralism disconnected from the linguistic turn and from its roots in linguistics and anthropology, it did not manifest a strong interest for suprasubjectivity. This is a significant difference between structuralist and poststructuralist semiotics (semiology) and Peircean semiotics. For Peirce relational ontology has been an important focus inspired from his scholastic sources. The aim here is not to prove something about Poinsot's work; the fact that scholasticism headed towards, and via Poinsot developed, a doctrine of suprasubjective reality proves Peirce's interest to break away from modern dualism. The interesting discovery is that Peirce is not the only author who, for being strongly influenced by medieval scholasticism, developed a suprasubjective semiotics. Belonging to late scholasticism, Poinsot's writings prove that the efforts of scholastic philosophy were tending to the development of a suprasubjective semiotics. That the suprasubjective character of ontology is clear in both the cases of Poinsot and Peirce enforces the argument that realist semiotics is indeed non-dualist.

Poinsot's account of the suprasubjective sign can be further used coherently in the development of a (neo-) Peircean philosophy. This thesis develops a Peircean Theory of Learning. As explained in Chapter 1, for grasping Peirce's philosophy in its wholeness, a historical account of philosophy is necessary. This is so for two reasons: (1) such was Peirce's method as well and (2) the sources from where Peirce recovered the *Doctrine of Signs* (Deely 2001a) need be, in turn, recovered by a late modernity which proved ignorant of medieval philosophy. The sources for Peirce's recovery of the *sign* concept are the same (in a very large extent) as Poinsot's. Therefore, the insights that Poinsot offers about the sign can shed a new light on Peirce's semiotics and on what a Peircean Theroy of Learning can turn out to be.

Deely considers Poinsot a precursor of biosemiotics in his own right, because his doctrine does not subject signification to a species-specific human cognition (2009, p. 62, p. 70). Signification is a matter of logic, not theory of mind. Suprasubjectivity is the key to understanding learning as adaptation and adaptation as interpretation. In Chapter 1 I have shown the necessity of biosemiotics for a Peircean Theory of Learning. Biosemiotics accounts for learning as a form and stage of evolution, understanding the organism as a part of its own environment, thus leading to an ecological (ecosemiotic) philosophy of education (e.g. Gough and Stables 2012, Andersen in Sebeok 1992, Stjernfelt 2011, 2014). It qualifies, as Gough and Stables argued, as education for *uncertain times* (2012), education for a transitional period. This is the transition identified by Deely (2001a) from dualist modernity to suprasubjectively minded postmodernity.

I consider that Poinsot's doctrine is an example of suprasubjectivity, being, though isolated and ahead of its time, not an unique example. The works of, for

instance, St Dionysius the Areopagite or St John of Damascus might hide similar philosophical surprises (Andreopoulos 2006). Deely noticed the germs of postmodernism in the Latin Medieval Age particularly because of the scholastics interest for *signs*, and thus posited the question *"Quid sit postmodernismus?"*(in Ciapalo 1997, p. 68). Postmodernism is therefore only a name for a philosophy that overcomes modern dualism by the suprasubjective Way of Signs (Deely 2009). The 17th century saw both the Way of Signs of Joao Poinsot as well as the Way of Ideas (mind dependent ontology) of Descartes and Locke. For the next couple of centuries, philosophy took the way of the latter. What we might call now philosophical postmodernism is *postmodern* only because it is becoming popular historically after modernity. To investigate its relation to the version of postmodernism proposed by Lyotard (1979) requires another study in its own right. It is safe to understand it as a *non-modern* doctrine, since Peirce did not *invent* semiotics, but recovered it from the medievals (Deely 2001) and developed it. Paul Bains pointed out a general contemporary philosophical interest for the concept of *relation* (2006). This is certainly a similarity with the scholastics who at least since the 13th century where mostly concerned with the Aristotelian category of relation (Marmo 2010). The link to the scholastics is acknowledged also by Bains, who brings to light other recent philosophers concerned with *relation*:

"Why write about the being of relation? I will take the risk of claiming that the concept of relation is like a skeleton or abstract key that allows us to move from Duns Scotus to John Poinsot, to Charles Sanders Peirce, to Gilles Deleuze and Felix Guattari, Immanuel Kant, Humberto Maturana, Martin Heidegger, John Deely, Alfred North Whitehead, Bruno Latour, and Isabelle Stengers (to mention a few members of the cast). All these thinkers are in one way or another concerned with relations and their being." (2006, p. 3-4)

Bains found some interesting possible compatibilities between, on the one hand, Peirce, and on the other, Deleuze and Guattari. This link should be investigated generally, as well as particularly in education, since Deleuze is so far much more popular in philosophy of education than Peirce. He is also an author of interest in the edusemiotics *Lebenswelt* (Semetsky 2006, 2009b). However, this thesis does not investigate the compatibility between Peirce and Deleuze. I shall only remark here Bains' observation of a generally spread interest towards a suprasubjective doctrine, which broadens the horizon of philosophy beyond language, inviting the whole biological world back into the scope of philosophy. What Bains is observing is the tendency towards what Stjernfelt named the *phenomenological turn* (*iconic turn*), contrary to the *linguistic turn*:

"Their understanding of the being of relation will determine the structure of their thought and the extent to which it is able to short-circuit the realist/idealist oscillation in Western philosophy; to provide the ontological foundations in relation both for a minimal correspondence between thought and things and for its more complex reformulation in terms of a collective of humans and non-humans

involved in a double individuation, a conjoined genesis of subject and object - in other words, what Deleuze and Guattari call the 'truth of the relative' rather than 'the relativity of truth' (1994, 130). The inherent subjectivism of some modern and much postmodern thought (in its assumption that language and thought can have no relation to anything other than their own products) has yet to wake up to this possibility. What will thus be envisioned is what postmodernism might turn out to be (using John Deely's Latin construction in the subjunctive mood - Quid sit postmodernismus?) if not a circular, or more complex, dead end." (Bains 2006, p. 4)

Indeed, the formula 'the truth of the relative' can fit to describe Peirce's pragmaticist logic as well. As for the question *why writing about the being of relation*, Deely could answer it straightforwardly:

"If there is one notion that is central to the emerging postmodern consciousness, that notion is the notion of sign." (2001a, p. xxx)

Phenomenological turn semiotics inevitably brings forth a postmodern strand of education, or at least a form of education foreign to modern western dualist philosophy. Its success or rejection proves the success or rejection of the project of suprasubjective semiotics as a new philosophical age. Since along its history semiotics has been closely connected to education (Chapter 1), if postmodernity is to be characterized by it, education will be one of the first affected fields. A semiotic based education will be exponential for the enhancement of semiotic consciousness as postmodern philosophy: not only should it be its first symptom, but, in turn, it will also cultivate it.

A criterion that Deely has found for testing whether semiotic consciousness is assimilated stands in which *tractatus* comes into mind first when encountering this word: Wittgenstein's *Tractatus logico-philosophicus*, an exponent of western modern philosophy, claiming clarity as a necessity for philosophy, or Joao Poinsot's *Tractatus de signis*, an example of relational logic, accounting for the suprasubjectivity and, implicitly, vagueness of being. Surely, a semiotic postmodernity would have Poinsot, as a philosopher of relation, an important figure of its educational curriculum.

B. Suprasubjective learning

For Peirce experience is suprasubjective. Experience is characterized by cognition. A modern dualist perspective will still tend to suppose that cognition is the objective, mind-dependent aspect of experience and that all that appears as mind-independent is simply assumed by a mind to be independent of it, thus still being essentially mind-dependent. Of course, Peirce's semiotics is not solipsistic. On his account cognition is a part of experience, and, also, suprasubjective in its turn, being composed of both objective and subjective elements:

"Every cognition involves something represented, or that of which we are conscious, and some action or passion of the self whereby it becomes represented.

The former shall be termed the objective, the latter the subjective, element of the cognition." (CP 5.238)

Stables discussed the implications for education of non-dualist semiotics in the 2012 *Be(com)ing Human: Semiosis and the Myth of Reason*. Even though Stables does not refer particularly to the term 'suprasubjectivity,' his emphasis on overcoming the modern dualist mindset (2005, 2012) through semiotics shows that his work fits in phenomenological turn semiotics. Stables found that the account of a participative phenomenology – supposing that reality consists in an overlapping of phenomenological worlds – is essential for a non-dualistic educational framework. This phenomenological overlapping can be seen as compatible with Peircean semiosis, Deely's idea of suprasubjective experience, that is. While relying on Peirce, Stables also criticized Peirce's notion of sign for still clinging on to *essentialism* to some extent, and his concept of *Object* (of the sign) for being unjustifiable and unnecessary. I argue that Peirce's notion of sign is absolved from essentialist assumptions if Peirce is read as a logician, not as a philosopher of science, as Stables accounts. By *Object*, Peirce never meant something distinct or attached to the sign, but simply the Object of the sign, the logical object. The Object might exist or not, be real or not, fictional or non-fictional; like any terminus of the sign, the Object has its being only within the triadic relation. This stems, for instance, from the definition of Icon. With icons signification properly comes *in actu* (Chapter 2). In the definition of the Icon sign type, Peirce mentioned that while the Sign refers to the Object, the Sign is "just the same, whether any such Object actually exists or not." (CP 2.247)

A key to understanding suprasubjectivity, according to Stables, is the account of *understanding* as not necessarily *mental*. In Chapter 2 I have explained that for Peirce the action of judging, that is, inquiring on the value of truth of a proposition, is not strictly a mental process, though we only experience it cognitively. Stables identified a similar stance in Wittgenstein:

"The sense of the 'something … me' comes from recognition of sequences but need not be understood as a mental act. It may be better construed, on a process account as implication in events. To quote Wittgenstein:

Try not to think of understanding as a "mental process" at all. – For that is the expression which confuses you. But ask yourself: in what sort of case, in what kind of circumstances, do we say, 'Now I know how to go on…' (Wittgenstein, 1967: $154)[20]" (Stables 2012, p. 48)

Despite other divergences, this is an interesting similarity between Peirce's semiotics and Wittgenstein's analytic philosophy. It directly concerns suprasubjectivity, and therefore it directly concerns this learning theory. It could lead to further investigations and, in the circumstances of the rising popularity of semiotics, it could set new directions of research in analytic philosophy.

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[20]Wittgenstein, L. (1967) *Philosophical Investigations.*Oxford: Blackwell quoted in Stables 2012.

The variety of divergent interpretations of Peirce is part due to our yet incomplete and disorganized collections of Peirce's vast work. His so far published work is "diffuse, and sometimes scrappy" as Stables explained (2012, p. 4). However, I consider that Stables' semiotic account of human becoming is compatible to Peirce's. The present thesis offers an account of the Peircean sign different in some regards to Stables'. Nevertheless, Stables accounts as well for what is here termed the suprasubjectivity of Peirce's semiotics. Stables observed that semiotics generally, and particularly the semiotics of Peirce, dismisses modern dualism[21]. He identified three issues at stake for contemporary philosophy of education which a suprasubjective philosophy solves: "that Cartesian mind-body substance dualism, though generally explicitly rejected, still infects educational and social thinking to an unwarranted degree", "that the world as 'is' cannot be therefore divorced from the world as it means to us humans," and "that processes, events and forces are fundamental; matter and substance are the result of processes and events, not *vice versa*" (p. viii). Stables acknowledged that Peirce, with his notion of sign, "moves beyond Kant's distinction between *noumenon,* the thing itself prior to our understanding of it, and the *phenomenon,* the thing as humanly perceived and understood. Peirce's ontology here is simultaneously realist, progressive and interpretive." (p. 6) Using a term preferred by Deely, Peirce's ontology is suprasubjective.

In a characteristically semiotic manner, Stables discusses the theme of what he termed "eternal Nowness: the sense that experience is present while it is always in flux." (p. 45) Stables developed this concept on a Derridian account, by arguing that the *present* is deferred in the context of passing time (2012). This understanding of time is typical for semiotics. That *being* belongs to the *present* is Peirce's assumption as well. This is sustained by Peirce's idea of continuity, which characterizes time. The time of *present* is an instantiation, a matter of Secondness that is, since it makes possible the mediation between First (time passed, which is present as Representamen) and Third (time to come, which is present as Interpretant). The past contains the qualities necessary for the objectified present and the future is the tendency of the present. Evidently, this passage is continuous. According to the Peircean account of continuity, that time is continuous implies that, its components (past, present and future) cannot be extracted from it. In Chapter 3 I mentioned that on a semiotic account time can be justified on account of semiosis (experience): semiosis occurs in time; this is what is meant by stating that past is instantiated in present and fulfilled in future. An important characteristic of Peirce's semiotics is that the termini of sign-relations cannot be separated from the relation. Thus, past cannot be separated from present, which cannot be separated from future. Any instantiation of the Past (a memory of it, a consequence, etc.) only participates in semiosis as present and it only has sense in the perspective of future (the

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[21]Even more than overcoming modern dualism, dualism is completely foreign to Peircean semiotics because of Peirce's pre-modern sources.

possibility of mediation). In the words of Stables, "experience is present while it is always in flux" (2012, p. 45).

It is important to notice that a particular approach to time, with a focus on the *present passing instant* characterizes semiotics. The first to explain that being belongs strictly to the present was the father of semiotic consciousness, St Augustine. In his *Confessions*, St Augustine found it necessary to explain memory and, to explain memory he had to explain time. St Augustine, understanding that being can only be present, explained that the times of *past, present,* and *future* cannot be the ground for any being: past things are not present since they have passed, future things did not come to pass yet, and since the present is simply the timeless moment where past and future meet it does not have space to contain being. The discussion is highly relevant for semiotics, as St Augustine aimed at explaining that meaning happens in time, as a passing. He reached the conclusion that experienced times, where semiosis occurs, and real phenomena that can be contained are *present past* – containing the present state of things that have passed, such as consequences of past events, memories, etc.*, present present* – containing things that are immediately present*,* and *present future* – containing what is present of things that are to come such us the rain which will fall soon through the present clouds, expectations, intuitions. He made it explicit that time is the passage of time, a transition that is:

"What now is clear and plain is, that neither things to come nor past are. Nor is it properly said, "there be three times, past, present, and to come": yet perchance it might be properly said, "there be three times; a present of things past, a present of things present, and a present of things future." For these three do exist in some sort, in the soul, but other where do I not see them; present of things past, memory; present of things present, sight; present of things future, expectation. If thus we be permitted to speak, I see three times, and I confess there are three. Let it be said too, "there be three times, past, present, and to come": in our incorrect way. See, I object not, nor gainsay, nor find fault, if what is so said be but understood, that neither what is to be, now is, nor what is past. For but few things are there, which we speak properly, most things improperly; still the things intended are understood." (Confessiones, Book XI, Chap. XX)

Time, therefore, is a shared ground in *Lebenswelten*. Two individuals might not necessarily share in memories or expectations, but it is clear that in the classroom, the *Lebenswelt* at stake, the individuals share in being present. The teacher should be aware of this sharing of the present moment, the moment where her world is overlapping to that of her students.

It is interesting to notice that this typically semiotic notion of time directly accounts for the vagueness of reality. St Augustine, observing this, mentioned that he does not bother in making clarity and precision aims of his discourse. Anyway, *few things* are *properly* spoken, *most things* are improperly spoken of, but what matters is that *things intended are understood.* This same understanding of time,

the acknowledgement that being can only belong to presence characterizes Deely's semiotic history of philosophy. Before he develops his semiotic history, in the 2001 *Four Ages of Understanding*, Deely defines the *present* as "the exclusive preserve of the living." (p. xxix) The way in which he frames his public, the readers of history, reveals this understanding of time as passage whereas the presence of things allows being:

"I write for the present, the living, both in being and to come into being". (p. xxx)

This understanding of time as passing is typical for semiotics. In the next pages I explain that this is also Peirce's concept of time. It is also revealed in Stables' educational semiotics. Stables showed that a fully semiotic philosophy accounts that the phenomenal worlds of living beings interact and overlap. This is as well the statement of biosemiotics, stemming from the understanding of environment as meaningful environment (*Umwelt*, *Lebenswelt*). The concept of *Umwelt*, while bringing the understanding of environment as species-specific and also as individual, also explains how it overlaps with other *Umwelten*. A mosquito and a frog inhabiting the same pond live in different *Umwelten*, but this biosemiotic concept allows a simple understanding of their interaction. Some structures of meaning are shared in *Umwelten*. Stables explains this interaction of phenomenal worlds also in what regards time with his concept of *My Now*. This is essential, since life proceeds in time, and, as remarked previously, for the semiotic consciousness approaching time has always been an important concern (Stables is another example besides St Augustine, Peirce and Deely). Meaning occurs in time, as a passing, and life, while it proceeds in time, it belongs to the present, the *now*:

"Suppose that my phenomenal world, incorporating the sum total of my present experience, and involving my different awareness of past and future, can be referred to as my 'My Now' (MMN). This is a phenomenologically, or phenomenographically, or existentially derived definition, though as comprehensive as possible on those terms. It does not attempt, for example, to clarify the nature of 'now' beyond 'what I am experiencing'. It accepts as valid that I have experience. Furthermore, this experience carries with it traces of other previous 'nows' and awareness of other experiencing persons. Again, it cannot be proved ultimately that 'Your My Now' (YMN) is real for you, but, on the basis that you are comprises not only My My Now but also many Your My Nows as there are people in the world. At least, therefore, I can conclude that the totality of phenomenal experience comprises MMN + YMN." (Stables, 2008b, p. 92)

That phenomenal worlds overlap is coextensive with the biosemiotic account of the self. If the whole *Umwelt* of a living organism is part of the self then other organisms, that find themselves in the *Umwelt*, become part of the self. Of course, a rabbit signifies very differently in a wolf's *Umwelt* than in an ant's *Umwelt*. This is why the overlapping of worlds is phenomenological and, as such, it cannot

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be supported on a noumenal account of existence. Stables' explanation of phenomenal overlapping and the idea of semiotic suprasubjectivity share the fundamental assumption of a relational, anti-atomistic ontology.

Since signification is suprasubjective, to acknowledge that the reality of an *Umwelt* contains the phenomenal world (*Umwelt*) of another living being is not difficult. Actually, that signification is suprasubjective proves that we (human beings) perform well in understanding the phenomenal world of another. This is why it is important for us to brush our teeth and to choose the appropriate shirt. Of course, brushing teeth is cultural, but we do care about it because of the way in which something affects another being's phenomenal world, culturally or otherwise, that is at *Umwelt* or *Lebenswelt* level. The suprasubjectivity of signification, thus, accounts for a concept of *totality of phenomenal experience*: the acknowledgement of reality containing the always infinite sum of relations among phenomenal worlds.

The recent findings regarding the cognitive activity of mirror-neurons (Rizzolatti and Craighero 2004) can explain this sharing of reality from a neuroscientific point of view. There is one striking contradiction, though, that regards the implications for learning between our so far understanding of mirror-neurons and Peirce's semiotics. The activity of mirror-neurons is understood through the prism of the hypothesis that *imitation learning* is an essential aspect of human life and that human culture rests on it (Rizzolatti and Craighero 2004). That imitation is an essential aspect of human culture because it is a species specific mode of learning is the general assumption of the cognitive approaches to social interaction (Tomasello 1999, 2008). In Chapter 3, section C.ii, I mentioned that on a Peircean account learning does not consist mainly in imitation. Also, in Chapter 1, section D, I explained that learning is a discovery of similarities, since it is the result of Icon manipulation. Discovery supposes a degree of creativity, understood in opposition to imitation. Thus, Peircean semiotics can offer a new insight in what regards mirrors neurons. The role of mirror-neurons in the waking time of our lives has been so far understood through the theoretical apparatus of social cognition, but the assumption of *imitation learning*, inherited from social cognition is not necessary. Semiotic suprasubjectivism is a proper ground for understanding mirror-neurons and continuing a dialogue between neuroscience, the social sciences, and philosophy. This semiotic educational philosophy would place imitation at the periphery of teaching practice.

The same account was initially inherited in cognitive semiotics and in experimental semiotics, which are now (if not at least should be) aligning to the phenomenological (iconic) turn of semiotics. This shift can be felt therefore in the social sciences as well, by the realization it brings that in a shared reality learning is discovering and, thus, it does not necessarily require imitation. This thesis does not develop on these inquiries, but they should be further explored in the horizon brought by a Peircean Theory of Learning. The implications of Peircean semiotics on creativity and imitation are discussed in Part II.

The acknowledgement of the other as non-self is not problematic for suprasubjective semiotics, hence the social function of mirror-neurons does not present any problems if denying the importance of imitation learning. At stake it is not whether but *how* one's life relates to non-self. Reality is suprasubjective because it is shared, and, thus, our efforts to learn stand in our availability to share with others. Intersubjectivity is possible in suprasubjective reality. On a cognitive semiotic account Per Aage Brandt (2007) explains intersubjectivity by accounting alloscopic experience as iconic signification. Brandt's idea is that we understand our relation with the Other because we can simulate the Other's phenomenality of (my) self by performing *iconic cognition*. By a manipulation of icons I know that I am the Other's other. This is possible because of certain similarities between the self and the Other:

"Seeing oneself through Others seeing oneself, and remembering this alloscopic vision, is essential to consciousness on higher levels. […] This Other […] will itself be implied in the scenario as a 'helper', or in narratological terms, an 'adjuvant' actant. For the Subject to enter in contact with the 'helper' is to imagine itself *being the helper (of someone like the Subject)*" (p. 52-53)

It is remarkable that, drawing on the semiotics of Peirce and Greimas, Per Aage Brandt explains intersubjectivity by using Levinasian terminology. In Chapter 9 the possibility of applying Levinas' phenomenology of the face in semiotics is further discussed.

Once a semiotic perspective is taken, therefore, the question comes down to whether we decide to live for the self and relate to the non-self as a subject of the self or to live for the non-self, acknowledging its right to being independent of the self. Arguably, this is the starting point for ethics. I argue that this is crucial for education and that on Peirce's account, understanding learning and education as *growth*, the latter is the only attitude that allows learning. This is the core of a Peircean Theory of Learning, which I develop in Part II. I suggest that, on account of the compatibility between Peircean semiotics and Husserlian phenomenology (accounted for in Chapter 2 and in Stjerfnelt 2007) Emmanuel Levinas' phenomenology of the face can be taken on board by a Peircean Theory of Learning. Both Peirce and Levinas favoured the self's focus on the non-self, not in an abstract way, but in an immediately practical way. Peirce treats this immediate acknowledgement of the other in terms of "*neighbour*" and Levinas in terms of "*face*". If throughout Peirce's works this focus on altruism is mentioned explicitly only sporadically, while being implicitly present, in Levinas this is the predominating topic. Therefore, Levinas' phenomenology of the face can prove valuable in further developing a Peircean Theory of Learning. This suggestion will be explored in Part III. The reasons for which I have chosen to develop this theory of learning as Peircean, and not as a Levinasian approach are explained in Chapter 1. Mainly, there are two reasons: (1) because Peirce's semiotics brings a firm ground for a new philosophical age through its account of suprasubjective reality, much needed in education, and (2) because Peirce's sign typologies offer a fully semiotic account of learning: the evolutionary passage from the Icon sign

type to the Argument sign type, within a physiology of arguments governed by an iconic syntax.

By his usual method of subduing idioscopy to coenoscopy, for Peirce education is (proceeds) within the borders of cosmology. Since the physiology of arguments is governed by iconic syntax, iconic syntax is what makes learning possible as well as what sets the limits of its possibilities. Stables arrived as well at the conclusion that what makes knowledge possible, generally, also limits it. This is for him an important but so far not enough acknowledged truth for philosophy of education:

"It is an important truth little acknowledged in educational theory that that which makes knowledge and understanding possible – our interpretive frameworks including our assumptions and prejudices – is also that which limits them." (2012, p. 47)

Our *interpretive frameworks, assumptions and prejudices* constitute, in one word, our *Lebenswelten*. The inner coherency of the *Lebenswelt* and, generally, of the *Umwelt*, stands in its iconic syntax (see Chapters1, 2, 3 and section *a* of this Chapter). It is, therefore, iconic syntax, as a characteristic of the phyisiology of arguments, that evokes and limits learning. The continuity of the physiology of arguments is guaranteed by iconic syntax, as similarity is the criterion distributed continuously through the typologies of signs from the Icon type onwards.

The account of suprasubjective being, the rejection of the mind independent and mind dependent ontological distinction, because it characterizes the whole cosmos, is inherited in all areas of reality, including education. An implication of suprasubjectivity in education is the rejection of a teaching/learning dichotomy. Learning, as argued (Chapter 1), is the Universe's method of discovering itself. Being spread from a self to another, learning is enhanced. Teaching is this particular case of learning where the learning of a non-self is at stake. Thus, teaching has proved valuable for living beings as an enhancement of learning. The account of teaching as a particular case of learning, and a non-dichotomical relation of teaching and learning, has occurred together with the emergence of semiotic consciousness, as St Augustine explained in *De Doctrina Christiana* that learning depends on two instances: (1) the acquistion of knowledge and (2) the passing on of it. On a cultural timescale, in the human *Lebenswelt*, suprasubjectivity produced *education*. The awareness of the overlapping and interaction of phenomenal worlds brings forth the realization that learning is evoked by sharing. In his refutation of the early Eco's arguments against iconicity, Stjernfelt explains that learning is possible because of sharing (see Chapter 3, section C.ii). Stables arrived at the same conclusion about sharing and learning – learning is possible because while two different beings are unique and distinct, and therefore do not coincide, they can share. Sharing is possible because since we are part of the same Universe, we inherit its iconic syntax:

"It is self-evident that the resources that I bring to MMN are not unique to myself. They include words from a shared language, and body parts that

correspond to those of others and react in similar ways to environmental stimuli; if this were not so, medical science would not be possible, let alone organ transplantation. My 'My Now' is not possible without your 'My Now' (YMN) and, by extension, others' 'My Now' (OMN), including the 'Now' of entities that may not be conceived of as having any consciousness at all. However, just as organ transplantation is not simple or always effective, because bodies have the tendency to reject elements from other bodies (though they also sometimes welcome them, as in sexual activity, and even in the act of eating), so each individual is unique in the pattern of responses to which s/he is prone, and such patterning also modifies over time. YMN therefore overlaps but does not coincide, with MMN." (2012, p. 49)

On this semiotic account, it is important to take into consideration the temporal dimension of our *Umwelten* and *Lebenswelten*. The overlapping of phenomenal worlds happens in time.

C. Learning as evolution of the self

Learning is a passage through time. This is brought into awareness by the suprasubjective account of being and, implicitly, of learning. Semiotics generates this discussion on time because semiosis occurs in time and has to be examined as such. Learning is a passage from one type of signification to another. This passage takes place in time.

Life is characterized by learning, according to both the biosemiotic definition of life (Chapter 1, and Kull 2005, and Kull in Bundgaard and Stjernfelt 2009) and the semiotic approach to time (Deely 2001a, Stables 2012). This realization recommends semiotics as philosophy of education. If the main characteristic of life is learning (a life form is re-cognized by it being *something that is learning*) then being a living organism, such as human, is a continuous learning. Using Peirce's concept of continuity I have explained that the experience of a living organism is continuous (Chapters 1, 2, and 3). Therefore, the life of a living being is a continuous becoming. According to Stables the perspective of living as becoming allows an altruistic frame of mind because it implies that no one at any present moment is *fully human*. The present is the time of the living and since the present is a *passing*, the step from a past *then* to a future *then*, the self is a becoming. At every present moment we are becoming, continuously meant to evolve in some sense. This idea, according to Stables, brings a more *humble* awareness of the self, making oneself available for the other:

"Aspiration to full humanity is far more humbling on this than on the standard humanist account, whereby we are imbued with a human essence that we might betray but can generally only express rather than improve." (Ibid., 2012, p. 96)

Like cosmological evolution, the evolution of the self does not pursue an externally predefined *telos* (Chapter 1), such as reaching a certain standard that qualifies the individual as *human*. Instead, evolution sets its *telos* from within the system, usually being aware only of the one next step. According to Peirce, Truth needs be pursued while being aware that it is infinitely distant at all times. In this regard, as well, Stables' view is coherent with Peirce's:

"The proposed approach is more challenging, as fully human status is always both desired and simultaneously out of reach. It cannot ever be attained fully, though everyone who aspires is trying to attain it." (Ibid.)

That is to say, a self as Representamen is tending to a future self as Interpretant, to which the present self is supplying meaning from itself.

For Peirce the key to understanding the suprasubjectivity of learning stands in the sound understanding of the development of the mediated self. The mediated self is the self as Interptetant, in relation to self as Representamen and self as Object. The self as Interpretant is never present, but always presently pursued. The Interpretant self is a future self, present in its relation to Representamen and Object – the self's becoming is, therefore, an *eternal nowness*. This similarity makes it not surprising that both Peirce and Stables, when explaining the development of the self, found it relevant to look upon the development of children. Looking at a child's becoming an adult it is clear that learning is a passage, a becoming. Peirce considered that very young children do not have a clear consciousness of the self. Self-consciousness emerges, according to Peirce, because of testimony. The idea is that "*error* appears, and it can be explained only by supposing a *self* which is fallible." (CP 5.234) Testimony is certainty stemming suprasubjectively. It is safety in numbers. Arguably an operation of *critical common sense*, it is a safety that solipsistic thought cannot accept:

"At the age at which we know children to be self-conscious, we know that they have been made aware of ignorance and error; and we know them to possess at that age powers of understanding sufficient to enable them to infer from ignorance and error their own existence. Thus we find that known faculties, acting under conditions known to exist, would rise to self-consciousness. The only essential defect in this account of the matter is, that while we know that children exercise *as much* understanding as is here supposed, we do not know that they exercise it in precisely this way. Still the supposition that they do so is infinitely more supported by facts, than the supposition of a wholly peculiar faculty of the mind.

The only argument worth noticing for the existence of an intuitive self-consciousness is this. We are more certain of our own existence than of any other fact; a premiss cannot determine a conclusion to be more certain than it is itself; hence, our own existence cannot have been inferred from any other fact. The first premiss must be admitted, but the second premiss is founded on an exploded theory of logic. A conclusion cannot be more certain than that some one of the facts which support it is true, but it may easily be more certain than any one of

those facts. Let us suppose, for example, that a dozen witnesses testify to an occurrence. Then my belief in that occurrence rests on the belief that each of those men is generally to be believed upon oath. Yet the fact testified to is made more certain than that any one of those men is generally to be believed. In the same way, to the developed mind of man, his own existence is supported by *every other fact,* and is, therefore, incomparably more certain than any one of these facts. But it cannot be said to be more certain than that there is another fact, since there is no doubt perceptible in either case." (CP 5.237)

There can be used another example of borderline consciousness to illustrate this argument, besides that of an infant. Take the case of a drunk man. The drunk man is not aware that he is drunk. If a number of sober persons testify to him that he is drunk, he might not find any solid reason to believe this account. Nevertheless, when he will be sober he will be certain that he is sober. Doubting whether one is sober is evidence that one is not sober. When one is sober he will not doubt whether he is sober. Doubting that *I am* is therefore useless since this is what I am most sure of. Stables expressed this conclusion of semiotics in a nutshell by claiming that "What things are is what they mean to us." (2005, p. 8) I am what I am to myself, and, since I am identical with myself, there cannot be anything more certain than this. My "error and ignorance" testify that *I am.* Through a series of errors I get to know myself. This is a relation between the *past I, present I,* and *future I.* This continuity of apperceptive ego leads to inferring the self: me in my privacy, who I really am, the evolving sign-relation. The self is inferred. This inference starts from necessary conclusions drawn from error. Error appears in our life (e.g., feeling of pain) and that shows that there is something doing something wrong – thus an author of the error is supposed and identified with the phenomenon of awareness with which it coincides and the consciousness of *self* is developed:

"Ignorance and error are all that distinguish our private selves from the absolute *ego* of pure apperception." (CP 5.235)

This is truly a strong awareness of the reality of the self. Modern philosophy could never trust *facts* as independent from the self's own faculties of mind. On Peirce's account the Cartesian *dubito ergo cogito, cogito ergo sum* principle is not needed to escape doubt of one's own existence. Rather, one's own existence is certain because our inference of the self is certain. Errors testify suprasubjectivity: if I banged my head against the wall, not only that I banged my head against the wall, but, also, the wall is there and it has such a consistency (its qualities are inferred).

The awareness of the self emerges in time, at a very young age, and in time it is further developed. There is an age to which we refer as childhood and another one to which, in opposition to childhood, we refer as adulthood. Stables explained that we do not have any ultimate criteria to judge when childhood ends and when adulthood begins (2012). The passage from a child's *Umwelt* to an adult's *Umwelt* is continuous. There is a continuous set of experiences that a human passes through that constitutes this passage. This evolutionary set forms, therefore, one continuous experience. Throughout an entire lifetime a living being learns. The realization that

like the child is always becoming so is the adult, should give an adult a sense of humility – nothing essentially really changed since she was a child:

"[…] there is not a point at which the non-human, pre-human or becoming-human child becomes the fully human adult: the quest towards full humanity is endless. We live in overlapping phenomenal worlds, the human ones among which share a sense of what is worth aspiring to as human." (p. 99)

This perspective does not justify any advantages that the adult might have over the child because both the child and the adult are human (or not) in the same manner – they are both becoming. In analogy to teaching, the teacher should realize that, like her student, she is in continuous becoming and therefore, she is not *better* in any way then the student. The student has to become in some regard similar to her teacher; this is the aim of teaching. Regardless of what the taught matter is, the student has to become similar in her knowledge of it to the teacher's knowledge. Stables noticed that we do not have ultimate criteria for determining where life begins and ends. The present thesis brings an insight to this matter. According to the biosemiotic ground of this theory, starting with Chapter 1, I have associated life with learning. Life, in the biological sense, begins and ends where learning begins and ends. This does not contradict Stables' affirmation: as we cannot draw the borders of life, we cannot tell where exactly learning begins and where it ends. Learning, life that is, inherits the characters of semiosis: it is continuous and its delimitations are vague. The very young infant might not have a clear awareness of the self, but to put our finger on the point where learning begins remains impossible, as it might not even depend on the development of self-awareness:

"On the other hand, children manifest powers of thought much earlier. Indeed, it is almost impossible to assign a period at which children do not already exhibit decided intellectual activity in directions in which thought is indispensable to their well-being. The complicated trigonometry of vision, and the delicate adjustments of coördinated movement, are plainly mastered very early. There is no reason to question a similar degree of thought in reference to themselves." (CP 5.228)

We cannot spot where learning begins because it does not simply *begin* at a certain moment of an individual's existence in time-space. It is a much broader phenomenon, which, as explained in Chapter 3, does not assume neither *tabula rasa*, neither *a priori* ideas. A human infant is not a reasoning being because it shares a *human nature* that qualifies it as reasoning, but because it shares qualities inherited from the abyssal continuums of evolution. Such is the fact of having a body which perceives, cognizes, and so on:

"A very young child may always be observed to watch its own body with great attention. There is every reason why this should be so, for from the child's point of view this body is the most important thing in the universe. Only what it touches has any actual and present feeling; only what it faces has any actual color; only what is on its tongue has any actual taste." (CP 5.229)

Learning does not start in a definite, isolatable, moment because it is part of the Universe's self discovering and thus it belongs to infinite continua of which the self is just a continuous subset. When philosophers committed to substance dualism search for the source of knowledge in an individual they deny at least the cultural and biological, if not also the cosmological, context which led to the individual knowing. Therefore, taking Peirce's concept of continuity (see Chapters 1 and 2), an individual's learning (becoming) cannot be isolated, removed, not even as an abstraction, from the larger learning of human kind and of life forms in general. Abstract mental operations that we might perform on an isolated in void, ideal thinking being do not reveal anything real and useful about learning. The suprasubjective being account implies that living beings are semiotically integrated within larger webs of signs (*Umwelten*). As such, this semiotic account contradicts the brain in vat hypothesis. Paul Bains observed this as well:

"We are semiotic, existential territories rather than brains in vats, and these territories or ecologies are not contained within our physical anatomy, nor are they known only as immanent representations. The question becomes this: Where does your cognition or subjectivity terminate if it is a suprasubjective process and not a stable substance? The 'self' becomes a sign relation or interpretant rather than an unrelated, ontological entity." (2006, p. 21)

As Stables remarked, the resources that a self brings in its own awareness of real presence (My My-Now) are not unique to the self. That phenomenological worlds overlap means that reality is shared, intersubjective that is. Because being is relational (suprasubjective) the intersubjectivity of real existence is suprasubjective. As such, real existence continuously expands towards infinite real possibilities. This is the same with saying that semiosis is infinite. For Peirce selves are connected continuously such that this whole continuum of selves might look as if one Self:

"Every reality, then, is a Self; and the Selves are intimately connected, as if they formed a continuum. Each one is, so to say, a delineation, -- with mathematical truth, incongruous as the metaphor is, we may say that each is a quasimap of the organic aggregate of all the Selves, which is itself a Self, the Absolute Idea of Hegel, or God. [...] It will be observed that if the Selves did form a continuum, each would be distinguished by its own point of Self-consciousness." (CP 8.125)

These points of Self-consciousness can only be in relation to other selves, within this continuum of consciousness, just like signs only are signs *in actu*, that is, used in and as relations, and within the physiology of arguments. Such remarks might inspire to read in Peirce a kind of panpsychism. The hypothesis of panpsychism is not necessary, I argue, for a coherent and holistic understanding of Peirce's semiotics and its implications regarding self-consciousness[22]. All selves belong to one

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[22]With very few exceptions (Deely in Sebeok and Umiker-Sebeok 1992) the semiotic academic community tends to regard Peirce's possible panpsychism with scepticism (e.g. Stjernfelt 2007). I consider that the hypothesis of panpsychism can be avoided in the development of the present thesis'

continuum because they each develop in relation to one another, not because they are indistinguishable. Peirce made a clear distinction between one self's consciousness and general consciousness. That *I* am is much more specific, implying a private consciousness, than merely the existence of *the I*:

"Self-consciousness, as the term is here used, is to be distinguished both from consciousness generally, from the internal sense, and from pure apperception. Any cognition is a consciousness of the object as represented; by self-consciousness is meant a knowledge of ourselves. Not a mere feeling of subjective conditions of consciousness, but of our personal selves. Pure apperception is the self-assertion of THE *ego;* the self-consciousness here meant is the recognition of my *private* self. I know that *I* (not merely *the* I) exist. The question is, how do I know it; by a special intuitive faculty, or is it determined by previous cognitions?" (CP 5.225)

According to Peirce, the self is a sign. As such, the self has to be in relation to signs similar to itself – other selves that is. The self developed from sets of signs and develops as a sign-relation. Peirce explicitly applied his Sign-relation concept to explain the self and the non-self (other):

"This passage from the many to the one is numerical. The conception of a *third* is that of an object which is so related to two others, that one of these must be related to the other in the same way in which the third is related to that other. Now this coincides with the conception of an interpretant. An *other* is plainly equivalent to a *correlate*. The conception of second differs from that of other, in implying the possibility of a third. In the same way, the conception of *self* implies the possibility of an *other*. The *ground* is the self abstracted from the concreteness which implies the possibility of another." (CP 1.556)

Thus, through relation to other selves, the self develops the characteristics that constitute a personality. Personality is evoked by the self's iconic relation to other selves. This notion of relational self brings to mind Heidegger's *Dasein*; some possible links to Heidegger will be suggested in Part III, in the context of the general discussion regarding the compatibility between Peircean semiotics and Husserlian phenomenology.

The (capital letter) Self is a semiotic way of approaching such realities as those that sociology dealt with in terms of *mental collective*, *collective memory*, *social cognition*, and so on. Peirce's notion of self-consciousness is not merely a sum of feelings, psychological states, and so on, but a *knowledge of ourselves*. Self-consciousness gives to the self its personal dimension, a re-cognition of a *private*, intimate self – its genuine character, that is, *me, I*. What the answer to Peirce's *how*

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argument. However, because of Peirce's method of stating hypothesis, namely abduction, more easily accepts a hypothesis than the more popular and sceptical method of Ockham's razor, I consider that, for the purpose of understanding Peirce's own philosophical thinking, the hypothesis should not be easily dismissed. Peirce might have accepted it as a potentially fertile hypothesis, even if difficult to support.

question envisages is broader than the self. It points to the non-self and the whole cosmos within which the self has spring forth to become itself – to re-cognize itself. Thus, a student and a teacher, being part of each other's *Lebenswelten*, are re-cognized by each other within each other's developing selves. In the first *now* instant of their encountering they are simply an aspect of each other's non-self. For their relation to evoke the desired learning they have to re-cognize the continuity between their two selves in regard to what is being taught and learned so as to produce the Interpretant Self. The self is a sign-relation and, as well, the teacher-student relation (a Levinasian I/Thou) is a sign-relation.

Learning properly happens when the consciousness of the teacher and that of the student are coextensive, perfectly continuous, without any interruptions, so that an Interpretant consciousness can occur. Two self realities evoke a third self reality – this is where learning begins. This means that the two are in relation. The fact that they are in relation means that they are distinct within the relation, but stop being outside the relation. This suprasubjective account of learning implies a tuning of significations between the student and the teacher, so that in their semiosis they can adhere to the Interpretant. The Interpretant here is common, shared consciousness, transcending the self and the non-self. The two selves are continuous, and, as continuous, cannot be extracted from the continuum. Literally, in semiosis, one simply stops being without the other. To be meaningless without the other: this is the conclusion of Peirce's suprasubjective semiotics applied to teaching and learning. The student learns to think through the teacher and *vice versa*, and, therefore, if something could halt their relation they would be meaningless. The self is extended into the non-self. The student becomes the teacher, to some extent, and vice versa: this is what it means that they share. In Part II of this thesis I will explain this thoroughly. I will show that the core assumption of Peirce's theory of evolution stands in that learning is agapic – it is a falling in love.

If there is anything in the Interpretant of the two selves' *wills* not harmonious with the Representamen and the Object then, if one of the two (teacher or student) does not *desire* the Interpretant, the possibility of learning is denied. If I do not want to be a part of the other, I do not want to learn from the other. This is a refusal to engage in a personal relation. Of course, semiosis cannot be in any sense suspended, the Interpretant necessarily emerges. Within this semiosis, the other has to be re-cognized as self. For example, when someone teaches me how to row, my experience of rowing becomes his experience and his knowledge of rowing becomes mine. The personality evoked by self-consciousness is not lost by the emergence of a common, shared consciousness (Interpretant). On the contrary, personalities are better emphasized when engaging actively in semiosis with the other. As noticed above, Peirce mentioned that *if the Selves did form a continuum, each would be distinguished by its own point of Self-consciousness.*

The other, in some extent, belongs to the future. In MMN I can only retain aspects of the other, of YMN. Therefore, for learning to occur there needs be a tendency (habit, law, an element of Thirdness) towards the other. The present can only contain an instant attitude, but not a tendency. As noted in Stables, "the totality of

phenomenal experience comprises MMN + YMN" (Stables 2008b, p. 92, see above). This totality can only be a habit, it belongs to an Interpretant of the semiosis in which MMN and YMN are engaged. As a habit, an element of Thirdnes, it is not possessed (grasped) at any present moment, but it is a tendency. As such, it belongs to eternal nowness. The totality of phenomenal experience is argument: presently pursued while always infinitely distant. Self-consciousness is a habit as well, since it is developed, or rather, it is in continuous developing:

"Introspection is wholly a matter of inference. One is immediately conscious of his Feelings, no doubt; but not that they are feelings of an *ego*. The *self* is only inferred. There is no time in the Present for any inference at all, least of all for inference concerning that very instant. Consequently the present object must be an external object, if there be any objective reference in it. The attitude of the Present is either conative or perceptive. Supposing it to be perceptive, the perception must be immediately known as external -- not indeed in the sense in which a hallucination is *not* external, but in the sense of being present regardless of the perceiver's will or wish. Now this kind of externality is conative externality. Consequently, the attitude of the present instant (according to the testimony of Common Sense, which is plainly adopted throughout) can only be a Conative attitude. The consciousness of the present is then that of a struggle over what shall be; and thus we emerge from the study with a confirmed belief that it is the Nascent State of the Actual." (CP 5.462)

This explains that an other which at some point is distinct from the self, properly a non-self, can become part of the self. The other in its dimension of Secondness presents a surprise – the surprise of encountering anything distinct from the self. As Thirdness, as mediation, the other stops being non-self: it is part of the future self, a constituting part of the Interpretant Self. Engaging or detaching from relation to another essentially changes my future self. It is because the self as well is a continuous becoming, that the self and the other can cooperate. The self has room to expand in the future, and, thus it can expand towards the other, in personal relation. Thus the self can integrate within the future self what as a present actuality is non-self:

"This reference to the future is an essential element of personality. Were the ends of a person already explicit, there would be no room for development, for growth, for life; and consequently there would be no personality. The mere carrying out of predetermined purposes is mechanical." (CP 6.157)

According to Peirce, personalities develop in time, being at each passing moment characterized by present feelings:

"This personality, like any general idea, is not a thing to be apprehended in an instant. It has to be lived in time; nor can any finite time embrace it in all its fullness. Yet in each infinitesimal interval it is present and living, though specially colored by the immediate feelings of that moment. Personality, so far as it is apprehended in a moment, is immediate self-consciousness." (CP 6.155)

The non-self always belongs to the future, to the Interpretant self, as in the present there is no room for an other. The other facilitates the self's personality's growth in the future, as it brings a concrete dimension to expand into. The self can engage into knowing the other, into knowing the other's knowledge. Therefore, when the student is facing the teacher, the student should have such feelings that would make her personality compatible with the teacher's personality. The same is true for the teacher. The cooperation between student and teacher is, of course, a semiosis, since semiosis is *par excellence* cooperation – the cooperation of Representamen, Object, and Interpretant. The purpose of teaching concerns the Interpretant of the semiosis between student and teacher. Peirce explained that personal character develops in the same way as the cosmos. There is a coordination (semiosis) between self-consciousness, which evokes personality, and everything that is non-self. Arguably, in this regard there can be noticed a similarity between Peirce's idea of personality, and that of the Patristic notion (*persona*, *hypostasis*), which was only conceived as relational and underpinned a triadic ontology (see Zizioulas 1985). Probably Peirce's reading of St Augustine influenced his concept of personality. Peirce explained that the coordination of the self with non-self builds up personality, in a developmental teleology, thus personality implying more than simply an immediate self-consciousness at a moment in time-space:

"But the word coordination implies somewhat more than this; it implies a teleological harmony in ideas, and in the case of personality this teleology is more than a mere purposive pursuit of a predeterminate end; it is a developmental teleology. This is personal character. A general idea, living and conscious now, it is already determinative of acts in the future to an extent to which it is not now conscious." (CP 6.156)

Therefore, the teacher and student need be in a teleological harmony, for the semiosis of their consciousnesses to evoke an Interpretant favourable to learning. The student and the teacher, in the learning and teaching phenomenon, have to develop together. Not only are they part of the same greater physiology of arguments, and semiosis is possible between them, but they need to develop their own argument, their own micro universe of discourse. The universe of discourse is "that to which the truth or falsity is limited" (CP 6.531). Peirce's universe of discourse is similar with Wittgenstein's idea of family of language games. The universe of discourse of the student and teacher is a specific educational *Lebenswelt*. This *Lebenswelt* is developed between student and teacher and, as such, by developing its own inner iconicity, can become incompatible to other *Lebenswelten*. For example, the student-teacher relation can lose a part of its teleological harmony in the presence of a third – another student, another teacher, the student's husband. Any such third presence deviates the *Lebenswelt* from the universe of discourse which the student and the teacher have developed. This might raise some concerns about the interference of colleagues, such as other students or other teachers. The classroom and the institution are an important part

of the *Lebenswelt* within which the student and the teacher develop their personal relation: this is where they discover similarities. The possibility of a teacher/student personal relation stems from the impossibility of isolating the relation, just like scientific experimentation cannot be practised in absolutely ideal experimental conditions (see Chapter 4). One teacher/student relation is part of the syntax of the classroom (*Lebenswelt*) which includes several teacher/student relations. As such, any of the teacher/student relations of one classroom have to be a diagram of the classroom. Each such relation has to reflect the whole classroom in terms of inner similarities. We know each other in context. The relations' copulation (semiosis) is possible because, according to Peirce, a predicate can be applied to several subjects. Further on, these relations have to be in diagrammatic harmony for the predicate (the teacher's teaching) to be compatible with all subjects (the students' learning). However, external interferences might be experienced: another student might require the teacher's time, attention, and efforts (her life altogether), or another teacher might require the student's. In Part II of the thesis I explain how any such obstacles are overcome via the agapic principle, the principle of growth.

There are mainly two semioses involved in the construction of this universe of discourse: one which has the student as Representamen and the teacher as Object and one which has the teacher as Representamen and the student as Object. The first moment when the student encounters the teacher, she encounters the Object (the Second) of semiosis, herself being the Representamen (the First, from where semiosis starts). For the teacher is the same: she is the Representamen, the student is the Object. These two semioses have two distinct Interpretants. The compatibility between the student and the teacher, that iconic syntax that allows learning, stands in the similarity of these two Interpretants. A student can learn from a teacher proportionally to the similarity of these two Interpretants. If the Interpretants completely coincide then the Representamen and the Object will coincide and the teacher and the student will reach such a level of *closeness* and *self-giving* that they themselves would hardly distinguish self from the other. I argue that this situation occurs at moments. We must not forget that semiosis happens in time and, therefore, such situations when these Interpretants would coincide are elusive, last but a glimpse of a moment. In that moment of coincidence of Interpretants the *other* appears manoeuvrable, comprehensible to the self, the other's knowledge is available to the self, one can *understand* the other, the other is revealed, opened to be discovered. It is a giving of the self: the self is discovered by another. When operating on an Icon one forgets that she is operating on the Icon and not on the Icon's Object. Stjernfelt coined this peculiarity of icon manipulation as the "imaginary moment" (2007, p. 83). As when "walking" on the streets represented on a map, one forgets that her teacher is a distinct consciousness: they are thinking together in that moment. The momentarily coincidence of Interpretants is such an imaginary moment.

Semiosis is continuous, and the Interpretants of a certain moment of coincidence evolve into further, future Interpretants. They do not simply

disappear; they are part of an evolution of a web of signs. If teaching is desired, then the resulting Interpretant signs of the student-teacher semiosis and the teacher-student semiosis have to be as similar as possible, even with moments of coincidence. The student-teacher semiosis is the semiosis where *I* as student am the Representamen and the teacher, as experienced, is the Object, and the teacher-student semiosis is the semiosis where *I* as teacher am the Representamen, and the student, as experienced, is the Object. The degree of similarity between the Interpretants of these two semioses constitutes the iconic syntax of the student-teacher sign-relation.

As explained in Chapter 1, the physiology of arguments is intelligible because of its inner iconic syntax. This is what makes communication possible as well. Personalities are compatible according to their similarities. By similarities here is not meant merely psychological or cultural similarities. I recognize another person because of similarity. I am person as well and I know what to recognize:

"The recognition by one person of another's personality takes place by means to some extent identical with the means by which he is conscious of his own personality. The idea of the second personality, which is as much as to say that second personality itself, enters within the field of direct consciousness of the first person, and is as immediately perceived as his ego, though less strongly. At the same time, the opposition between the two persons is perceived, so that the externality of the second is recognized." (CP 6.160)

The very fact that I am person and the other is person as well allows dialogue, as I re-cognized in the other something that I have myself, namely personality. Therefore, the term *personality* is here used as iconic syntax of the self. A healthy personality is a self with sound inner iconic syntax − perfectly continuous inner similarity[23]. A person is in teleological harmony with another according to the diagrammatical character of their semiosis, the iconic syntax of their semiosis, that is. On a semiotic account personality is understood as a phenomenon of signification. Underpinned by suprasubjective ontology it becomes all the more clear that personality is relational. Per Aage Brandt defined personality as metonymy:

"Metonymy is essentially the cognitive logic of personhood; this well-known rhetorical trope is really a cognitive process that is as deeply rooted in the human mind as the concept of Person: a self, understood as a Person, transcends any bodily reference (you are not 'just' your body), because it is determined metonymically as the abstract or ideal referent of all accessible indices of the activity of the individual." (Brandt, 2007,p. 55)"

In cognitive linguistics metonymy has been generally defined as the conceptual relationship within a single domain (see Geeraerts 2008), in contrast with the metaphor, which is understood as a relation between elements of distinct domains.

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[23]Whether such inner continuity is possible or not is debatable.

In the same manner, according to Peirce metaphor is a parallelism with something else, something external to the relation between Representamen and Object. Therefore, metonymy is identified with Peirce's diagram. The diagram type evokes the phenomenon and particular existence of person. Personhood is defining, as such, for the human *Umwelt*.

In this chapter I have shown that a suprasubjective reality implies a suprasujbective account of learning. Selves, being sign-relations, expand. The expansion of the self is the Universe's expansion and suprasubjectively connected learning selves is the Universe's self-discovery. Since the self is an expanding sign-relation, the interaction of selves is, therefore, a semiosis. This semiosis, the cooperation of two selves, reveals the element of *personality* evoked by each self-consciousness. I have advanced a semiotic understanding of personality, identifying personality with the inner iconic syntax of the self. Two selves can tend towards shared personalities, to some extent, within their relation. The student and the teacher have to tend towards this personal sharing, so that their communication can evoke their expansions towards and within the other. This is the purpose of teaching: that the teacher's knowledge becomes the student's. It is a passage happening in time.

Part II

In this part I develop the main arguments of the Peircean Theory of Learning.

I define learning as the passage from Icon to Argument. This definition implies that learning is an evolutionary semiosis. As such, I approach education in the perspective of Peirce's theory of evolution. According to Peirce, there are three modes of evolution, corresponding to the three phenomenological categories: Tychasm, evolution by chance, Anancasm, evolution by necessity, and Agapasm, evolution by love (CP 6.302). The cornerstone of the Peircean Theory of Learning consists in the understanding of learning as a cosmological matter, having as rationale self-denying love.

I argue that, following Peirce's theory of evolution, a student/teacher relation can only be justified on the ground of mutual, self-denying love. This is revealed by the way in which signification evolves, from iconicity, being driven by chance, to indexicality, being driven by necessity, and to its fulfilment in argumentation.

Chapter 6
From Icon to Argument

In Chapter 2 I introduced Peirce's sign typologies, including the concepts of Icon and Argument. In this chapter I explain why the Icon plays an essential role in learning and how learning can be defined as the passage from Icon to Argument. I consider that this is a broad, comprehensive account of learning which, unlike other attempts at definition, does not reduce the richness of the learning experience to the limitations of a theoretical framework. In the same time, while it does not narrow down learning, accounting for it in all its aspects, it is deeply insightful from the semiotic perspective.

The Icon has been presented as the sign which in its existential relation to the object presents a similarity (Chapter 2). This means that the Icon is the sign which signifies by means of similarity, a likeness that is. The phenomenon of signification occurring by similarity shall be referred as *iconicity*. The difference between Icon and iconicity is purely conceptual since the Icon, like any sign, is a phenomenon. In the present work the term *iconicity* refers to the general phenomenon and the term *Icon* shall refer to particular signification phenomena. An Icon can be analysed, while the sign's iconicity can also be analysed. Even though it would not be conceptually wrong to discuss 'a sign's Icon' it would be somewhat strange and perhaps misleading, since the Icon is a sign type. Therefore the use of a sign's similarity to its object will be referred to as the 'sign's Iconicity'. Consequently, the *indexicality*, the *symbolism*, the *proposisionality*, the *argumentation* etc. of the *sign* are as well phenomena of signification (signs) that can be analysed as such. This apparent terminological confusion is due to the fact that the types (and classes) of signs are always mingled in experience (semiosis). Signs, we must not forget, are relations. This is why Peirce discussed in terms of the sign's *correlates* (the types of signs composing a sign, each identifiable within the phenomenon of signification, but none separable). (CP 2.238)

Frederik Stjernfelt's *Diagrammatology* (2007) offers a new insight into Peirce's Icon, underlining the importance that Peirce himself gave to this sign type particularly as regards its role in learning. This framework brings two controversial claims (in regard to Peircean semiotics) that are essential for the present thesis, namely (1) that iconicity suffices for meaning to occur and (2) that signification cannot occur without iconicity, or at least that an iconless sign would be an useless abstraction (e.g. the contextless variable *x*, a proposition that does not contain a predicate, etc.). Stjernfelt defines Iconicity as follows:

"Iconicity is generally conceived of as the sign-relation making one phenomenon signify another by similarity in some respects." (2007, p. 49)

Similarity is the criterion for Iconic signification, but it does not define it entirely. Similarity can also be called "shared qualities" (Stjernfelt 2007, p. 75). While Iconicity is a phenomenon of signification similarity on its own does not suffice to signify. As Stjernfelt explains, it needs an *intention*. This happens because similarity is symmetrical, while signification is not necessarily symmetrical. This

means that if *a* is similar to *b* then *b* is necessarily similar to *a*, while if *a* signifies *b* then *b* does not necessarily signify *a*. It can be said that *a* is similar *with b*, while the essential character of the sign does not stand in that *a* is signifying *with b*, but that *a* signifies *b*. If someone thinks of me as a result of her seeing a photography of me, because she finds the content of the photography to be similar with me, it does not mean that she would necessarily think of the same photography if she would see me in flesh and blood (by this not construing at all the infinity of semiosis: if *a* signifies *b* it does not imply that *a* does not simultaneously signify *b1*, *b2*, *b3*, …, *bn*). This does not mean that in signification the equivalence is excluded, but only that it is not implied. If I would see Al Pacino in flesh and blood surely the cover of the *Godfather* movie would come to my mind when recognizing him. This *direction* of signification in the case of the Icon is determined by the way in which the sign is used. The way in which the sign is used constitutes the sign's mode of being: the use determines the type of the sign. I have explained in the previous chapters that a cornerstone of Peirce's semiotics is that a sign is only a sign *in actu* (see Chapters 2 and 3).This is the application of the principle of pragmaticism to semiotics. Peirce clearly accounted for this:

"A sign is only a sign in actu by virtue of its receiving an interpretation, that is, by virtue of its determining another sign of the same object." (CP 5.569)

Thus, a web of signs is meaningful (comprehensive for the mind) if the signs constituting it share a common object which constitutes a middle term. Signs are therefore placed in syllogistic relations. Peirce noted that "Every assertion is an assertion that two different signs have the same object." (CP 2.437) This is the sort of sharing within the physiology of arguments which Stjernfelt (2007) identified as *iconic syntax*. That is why a certain meaning can be dissonant with another: there might be no common object inferred. For example, a person who developed a more sensitive experience of colors might disagree with another claiming that the sky on a particular day is blue, but she might claim the sky to be *azure*. While one might find *blue* and *azure* to be more or less the same qualities, another might find a dissonance between the sentences *a is blue* and *a is azure*, while simply failing to see a common object between the signs (iconic predicates) *'is blue'* and *'is azure'*. Of course, one might be considered presumptuous for not admitting that as predicates the qualisigns *blue* and *azure* share in their turn some qualities (e.g. they share their being within a certain range of the chromatic spectrum, therefore there should be a genus of which they are both species), but one must understand that signification is not quantifiable and, thus, what for one is obvious for another might be contradictory while none of them being necessarily wrong or right. The principle of excluded third does not apply in semiotics (Semetsky, 2005b). Peirce stated that "the principle of excluded middle only applies to an individual (for it is not true that "Any man is wise" nor that "Any man is not wise")" (CP 6.168). Within the physiology of arguments entities cannot be separated into individual termini. Peirce inherited from Duns Scotus the scholastic realist assumption that the real existence of individuals rests metaphysically on the real existence of universals, an interdependence that occurs clearly from Peirce's three phenomenological categories and their cooperation

(semiosis). As such, there is no *a priori* for Peirce; none of the termini of the sign is *a priori* to any of the other two, as the triadic relation is not a sum of dyads or monads.

Consider the teacher-student possible situation where the teacher's concept of *negative numbers* functions within the perspective of *ideal numbers*, while the student's concept of the same object functions only as *concrete numbers* (e.g. the student can express with negative numbers that there is sea level below *0*, or that there are such realities as one being in debt to the bank more money than she actually has). In such a situation, if the teacher would try to teach complex numbers to this student, a subtle problem would occur. The student will experience a *categorical mismatch* between her concept of *negative numbers* and the way her teacher is using this concept when her teacher will tell her that there is a number *i* so that $i*i = -1$ (e.g., the sea level cannot be equal with the square of a number, but an ideal number, that does not simply define quantity, but is a quality in itself – and, thus, contains within itself the possibility of being used as *predicate*, can). This *categorical mismatch* will determine some particular effects in the semiosis implied. In this situation, the web of signs constituting the student is not fitting with the web of signs that she encounters. Several consequences might occur, from the student giving up mathematics, to the student making an effort of assimilating a new web of meanings into her own and thus redefining her understanding of *negative numbers*, or to increasing the amount of chocolate she eats daily (the teacher has no real control over this).

The present theory of learning will not engage with such situations either as change of opinions, shift of paradigm, or as a simple theoretical advancement on the behalf of the student. Such situations will be approached as experience of meaning that provoke the changing of one's *Lebenswelt*; this means the changing of one's own very *self*. If my understanding of wine changes then my entire phenomenal world changes: from my appreciation of art to the way I swim and to my understanding of semiotics, because all these signs that constitute my being are (and need be) coherently connected syllogistically. The *Lebenswelt* and *Umwelt* of a living being are dynamic, evolving as the organism is evolving. Since experience is continuous, that is, the self is a continuously expanding sign, the Umwelt and Lebenswelt continuously evolve as well. All knowledge (the entire being) of a knowing subject is connected. The situation in which one would know what *negative numbers* are without this affecting his performance of *swimming* is impossible. Like the cognitive scientist knows that all organs of an organism are connected to the brain, and thus they are all together interconnected, so the semiotician needs to be aware that all semiosis in which a knowing subject is involved is integrated in one web of signs. In the framework advanced here to be interconnected is the same with being connected, as one of the principles of Peirce's relational logic is that "to be in relation to X, and to be in relation to a relation to X, mean the same thing" (R 611:14–15, 1908, in Bellucci, 2013, p. 181). To state that one knows something which is not part of herself is like stating that an organ which is not connected to her brain is hers. Of course, the web of signs, the self, expands into knowing the other;

the student gets to know the teacher and *vice versa*, and thus they are assimilated one into the other. Their phenomenal worlds merge into one. I explained in Chapter 5 that this merging of phenomenal worlds is ideally a coincidence of Interpretants, which results from operating on the other's knowledge as with an icon. This requires having the other's knowledge available as purely iconic. In that moment the other is perfectly operational for the self; it is part of the self. I consider that learning needs have such moments, elusive as they might be. This *sharing* of signification is the peculiarity of life, defined in biosemiotics as *local plurality* (see Kull in Chapter 1) – the possibility of breaking ontology through unification of phenomenal worlds.

Stjernfelt observed that in icon manipulation such a climax is reached at some point, where "the icon performs its full impact, a moment of imagination, one might call it." (2007, p. 83) This imaginary moment consists in such a fine manipulation of the icon that it is identical to the manipulation of the Sign Object. This is possible because the icon, being *pure quality*, makes the Object operational. The Icon sign presents its Object in respect of some of the Object's qualities. Because qualities are graspable in terms of similarities, an Icon's Object is operational. An Object which in relation to the Representamen lacks iconicity is meaningless; it lacks any sort of Representamen, and is not a terminus of a Sign-relation. These are limit cases such as pure convention, which is, if possible at all, useless (a void, functionless parameter or variable *x*, a subject without predicate). It is inaccessible, if existing at all. Iconic manipulation effects an operation of substitution, which allows the performing of experimentation on the Replica as on the Type. A simple example is that of our manipulations of geometrical figures. Due to their very definition a triangle, a square, a circle cannot be drawn (geometrical lines do not have width, it is impossible to obtain the precise measure of angles, an infinity of points cannot be represented, etc.), but, nevertheless, we draw things similar in some regards to the triangle type, the square type, the circle type etc., which allow us to operate on the types. This is possible because we can operate on these perceivable iconic grounds as if on the types themselves. We forget that those traces of ink on paper, actually, are not a triangle, while maintaining our understanding of the triangle. This relation is an icon: the triangle, the drawing, our manipulation of them. One can argue that the similarity between a pictogram and a triangle is only constructed – there is no *real*, *inherent* similarity between the geometrical figure that contains three angles and some traces of ink on paper. If this would be the case the pictograms are either useless, or any pictogram can be used to serve for an Icon about a triangle. The answer to this stands in that the pictograms that best serve as a perceptible ground for a triangle Icon share obvious similarities between them, which they do not share with the pictograms that best serve as perceptible grounds for Icons of squares, circles or other figures. If one tries to operate on a drawing that iconically presents itself as square as if on a triangle, it will simply not work.

Anything can be similar with anything else and anything can signify anything else, but the Icon represents the sharing of qualities between the Representamen and the Object *in some respect*. It is this exigency of the Icon – of signifying in some

respect – that makes it so useful. Of course a triangle is similar to a square, is similar to a whale, is similar to my feelings in this moment, but the pictogram that is usually used to represent triangles for geometrical purposes is useful because it represents the triangle in the respect in which concerns relations of trigonometry (it clearly evokes the characteristics of three segments and three angles). The triangle might signify as well my feelings in this moment, but we are operating on an icon when the operations on the triangle coincide with operations on my feelings, when the triangle casts light on some features of my feelings so as to make them available (operational).

Iconic manipulation makes reality accessible. I can lift the glass of wine on the table to my mouth and drink because I can simulate this action in my imagination. For the action to be successful the relation between it and the simulation has to be iconic. Drinking from a glass is not a difficult task, the possibility of its simulation simply proves its possibility. Nevertheless, iconic manipulation can give insights towards the performing of more difficult tasks. Take the example of a soccer player trying to score a goal from a free kick from a distance: her simulation of the event is crucial for its performance. The better the simulation is, the better the performance will be. A better simulation here implies a more accentuated iconic character in the relation to the (desired) performance. This gives a hint to how the Peircean Theory of Learning can be used in teaching practices generally (take into consideration the insight that this example offers regarding physical education). The teacher needs be aware that the student needs to be capable of simulating the performance. This is what the icons does:

"The value of an icon consists in its exhibiting the features of a state of things regarded as if it were purely imaginary." (CP 4.448)

Stjernfelt considers that the imaginary moment of iconic manipulation is essential for the possibility of thought:

"This moment of fiction is crucial to the possibility of thought, of imagination, or contemplation of pictures to approach the object intended." (p. 83)

This statement does not concern only cognition and mental representation. It gives an insight on ontology, as it explains iconic syntax. In Chapter 2 I have explained that according to Peirce judgments are not strictly mental and in Chapter 5 I have mentioned Stables' similar remark, which he identified in Wittgenstein's *Philosophical Investigations*. According to Stables this is an important aspect of phenomenologically overlapping reality (termed suprasubjectivity in this thesis). The present thesis does not aim at performing an investigation on Wittgenstein, but it is relevant that, even though essentially incompatible with semiotics, there are common assumptions with Wittgenstein's contribution to analytic philosophy, particularly regarding suprasubjectivity.

The imaginary moment phenomenon can be, as well, a more rigorous and insightful explanation of the folkloric *"If you can dream it, you can do it"* motto. According to Stjernfelt, the success of any experiments rests on the realization of the imaginary moment of icon manipulation – the identification of *Object* of

signification with an Object of *pure qualities* (the realization of an iconic version of the Object):

"In many cases, of course, this imaginary moment may be unrestricted as the notorious 'free play of imagination'; in others it is constrained by various, more or less severe, regulations pertaining to the object, for practical, aesthetical, scientific, or other purposes. In all cases, however, this moment of identification where the manipulation of the icon in a certain sense is a manipulation of the object itself, is crucial to the possibilities of solving the constraints and success of the experiment." (p. 83)

To draw a portrait or to solve a mathematical equation the simulation of the act needs to precede it. In many cases education aims precisely at cultivating simulation (distinct from imitation). This is clearly the case of mathematics, which consists in diagrammatic reasoning *par excellence*. The solving of an equation is itself a simulation of a real life circumstance. Surely, one needs to be capable of simulating the writing of her PhD in order to write it. At times only the next small step is available for simulation, but this is already another aspect of learning. If something (e.g. psychological states) obscures the performing of the simulation, the success of the learning itself is compromised. Also, if the simulation is not accurate the learning can be compromised. Such is the case when one is overly enthusiastic (naïve) and simulates her moment of glory when her PhD is published (a case of lucid dreaming), but ignore the simulation of the writing of her PhD (the schedule planning, playing with the icons of her argument, etc.).

The imaginary moment is the moment when no distinction is perceived between the Type (an Icon's Object) and the manipulated Replica (an Icon as Representamen). When "roaming on the streets of a map" we tend to forget that *this shape on paper* is not the *building we are looking at*. Actually, we tend to point at a colored rectangle on the map and say "This is Westminster Abbey!" This is the imaginary moment. Peirce described this central point of icon manipulation:

"I call a sign which stands for something merely because it resembles it, an *icon.* Icons are so completely substituted for their objects as hardly to be distinguished from them. Such are the diagrams of geometry. A diagram, indeed, so far as it has a general signification, is not a pure icon; but in the middle part of our reasonings we forget that abstractness in great measure, and the diagram is for us the very thing. So in contemplating a painting, there is a moment when we lose the consciousness that it is not the thing, the distinction of the real and the copy disappears, and it is for the moment a pure dream -- not any particular existence, and yet not general. At that moment we are contemplating an *icon.*" (CP 3.362)

As in icon manipulation generally there is a moment of coincidence when the Object is translated into a qualitative Representamen (Icon), thus becoming operational, there needs to be a moment of coincidence in the student/teacher relation. The student (as sign) becomes the teacher (as sign) and, obviously, *vice*

versa. Chapter 5 concluded with the idea of the momentary identification between self and other, at least in some respect, as necessary for learning. It is a sharing of phenomenal worlds in its ultimate stage, that of identification of Interpretants. This moment of identification of Interpretants, having the characteristics of the imaginary moment, consists in one's (the student's) possibility to use the other's (the teacher's) knowledge. Further on, this identification leads to argumentation. Since the student could iconically manipulate some of the teacher's knowledge, they now have a common predicate: they share it. From here they can develop arguments together.

The sharing of phenomenal worlds, almost up to the point of identity at moments, is an unavoidable phenomenon that makes teaching and learning possible. In the same time, it can have two negative effects: (1) the student can be exaggeratedly biased by her teacher, which brings obstacles to her learning and (2) the teacher expects the student to be the *student* of her own web of signs, and thus in her evaluation of the student will look for herself rather than for the genuine student (what the teacher knows about the student is different than what the student knows about herself). The problem here is that the self subjects the other to the self. If the student sees in the teacher only what she already knows about the teacher (apperceptive other), without acknowledging that there is an abyssal *unknown* teacher (the personal teacher), and not the genuine teacher, she cannot learn from the teacher. This is because the apperceptive other is already part of myself– it is my concept about the teacher – and, therefore, instead of growing in signification towards the other the self is still focused on its own meaning phenomena. If the teacher fails to see the genuine student and is aware only of her awareness of the student (apperceptive other), evidently, the teacher has nothing to offer to the student. This situation is particularly dangerous when evaluating the student: the teacher will be searching for herself in the student, for identification, and not for similarity. By this attitude the teacher rejects the student's unique personality (see Chapter 5) and any possibility of creativity from the student's part.

The phenomenological school developed since Husserl has been concerned with this aspect of personal relations as well. Heidegger's concept of *Dasein* and Levinas' concept of *Thou* (inherited from Martin Buber and generally from the Chasidic philosophers) offer a valuable insight in this regard (further explored in Chapter 10). Stjernfelt (2007) found essential similarities between Peirce's semiotics and Husserl's phenomenology (Chapter 2). If the legacy of the former brought about the understanding of being as suprasubjective (e.g. Deely, 2001), the legacy of the latter brought the understanding of being as intersubjective (Levinas, 1998) – both explain that our phenomenal worlds collide and overlap. The intersubjectivity of humans involved in learning is understood as personal suprasubjectivity (personality is evoked by self-consciousness, realized in relations of the selves' consciousness, see Chapter 5). This can be seen as coextensive with Stables' semiotic philosophy of education, centered around the idea of a reality of "overlapping phenomenal worlds" (Stables 2012, see also Chapters 2 and 5); its implications will be investigated further on. In Part III I explain how Husserlian phenomenology, via Heidegger and Levinas, is coextensive with the Peircean Theory of Learning and that semiotic

phenomenology can lead to further advancements in edusemiotics. For now it will suffice to take into consideration that the key to overcoming these two obstacles in learning (stemming from the same one problem) is accepting the authenticity of the other. While the student must not develop a fanatical appreciation of her teacher, thus developing her-own-teacher (the teacher as apperceptive other) and obscuring the genuine teacher, the teacher has to search for the genuine student, not her own subjectification of the student. This comes down to a search for similarity, a relation which is opposed both to the relations of difference and identity. Each knowing subject involved in the learning phenomenon has to discover the genuine other. If learning in general was defined as a discovery of similarities, learning in the student-teacher situation is a discovery of the other. The discovery of the other has to be done, of course, via discovery of similarities. It is an erotic relation which transcends the inauthenticity of the mundane:

"To love is to exist as if the lover and the loved one were alone in the world. The intersubjective relation of love is not the beginning of society, but its negation." (Levinas, 1998, p. 20)

Like Levinas claiming that "the emergence of the human in the economy of being upset the meaning and plot and philosophical rank of ontology," (1998, p. xiii) Peirce accounts that the encountering of the other is a *surprise*:

"The phenomenon of surprise in itself is highly instructive in reference to this category because of the emphasis it puts upon a mode of consciousness which can be detected in all perception, namely, a double consciousness at once of an *ego* and a *non-ego,* directly acting upon each other." (CP 5.52)

Learning something new literally places one in a new (different to some degree), phenomenal world: the semiosis the learner is involved in is different now, that she is (constituted by) a new set of signs. The ethical dimension ascribed to learning from this perspective transcends the mere teacher-student local circumstance. A fundamental idea introduced in Chapter 1: education is a method which appeared along the Universe's discovery of itself. The teacher is not only responsible for her student or for herself and likewise in the case of the student. They are both engaged in semiosis: the Universe is unfolding, the ultimate Argument is slowly being unveiled. Education concerns the entire evolution of signification. Arguably, the entire academic community and the entire human society benefit from a growing student/teacher relation. As the learner learns the web of signs expands. It is important to acknowledge that both the student and the teacher are learners. Not only that we permanently learn through our lives, but within the teaching/learning experience both sides are learning, as each side is confronted with the shocking reality of dealing with a web of signs other than its own – and they have to *signify* together. From this point of view, an artist is one who interprets art, the art lover, not the producer of an artifact. The producer of an artifact (painter, musician, etc.) is only an artist because in the process of production she is interpreting her own creation – otherwise she could not perform it. Nevertheless, any interpreter of her

artwork is an artist in her own right, as anyone could discover meanings in the artwork that its producer herself could not discover:

"In a painting are concealed many enigmas which the painter himself has never contemplated (and since the sheet of the painting is continuous, the number of possible similarities is infinite which means that he would never even be able to contemplate them all in finite time – so much for the biographical method) – what is, for instance, the precise distance between the main characters, which geometric figure do the persons describe if we draw lines between them, what is the sum of the height of all the trees depicted." (Stjernfelt 2007, p. 85)

The same happens in the case of teaching. The student always has the possibility of discovering information in the taught material which is hidden for the teacher herself. Of course, as in Stjernfelt's examples, many possible similarities are not insightful. Nevertheless, in an infinite class of similarities no one will exhaust the insightful ones. No one's knowledge is infallible or perfect. The teacher needs be aware of this about herself; it should be a constant and continuous characteristic of her MMN and, as such, influence the classroom *Lebenswelt* accordingly. Meanwhile the student is learning she can unveil new meaning for her teacher as well. That the student-teacher semiosis arrives at the level at which it can properly be called mediation it becomes symmetrical (student-teacher = teacher-student); the teacher and the student share a predicate. Thus, a habit is developed between student and teacher. Sharing has to become a habit, a matter of Thirdness, that is, for the teacher and the student. In Peirce's terms *habit* and *mediation* are synonymous, as they both refer to a Third signification, an Interpretant. When one is teaching one is learning. In the authentic discovery of her teacher the student transcends the dangers of boredom on the one hand or blind indoctrination on the other and in her discovery of the student the teacher overcomes the banal replication of knowledge, and, through her student, she generates new knowledge. Thus the purpose of education is achieved: the web of signs expands and the Universe is discovering itself through life forms.

Icons are signs that pertain to a domain of Firstness. They are the First in the Icon-Index-Symbol trichotomy and thus they set the criterion on which this trichotomy develops continuously from simple to complex: similarity. Peirce preferred to refer to *sets* of signs (not *webs*). A set can have an inner continuity. Similarity is, as mentioned, a relation that occurs among qualities of things. Similarity evokes signs. If the sign was there and it was discovered by a knowing being or if it was created once with its discovery or if it was simply *constructed* by a knowing being it is perhaps impossible to discern, but surely, it has been evoked by the similarity discovered by the knowing subject. Also, according to Peirce continuity occurs among qualities of things (Peirce's concept of continuity was explained in Chapter 2). By *thing* we shall here understand *anything*, be it an actual sign or a possible sign. Thus, *thing,* in this sense, is synonymous with *no-thing* (there is no dichotomy, since all of these – *a thing, nothingness,* and *anything*, in their generality, can signify).What cannot signify, that which is *useless*, has no ontological

validity whatsoever, and, therefore, about such a *thing*, such as the Kantian *thing-in-itself*, there is no reason to speculate. Since it cannot come into the physiology of arguments, since it cannot be of this world, it would be wrongly considered a *thing*. This is not because our only grasp of existence happens via meaning, but because things have the quality of signifying. Even a non-existent thing might signify. The possible but not yet actual sign can only be contemplated abstractly, because as soon as any cognition of it arises (e.g. the slightest mentioning of it) it signifies and thus it becomes an actual sign[24].

To return to the issue of continuity, the individual entities populating a set are not continuous, but the qualities of the individuals give the set's continuity. Thus, if two objects share a quality, like an apple and a car being both red they can be placed in the same continuous set of red objects. Such a set of redness, according to Peirce, is continuous and infinite, containing all the redness in the world and infinitely more redness as possible reality. According to Peirce's account of Iconicity, a continuum can never be exhausted by the instantiations it includes. Since Icons pertain to Firstness it is no surprise that they represent qualities. In Chapter 2 it was explained that qualities populate Firstness, indivual, brute objects populate Secondness, the category of *haecceity* (*thisness*), and Thirdness is populated by laws. It is a crucial observation that similarity is not identity. Similarity means shared qualities, but not identity of *haececeity* (individuality), or of anything else. If two perceptibles share a quality (e.g. *these two cars are red*) it does not mean that they have something identical (*the red paint covering one car is literally the same physical red paint covering the other*), but that they both dispose of a quality from the same continuum (*the red paints are distinct in their being objectified on different cars, but they are continuous – they belong to the same continuity of redness*). For this Peirce considers that only Icons are the signs that can function as predicates (see Chapter 2, section C) – to predicate is to discover the sharing of a similarity (e.g. *These two cars are red*):

"The only way of communicating an idea is by means of an icon; and every indirect method of communicating an idea must depend for its establishment upon the use of an icon. Hence, every assertion must contain an icon or set of icons, or else must contain signs whose meaning is only explicable by icons. The idea which the set of icons (or the equivalent of a set of icons) contained in an assertion signifies may be termed the predicate of the assertion." (CP 2.278)

Semiotics brings the insight that the essential characteristic of a predicate is its being an icon (it is essential for a predicate to signify iconically). Stjernfelt accounts that "the predicate in logic as well as ordinary language is essentially iconic." (2007, p, 76) This reveals the importance and the role of predicates in learning, since all learning happens via icons. An Icon can evolve in two ways: (1) it can become an Index by establishing a reference following a continuum of similarity

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[24]St Augustine remarked that the unspeakable is speakable at least in the extent that it can be named as *unspeakable* which already involves speaking about it: "There is a kind of conflict between words here: if what cannot be spoken is unspeakable, then it is not unspeakable, because it can actually be said to be unspeakable." (*De Doctrina Christiana*, I, 13-14)

between the Representamen and the Object, or it can become a Predicate (Rheme) by mediating the similarity between Representamen and Object to an Interpretant. To state something in the form of a proposition requires both an Index and a Predicate. Having learnt something, one can use a predicate so as to state something about what was learnt.

As presented in Chapter 2, the proposition, also termed dicisign, is a Subject-Predicate structured sign. The Subject has to be an Index, the sign that has an existential relation to its Object, and the Predicate, has to be an Icon. Peirce's denomination for Predicate (see Chapter 2) is *Rheme*. The Rheme (predicate) is simply an Icon used to communicate (to mediate) – an Icon extended to Thirdness, an Icon in its Interpretant aspect. Therefore the Predicate can be defined as a Sign that in relation to its Object presents a similarity and its relation to its Interpretant is a possibility (e.g., "is blue"). By adding to such a sign a Subject (which needs be an Index), a Proposition is constituted (e.g. "the sky is blue"). Even a noun (such as "sky") can essentially be understood for its iconic structure. Its interpretation as a pure index is practically impossible and our use of such signs as strictly nouns is a theoretical abstraction (according to the pragmatic maxim of logic, we can only understand "sky" as "sky!", thus making it a predicate).

Francesco Bellucci is right in arguing that according to Peirce "common nouns are in fact unsaturated predicates or *rhemata*, i.e., predicates from which one or more subjects have been removed." (2013, p. 181) Signs tend towards the Argument type (see Chapter 2). Arguments are constituted by copulated sets of Propositions. What makes the copulation of Propositions possible is a criterion of continuity. Continuity distributes a criterion throughout the three categories, from Firstness to Secondness and to Thirdness. Thus, the criterion of such continuity within arguments has to be similarity: if the continuity would be simply *quality,* the criterion of Qualisigns, the distribution of quality would not be anything else but *shared quality* and this is similarity. In its progression towards argumentation a sign obtains the criterion of *possibility*, once it becomes rhematic, but it is similarity itself that makes the horizon of possibility real. This is the same with saying that predication is possible because of the continuity of similarity (in Chapter 2 I explained that Peirce's concepts of *similarity* and *continuity* are inter-dependable). It is the development of sign relations towards the Argument that constitutes the very phenomenon of learning: the Universe's discovery of itself, the Universe's becoming aware of itself through life forms.

So far there are three types of signs that prove to be essential to learning: the Icon, the Proposition (Dicisign) and the Argument. The Icon evokes learning. The Proposition sign type is necessary in the development of arguments. Among an Argument's correlates there has to be a Symbol as well, so, arguably, if a sign evolves to a Symbol, before it has any propositional character, it could evolve to Argument while avoiding the Proposition type. In this case, such an Argument would have a Proposition as a correlate in its composition accidentally rather than properly participating in the semiosis. Nevertheless, the nature of Arguments is mediation of propositions. The mediation of propositions is symbolic and the

mediation of symbols is propositional. Mediation is, by definition, the characteristic of Thirdness. Propositions have Thirdness through a Predicate correlate, but there needs be Thirdness stemming from an Index for copulation of propositions to occur – a phenomenon of signification literally pointing to what the copulation consists in. Indexical copulation constitutes a middle term (*tertium comparationis*). Indexicality per se is a matter of Secondness, and by developing mediation from an Index to a Symbol – the sign that signifies its object as law – emerges. Therefore, at this categorical level of signification, iconic syntax is developed into a symbolic syntax. It does not come as a surprise at all that Symbols make the copulation of propositions possible, since it was already established that this copulation is possible due to the continuity of similarity. The Symbol is the Third of the trichotomy through which similarity is distributed continuously, starting from the Icon, and continuing with the Index. The Proposition has in its constitution a Rheme (Predicate) and an Index (Subject). Therefore, to enrich a Proposition's signification, a Symbol could be correlated to it. The evolution of two propositions into one sign, therefore, will imply a symbolic signification. To mediate into one sign (whatever that sign is) the proposition *George is here* with the proposition *The cat is hungry* one needs to know that *George is the cat* (the *cat's name is George*, that is). This is a symbolical syntax which makes such copulation, that is the mediating of two Indices into one Symbol, possible. A proper noun (*George*) is a symbol. Even the copulation between *The cat is hungry* and *The cat is here*, that is the copulation between two Replicas of the same Type (*cat* and *cat*) needs a Symbol because the Index is the Replica of a Symbol, and the Subject of a Proposition is always an Index (*cat*). Therefore, mediation of propositions is symbolical. Copulation of symbols has to be propositional as well, since Symbols are still unsaturated predicates. A non-propositional copulation of symbols is just an enumeration. The argument is the fulfillment of signification. As such, it is inexhaustive and its digression presents a perfect harmony of correlated sign types. To express the ultimate Argument's full incomprehensible character, Peirce explains precisely the high level of complexity resulted from the combination of simple Qualities:

"The Universe as an argument is necessarily a great work of art, a great poem -- for every fine argument is a poem and a symphony -- just as every true poem is a sound argument. But let us compare it rather with a painting -- with an impressionist seashore piece -- then every Quality in a Premiss is one of the elementary colored particles of the Painting; they are all meant to go together to make up the intended Quality that belongs to the whole as whole. That total effect is beyond our ken; but we can appreciate in some measure the resultant Quality of parts of the whole -- which Qualities result from the combinations of elementary Qualities that belong to the premisses." (CP 5.119)

Learning, therefore, is this passage from Icon to Argument. The premisses are constituted by qualities which signify iconically – they are comprehensible, they make the world intelligible. The Argument is constituted from the combination of qualities: upon qualities new qualities occur. The Argument is overwhelming,

beyond our ken, but, due to its iconic syntax, it is intelligible. The iconic syntax is precisely this diagrammatic character, the parts resemble the whole: Quality premisses together form intended Quality. What we can understand, what we can appreciateconsists in parts of the whole, as Quality.

Process philosophy adopted such views from Peirce, that reality consists in an evolutionary passage (a process). Nevertheless, process philosophy generally did not commit completely to the idea of Universe as a physiology of arguments. This can be observed in Alfred North Whitehead's *Process and Reality* (1929). Whitehead advanced a notion of 'applicable' which appears to be equivalent with Peirce's idea that signs can only be fulfilled *in actu*. Nevertheless, Whitehead's thought is different than Peirce's in that, like it is commonly the case of modern philosophy, it regards language as a means, more or less appropriate, for describing reality. From this point of view the means that build our knowledge, such as language and even experience are limited and bring obstacles in knowledge:

"Philosophers can never hope finally to formulate these metaphysical first principles. Weakness of insight and deficiencies of language stand in the way inexorably. Words and phrases must be stretched towards a generality foreign to their ordinary usage; and however such elements of language be stabilized as technicalities, they remain metaphors mutely appealing for an imaginative leap." (p. 4)

For Peirce, the Universe, reality itself, has a semiotic structure from which life, experience, and language spring and evolve. Language is not *something else*, apart from reality, but it is inherent in reality and thus similar to the other (non-linguistic) signs around it. Words, phrases, metaphors are signs that constitute the Universe. If by words we refer to units of articulated speech we know that we only find them (at least so far) in the human *Lebenswelt* and that they are absent in the entire non-human world. Nevertheless, words can be indices, symbols, rhemes, metaphors and other types of signs which are used by several other living beings. We use the same sign types because we partake in the constitution of the same reality, the same physiology of arguments. Metaphors are not simply attempts at describing reality in artificially constructed, but intelligible analogies. According to Peirce, metaphors "represent the representative character of a representamen by representing a parallelism in something else" (Chapter 2, CP 2.277) and, as signifying pure quality, they are hypoicons stemming from diagrams. The difference between Peirce's semiotics and this account of process philosophy stands in that, for Peirce, the imprecision and vagueness of language and of signification generally makes communication possible (Nöth and Santaella 2011). The Universe is metaphoric and there is no point for us to try to understand it non-metaphorically:

"Therefore, if you ask me what part Qualities can play in the economy of the universe, I shall reply that the universe is a vast representamen, a great symbol of God's purpose, working out its conclusions in living realities. Now every symbol must have, organically attached to it, its Indices of Reactions and its Icons

of Qualities; and such part as these reactions and these qualities play in an argument that, they of course, play in the universe -- that Universe being precisely an argument. In the little bit that you or I can make out of this huge demonstration, our perceptual judgments are the premises *for us* and these perceptual judgments have icons as their predicates, in which *icons* Qualities are immediately presented." (CP 5.119)

A representamen's character as conclusion is a metaphor (the representamen's parallelism in something else). Conclusions by definition are Interpretants, but there is a sign of Firstness that represents as conclusion; this is the sign which explains a First in parallelism to something else, the metaphor, namely. A metaphor, such as the Universe is, has inner diagrammatical character because if something can be represented in parallelism (relation of similarity) to something else, than it needs to have similarities between its parts and the whole. Its own iconic syntax makes it possible to correlate it iconicaly to something else that has iconic syntax, otherwise iconic syntax itself is unintelligible. The universe has such an iconic syntax, and therefore it can be analysed mereologically.

For this, Peirce's semiotics is rather compatible with Husserl's phenomenology (Stjernfelt 2007) and not with process philosophy, as it has been often argued. Husserl's idea of analysis of constituting parts and whole being possible due to the a priori grammar of local ontologies is the same as the iconic syntax of a physiology of arguments (see Chapter 1, section D). Certainly, the sharing of sign types does not mean that two different living beings will know precisely the same signs (different learners are not learning the same thing, the knowledge of the learner is never identical with that of the teacher). On the contrary, two distinct living beings discovering the same Replica is probabilistically impossible. The types of signs, the mode of signification, are the same, otherwise reality would be schizophrenic. We use metaphors in literature, in mathematics, in complementing our lover because metaphors appear (are experienced) in our *Umwelt*. Experience stands in that Qualities (of Firstness) are objectified (in Secondness) and mediated amongst each other (in Thirdness). This is the central assumption of this thesis: signs, by combination of their Qualities, lead to the ultimate Interpretant, the Argument, the identification of Mind and Truth. Since this happens via combination of Qualities, it happens through Icons, which play the role of predicates in premisses. Whitehead, not following this aspect of Peirce's semiotics, advances a different notion of learning than discovery of similarities. While for Peirce the ground for learning is that which is present, because it can produce analogies due to similarities, Whitehead accounts for the essential role of difference and absence in learning:

"We habitually observe by the method of difference. Sometimes we see an elephant, and sometimes we do not. The result is that an elephant, when present, is noticed. Facility of observation depends on the fact that the object observed is important when present, and sometimes is absent." (p. 4)

As mentioned, the reason for which Propositions are essential to learning is that by their copulation Arguments are constituted. In Chapter 2 I explained that a judgement is the action of acknowledging the truth of a proposition. Since the interest does not fall on the psychological, but on the semiotic aspect of the judgement, the judgement will be treated as an Argument. This is possible because "we may discern the phenomenological core in the psychological shell" (Stjernfelt, 2007, p. 102). Hence, Propositions will be examined as a part of learning only because they mediate the passage from Icon to Argument. Of course, as it was already shown, all types of signs participate in this mediation: Predicates (as Icons used to express possibility), Indices (at least by playing the role of Subjects), Sinsigns (at least as necessary Replicas), Legisigns (without which reference and therefore copulation would not be possible), Symbols (by which copulation of propositions particularly is made possible) etc. Thus, a fully semiotic definition of learning, expressed in Peircean terminology, is that learning is the passage from Icon to Argument. Actually, it is even broader, it is the passage from Qualisign to Argument. Strictly a Qualisign is too basic to be used without immediately becoming an Icon, but we do not have any insight on a pre-Iconic signification – such a signification is at least ungraspable, if even possible. The question if life forms are the only semiosic beings will not be posed here (it is not the topic of this thesis), but since this thesis investigates learning within the endeavour of education, the spectrum of learning is constituted in the agents involved in the passage leading from Icon to Argument. This passage is a semiosic process, obviously.

The importance of the Icon type stems from the fact that iconicity is necessarily required and sufficient in the formation of a sign. This is a premiss in Stjernfelt's (2007) reading of Peirce, and it justifies that the semiotic examination of learning should start with and follow the role of Icons in argumentation. The role of iconicity in the basic formation of the sign was discussed since long before Peirce. As it was shown in section C of Chapter 1, the idea of learning something new by analogy to something familiar has been supported by several authors from different ages, such as the cases of St Dionysius the Areopagite in the Patristic Age or Petrus Fonsecus in late scholasticism. The idea is that analogy is possible due to similarity.

Iconicity is the answer that this study brings to the following educational dilemma: how is learning possible at all if learning presupposes learning something which, at a moment, is unknown? Learning something unknown is possible because anything can be similar to anything else: "every scientific explanation of a natural phenomenon is a hypothesis that there is something in nature to which the human reason is analogous" (CP 1.316). This analogy is not a sort of an *a priori* concept, it does not account for *givenism*. This analogy is iconic syntax: I am part of the world, my thoughts are part of the world, therefore I am in coherent iconic syntax with the rest of the world within which I am a self-conscious sign. I am semiotically (not necessarily psychologically) coherent within myself because I am diagrammatic with the rest of existence with which I am in relation. As such, as a constituting part of the world; I inherited the world's iconic syntax.

Thus, when similarity is used to signify in regard to the object to be learned the unknown starts being discovered in relation to the known. It can be said that a learner knows about x when she can predicate about x, that is when she can apply predicates to x, and a certain mastery of x is achieved when she can use x as a predicate. How she knows, how precisely she uses x as a predicate is something pertaining strictly to the intellectual intimacy of the learner – here no one, not even the teacher who taught her about x, has access, because x as meaning is appropriated into her own being, into her own set of signs, into her own signifying world, once it was learned. Once it was learned, x for the learner stops being x and takes upon a new form of being, we can call it x'. This x' is the sign or set of signs that the learner now masters about the x sign that the teacher was teaching her. X and x' cannot coincide, apart from the elusive imaginary moments of coincidence of Interpretants. The occurrence of imaginary moments only allows sharing, so that the student can manipulate the teacher's knowledge as if her own and vice versa. X and x' are never identical, but the proof of the learner having learnt precisely about x and not any other adjacent subject is the similarity between the learner's x' and the teacher's x. To put it simply, one never learns x from someone, one can only learn about x. Something about x is distinct from x and similar to it: the result of the semiosis involving x' and x is an Icon.

A common observation that comes against this iconicity based learning is that if anything can be similar to anything else, similarity stops being useful. Indeed, this is the case, but signification is a matter of use, a fact which makes the Icon a highly operational sign. It is the focusing on a particular similarity, on some particular qualities, that characterizes the signification. For instance, part of this focus is a motivation of the sign, giving its intentionality – the element that together with similarity makes an Icon. Thus the Icon can be defined as used similarity. When a similarity is used, focused upon, it becomes insightful: one can infer that the picture is representing a particular person for observing a certain resemblance, which determines the sign so that it will not signify another person, though it could. This focus is a matter of use. Understanding Icons is essential for learning because, more than being strictly necessary and sufficient for signification, the Icon is operational. The Icon is useful because it is easy to play with: while being immediately recognizable it affords manipulation; it is immediately graspable. It is for its very quality of being, the primal way of signification, the fact that iconicity presents the sign *in actu*, that qualifies it as operational, bringing about an understanding and thus broadening the horizon of real possibilities. Since it is highly operational an Icon brings about more than simply its own signifying instance. Peirce himself stated this clearly:

"For a great distinguishing property of the icon is that by the direct observation of it other truths concerning its object can be discovered than those which suffice to determine its construction." (CP 2.279)

This remark of Peirce leads Stjernfelt to comment straightforwardly which is "the most decisive feature in icons at all: the fact that they are the only signs through the contemplation of which it is possible to learn more." (2007, p. 78)

The Peircean Theory of Learning is grounded in that learning is a *play of musement* (Sebeok, 1981), nothing else but experimenting with Icons. Experimentation and thinking in general are possible because of imagination. Real actual signs by which we live, forming our semiotic environment, are particular cases of real possibilities, an infinite playing ground for the mind to experiment in. Free manipulation of signs results in learning. While we can easily imagine fictional situations (e.g. unicorns), or things we haven't witnessed (e.g. the battle of Waterloo) or we can even lie to ourselves (e.g. *"this never happened"*) we cannot imagine impossible things (e.g. a round square). This has to do with the way in which we manipulate Icons, the signs that signify due to similarity. Stjernfelt accounts that "The icon has the undeniable quality of showing something possible – it cannot, unlike symbolic speculation, yiled neither Husserlian *Unsinn* nor *Widersinn*, the first being only possible through the breakup of iconic syntax, the other only by constructing a contradictory predicate. We may talk and wonder about the xlypf, the which are has, the round square, the rational square root of two, or the married bachelor, etc., but no simple icon can display any of them." (2007, p. 87)

We can use language because of its fundamentally Iconic structure. Our long history of developing conventional metaphysic languages might be misleading and obscure the iconic character of any mediation, and language is *par excellence* a mediator. Original onomatopoeic proto-languages would show this clearly, but, however, one might ask what qualities does the English word "*dog*" share with the reality of that barking four-legged animal? This is a question stemming from linguistics and it might be approached, for example, by semantics or phonetics, but semiotics is concerned with signification as being, not strictly with the content of language. Peirce accounts that languages which at a first glance are all the more artificial and conventional than native languages, languages, as we have seen, as the algebra of mathematics, are iconic, let alone English or Chinese:

"That icons of the algebraic kind, though usually very simple ones, exist in all ordinary grammatical propositions is one of the philosophic truths that the Boolean logic brings to light. In all primitive writing, such as the Egyptian hieroglyphics, there are icons of a non-logical kind, the ideographs. In the earliest form of speech, there probably was a large element of mimicry. But in all languages known, such representations have been replaced by conventional auditory signs. These, however, are such that they can only be explained by icons. But in the syntax of every language there are logical icons of the kind that are aided by conventional rules." (CP 2.280)

The manipulation of an equation's syntax by means of arithmetic relations leads to the same solution for the equation as its graphical representation – this stands as evidence that the graphical and the algebraic representation share iconic syntax:

"Another prototypical example is the solution of an equation during a series of well-controlled steps according to the transformation syntax given by the

elementary arithmetic – mirrored by the solution of the same equation given its graphical representation thanks to analytical geometry." (Stjernfelt, 2007, p. 101)

Stjernfelt emphasized Peirce's idea that algebra is comprehensible and useful to the extent that it can be manipulated. Any type of syntax can be manipulated due to its iconicity:

"Mere formalization without motivated syntactical, generative possibilities is in this view a blind alley. Of course, it may not always be told beforehand whether a certain formalization is fertile, and the relevant experimentation might be very mediate: to write down a fifth grade equation might seem hopeless in so far as we now know it has no canonical solution, but the very fact that it is formulated in the same language as solvable polynomial of lesser grade ultimately permitted the proof that it in fact has no solution – which is an even more impressive manipulation of it. But the mere substitution for some objects or object categories by letters or the like makes no manipulable icon, and this is why so many algebraic attempts in the humanities have proved sterile: they have merely exchanged some concepts with letters and have not furnished a motivated (that is, iconic), formal set of rules for their manipulation." (Stjernfelt, 2007, p. 79)

This critique of attempts in the humanities that proved to be unusable targets the paths that both recent analytic philosophy and post-structuralism have followed. They aimed at developing abstract, Icon-less, tools for philosophy. Analytic philosophy's focus on the clarity and precision of arguments as well as the concept of structure became abstract but useless conceptualizations, as a contextless, floating in void, *variable x*.

The fact that only from Icons other truths besides their construction arise, or, in other words, that only from Icons information can be derived, leads to the assertion that the physiology of arguments has an Iconic Syntax, by which, through living beings, which are part of the same syntax, creatively discovers itself. Reality is algebraic because reality, like the algebraic codification that we developed, is iconic. Otherwise it would not *represent,* it could not bring about anything else besides itself and living beings could only be schizophrenic, as reality itself would be, by managing to focus only on the immediately present. If the physiology of arguments would not have an iconic syntax, mediation, that is representation, would be impossible and the *I* could not go out of itself into *Thou*; *ego* would never be aware of *non-ego*, or, in the best case, could not relate to the other person, but only to the apperceptive ego of other:

"This capacity of revealing unexpected truth is precisely that wherein the utility of algebraical formulae consists, so that the iconic character is the prevailing one." (CP 2.279)

Some similarities are obvious and do not offer an insight, but nevertheless, real discovery consists in the same:

"The fact that it has never before been asserted that this orange on the table before me is similar in shape to the moon (given a certain granularity of

similarity classes), might cause sensible souls to see me as a genius for creating metaphors, but, modestly, it seems strange that this similarity should be something created by me. I merely discover (no great effort) this similarity by applying a certain *tertium comparationis* (a circle, give or take a certain rate of deformation). In rare cases, of course, it may take great pains to establish a new complicated *tertium comparationis* to see a similarity (Newton discovering the similarity between the movement of the apple and of the heavenly bodies, Eliot discovering the similarity between cruelty and the growth of April flowers)." (Stjernfelt, 2007, p. 57)

Peirce himself accounted that essentially learning consists in discovery and that discovery is the accident of experimentation. It is something more basic than experimentation that makes learning possible, namely experience. He distanced himself from classic empiricism, as he distanced himself from modern philosophy generally, by rejecting the idea of *tabula rasa* (see also Chapter 3), not because there would be an innate notional ground, but because it is simply not an issue:

"Experience is our only teacher. Far be it from me to enunciate any doctrine of a *tabula rasa*. For, as I said a few minutes ago, there manifestly is not one drop of principle in the whole vast reservoir of established scientific theory that has sprung from any other source than the power of the human mind to *originate* ideas that are true. But this power, for all it has accomplished, is so feeble that as ideas flow from their springs in the soul, the truths are almost drowned in a flood of false notions; and that which experience does is gradually, and by a sort of fractionation, to precipitate and filter off the false ideas, eliminating them and letting the truth pour on in its mighty current." (CP 5.50)

Our only teacher is semiosis. On this account of experience, inquiries to know do not stand mainly in the elimination of wrong notions, but also in *letting the truth pour on its mighty current*, which means discovering premises (see also Chapter 4). This is the logical operation of advancing hypotheses by qualified guessing, abduction (or retroduction), as Peirce coined it (see CP 2.96, CP 2.638, CP 2.753, CP 1.755, CP 5.189). Eliminating wrong notions in order to letting "the truth pour on its current" means emptying and adjusting the self so that it can take in new, unknown yet, signification. Adjusting the self so as to be similar to what yet is non-self, and, therefore, unknown, and to engage in semiosis with what is yet unknown, is an act of selflessness. This act of selflessness is facilitated by having an other to focus upon, to have a teacher, if a student, or to have a student, if a teacher. Abduction here finds its material in the other: the self can consider hypotheses as they stem from the other. This is the principle of agapism which I discuss in Chapter 8. Agapism, which supposes continuous growth, starts with diagrammatic reasoning, a play on icons, which I explain in the following chapter.

Chapter 7
Diagrammatic reasoning and learning

In Chapter 2 (section D) Peirce's idea of diagrammatic reasoning and the hypoicon sign types have been introduced. Hypoicons are pure Icons, describing a Representamen's Iconicity. They are divided into Images (simple qualities), Diagrams (relations of qualities) and Metaphors (parallelism of qualities in something else). The peculiarity of diagrams consists in that they signify by the similarities between the parts and the whole, as well as among the parts. Stjernfelt, in *Diagrammatology* (2007), his work focused on the semiotic concept of diagram, explained that the peculiarity of the diagrammatic Icon stands in it being constituted of rational relations:

"The diagram is a skeleton-like sketch of its object in terms of relations between its parts, but what makes it apt to reason with, to experiment on, respectively, is the fact that it is constructed from rational relations." (p. 94)

Metonymy is an example of diagram. In Chapter 5 I presented Per Aage Brandt's idea of personhood as metonymy. Personal relations and a society composed of personal relations are diagrams. As such the classroom can be thought of as a diagram.

The notion of diagrammatic reasoning explains icon manipulation and, thus, gives an insight into the phenomenon of re-cognition. Below I approach these two topics (diagrammatic reasoning and re-cognition).

A. Diagrammatic reasoning

Diagrammatic reasoning is a translation, therefore, from structures that are difficult to grasp to manoeuvrable structures of interrelated rational parts. This, Stjernfelt observed is a continuation of Kant's project of schematism. The essential difference between Peirce and Kant, as well in this regard as in general, is the difference between *givenism* and *pragmatism.* Peirce "pragmatized" Kant's *synthetic a priori* concept (see Stjernfelt, 2007, Chapter 4). While admiring his role in the history of philosophy, Peirce stated that Kant's question 'How are synthetical judgements a priori possible' should rather be 'How are universal propositions relating to experience to be justified?' (in CP 4.92) The answer to Peirce's (reformulation of the) question lies in his idea of diagrammatic reasoning. Stjernfelt presented diagrammatic reasoning as an analysis of parts and wholes:

"As soon as an icon is contemplated as a whole consisting of interrelated parts whose relations are subject to experimental change, we are operating on a diagram. Thus, the inclusion of algebra, syntax, and the like in the icon category takes place thanks to their diagrammatic properties – but the same goes for your average landscape painting as soon as you stop considering its simple qualities, colors, forms etc. and move on to consider the relations between any of these parts and aspects. As soon as you judge,

for instance, fore-, middle-, and background and estimate the distance between objects depicted in the pictorial scene, or as soon as you imagine yourself wandering along the path into the landscape, you are operating on an icon – but doing so in this way is possible only by treating it as a diagram." (p. 92)

The study of parts and wholes was coined by Husserl in his *Logical Investigations* as *mereology*. Stjernfelt found four main sources of philosophical interest for mereology (p. 161). One is, obviously, Peirce, for his notion of diagram. The second are the founders of phenomenology, Franz Brentano and Edmund Husserl. The other two are also linked to phenomenology, being influenced by Brentano and Husserl. One is the case of formal and structural linguistics, here mentioning, above all, Roman Jakobson and the other consists in the structuralist beginning of the Copenhagen school of semiotics, in the case of Hjelmslev and Uldall.

Peirce's argument for the iconic syntax of logic is particularly similar to Husserl's idea of formal ontology and grammatical analysis of logic, explored in Husserl's Third Logical Investigation. According to Husserl "the relationships between Whole and Part and among the Parts of one and the same whole" are *a priori*[25] and, as such, can be analysed phenomenologically (1900b, p. 465, Investigation 3, 15). That these relations are *a priori* does not suppose a noumenal existence, but, instead, the underpinning of existence by a logical structure, something such as iconic syntax on which the physiology of arguments stands (the possibility of rational relations among entities). Phenomenological analysis, Husserl argued, is possible due to formal ontology. As in Peirce's case, Husserl's formal ontology analyses any kind of syntax in its grammatical parts and the relations among them. The assumption for diagrammatic reasoning is that something is manoeuvrable (by this understanding comprehensible, apprehensible, signifying, useful etc.) if the coherent relations between its parts and the whole are discovered. A possibility can be used as a predicate if in itself it presents some similarities. For example, I can use a hammer if I notice the relations between, for instance, its handle and the metal top; once I realize its structure in terms of relations between parts and the whole I know how to grab it and I know I can knock nails with it by performing certain moves. At this point I have *learnt* how to use the hammer, I actually *see* the hammer (like in the case of *seeing* the sum of two adjacent angles (Chapter 2)), and not just a wooden bar and a piece of metal.

With his famous experiment, Duncker (1945) proved the difficulty a human being faces when she needs to reconceptualise things that have become familiar. Duncker's *candle problem* experiment consisted in presenting to his participants a box of thumbtacks, matches and a candle and asking them to attach the candle to the wall so that wax would not drip on the table underneath. Most participants tried to fix the candle to the wall with thumbtacks or by melting it. Too few had the idea to

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[25]On the Austrian (non-Kantian) notion of *a priori*, inherited by Husserl, see Chapter 9, section A and Stjernfelt 2007, p. 176.

empty the box of thumbtacks and to fix the box (instead of the candle) to the wall so as to serve as a support for the candle. The difficulty is that of *re-cognizing* the *box* as something else, something such as a *support.* As such, this solution to the task implies a modification of one's Lebenswelt – a growth, an evolution of signification. For arriving at this more elegant and practical solution one needs to perform a mereological analysis. If the rational relations between box of thumbtacks, matches, and candle are observed they might appear similar with the rational relations between the interrelated parts of a candle support. Thus, a diagram integrating box, thumbtacks, and candle might turn out to be, in its Interpretant, a candle support. This discovery, resulting with the invention and fabrication of a candle support, is realized if the parts that together will become a candle support are treated together, as one operational sign – one icon that is. Treating them as one sign is possible if the similarities between them are discovered; this is precisely what constitutes an Icon. The interrelated parts do not simply signify each other, but they also signify together, as one Icon. As such, they need be in iconic syntax. Thus, the *candle support* possibility is discovered when *box, thumbtacks, and candle* appear as an icon treated like a diagram. Such a discovery is a growth of Lebenswelt, as it broadens the horizon of similarities.

A complex sign, an argument for instance, is analysed diagrammatically. The argument is comprehensible through the analysis of its parts: subjects (indices) and predicates (rhemes), which have to be icons, form propositions (dicisigns) which copulate via a middle term (icon). The process of developing an argument consists in the copulation of parts, which is possible by seeing the sharing of qualities between the parts coming together in the whole. This process is diagrammatic reasoning. Nevertheless, learning consists in continuous experience, and not in a discrete set of events in which to a proposition another one is added. This is also the case for diagrammatic reasoning, which "is no more built out of Propositions than a motion is built out of positions. The logical relation of the Conclusion to the Premisses might be asserted; but that would not be an Argument, which is essentially intended to be understood as representing what it represents only in virtue of the logical habit which would bring any logical Interpreter to assent to it. We may express this by saying that the Final (or quasi-intended) Interpretant of an Argument represents it as representing its Object after the manner of a Symbol. In an analogous way the relation of Predicate to Subject which is *stated* in a Proposition might be merely described in a Term[26]. But the essence of the Proposition is that it intends, as it were, to be regarded as in an existential relation to its Object, as an Index is, so that its assertion shall be regarded as evidence of the fact." (CP 4.572)

Thus, learning, as diagrammatic reasoning, is a continuous process of transformation whereby the argument (or any sign) is understood because of its diagrammatic structure (its local formal ontology). The diagrammatic character of its composing signs makes copulation possible. It is the same diagrammatic character of sign-relations that makes possible the understanding of a whole argument as one

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[26]'Term' here is synonym for rheme (or predicate).

predicate, one icon. According to the previous passage quoted from Peirce, a Term (predicate) can express the whole meaning of the proposition, but by its copulation with a Subject and becoming a Proposition an existential relation is asserted. The compatibility between a Subject and a Predicate consists in their diagrammatic signification, meaning that there has to be an inner sharing of qualities between subject and predicate. When two signs signify together, and thus act as one sign, such as in a proposition like "*I am*" they share qualities: "I" could not "be" if "I" was not similar to "being". The concepts of *square* and *rectangle* cannot signify as *"square rectangle"* because none can be applied as predicate to the other. They are similar, since they both are geometric figures, but their copulation would not be an icon, and it is thus absurd, since any of them used as a predicate cannot be understood diagrammatically in relation to the other. "*Square*" as a hypoicon does not have the trigonometrical similarities making it compatible with the hypoicon "*rectangle*" – their inner qualities do not match. It was previously noted (Chapter 6) that that the Peircean Icon cannot produce either Husserlian *Widersinn* (logical nonsense)*,* or *Unsinn* (grammatical nonsense). That is, Icons can neither combine irreconcilable syncategorematica, nor can be semantically contradictory, while grammatically correct. The same does not happen for the iconless abstraction – the 'round square', the 'pregnant father', the 'dsfghjkl' etc.

Thus, the concept of diagram can be used to explain as well the compatibility between student and teacher, or between taught and apprehended. In the student/teacher relation, as a whole, the parts ('student' and 'teacher') have to share qualities with the whole. The student/teacher relation needs its inner iconic syntax. When one obscures the other from coming in the relation diagrammatic compatibility is not possible. Such are the cases when the teacher wants to impose her teaching on the student or when the student is not interested in what the teacher is teaching. In such a situation copulation of signification (overlapping of phenomenal worlds) is impossible. Of course, the extreme case where absolutely no similarity is found is probably never actually experienced. One can try to imagine the situation in which a human being is taught to hunt by wolves, but even here it might work. Apparently there is a similarity between wolf and man: they obviously share qualities: both are animals, mammals, both can be hungry, can bite, etc. – these are predicates by which both wolf and man live. In the same way, as mentioned previously, the case where what is taught is identical with what is learnt is impossible.

A classic example of a discovery of similarities that generated the development of a new, usable predicate, that produced a scientific breakthrough is that of August Kekulé's discovery of the stereochemical arrangement of the Carbon atoms in Benzene. Before Kekulé's discovery it was clearly known what atoms form the Benzene molecule, but the scientific method seemed to be stuck and incapable of explaining how six atoms of Carbon and six of Hydrogen can be arranged in the same molecule. In the thinking that led Kekulé to his revolutionary discovery Stjernfelt finds an obvious example of diagrammatic reasoning. The diagrammatic analysis of Kekulé's reasoning explains to some extent how the researcher's

creativity was triggered, and how a discovery of similarities proved so useful. Kekulé himself explained how he discovered the structure of the Benzene molecule and Stjernfelt explains the obvious diagrammatic reasoning that made the discovery possible:

"According to his description in his 1890 25 years celebration speech, the scientist sat in 1863 daydreaming before the fire, exhausted by speculation. He then saw one of the flames assuming the figure of a snake which turned around and bit itself in the tail to form a ring-like structure which wiggled contemptuously before his gaze – and all of a sudden, Kekulé realized that the normally linear carbon chain in the Benzene case turned around to form a circle. That discovery thus formed a spontaneous case of diagrammatical reasoning, realized in the shape of metaphors. The flame was taken as a metaphor of the snake which, in turn, was taken as a metaphor of the carbon chain, a structure of metaphors held together by the common diagram of a piece of line, able to bend. The spontaneous diagram experiment argued that the Carbon chain, just like a snake was able to form a ring, and subsequent chemical analysis corroborated the idea, leading to a major breakthrough in organic chemistry." (2007, p. 102)

For his thinking to proceed to the understanding of this arrangement of atoms Kekulé needed an Index (Secondness), that is a strong focus on Benzene, but, also, when the yet unknown structure of Benzene appeared incomprehensible, he needed to go back to an Icon (Firstness), back to a random play that allowed the discovery of similarity between a snake biting its own tail and the arrangement of atoms. Before the imaginary moment where a flame became similar to a snake Kekulé did not have something known which could be similar to the unknown focused upon.

For Peirce imagination is a part of experience, experience being broader than strictly empirical experience. In this regard there is a similarity between Peirce and Whitehead's process philosophy, which also accounted imagination as a means of experiencing things that are not experienced in actual physicality. For Peirce imagination is the form of experience which enables all other types of experiencing: if we could not simulate possibilities, we could not cognitively process actual reality neither. The reasoning by which Kekulé made this discovery is diagrammatic. Within his argument, the arrangement of the atoms became a clear conclusion once the hypothesis of the snake biting its own tail was discovered. Before the flame was taken as a metaphor for the snake there was no way of predicating about Benzene's molecular structure. Diagrammatic reasoning produced a metaphor: a snake biting its own tail, something comprehensible that is, was place in a relation of parallelism to something unknown – the molecular structure of Benzene. A likeness to a possibility was discovered and then the rest was easy. Once this Icon was discovered Kekulé knew something which is similar to the unknown, and this Icon made the set of metaphors, and the whole argument, coherent.

At a first glance it might seem strange to the scientific mind that what appears to be idle speculation consisted in the ground for firm, revolutionary scientific

results. This should not come as a surprise, though, as all reasoning occurs in this way and science is founded on this method. This discovery is just an example. The discovery did happen *spontaneously*, a fact that might sound frightening to teachers who have the illusion of being in control of the apprehension of their students. We do not know for how long Kekulé focused on the Benzene molecule, how much he struggled with the Index of Benzene that is, without having a predicate to apply to it; in the narrative we are told that he was *exhausted by speculation*. We might consider that the more he focused upon it, the more chances increased that he had this insight, but the moment of discovery was *spontaneous* nevertheless. Teachers have to be aware that while a big workload might favour learning it is not the essential ingredient involved in their students' apprehending what is taught. A big and wrong workload might even be distractive, it might bring to a student's semiotic structure sets of signs that obscure learning. This is a discovery as well: the discovery that what is taught is similar to *boring*, to *uninteresting*, perhaps even to *harmful* and so on. This accounts for boredom, lack of creativity, etc. Work overload might be a distraction in itself, a diversion away from the taught object. The *inventio* that triggers learning consists in a re-cognition, like in Kekulé's case. In that case, of course, *experience was the only teacher*, but from such examples ways of triggering this *inventio* can be examined. This analysis should uncover methods also for teachers, who should inspire their students and also for students who are trying to learn.

Once some similarities are shared (e.g., between snakes biting their tails and arrangements of carbon atoms) they suddenly become obvious and are impossible to negate. Diagrammatic reasoning makes the unknown resemble the known and thus makes arguments possible. If the unknown resembles the known (molecule of Benzene resembles snakes) then also the known starts resembling the unknown (all of a sudden the concept of *snake* changes, since it now resembles molecular structure). For this, sound diagrammatic reasoning can be justly qualified as critical thinking. In this sense, pragmatism is critical common sense (Chapter 3). Diagrammatic reasoning, by advancing a possible similarity of the known to the unknown redefines the known as well, putting it in a different light. Having the structure of an adbudction-deduction-induction continuous process diagrammatic reasoning keeps on redefining the hypothesis, not only the conclusion. Through this method the conclusion is integrated in the premiss and the premiss rearranged as to fit the new set of signs which it receives. This tends to give rise to new conclusions rather than restructuring old ones.

B. Re-cognition

The phenomenon of integrating yet unknown structures of meaning into the known is an act of *re-cognition* (Chapter 1). Re-cognizing signs consists in (1) the identification of real possible relations of signification and (2) the cognitive operation applied to them. Re-cognition is the centrepiece concept of this thesis' attempt to give a mereological account of educational philosophy. It is an account of

how the unknown becomes known, of how that which is taught is integrated in what is already mastered. It is a continuous phenomenon that characterizes life. The compatibility between what is taught and the learner's already existing signification is the diagrammatic character of learning, that is, the resemblance between taught and learned. The student has to re-cognize what is taught by using what she already knows and the teacher has to re-cognize what is taught into what starts being learned. The situation where the teacher does not re-cognize what was taught among the knowledge of the student is probably a case of unjust evaluation. The operations that the teacher's re-cognition supposes are applied to what is taught rather than to what is learned. It is rare that the student fails to discover any similarity between what she knows and what she is being taught. Eventually, the student and the teacher have to re-cognize themselves in each other if learning is to happen. This account of learning as re-cognition is coextensive with the idea of semiotics as a theory of life, an idea developed on Peircean ground in biosemiotics (Kull, 2005) and also in semiotics of education (Stables, 2005).

The main argument of this thesis stems from the possibility of re-cognizing the curriculum in the divisions of science. In Chapter 4 I explained that the ideal curriculum coincides with the divisions of science because the divisions of science constitute one diagram (Figure 4 in Chapter 4). A different, invented curriculum is not as operational as the naturally evolved one because it is to some extent artificial. Its degree of iconicity is lesser while its symbolic character (e.g. symbolical language) is more strongly present. Symbolic signification which is not sufficiently supported by underpinning iconic signification is less fertile. This is what is meant by 'artificial' here. The way in which over historical time science has been divided into branches according to modes of observation is obviously a case of semiosic evolution, and, therefore, has to be diagrammatic: it inherits the universe's iconic syntax. Because the various sciences are similar, and thus together form a diagram, education is possible. By education here is understood the application of certain indices to the icons of spontaneous learning. Humans, like all living species, learn. Humans are (at least one of) the species among which education developed: we imposed systematic directions of focus to our random learning. In other words, we *concentrate*, we *focus*. This is possible due to our discovery of semiosic activity. According to Deely (2009) metasemiosis is species specific to humans[27]. Metasemiosis refers to the knowledge of, the study of semiosis – semiotics, namely. There was nothing ever taught systematically that does not fall under the divisions of *science* because something that is not observational cannot be taught. To be scientific is to be observational. Our awareness of semiosic activity, through its various historical stages, led to our indexicalization of learning. What we learn we systematically hand over, we point it out (*index* it) to others – this is education.

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[27]Whether metasemiosis is characterizing the peculiarity of humanity might still be controversial. Nevertheless, the development of science and education are the clear evidence of our performing of metasemiosis.

In Chapter 1 I explained that semiotics should bring a liberal approach to education. Therefore, the proposed liberal curriculum coincides with the theoretical sciences: the study of mathematics, philosophy, psychical and physical sciences and the method of retrospection[28]. This means the teaching and learning of a (logical) diagram. The curriculum thus coincides with *logic*, under its other name, *semiotics*. The liberal curriculum cultivates, through its own very structure the abductive-inductive-deductive operation that is found in the sign-relation's Representamen-Object-Interpretamen structure. Practical sciences should be taught as well, but not as part of the essential liberal education because their teaching is more problematic: they are observed only via practice. This is the case of pedagogy (Chapter 4).

Thus, I argue that the growth of semiotic consciousness can justify the teaching of semiotics as one of the first subjects in primary education (see also Chapter 4). Since semiotics proves itself so closely connected to and supporting liberal education there is no reason not to start the education journey by learning semiotics. So far we only know semiotics as an academic discipline. Certainly, a 7 or 8 year old will not be taught the particularities of Ferdinand de Saussure's *signe* or of Charles Peirce's *sign*, but triadic relation (signification) is, arguably, more basic than reading, writing, and counting. If children would develop an awareness of causality as a triadic phenomenon, instead of dyadic, many subjects would become easier to learn. The understanding of the natural world as composed of actions and reactions, dyads, that is, underpins a mechanistic view of the world. Such is the example of classical mechanics, which, ever since it was developed by Newton and Galilei, has been determined by a dualistic view which implies a dyadic structure of physical phenomena. 'Life' in this case is seen as the reaction to a certain initial impulse which sets the mechanism in motion. This is the 'ghost in the machine' argument. Rightly so, modern science refuses to approach the *ghost*: it does not need such a hypothesis. The difference between the ghost and the machine, between the action and the reaction, is ontological. Semiotics argues that phenomena are triadic (see Chapters 1, 2, and 5) and that a phenomenon's three elements are inseparable. One of the crucial differences that this brings along is that, as such, phenomena are infinite. Triadic cooperation (semiosis) is infinite, but it is graspable, because of its core triadic structure. The dualist view, therefore, tends to see experimentation within ideal conditions, where the elements of the phenomeonon are separated from the rest of the Universe, as desirable. The semiotic (triadic) view does not admit there to be much relevance in isolating in void, scientifically hygienic conditions, the elements involved in the phenomenon: the phenomenon at stake occurs within the infinity of the Universe. This Universe is driven by chance, which might mess up the experiment, by necessity, which makes the experiment worthwhile, and also by love, which escaped modernism. Cultivating the consciousness that phenomena, by being

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[28]The seven classical liberal arts are all included here: mathematics as a branch per se, dialectic, rhetoric and grammar as branches of philosophy or of psychical sciences, according to the method of observation used. Literature is not missing either. It falls under philosophy as curious investigation or under psychical sciences as literary critique, text analysis etc.

triadic, are infinite will overcome the modern dualist paradigm and the mechanistic view of life in favour of a phenomenological hermeneutics. How this, namely semiosis, can be taught to children is a difficult question because of the simplicity of semiosis. This thesis advances the first recommendations for such an education: eliminating dualist assumptions and allowing learners the freedom to explore (to play).

The implications of having a semiotic consciousness for speaking, reading and writing any language (from a native language to mathematics, logic, or chemistry) are immediate, though. I argue that learning the basics of semiotics, in the terms of a child, would offer new horizons to the child's possibilities of categorization generally. She would be eager to subject her opinions (Representamen) to further abduction. At the same time, she would be eager to reject imposed information that does not resonate with herself. Such objective information (a matter of Secondness) would not prove fertile in semiosis with the learner. Rather, the semiotic awareness of a child would develop the child's critical common sense. Re-cognition would be easy and it would replace the useless and mechanical adoption of information. For example, when learning about the First World War, an eleven to fourteen years old child can learn that what produced it was the assassination in Sarajevo of Archduke Franz Ferdinand. However, to limit oneself to this as an explanation would be reductivist. Of course, one can look at this assassination as being the result of several conflicts in the Balkans at the time, and those conflicts produced, in their turn by other events and so on. On this dyadic account history looks as a linear and mechanistic set of events. If the learner explores the circumstances of the First World War freely she can discover many factors and parameters that contributed in various ways to the conflict. From a semiotic perspective such an historical event does not have a linear structure, but a rhizomatic one. The different and complementary aspects that various historical approaches, anthropology, sociology, geopolitics and other sciences would look at and discover are not understood, from a semiotic perspective, as contradicting or excluding each other. By freely exploring the subject the learner can understand the richness of its semiosis: that it is not a dyadic event, merely a cause with an effect. It is difficult to identify an objective (dyadic) causality because there is no such cause. By the free exploration of the topic, the free iconic manipulation of the features of the event, which semiotic founded education brings, the learner accepts its wholistic complexity (or simplicity). The psychological traits of the assasins in Sarajevo, the socio-cultural dynamics in the Balkans at the time, the world and regional political situations are all relevant in understanding the conflict. They are all elements participating in the same semiosis. The student has to learn to see all of these as related into one coherent diagram. This begins by the free investigation of the subject. There in only one teaching practice that can be prescribed to serve in this sense. This consists in simply showing to the student that every time she considers that she discovered something what she discovered is true and, also, incomplete. It is a matter of presenting new real possibilities connected to the studied subject, an indexicality that obliges her to take into consideration more. This differs from the

Socratic method by which the learner's knowledge is claimed incomplete, its relevance and truth are accepted. What we know is not ignorance, but rather very useful to continue learning. This is an expression of the contradiction between realism and scepticism.

Learning through a semiotic approach implies learning about semiotics as a first step of the curriculum. This might seem controversial and difficult to implement but our curriculum is already teaching semiotics in an unassumed manner. For instance, mathematics is one of the first and most emphasised subjects of our curriculum. According to Peirce (see Chapter 4) mathematics is mostly abductive, coinciding to a large extent with logic. The change that a semiotic consciousness would generate would be a switch from the vulgar arithmetic taught in the first classes to calculus, instead. This, again, might seem controversial as we tend to think of calculus as a complicated subject which only keen mathematicians can understand well. However, calculus is nothing else but the discovery of relations among classes. Therefore, I argue that this is something which young children (seven and eight year olds) can learn, in the first years of schooling: discovering similarities among classes. They do not even need to know numbers and counting to perform this. The very engagement in discovering similarities among classes will help children understand numbers, since classes are composed of certain numbers of elements. Thus, a child might discover that a class, in some respects, is bigger, smaller, or equal to another class. From here the intuition of a concept of number and counting can come forth. Discovering a numerical similarity implies learning to count. By arriving at the Interpretant that a certain class (Representamen) is bigger than another class (object) the child is on her way to discovering numbers. The Interpretant holds the possibility of serving further on as Representamen in a semiosis which has as Interpretant a sign containing the qualities specific to numbers. Differences and simialities in quantity are relations that are similar to numbers. Like in the above example regarding the teaching of historical events, in the teaching of numbers as well, the only teaching practice that can be prescribed consists in showing to the child that, while her comparison of quantity is good, it can also be improved. The child herself can improve her understanding, by exploring all the more the potentiality of icons already discovered. For instance, a child is right in managing to express that a set of nine apples is three times bigger than a set of three apples, but further exploration can lead to the understanding that the apples compared are not identical in size. This leads to the discovery of rational numbers (an apple can be one and a third bigger than another one) and, therefore, to the evolution of the child's understanding of quantity and numbers.

I consider that research in semiotics and education can lead to finding ways of replacing a curriculum of established subjects from an early age to a more organic curriculum, where the child can chose her own direction. Learning that causality is triadic might cultivate the desire for knowledge, the very purpose of liberal education. Realizing the difference between type, token and tone, such as for instance between the type of triangle, its representation, and its composing parts that are not the triangle itself, can arouse curiosity towards more investigation. It feeds

the simple realization that there is more to reality than it occurs immediately. The simple thought that the word 'chair' is not the object <<chair>> can lead to a reflection on, for instance, ontology or linguistics. By this the child is already engaged in a semiosis with the curriculum that shall develop as Interpretant an appropriate subject for this person to study next. The curriculum thus develops on the evolution's usual criteria.

In the next Chapter I apply Peirce's phenomenological categories to education. This reveals the abduction-deduction-induction structure of education. Since education is diagrammatic and inherits the iconic syntax of the physiology of arguments, it has to preserve the diagrammatic reasoning of its students. I explain that, according to Peirce's theory of evolution, the only rationale and fulfilment of education is *agapism*. In this case, agapism consists in the self-denying love between teacher and student. The teacher's self-denying love for her student preserves the student's original genuine discovery and play on icons, allowing its undertaking in further investigations. The student's self-denying love for her teacher manifests in the student's genuine interest for what the teacher has to offer, the knowledge to be acquired. Thus, the teacher-student relation has diagrammatic coherency and is a metaphor for the whole educational endeavour and the learning cosmos.

Chapter 8
Agapic Learning

Science has been presented as a result and stage of evolution (Chapter 1) having as a main symptom *an incessant state of metabolism growth* (CP 1.232 in Chapter 4). Following this understanding of science I here explain that according to Peirce any growth, of which science is one of the best examples, is only possible due to self-giving love for the other. This conclusion is the immediate result of applying Peirce's theory of evolution to education. Peirce's theory of evolution has to be the ground for a Peircean Theory of Learning, since learning is understood as growth (evolution) par excellence.

Peirce did not develop a theory of strictly biological evolution, but generally of cosmological evolution. As such, the principles of cosmological evolution are continuously inherited in biological and cultural evolution. Also, this evolution does not imply a transition from '*lesser*' life forms to '*better*' ones, but an evolution of signification, an expansion of the web of signs. As a growth of signification, evolution is not mono-directional and *arborescent*, but it is circular (or spherical) spreading in an infinity of directions (using Deleuze's term, evolution is *rhizomatic*). A less evolved species is not by any means *worse* than a more *evolved* one; it is simply different. *More evolved* is, actually, a clumsy way of expressing an evolution of signification that is closer to the Argument; nevertheless, it is still, at all times, infinitely distant from grasping Truth in its totality. Therefore any hierarchy among constituting parts of the physiology of arguments (among which life forms) which would evaluate some things as '*better*,' in absolutely any sense, than others is simply wrong. A human being is not better than a monkey or a worm, just like an adult is not better than a child. Different species and different individuals signify in different ways and re-cognize different *Umwelten* and *Lebenswelten*. It is curious that while any grocer knows that apples are not quantifiable with pears (the reality of having '2 kilograms of apples and 10 kilograms of pears' is not equivalent with that of having '12 kilograms of apples and pears'), mankind still tends to evaluate itself as better than other species, teachers as better than students, adults as better than children, etc. I explain that this attitude obstructs learning (understood as metabolism growth).

The awareness of the reality that we are always infinitely distant to the Truth should feed critical common-sense (pragmaticism), and, therefore, a certain sense of humility. Having this in mind the teacher has no reason to regard her students as *lesser* than herself. We are all commensurable with each other, not only in our strictly *'mental'* knowledge, but in our whole being. To be a person and to have a personal life means to be unique and commensurable, at the same time, with other persons. While selves cannot coincide, we can and must learn from one another. The other is the best source from which yet unknown signification can be re-cognized by the self. As self-conscious signs, we are tending towards the Argument which is always infinitely distant.

It is understandable why we developed modes of signification that acknowledge us about our advancement through the web of signs: moments of

knowledge acquisition feel pleasant. This pleasure is not a mere emotion; it is a sign for the organism's insight. By learning, the *Lebenswelt* of an organism changes so that the organism finds itself in a new world. If a human being is not pleased with her own life all she needs is to learn something. If one learns art history every building she walks by will be different than before the learning happened. This is an insight to a new world, to a new stage of life, continuous with the organism's entire life. Learning is a powerful way of reinterpreting the world; by reinterpreting we readapt (Gough and Stables 2011 in Chapter 1). A re-cognition of sound argumentation implies the re-cognition of pleasure, of joy, in the self-conscious sign. This is a re-cognition of the self: the self-conscious sign re-cognizes that itself has grown in signification (has learnt something) and so it re-cognizes something which used to be foreign, non-self signification, as part of itself. Self-conscious signs, at least human beings, mostly enjoy integrating other self-conscious signs into their own. Such are the cases of friendship, love and any state generally characterized by compassion. Such has to be the student-teacher relationship in order for learning to be most favored in the semiosis of these two self-conscious signs. Certainly, growth is not determined by re-cognition of pleasure or joy. One might want to learn the unpleasant truth that there is a predator in the area and has to be cautious and act accordingly. However, to escape from the danger caused by a nearby predator is, arguably, pleasant and allows the organism at stake to further grow in knowledge. If the predator learnt her hunting skills better than her prey learnt her survival skills then the argument is articulated by the predator eating its prey. It is important to acknowledge that the teacher-student relation is not a predator-pray relation. Even if at times a learnt truth is painful, because of the nature of education itself, how and why it evolved to be, there are no such situations (or should not be) in the student-teacher relation or in the classroom generally. The phenomenon of learning the truth is often painful, it is a struggle. My argument, the cornerstone of this Peircean Theory of Learning, is that this pain is overcome by love. Not only that love justifies the effort of learning but it is the sole rationale for the teacher and student to engage in a relation. The account of love in this sense, as the foundation and rationale of a relation between teacher and student, is not limited to love as merely an emotion or feeling. It does not entirely fall under the subject of cognitive scinces. It is a cosmological matter, as it stems from Peirce's evolutionary semiotics. Such love does not deny the existence of certain pleasant emotions and feelings, even infatuation, in the relation's subjects. Such emotions and feelings can be an important aspect of this semiosis. However, they are not the love itself. Feelings and emotions might as well come in the way of what shall be termed agapic semiosis, by which the teacher and the student develop their relation and, therefore, their knowledge. If one might *like* the other then this can be good starting point for learning. It might also be an obstacle, as it might evoke, for example, inhibition.

In 1981 Thomas Sebeok's book on the Peircean view of learning as a *Play of Musement* was published. Due to Sebeok's development it is now acknowledged that for semiotics learning is a wondrous quest through a labyrinth of signs. It clearly occurs that learning can only happen properly in a free environment where the

learning subject has the freedom to play. What Sebeok could not accomplish yet in 1981, but due to the developments on schematism (and therefore iconicity) occurring in the meantime is possible now, is the identification of this play of musement with Icon experimentation. This is the claim of the *iconic turn* (Chapter 5). Operating on icons is a play of musement. Iconic signification pertains to Firstness, the category of qualities, which is governed by chance. The play of musement is a vital sign (a sign of life), the very evidence that a *self-consciousness* can be identified within the continuity of *consciousness*. Only living organisms show this *curiosity* of playing with signification. Discovery is the result of musement and therefore "the student must be taught to observe," as Sebeok quoted Joseph Bell (Joseph Bell in Sebeok, 1981, p. 48). Science consists in that which is observational (Chapter 4). The Peircean Theory of Learning should offer teachers a strong awareness of the reality that, at least from their perspective, there is always an element of chance in that the student learns.

Learning is continuous in a self-consciousness; it describes its life. It might seem discordant to consider that while learning is continuous it is only possible in a free environment. This shows, on the one hand, that there always is a degree of freedom of a living organism. There is a degree to which an organism organizes its own *Umwelt* and *Lebenswelt* even in a prison cell. On the other hand, the more obvious its freedom, the more a self-consciousness is likely to learn (to expand meaning). This is so because the class of real possibilities with which it can play is larger. The class of real possibilities contained by a *Lebenswelt* is the degree of freedom a living being enjoys. Learning expands this class.

At times one is prone to learn rather under an apparent restriction: a student learns to cook when for the first time she is living on her own, an outcast learns to hunt when it is essential for his survival, a prisoner learns to meditate while in his prison cell. This is so because these apparent restrictions are a gateway to freedom. In what appears to be absolute freedom a self-consciousness might be largely restricted by its own self. We can always be self sufficient with ourselves. The challenge of freedom consists in going out of the self, out of that which is already known. The risk of never-ending random play with Icons is idleness. One can continue to play with things already discovered. This is where Indices literally come into play: to the random play of signs a focus is inputted. The result of this indexical signification is that the play of musement proceeds within certain parameters.

It is difficult at times to impose focuses on the self by ourselves because the self does not know anything outside the self to focus on. This is where the other, the teacher, helps: another, a teacher that is, imposes a focus on a learner. Suppose that a child has discovered counting one way or another, by some series of random playing with signification in her *Lebenswelt*. She might even perform very simple additions. However, she never really needed to perform the operation of addition often. This is where the teacher sets an Index: she points out the operation of addition to the child. The teacher imposes the focus on the learner. It is as if the teacher puts horse eye covers to the learner's play of musement, so as to play within one direction only, the direction of what is being taught. For the teacher the Index is sound. In her own webs

of signs it occupies a harmoniously integrated place, it is justified, because she knows the Symbol to which it leads: because of such and such tendencies of the world addition is useful. Until the learner sees the Symbol, the Third signification – the goal of the Index – the Index is, though perhaps understood, useless. This is why the teacher has to learn the student as well. To explain her own Symbol to the learner, the teacher has to know the Icons of the learner on which this Symbol is ought to develop.

We cannot tell where musement leads us or any other living organism. According to Peirce's theory of evolution, evolution starts with the play of musement. Peirce's doctrine which he calls Tychism consists in that Firstness is governed by chance. The Icon type pertains to Firstness. Nevertheless, on Tychism are developed further on Anancasticism – evolution by necessity – and, finally, Agapism – evolution by love –, which explain how chance is transcended into other evolution criteria. Evolution is not all the way an element of determination. Chance, the tychastic principle, is always present, in some degree. Also, determination, the anancastic principle, that of mechanical necessity, is overcome in Agapism. Agapism is only manifested freely, as the "spirit of love" is "the support of a vital freedom." (CP 6.305) The principles of Tychism and Anancasticism are degenerate forms of Agapism (6.303). The three constitute a continuous evolution, when one mode of evolution inherits the previous. Peirce named the continuous principle active in this doctrine of evolution *Synechism.*

Peirce defined Synechism as "that tendency of philosophical thought which insists upon the idea of continuity as of prime importance in philosophy and, in particular, upon the necessity of hypotheses involving true continuity." (CP 6.169) While among all types of signification there is continuity, the second trichotomy of signs, describing the sign's relation to its object, is *par excellence* the Synechistic trichotomy, as it starts precisely with continuity of similarities, from Icon to Index and to Symbol. The word Peirce chose for this doctrine suggests a coming together, an ordinate classification of qualities into objects, as it starts with the prefix "syn", meaning a togetherness. It is no wonder that Synechism concludes with *Symbol* (literally, the "*throwing together*"). Agapism is "the law of love" (CP 6.302). The Greek word *agape* (αγάπη), the root of Peirce's *agapism*, is simply translated as *love*, a perfect *love* that incorporates and transcends *eros* (ἔρως), *philia* (φιλιά) and *storge* (στοργή). According to Peirce, the doctrine of chance, "tychism must give birth to an evolutionary cosmology" (CP 6.102). This evolutionary cosmology is the physiology of arguments, the Universe's expansion of meaning from Iconicity, similarities shared by chance, through Indexicality, organizing Icons into Propositional relations and to Arguments.

Peirce developed this threefold theory of evolution in the early 1890s, the period when his mature thought was crystalized. The conclusion of his semiotic theory resulted in this theory of evolution, whereby the entire Universe of signs, the physiology of arguments, is best characterized by "Evolutionary love" (CP 6.287). The Peircean Theory of Learning has a Tychism-Anancasticism-Agapism structure. These three doctrines are modes of evolution:

"Three modes of evolution have thus been brought before us: evolution by fortuitous variation, evolution by mechanical necessity, and evolution by creative love. We may term them *tychastic* evolution, or *tychasm, anancastic* evolution, or *anancasm,* and *agapastic* evolution, or *agapasm.* The doctrines which represent these as severally of principal importance we may term *tychasticism, anancasticism,* and *agapasticism.* On the other hand the mere propositions that absolute chance, mechanical necessity, and the law of love are severally operative in the cosmos may receive the names of *tychism, anancism,* and *agapism.*" (CP 6.302)

In the Universe's quest of discovering itself, learning first arose, probably from mere chance, and it is driven by chance, as learning is defined here as discovery of similarities − this is Tychism. Sebeok, continuing further on from Peirce's intuition of semiosis as a reasonable explanation for the emergence of life, considered that "It is important to realize that only living things and their inanimate extensions undergo semiosis, which thereby becomes uplifted as a necessary, if not sufficient, criterial attribute of life" (Sebeok 1994, p. 6). It then moved and it was objectified. Life forms learned and thus organized themselves into social structures, and being was extended from the natural to the cultural domain, so that, at some point, as a necessary result of this evolution learning was institutionalized into education. This is the principle of Anancasticism. Further on, the purpose of education is driven from the purpose of learning: the discovery of the Argument, the unfolding of the Universe and its revelation, ultimately, infinitely distantly realized by the identity of Mind and Truth[29]. The purpose of education is much more than serving the mere functionality of society; the purpose of learning and education is research. Therefore, the Tychism-Anancasticism-Agapism cosmological evolution applied to learning reveals the Learning-Education-Research evolution of the role we play in the Universe's revelation of itself. Thus Peirce teaches that research is the Law of Love:

"The movement of love is circular, at one and the same impulse projecting creations into independency and drawing them into harmony. This seems complicated when stated so; but it is fully summed up in the simple formula we call the Golden Rule. This does not, of course, say, Do everything possible to gratify the egoistic impulses of others, but it says, Sacrifice your own perfection to the perfectionment of your neighbor. Nor must it for a moment be confounded with the Benthamite, or Helvetian, or Beccarian motto, Act for the greatest good of the greatest number. Love is not directed to abstractions but to persons; not to persons we do not know, nor to numbers of people, but to our own dear ones, our family and neighbors. "Our neighbor," we remember, is one whom we live near, not locally perhaps but in life and feeling." (CP 6.288)

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[29]This relation of identity is a real possibility but ever infinitely distant. The similarity to Truth, on the other hand, is achievable.

One might be intrigued by the need of developing an entire cosmogony when the exigency is strictly that of understanding learning and improving education (whatever that might mean). It seems antiscientific: would so many hypotheses need be assumed? This is not an unscientific assumption of unneeded hypotheses though, but an embracing of a holistic view on education. According to Peirce such an approach is unavoidable, since the history of philosophy led here:

"Such are the materials out of which chiefly a philosophical theory ought to be built, in order to represent the state of knowledge to which the nineteenth century has brought us. Without going into other important questions of philosophical architectonic, we can readily foresee what sort of a metaphysics would appropriately be constructed from those conceptions. Like some of the most ancient and some of the most recent speculations it would be a Cosmogonic Philosophy." (CP 6.33)

This justifies the need for integrating biosemiotics and the history of semiotics in the effort of developing a fully semiotic and holistic educational philosophy. Myrdene Anderson promoted biosemiotics for the argument that it advances the understanding that "the earth is a living organism" (in Sebeok, Umiker-Sebeok, 1992, p. 5), a conclusion of which philosophy of education might be in need now (Gough and Stables developed such an argument in 2011). Semiotics integrates education in a holistic view whereas life forms are a part of learning itself.

Learning is the discovery of the other. The ultimate revelation of this Cosmogonic Philosophy is the discovery of the other which occurs through the abandonment of the self. It is not a matter of ethics. Peirce made it clear that his 'Golden Rule' is not utilitarianism (not the Benthamite motto). It is the cosmos' evolution through life forms, such as human beings. Evolution by chance (tychasm) led to evolution by necessity (anancasm) which led to evolution by love (agapasm). The ultimate expression of agapasm which the cosmos came about with so far is personal existence, personality namely. On endless continua of being structures became aware of themselves – life emerged, that is. Self-conscious signs developed personality. Personality was developed in and by selves involved in semiosis with other self-conscious signs (see Chapter 5). Personality is, therefore, evolution's mode of adapting to certain structures of signification. So are, as argued in Chapter 1, education and science. Learning is enhanced and more easily becomes scientific if it is structured in an educational system. Education implies learning from others. We call this *teaching*. Teaching is a particular mode of learning, the learning of a non-self.

A *Cosmogonic Philosophy* is required, because love is not merely a sentimental thing, or a matter of morality. It is the rationale and drive of life, which, in turn, is the utmost expression of an existing and evolving Universe. Love is not only the result of chance, it is not Tychistic. Living beings do not just '*fall in love*' randomly. Love is not only mechanically determined either, it is not *Anancastic*. This means that living beings do not '*fall in love*' out of necessity and determined by biological, cultural or other factors. In either of these two cases love would be the

object of cognitive sciences, or sociology, or anthropology, and its manifestations that would be apart of these sciences' spectrum would not be interesting anyway. Even feelings, emotions, thoughts and beliefs can be studied into a large extent from the mentioned perspective, but love does not coincide with any of these and neither is it the sum of all of them. Love is the very transcendence of chance and necessity. This *agapic* love has to be actively manifest in the relation of the student and the teacher. By this learning randomly or mechanically are transcended. Of course, one might object that by making love the subject of semiotics there is the risk of reducing it in some way, as other sciences would as well. The answer to this stands in that the Argument is the agapic sign (Thirdness of Thirdness) and, as explained (Chapter 2), the Argument is the sign that most thouroughly tends to the infinitely distant truth. Therefore, Peirce's semiotics simply realizes that love cannot be fully comprehended or satisfactorily approached. At the same time, love is not *noumenal* or impossible. In Peirce's cosmology, it is the possibility of transcendent presence. It is obvious when, for instance, a student learns by the semiosis in which herself and her teacher are involved, as they discover new arguments.

Surely, lion cubs learn from their mothers, but the more personal these relations between teacher and learner are, the richer the interpretation is. Personal relation results in an attachment to the other even to the point of self denial. The teacher-student relation imitates the parent-child relation, which was already well established within evolution by the time education came about. Thus, adoption of orphaned younglings is a result of agapastic evolution. Some species (such as Chacma baboons, see Hamilton, Busse, Kenneth 1982) developed this method which is quite often found in humans. Life forms get to know the relation to parent even before birth, through the intra-uterine life (in the case of mammals) and develop it strongly since the first moments of extra-uterine life. The fact that any new individual of a species has its procreation literally in another individual of the species is an expression of agapasm. It is impossible to tell where precisely a new self-conscious sign (a new organism) was crystalized within the continuum of consciousness, imposing itself as a self. What is obvious is that it is part of the continuum since it clearly sprang forth from an already defined self. Evolution made association of individuals necessary: at some point organisms needed to copulate in order to reproduce. This justifies that the synechism of tychism and anancasticism necessarily implies agapism: an external focus becomes mandatory for evolution. A cosmology of chance and necessity would be incomplete, according to Peirce. Their mediation is love, agapism. The only critique that Peirce brought to Hegel consists in that Hegel, in his triadic philosophy, did not arrive at the idea of transcendence by love. Therefore, Hegel's philosophy is seen as mechanistic (assuming the determination of chance and necessity):

"The anancasticist might here interpose, claiming that the mode of evolution for which he contends agrees with agapasm at the point at which tychasm departs from it. For it makes development go through certain phases, having its inevitable ebbs and flows, yet tending on the whole to a fore-ordained perfection. Bare

existence by this its destiny betrays an intrinsic affinity for the good. Herein, it must be admitted, anancasm shows itself to be in a broad acception a species of agapasm. Some forms of it might easily be mistaken for the genuine agapasm. The Hegelian philosophy is such an anancasticism. With its revelatory religion, with its synechism (however imperfectly set forth), with its 'reflection,' the whole idea of the theory is superb, almost sublime. Yet, after all, living freedom is practically omitted from its method. The whole movement is that of a vast engine, impelled by a *vis a tergo,* with a blind and mysterious fate of arriving at a lofty goal. I mean that such an engine it *would* be, if it really worked; but in point of fact, it is a Keely motor. Grant that it really acts as it professes to act, and there is nothing to do but accept the philosophy. But never was there seen such an example of a long chain of reasoning -- shall I say with a flaw in every link? -- no, with every link a handful of sand, squeezed into shape in a dream. Or say, it is a pasteboard model of a philosophy that in reality does not exist. If we use the one precious thing it contains, the idea of it, introducing the tychism which the arbitrariness of its every step suggests, and make that the support of a vital freedom which is the breath of the spirit of love, we may be able to produce that genuine agapasticism at which Hegel was aiming." (CP 6.305)

Peirce's argument is that pragmaticism, as a doctrine of critical common sense, if it considers that reality is synechistic, inevitably leads to agapism. Critical common sense urges us to see the law of love active in the Universe, setting existence free from chance and mechanical determination. By this argument it occurs that Peirce considered that the idea which ultimately qualifies his semiotics as realist, and not idealist, is the idea of agapistic evolution.

This reality of the natural realm is present, of course, in the cultural. Any human being knows that parenting is, or at least should be, associated with love. Therefore, assuming the continuity of nature and culture, any teacher-student relation which is deprived of love is pathological and it will not function. Such a relation would be against the cosmos' evolution.

This association of personality and science might raise some doubts: how can personal love be the very essence of research? How can research still be objective if its drive is personal? According to Peirce's pragmatic maxim the effort for objectivity only makes sense when performed by "an experimenter of flesh and blood" (CP 5.424). Science and research are practised within the conditions of suprasubjective reality. We claim that our science should be *objective* because it should be *indexical* – focused on an Object. We tend to fallback to the play of musement, the preponderantly Iconic level of learning, which is pleasant and easy for us. It is difficult to stay focused and perform semiosis on one and the same Object. The semiotic Universe is very rich and presents many *distractions* for a life form to play with all around. Nevertheless, to develop arguments indices are needed, as they constitute Subjects in Propositions and, as such, they will become middle

terms[30] in arguments. This fall back from more complex signification to Icons is the *unscientific subjectivism* that science should be aware of.

The argument type brings even more pleasure than the play on icons, because the Argument is agapastic, though, at times this is difficult to see for both teacher and student. Before the student develops arguments on the Objects indexed by the teacher she cannot foresee how the argument is interesting: its semiotic power and the joy of using it. The argument is the sign most capable to change a *Lebenswelt*. There is no better adaptation (interpretation) than argumentation. An argument, for instance, can accommodate a student with her teacher. Without having arrived at the Argument yet, the student only knows the semiotic fertility of the icons that she can use for developing the argument. Also the teacher might be tempted to give up on the student: since she knows the power of these arguments and does not perceive any joy towards them from the student it might seem pointless. It is important to be aware that never is there an ultimate argument reached. Two students will develop each their own unique argument in regard to one teacher's teaching on the same subject. None of their arguments is better than the other and none of their arguments puts an end to learning on the topic. That arguments are agapistic means precisely that they enhance the growth of learning. To have developed an Argument starting from a certain predicate means that the horizons of using that predicate are expanding widely, not that a certain point of sufficiency was reached.

Nevertheless, the fallback to Icons sometimes might be useful: the student might become so lost in indexical signification that she forgets her own icons from where it all started, by which sense of things came about in the first place. In that situation, when the Iconic ground is ignored, to the extent that it is possible to be ignored, the arguments the student develops will lack iconic syntax. As such, they are not proper arguments. It is a case which is referred to as *mechanical* learning, characterized by the student's apparently performing well when evaluated but not understanding herself the arguments. It is the student's way of lying. She did not discover a similarity by which she developed herself a predicate that could argue on the taught topic. Instead, she discovered a predicate that allows her to mislead the evaluation method: her performance simulates having had discovered a relevant similarity.

Peirce's argument for science's necessity for Agapism is revealed in his interpretation of love as from the Gospel according to St John, the 'ontological gospeller', as Peirce referred to him (CP 6.287):

"Everybody can see that the statement of St. John is the formula of an evolutionary philosophy, which teaches that growth comes only from love, from I will not say self-*sacrifice,* but from the ardent impulse to fulfill another's highest impulse. Suppose, for example, that I have an idea that interests me. It is my creation. It is my creature; for as shown in last July's *Monist,* it is a little person. I

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[30]It is possible for an Index to become the element of copulation (middle term) because of its Iconic ground. Indices used as Subjects are unsaturated predicates (Chapter 4). When used as middle terms their Qualities (Iconic valency) is used.

love it; and I will sink myself in perfecting it. It is not by dealing out cold justice to the circle of my ideas that I can make them grow, but by cherishing and tending them as I would the flowers in my garden. The philosophy we draw from John's gospel is that this is the way mind develops; and as for the cosmos, only so far as it yet is mind, and so has life, is it capable of further evolution. Love, recognizing germs of loveliness in the hateful, gradually warms it into life, and makes it lovely. That is the sort of evolution which every careful student of my essay "The Law of Mind" must see that *synechism* calls for." (CP 6.289)

By this Peirce also stated that the growth of the Universe is possible while there is life populating it. It is clear that by development, or growth, Peirce had in mind something biological[31]. Since the issue here is a cosmogonic philosophy, this focus on life can be intriguing: stars, planets and entire galaxies expand infinitely in the infinite vastness and yet without life forms, which quantitatively are insignificant, development is not possible. This comes not as a conclusion, but as a necessary assumption, a result of abduction. It is a breakthrough out of any *eparhe*, a denial of any slightest flavour of skepticism. How is one capable of performing this absolute denial of skepticism and place the equal sign between learning and loving?

"His statement that God is love seems aimed at that saying of Ecclesiastes that we cannot tell whether God bears us love or hatred[32]. "Nay," says John, "we can tell, and very simply! We know and have trusted the love which God hath in us. God is love." There is no logic in this, unless it means that God loves all men." (CP 2.287)

That arguments are agapistic and that their evolution is enhanced by intra-personal relations also means that an agapic semiosis will lead to learning in some way; it will set things straight, even if obstacles are encountered. If a teacher admits that she really loves her pupils, but at the same time she hates teaching them a certain subject, then she already has the appropriate *Lebenswelt* to turn the hatred of the teaching practice into an enjoyable activity. It requires sacrife, as Peirce suggests. The teacher's love for her students provides the willing to sacrifice. Agapism is revealed by the teacher's willingness to make the efforts, to care more about her students than about herself, eventually. At that stage of the semiosis it will not be possible for her to hate the teaching of any subject to these students, as she does not perform it for herself anyway (except the unfortunate cases of the system imposing the endoctrination with ideologies of hate that

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[31]The threshold between life and non-life is at least vague, if not problematic in Peirce. The issue of panpsychism is discussed in Chapter 5.

[32]Peirce's interpretation of *Ecclesiastes* is, however, not necessary for the development of this theory of evolution. Neither his interpretation of the *Revelation* book stemming from the same text ("Evolutionary Love") is necessary. The main argument stems from his interpretation of the Gospel according to St John and of his epistles. The important idea is that love is not contradictory to hatred, but rather it is overwhelming, transforming everything, including hatred, into loveliness, and establishing in everything a healthy growth.

exclude the possibility of agapism, as their semantics do not fit in the syntax of an Agapic Universe).

More than anything else, we, the presently alive, are developing the argument. Love is a matter of ontology, that is why Peirce terms the gospel writer who stated "God is love" the "*ontological gospeller*." From here also the ethics of this theory of learning germinates: if a teacher's teaching produces anything but love in any regard, it is not to be accepted. Love does not exclude love. If a student and teacher love each other, as desirable and necessary, then this will result by their love expanding. A teacher excluding the rest of the classroom for love for one student is a contradiction: this is not how agapism works. Also, if by her love for the teacher, the student comes to exclude from her love other things, the learning is not agapic. An example would be the teaching of hatred doctrines: if the students love their teacher who is teaching them racism, then, by the exclusion from love of a certain race, their learning is not agapic. An agapic meaning phenomenon would be that in which the students are not compelled by the teacher's racism, but love the teacher nevertheless. By the argument for evolutionary love, in this case, those formally called students will be teaching the one formally called teacher: their love will eventually persuade her to a different argument. The student's argument, because agapic, will be stronger than the teacher's. The argument is agapic, and, therefore, properly an argument, because it follows the principle of evolution. Therefore, the Peircean Theory of Learning brings simple criteria for accepting or not accepting a certain teaching. Agapism enhances learning, and therefore, the criterion stems immediately: anything that obstructs learning is not desirable. Love alone enhances learning without obscuring any potentiality.

Creating ideas is falling in love. Though, just before making this remark, which might be *suspiciously* narcissistic (falling in love with one's own ideas), Peirce explained that love happens (it occurs) for "our neighbour", who is no abstract concept, but "one whom we live near". Love is personal, it is practised by self-conscious selves for self-conscious others. Self-consciousness evokes personality (Chapter 5). Thus, education will always be driven by the desire of fulfilment within the other. The student has to be the teacher's neighbour and *vice versa*. It is no wonder that students have teachers. In the opening of *De Doctrina Christiana* St Augustine argued that learning consists first in teaching the self but also in teaching to others.

In the first stage, that of learning, the student is free, explores aimlessly. The drive of *Agape* – the tendency of the cosmos – towards knowledge, makes the student delight in a play of musement – she is discovering similarities. The learning process of logic is immanent, occurring naturally, as evolution has perfected it over time, being any human person's capability of predicating (discovering similarities). This is the Tychistic stage of learning. It is mostly characterized by iconic signification: the learner randomly discovers relations of similarity in her *Umwelt* and *Lebenswelt*, thus expanding them. Further on, the student is restricted by the teacher, she is forced by her teacher to focus upon some particular object and to look for some

particular qualities that, according to the teacher, have to occur as similar. This is the Second, that is the Anancastic, stage of the learning continuum. It is mostly characterized by indexical signification: the teacher (or educational institution) points out (indexes) to the learner what to study. It is here that the two previously mentioned learning obstacles are found. One possibility is that the student either hates the teacher for unjustifiably taking her freedom away and obscuring from her the free musement that she loved, and thus, she sinks into boredom. The other possibility is that the student is fascinated by what the teacher is revealing to her, up to the point of adoration. In this case the student loses the interest to discover and develop her own predicates. Usually these two possible situations mingle, the student arriving at an Interpretant about the teacher as perfect and depersonalized *connoisseur*: the teacher's perfection is sought after but never reached. Of course, the teacher's knowledge is never achieved, because these two sets of signs (the teacher's and the student's) cannot coincide. Having this in mind the student should not lose hope for not identifying with the teacher. The teacher should not want the student to be identical to her. This identity is impossible and, if sought after, detrimental: the student loses her own personality by being confounded in the other's self-consciousness.

Peirce defined Secondness as "struggle" (CP 1.322). The anancastic stage of learning, the dyadic stage of teacher/learner situation is a struggle where one becomes aware "of the presence of a *non-ego*" (CP 1.332). Surprise is also a matter of secondness, an anancastic matter, as it consists in this encounter with the non-ego (see Chapters 5 and 6). When we have learned we are surprised, it is a bewilderment: the world has changed, we live in a different *Lebenswelt* and the reality of possibilities is different than before the discovery. It happens accidentally, like stumbling upon something unforeseen:

> "But precisely how does this action of experience take place? It takes place by a series of surprises. There is no need of going into details. At one time a ship is sailing along in the trades over a smooth sea, the navigator having no more positive expectation than that of the usual monotony of such a voyage, when suddenly she strikes upon a rock. The majority of discoveries, however, have been the result of experimentation." (CP 5.51)

> Experimentation has something more than mere experience. Aimless experiencing is tychistic, experimentation is anancastic and also synechistic. Experimentation is experience with a certain focus (Index). The focus is imposed by the teacher on the activity of the student. It involves an effort, a struggle, and when it is imposed from the outside, that is by the teacher, upon the student, it might seem useless. Unless the student sees herself the purpose of experimentation she cannot follow it successfully:

> "Now no man makes an experiment without being more or less inclined to think that an interesting result will ensue; for experiments are much too costly of physical and psychical energy to be undertaken at random and aimlessly. And

naturally nothing can possibly be learned from an experiment that turns out just as was anticipated. It is by surprises that experience teaches all she deigns to teach us." (CP 5.51)

This is why the student needs to comprehend the experimentation that schooling is putting her through as continuous with her life experience. What the teacher is teaching needs to be similar with what the student used to discover by herself in her ordinary experiences. Since anything can be similar with anything else this wouldn't be a problem, but the student needs to discover the similarity between her experiences and focused experimentation, between the pleasant, accidental meanings she discovered by herself with the meanings that her teacher is urging her to discover. That is to say that the Index (anancastic struggle) is useless unless grounded in the Icon (tychistic discovery). The grounding of the Index in an Icon is what gives experimentation its continuity (synechism). If the student has a teacher in *flesh and blood* she also has an inner teacher – her own experience, that is, which is *flesh and blood* as well. That is from where the possibility of any teaching and learning emerges. The self is never a *tabula rasa* which could fit any new teaching; at any point the self is a sign (or set of signs). No self-consciousness is, at any point, *tabula rasa*, since it originated from another self-consciousness. An organism which has paws and a tail and two eyes gives birth to an other with paws, a tail and two eyes. This most simple remark dismisses any discussion of either *tabula rasa* or *innate ideas*. Life is continuous. Peirce showed his disappointment with pedagogy in general for not being aware of the continuity of life and the reality of the learner's play of musement:

"In all the works on pedagogy that ever I read -- and they have been many, big, and heavy -- I don't remember that any one has advocated a system of teaching by practical jokes, mostly cruel. That, however, describes the method of our great teacher, Experience. She says,

> Open your mouth and shut your eyes
> And I'll give you something to make you wise;

and thereupon she keeps her promise, and seems to take her pay in the fun of tormenting us." (CP 5.51)

We learn only by experience. As such, learning is an enjoyable torment. Even if we are following an indexical signification, we never know what the outcome of the experiment will be. If we knew, we would not run the experiment. In the same time, without an expectation, an Interpretant probably in the form of a Symbol, we would not run the experiment neither. The student, thus, needs to have an expectation that interests her towards what the teacher is teaching. When the teacher is identified with the deliverer of the interesting outcome the student is falling in love with the teacher. Even though expressed so simply, this is much more than a Pavlovian stimulus (that semiosis does not account for Pavlovian behaviorism see

Eco 1976). The student is not merely consuming bits of information coming from the teacher. The two (student and teacher) are involved in a complex semiosis by which they are realizing, at some point, that they are learning the other, in all her complexity, not just some abstract, detached from personality, free floating ideas.

Anacasticism, this struggle, *calls for* Agapism, for evolution by self-denying creative love. The only chance to overcome the anacastic struggle is loving the non-ego. The self finds no difficulty in learning by itself because learning is the evolutionary tendency of the Universe. The situation is different of course in situations such as a person having multiple personalities. If one self both hates and loves its own structures of signs it will encounter serious obstacles in playing coherently with icons. In such a situation the self, actually, does not really love: true love, in the form of agapism, would overcome hatred, transforming it into loveliness, as *agape* (evolutionary love) is not opposite to hatred, being all-encompassing. This thesis does not aim at examining psychological disorders though. That which matters is acknowledging that for a coherent, that is inner continuous and diagrammatic personality, learning is pleasant. As such, it is necessary that the initial play of musement is carried continuously carried further on throughout the evolution of signification.

Learning by oneself is a play of musement: wherever the self's own *Umwelt* and *Lebenswelt* lead, that is where and what the self explores. The self is surprised that one should learn from another. The self might not see the purpose of anacasticism, of the indexical imposition set from outside (e.g. by a teacher). The direction of the self's own growth, like the growth of the cosmos, has been set from within. The cosmos, in its Agapasm, makes an identifiable self-consciousness along the continuum of consciousness cooperate with other self-consciousnesses. Anancasticism – the encountering of the non-ego – is only overcome by Agapasm. The non-ego becomes self, it comes to belong to one's own *Lebenswelt* like an organ of its own body, like a defining sum of ideas of its own, like a set of signs which critically defines the self. The self can only learn from another if it loves the other.

Once anancasticism is transcended the student recovers her freedom by wanting to pursue her own research. This is the moment where the student/teacher relation becomes freely assumed discipleship and, the more both of them inquire into it, they become the predicates and the student/teacher relation is transcended into, I shall use Buber's and Levinas' terminology, I-Thou[33]. For the student the other is not teacher anymore, she is Thou and likewise for the teacher. Mediation is a matter of Thirdness:

"By the third, I mean the medium or connecting bond between the absolute first and last. The beginning is first, the end second, the middle third.

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[33] Levinas' philosophy places his understanding of I-Thou in the context of western metaphyiscs and phenomenology, which gives it valencies beyond Buber's I-Thou, developed rather within the rationale of religious experience and worship. However, Levinas inherited this terminology from Buber and in the present thesis the terminology is used to refer to the relation between the self and non-self, particularly between the teacher and student.

[…] Sympathy, flesh and blood, that by which I feel my neighbor's feelings, is third." (CP 1.337)

In Agapasm, the transcendence of Tychism and Anancasticism, there is no more student and there is no more teacher, there is Thou, and the key to the long awaited, infinitely distant *telos* that the student foreseen since the innocent stages of her initial play of musement, haunting her desire for knowledge ever since, is found in the teacher, in Thou, who is not anymore a demagogue, but a mentor. Research is personal love. This is the third stage of learning, the agapic stage. Not only that this stage is characterized by metaphors, symbols, and arguments, but at this point the teacher and the student signify as one Argument. They are in continuous diagrammatic coherency and participate in the semiosis of an Argument. The agapic moment is the moment of recognition, when the student and the teacher re-cognize themselves in each other; it is the moment of discovery: *I* is similar to *Thou*. This is a great discovery because it leads from the perceptual judgment of non-ego being an obstruction to the self to it being the self's only chance of transcendence. This is where the student realizes that she has what to learn from the teacher. Locked in the limitations of the self, without the teacher, life is boring. Life without the teacher is no more *local plurality*. In that case life would be death. Something is alive if something learns (Chapter 1) and now, in the agapic moment, the student is learning from the teacher. The student observes how her *Lebenswelt* expands and her life achieves new horizons because of the teacher's teaching. The teacher unlocks hidden treasures. After one has learned how to operate with negative numbers, how to swim, how to play the violin, the awareness of real possibilities expands. Music is much more interesting and generates more profound aesthetical experiences after one has discovered some similarities among sounds, namely if one learned some musical theory. Once with having learnt something the self holds a richer *plurality* of signification. She who learned will be infinitely grateful to her teacher while also aware of the uniqueness of her learning: her teacher never played a *vibrato* on the violin with the particular sensitivity with which she performs it and yet her teacher taught her to do it. The teacher should experience joy as well when hearing her student's *vibrato* – they have learned each other. The student gives a new voice to the teacher's teaching. As such, the teacher can evaluate herself, can practically observe the results of her teaching while being aware that it is the student's merit for the learning and, therefore, for a new expression of her own doctrine (e.g. a *vibrato* performed by the student). The teacher teaches things that herself does not know because she is not teaching herself, she is teaching an other self.

In Agapasm, the student is not any more biased by the teacher, but inspired. The same happens for the teacher: "The conception of mediation springs out of the plural consciousness or sense of learning." (CP 1.378) This obviously places learning in a coextensive relation with life, which, in Chapter 1, has been presented, according to Kull's biosemiotic account, as "local plurality" (in Bundgaard and Stjernfelt, p. 116) Research is a mediation of Learning and Education. It is the mediation (Thirdness) of the student's diagrammatic reasoning (Firstness) and the

teacher's indices (Secondness). Learning is free discovery and education is externally imposed focusing. The transcending mediation of these two consists in a revelation of knowledge, a unification of signs in one Argument. Learning happens in time. The self, a First, contains its own past. The other, the non-ego, the Second, is an element of the future self – there is a time when the other is unknown. The Third consists in their coming together in a present sign. Thus, the present is the only time when transcendence in to Thou can happen, that is, it is the only time when learning can happen at all. Peirce most likely inherited from St Augustine's *Confessions* this conception of time which determines a phenomenology of the *self*. A similar argument was developed within philosophy of education by Stables (2012) around the concept of "my now" (Chapter 5).

The development of the Agapistic state from an Anancasticism that might even be characterized by hate is not antagonistic. Peirce explains the irrelevance of hatred in respect to love, which conquers and transforms all. Peirce explained the irrelevance of hatred in respect to love using a metaphor of light and darkness:

"Thus, the love that God is, is not a love of which hatred is the contrary; otherwise Satan would be a coordinate power; but it is a love which embraces hatred as an imperfect stage of it, an Anteros -- yea, even needs hatred and hatefulness as its object. For self-love is no love; so if God's self is love, that which he loves must be defect of love; just as a luminary can light up only that which otherwise would be dark." (CP 6.287)

The light and darkness idea here is a metaphor, because it is a parallelism of something to something else: light can enlighten darkness – they present a potential similarity in one direction only. Darkness cannot *comprehend* light by any means, but light makes something dark similar with itself: it enlightens it (e.g. the Moon shines in its turn because it reflects light originating from the Sun). Following this metaphor, the teacher and the student have to lighten for each other that which used to be dark, thus transposing each other in a new semiotic world, closer to an ecosemiotic harmony, a shared *Lebenswelt*, coming closer to the identity of Mind and Truth. The Argument, the fully developed sign type, is realized at the level of Agapism. In this sense learning is achieved only in the circular movement of love which Peirce considers the principle of growth. The passage from Icon to Argument is a suprasubjective phenomenon of meaning which is possible only by the search for the genuine other both from the part of the student and from that of the teacher. It transcends both the singularity of the isolated learner and the duality of the local student/teacher circumstance.

Part III

In this Part I discuss the new insights and advantages of this Peircean Theory of Learning in respect to other mainstream philosophical approaches to education. I identify the arguments of the Peircean Theory of Learning that might seem controversial and explain them, so as to clarify the potential and coherency of the theory. I shall treat individually each of the possible objections that might stem from other philosophical schools. The rationale of this part is to explain aspects of the Peircean Theory of Learning in contrast to other schools. It brings a critique to other educational theories, but its main purpose is to further explain the Peircean approach and to underline its similarities and opposition to other approaches. This will clarify the theory's epistemological stance.

As I mentioned previously (Chapter 2), Husserlian phenomenology is the school which presents most similarities with Peircean semiotics. Therefore, a chapter (Chapter 9) is dedicated to comparing the Peircean Theory of Learning with phenomenology as applied to education. I explain that the Peircean Theory of Learning brings new insights for the phenomenological analysis of education. They envisage the framing of learning phenomena within semiosis, thus placing human education in continuity with cosmological, biological, and historical evolution. This phenomenological semiotics (broader than a linguistic semiotics) proves to be a comprehensive ground for the analysis of classroom phenomena, understanding the classroom as *Lebenswelt*, and the semiosic evolution of the student-teacher relation, the agapic integration of two selves as Intepretant.

However, the present thesis envisages only the development of a Peircean Theory of Learning. The links with phenomenology that this educational semiotics presents are only mentioned and briefly explained here. The proper collaboration of these two schools would be a larger project which this thesis does not aim at resolving. Also, their full collaboration could not be exhausted in one work, but in an effort that would take years of research undertaken by semiotics and phenomenology. I simply remark the compatibility between these two traditions, emphasizing one of the epistemological circumstances that brought forth the present thesis, namely the phenomenological turn in semiotics.

Another chapter (Chapter 10) is dedicated to identifying and discussing the main objections that other philosophical positions might bring to the Peircean Theory of Learning. I discuss the main objections that can be brought to the Peircean Theroy of Learning from three different perspectives on education: pragmatism, humanism, and instructionalism. By approaching the objections coming from these three directions I cover the basic and general critique that the thesis is subject to. The issues raised concern: (1) the critique of the Peircean Theory of Learning as logocentric and therefore limited in approaching human life to its fullness, (2) the apparent preference to use theory without being backed up by empirical evidence, (3) the excessive focus on the role played by iconic signification in learning and an apparent ignorance of the importance of indexical and symbolic signification, (4) the focus on the personal aspect of the teacher-student relation being detrimental to the

focus on the taught content, (5) the dangers of a close erotic and agapic relation between student and teacher, and (6) the apparent non-differentiation between human education and non-human animals' learning.

Chapter 9
The Peircean Theory of Learning and Phenomenology

This chapter explains how this semiotic approach to learning brings new insights to the phenomenological developments in education. I argue that semiotics, being coextensive with the phenomenological school, broadens the phenomenological research horizon, as well generally as particularly in education. The key to the new semiotic insights stands in semiotics' specific concepts, those of sign and semiosis. Thus, I propose semiotics as a cosmological framework for phenomenology, where the phenomena populating the world are meaning phenomena, signs that is, cooperating in semiosic triads.

The phenomenological tradition set in motion by Edmund Husserl is coherent with Peircean semiotics, especially in what concerns learning, particularly because both of these schools assume a mereological (diagrammatic) structure of existence (see Chapter 6). Two epistemological developments were noted in the previous chapters: (1) that *iconic turn* semiotics is phenomenological (see present thesis, Chapters 1 and 3 and also Stjernfelt in Bundgaard and Stjernfelt, and Stjernfelt 2007) and (2) that phenomenology already is an established approach to education (e.g. Peters 2009). I explain that semiotics' recent *phenomenological* turn can generate a *semiotic* turn in *phenomenology*, as Peirce's hypoicon (image, diagram, metaphor, see Chapter 2, Section D) concepts provide a rich apparatus for mereological analysis. Using Peirce's schematic semiotics for mereological analysis implies identifying phenomena with meaning phenomena, that is signs. Moreover, I explain that the phenomenological approaches to education have developed positions close to Peirce's agapistic principle of evolution. However, phenomenology has never explained the mutual, self-denying love in the student-teacher relation (or in general) as a matter of evolution. The semiotic perspective explains this mutual love as a matter of cosmological evolution of meaning. Phenomenology has shown an anthropocentric tendency at times, at least for the reason that the only way we can look at phenomena is from and within our human perspective. Semiotics offers a phenomenological and holistic explanation that integrates human life in the wider perspective of biologic and cosmologic evolution. Thus, the horizon of phenomenological research can be substantially broadened by performing phenomenological analysis in the perspective of a semiotic universe. On this account, phenomenology is epistemologically grounded in semiotics. This is possible by taking into consideration both Peirce and Husserl's arguments for a logic which is not subject to psychology (see Chapter 2, Section B) and their preference of non-noumenal ontology.

Iconic, that is phenomenological, turn semiotics, the reading of Peirce accounted for here, is the semiotic trend that accounts for the crucial role of the icon type in learning. In Chapters 1 and 3 it was explained that *iconic turn* semiotics, first clearly noticed in 2007 by Stjernfelt, is a *phenomenological turn*. The turn towards an Icon focused semiotics was triggered by the cognitive approach to meaning, finding that meaning phenomena are continuous and not reducible to algebra. The

iconic turn consists in the rediscovery of semiotics as phenomenological and independent from linguistics. This take on meaning proves coherent with the simultaneous "Peirce renaissance in semiotics" (Stjernfelt 2007, p. 53), being partly triggered and enhanced by it. Peirce's schematic semiotics is a rich conceptual ground for mereologic phenomenological analysis. The concepts of diagram and metaphor are employed as means for mereological analysis of the student-teacher relation.

If in 1988 Garisson and Shargei noticed that despite the many common interests between Husserl, the main figure in phenomenology, and Dewey, the main figure in 20th century progressive education, an educational phenomenology was still not developed. In the recent years phenomenological research has become an established trend in philosophy of education (Peters 2009, Friesen Norm, Henriksson Carina, Saevi Toni 2012). Hence, for the establishment of an educational philosophy based on a phenomenological trend of semiotics an awareness of other phenomenological approaches to education and the compatibility between these and the semiotic account is necessary and useful. Both semiotics and phenomenology, being hermeneutically rich and highly descriptive philosophical approaches, have provided mostly qualitative methods when implemented in the social sciences in general or in education in particular. Both of these approaches impose an analysis of phenomena as experienced, denying any attempt of an *objective* and *detached* experimenter. When approaching education, semiotics and phenomenology tend to focus on interpretation phenomena occurring in the teacher-student relation, offering a descriptive analysis of this relation. However, phenomenology does not possess the conceptual tools that semiotics developed. The semiotic concepts of sign and semiosis and the typologies of signs explain suprasubjective reality through the perspective of being as meaning phenomenon, an account missing in phenomenology. Thus, phenomenology, for its compatibility with semiotics, can be employed by semiotics as a method in education research.

Phenomenological research in education can open itself to a semiotic horizon by embracing the concept of *sign* as the most comprehensive concept of *phenomenon*. Thus, the iconic turn of semiotics can generate a semiotic turn of phenomenology: the focus of attention to phenomena of meaning. The insight that semiotics offers is that all phenomena are meaning phenomena (signs). An example of such a collaboration, which I discuss in section C, would be the understanding of Levinas' *face* as a particular application with an ethical dimension of Peirce's *Icon*. A particularity of *face* is that it is *conceptless*; it stands beyond any rationalization. If *sign* is not strictly a concept then these two cannot refer to the same reality. The Peircean sign, the vehicle and result of semiosis, is a real existing phenomenon. Though we can refer and think of *sign* and *face* only conceptually, none of them, as real phenomena, is conceptual. Peirce's *sign* is a real phenomenon as lived experience. This is why theoretical examples of signs cannot evoke a sign's character as sign properly. What I propose, as a phenomenological analysis within a semiotic cosmology, is the understanding of the *face-to-face* encounter within the context of the Universe of signs.

The mereological analysis of signification reveals aspects of real existent phenomena, but it never exhausts reality. This is so because semiosis is infinite. The analysis, as well, can be performed *ad infinitum*. The infinity of semiosis is a necessary condition for the possibility of observation and science. At the same time, the infinity of the observed object makes any observation, any analysis incomplete. That nothing can be isolated out of the infinity of the physiology of arguments and analysed in perfect laboratory conditions qualifies any analysis as falsifiable. In Chapter 4 it was explained that the falsifiability and imperfection of analysis, stemming from the infinity and vagueness of its object makes the analysis potent and worthwhile. Since any analysis is incomplete but can be revealing, Peirce's ten classes of signs, composed by sign types, which we encounter in experience (see Chapter 2), can be analysed mereologically. We can state that an example of the class of signs of Rhematic Indexical Sinsign is a *spontaneous cry* (2.256) or that a *weathercock* is a Dicent Sinsign (CP 2.257), but such a statement does not determine the *local plurality*. The sign is the correlation of three termini which occurs only in a peculiarity of circumstances. That the experienced sign always has a token (replica) character, a component of Secondness, means that signs are unrepeatable. Because signs are mediations and mediated reference is possible we can refer to *that spontaneous cry* or *that time when John noticed the weathercock changing direction*, but the genuine and unique sign which is referred to is not disclosed. It is impossible to put our finger on *this or that* sign precisely as signs do not have clear borders. Because of the infinite proceeding of semiosis signs are vague phenomena (on the vagueness of semiosis see also Nöth and Santaella 2011). Certainly, the vibrations of some vocal chords and of the air and their effect on a human eardrum and on a cognitive system participate in the semiosis composing the *spontaneous cry* as a Rhematic Indexical Sinsign. These elements can be identified, but semiosis is never exhausted and it is impossible to circumscribe the limits of the particular sign: the pain that caused one to shout, the blowing of the wind in a certain direction, the previous experiences of one hearing the shout, are these elements of the sign referred to, or are they elements of signs to which the Rhematic Indexical Sinsign in question interacts semiosically outside its tripartite structure? How essential are they in providing the sign's Interpretant as real possibility? We can think of and refer to *that spontaneous cry* but we cannot repeat the genuine meaning phenomenon that occurred. Nevertheless, signs can be mereolgically analysed and this gives some insight about the lived experience that partakes at a life form's *Umwelt* through the life form's engagement in signification. Analysing the semiosis evoked by a *spontaneous cry* as a Rhematic Indexical Sinsign reveals the correlates composing it and the relations amongst them: (1) an Iconic Sinsign (a cry as a generally intelligible unsaturated predicate), which in turn contains a Qualisign (a quality that affords the sign's intelligibility within the world of experience), and a (2) Qualisign (a quality which affords the construction of a predicate).

Such an analysis of *face* would be false to the real experienced phenomenon, the *face-to-face* encounter. Instead, I argue that *face* can be analysed in the perspective of a semiosic Universe, being an example of *agapic* evolution. Even *face*

has a diagrammatic character and it is possible only as phenomenon of signification. As part of the Universe of signs, it is implicit that *face* has a diagrammatic structure; it obviously does so in the relations between its components: eyes, nose, mouth, brows, and all the rest. Any description of *face* is false to it because its defining character is its *infinity*. Semiosis is infinite as well, and one of the main assumptions of a Universe of signs is that there can be no isolated semiosis. Any attempt to give examples of a sign is false to what the sign is (a triadic mediation among mediations). I shall discuss this in section C of the present chapter. *Face*, like the *other*, to which *face* is a gateway is infinite. Semiosis, as well, is infinite. The *face* of the *other* makes the self acknowledge that the genuine non-self which the self is beholding cannot be circumcised. The *other* cannot be comprehended in a totality. Semiosis brings the same awareness regarding Truth and the pursuit of truth: it is never ending. As such, a semiotic approach to *face* is possible without narrowing the genuine immediacy of *face* to a sum (totality) of concepts.

Face, if understood as meaning phenomenon, is descriptive for the human *Lebenswelt*. Being a species specific Iconic signification, *face* characterizes the human *Lebenswelt* without implying a discontinuity in the biological realm between human and non-human. All species experience icons: the semiosis' regional ontology, its specific *a priori* ontology, is the same. The phenomenology of face explains a human being's re-cognition of another human being in her intimacy, engaging in an assumed intersubjective relation of two self-aware consciousnesses, making each other possible as *personality* (Chapter 5). Understood in the broader horizon of biosemiotics, the semiotic account of *face* avoids the danger of anthropocentrism or human/non-human ontological dichotomy. This is the general epistemological advantage of performing phenomenological analysis with a semiotic consciousness (that the Universe is constituted of signs), placing phenomenological analysis in the context of semiosis, much broader than the strictly anthropologic horizon where signification is regarded as constructed within cultural boundaries, and, as such, purely symbolical and devoid of iconicity.

Levinas' phenomenology of face is a proper Husserlian approach to the encounter between self and non-self. In an introduction to Levinas' *Totality and Infinity* John Wild recommends Levinas' philosophy as the proper candidate for a contemporary non-dualistic phenomenology. He declared that "Ever since the beginning of the modern phenomenological movement disciplined attention has been paid to various patterns of human experience as they are actually lived through in the concrete." (Wild in Levinas, 1961, p. 11) Peirce as well paid attention to experience as lived. Peirce's logical approach to life (semiotics) led to the concepts of *sign* and *semiosis*, which, in Peirce's philosophy, came to have a cosmological relevance. The phenomenological school did not insist systematically as much on *meaning*, though Husserl's mereology stands on his theory of intention and his concept of *signitive act*. Nevertheless, both Peirce's semiotics and Husserlian phenomenology qualify as logical approaches to life and develop a suprasubjective ontology. Thus, the developing phenomenological philosophy of education can develop together with, or rather into, a semiotics of education. Semiotics can offer its own tools to the

qualitatively descriptive analysis of education: sign, semiosis, the sign types, and the classes of signs describe the real phenomena which phenomenology is interested in.

Some accounts of phenomenological philosophy are still embedded in modern dualism. As an example, Wild considered that Sartre's phenomenology presents the danger of a dualistic ontology, because of the dichotomy between en-soi and pour-soi (in Levinas 1961, p. 11). Heidegger, Wild argued, is "the only contemporary thinker who has formulated a total ontology which claims to do justice to the stable results of phenomenology and to the living existential thought of our time." (p. 11) Nevertheless, there is one issue with Heidegger's phenomenology, a point at which it fails to be entirely coherent with Peircean semiotics as well: Heidegger's phenomenology is exaggeratedly anthropocentric (Wild, p. 11). As such, Levinas' philosophy of the *Other* remains the most suitable candidate for a suprasubjective phenomenology. If *face* is accounted for as *Icon*, then it gives an immediate embodied access to the *Other*'s *face* which is similar to the self's face while each face is obviously unique. Terms such as *love* or *agape* do not belong to Levinas' philosophical vocabulary but I argue that, on this joining of *face* as the ethical application of *Icon*, as phenomenological analysis, Peirce's doctrine of agapism reveals the spirit of Levinas' ethics. Thus, it can be argued that there is a re-cognition of *faces* that makes intersubjectivity, inter-personal relations, possible. The teacher-student semiosis requires the re-cognition of faces, the iconic level of a semiosis that reveals the similarity with the Other: the self and the Other are potential personalities. Another candidate, besides Levinas, is Merleau-Ponty, who developed a phenomenology of the body, on the basis of Husserl's phenomenology and von Uexkull's biology. For this, Stjernfelt commented that Merleau-Ponty's phenomenology confirms (unintentionally) several Peircean hypotheses (Stjernfelt 2007, p. 257-267). In his case it is particularly interesting that locating the animal in an "inter-animality" anticipates "intersubjectivity" (cf. Stjernfelt, p. 257). However, I shall not approach Merleau-Ponty particularly, as there is no need for the further development of the biosemiotic apparatus within this thesis. If philosophy of education will properly take the direction of iconic turn semiotics then Merleau-Ponty's work will prove an important pivot that will help phenomenology integrate in a biosemiotic framework.

In this chapter I show that the Husserlian phenomenological school is generally coherent with Peirce's semiotics and that particularly Levinas' philosophy centered on the genuine *Other*, who is situated beyond the self's concept of the other, is thoroughly coherent with Peirce's agapistic principle. The basic common idea is that by denying the Other, the self denies itself, thus losing any possibility of what Peirce referred to as growth, or evolution. Therefore, as in Peirce's case, approaching learning and education from Levinas' perspective inevitably leads to the life (local plurality) of the student-teacher relation.

To begin, I shall explain the general compatibility between Peircean semiotics and the Husserlian phenomenological school. Once these similarities underpinning both of these approaches are introduced I will discuss the place that Heidegger and Levinas can play in a semiotic or phenomenological postmodern,

non-dualistic approach to education. These two of Husserl's most influential students, Heidegger and Lévinas, are currently common references in philosophy of education and their works, following the lines of Husserlian phenomenology, loosely fit epistemologically with the Peircean Theory of Learning.

A. Edmund Husserl and Charles Peirce: logic grounded in phenomenology

Stjernfelt noted the possibility that Peirce actually inherited the term *phenomenology* from Husserl's *Logical Investigations*, works which Peirce had read (2007, p. 144). Also, Stjernfelt accounts the lack of interest between these two contemporary logicians on a mutual misunderstanding. Without going into details on Peirce's reading of Husserl and vice versa, below I point out the main reasons that interest philosophy of education, which qualify their philosophies as profoundly similar.

The main reason for the coherence between Peircean (iconic turn) semiotics and phenomenology (in the Husserlian tradition) is that both of these account for a non-psychologistic logic (see Chapters 1 and 3). Husserl's quest for *pure logic* has a similar aim with Peirce's quest for *semiotics*. Husserl's transcendental phenomenology is, as he put it, "not founded as the empirical science of the empirical facts of this field of experience." (1913b, p. 11). Husserl had in mind a notion of *transcendental experience* which comes close to Peirce's (suprasubecjtive) semiosis, precisely a *transcendence* of the *empirical* and the *a priori*, but not the Kantian *synthetic a priori*. Stjernfelt explained that Husserl inherited a concept of *a priori* different than that of Kant, stemming from the Austrian tradition, mastered, among others, by Husserl's professor and one of the first developers of mereological analysis, Brentano (Stjernfelt 2007, on Brentano see also Chapter 6). The main difference between the Kantian and the Austrian tradition *a priori* stands in that according to the latter it refers to the object of judgment, and not, like in Kant, to "anybody's 'judgment'." (Stjernfelt 2007, p. 176) This is precisely the assumption of a non-psychologistic logic. Both Peirce's and Husserl's logic are based on reality as *experienced*.

Husserl's version of *a priorism* is noticeable in his distinction between 'regional' and 'formal' ontology, which roughly corresponds to Heidegger's distinction between ontic and ontological. Formal ontology consists in the study of abstract concepts and relations − the possibility of mereology. As such, formal ontology manifests *analytic a priorism* and regional ontologies are manifested *synthetic a priorism* (Tieszen 2005). Mereology, however, is applied in regional ontologies, which deal with the various domains (regions) of being (language, *Lebenswelt*, a species specific *Umwelt*, a scientific paradigm). Thus, "Husserl's idea is to base the mereological description of language on certain ontological presuppositions, namely the privileging of the noun and sentence, respectively, as independent entities (after the Scolastic distinction between categorematica and syncategorematica, respectively; the former possessing an autonomous signification)." (Stjernfelt 2007, p. 164) The mereological character of regional

ontologies makes phenomenological analysis possible. Therefore, Husserl's *a priori* is strictly bound to the supposition of diagrammatic coherency. This means that the rational character of the relations between parts and wholes within a regional ontology (iconic syntax) is what makes phenomena intelligible. Stjernfelt's statement that "Husserl's mereology further forms the basis for his reinterpretation of the a priori," (p. 163) qualifies mereology (that reason is diagrammatic) as a phenomenological a priori. This is to say that (only) grammar is a priori. Grammar is, of course, a priori to the content which is grammatic, but there is no grammar without a content, without elements in grammatical relation. This a priori grammar is iconic syntax. This is equivalent to Peirce's idea that pure Icons (hypoicons) are matters of Firstness. By necessity, icons (Firstness) exist objectified (Secondness). The revealing insight is that analogy, in the form of diagrams and metaphors, gives rise to real possibilities. No ontology would be possible unless through analogy, not an analogy performed by a third, but an analogy between the constituting parts which evokes and in itself already is the third, the mediation.

Peirce himself justified the psychological sciences' dependence on metaphysics by the "intimate bearing of logic upon grammatical syntax." (CP 1.250) The assumption here is that regional ontologies (language) resemble the structure of formal ontology and, therefore, a phenomenological *a priori* can be noticed in both (grammar is prior to language). In Peirce's presentation of the ten classes of signs (see Chapter 2) the combination of sign types by which sign classes are obtained is possible due to a certain *syntax* that *per se* is meaningful. For instance, in explaining the combination of an Iconic Sinsign ('*it is*') and a Rhematic Indexical Sinsign ('*John!*' as a *spontaneous cry*) which leads to a Dicent Sinsign (a simple proposition, such as '*It's John!*'), Peirce mentioned that "the mode of combination, or *Syntax*, of these two must also be significant." (CP 2.257) This means that these signs, an Iconic Sinsign and a Rhematic Indexical Sinsign contain some qualisigns, which behaving as hypoicons[34] in their composition, assure the iconic syntax between the two signs (this is to say that there is a basic similarity between *John* and *it is* – they share in participating, or at least in potentially participating, in the physiology of arguments). The signs can be combined into one Interpretant sign because of their diagrammatic compatibility which is ontological syntax. In Chapter 7 it was explained that this syntax is diagrammatic coherence. This leads to another important reason for this epistemological allegiance, namely the equivalence between Peirce's realization that something is meaningful (intelligible) because of its diagrammatic character and Husserl's assumption that any syntax can be analysed mereologically. Putting it simply, both Peirce and Husserl accounted for the rational character of relations among parts and wholes. This is a cornerstone for both of these accounts of

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[34]This is precisely the place that hypoicons occupy in signification, since, like qualisigns, they are Firsts of Firstness. The qualisign is a signifying quality, before it is embodied so as to act as sign and inevitably becomes an Icon (see CP 2.244, and Chapter 2), and the hypoicon type is an Icon in its Firstness, prior to its Second relation, that of similarity to its Object, which defines it as Icon.

logic. This compatibility was explained thoroughly by Stjernfelt (2007) who termed this assumption *iconic syntax*.

Also, they both regarded meaning as general, that is universal (Stjernfelt 2007, p. 145). Mediation, Thirdness, is, according to Peirce, the very definition of generality. Moreover, like Peirce, Husserl seemed to account for the idea of the universal as tendency. Peirce, by his *extreme realism*, was a pioneer in considering laws (natural, social, cosmic, etc.) as general tendencies and not definite, rigid, absolutely determined states of affairs which under any circumstances present the same identical behaviour and outcome (e.g. Argument signs tend to the truth). Husserl as well remarked this, stating that such an observation has profound consequences for logic:

"Norms, however, do not say "universally it is so", but rather "so it should be"; thinking is supposed to take this form, or else it is not, nor can it <be> correct thinking. It falls short of the goal of truth. This may, for the time being, give an inkling, an inkling of a certain difference in the way in which psychology on the one hand, and logic on the other, are concerned with thinking." (1906/07, p. 4, §1, 3-8)

Peirce expressed in a few words the idea that the indeterminacy of real universals is a necessary condition for a phenomenologically based logic:

"It would be a great mistake to suppose that ideal experimentation can be performed without danger of error […]. The results of induction from sensible experimentation are to afford some ratio of frequency with which a given consequence follows given conditions in the existing order of experience. In induction from ideal experimentation, no particular order of experience is forced upon us; and consequently no such numerical ratio is deducible. " (CP 3.528)

Husserl developed a concept and method of analysis of *pictures* in conformity with his mereological method. It is mostly developed in the third *Logical Investigations* (Husserl, 1990b) and in *Phantasie, Bildbewusstsein, Erinnerung* (Husserl, Husserliana XXIII, 1989-1925). Husserl's concept of *picture* is an example of the Peircean icon. It is only an example of icon, which is a more comprehensive concept, because it covers less phenomena than the Icon type since for its functionality it requires termini that are strictly physical and non-mental, and termini which are strictly mental. Each of the termini of the Peircean sign, as presented, can be anything; it is their triadic cooperation that gives the relation its character as sign. Husserl's *picture* has, like any sign (and thus like the icon), three components: *picture* (physical), *pictural object*, and *sujet*. The *picture* (the first element of picture) is the physical and mind-independent aspect of a picture: the canvas with its traces of paint, the ink on a piece of paper, etc. The *pictural object* is the representing object, the analogical ground for the depicted subject in its real instantiation. The *sujet* is the fictional depicted (represented) object. Between picture, pictural object, and sujet, in Peircean terms, an iconic semiosis takes place to constitute the picture act. According to Husserl, picture acts are possible because of

the similarities between the three parts – this is the diagrammatic (mereological) character of the picture act, its iconic syntax. It is important to note that while some of the elements of the picture act belong strictly to the mental realm and some strictly to the non-mental, because of this very bringing together of mental and non-mental in one act, the picture act as a whole is suprasubjective.

Husserl also introduces the concept of *contradiction* which, together with that of *similarity*, is necessary for the picture act. There is similarity but also contradiction within a picture act so that the three elements, while similar, do not coincide. Through the concept of *contradiction* Husserl explained that the coherency of a picture act demands *similarity* only, and not *identity*. Each of the three elements of the picture act is always distinguishable from the other two. There is *contradiction,* for example, between some yellow and blue traces of paint (*pictural object*) and a flower (*sujet*) because a flower *is* not some traces of blue and yellow paint. This contradiction is necessary so that traces of yellow and blue paint can actually signify a flower. This is equivalent with Peirce's stress on the irreducible threefold structure of the sign: if two of the termini of the relation would coincide the relation would be a dyad, not a triad, and, therefore, not a sign.

This mereological analysis applied to picture acts – obvious cases of iconic signs – demonstrates the coherency between Husserl's transcendental phenomenology and Peirce's schematic semiotics (see also Chapter 14 in Stjernfelt 2007). However, the Peircean Icon, by covering any phenomena of signification by similarity, can be applied to situations to which Husserl's picture act is not meant to be applied. Such would be human intersubjective relations, particularly, the focus of this thesis, the teacher-student relation. As such, Peirce's Icon can also offer an insight on the grammar of human relations inferred from the grammar of diagrammatic reasoning generally.

As such, the phenomena specific to educational contexts can be analysed diagrammatically. The classroom, a regional ontology, is understood as *Lebenswelt*. It is not merely the sum of its composing parts (each student, student social groups, teachers etc.), but it can be analysed mereologically, in terms of part-whole relations and relations among parts. Here the concepts of icon and hypoicon prove to be highly relevant. The classroom needs its own iconic syntax, which results from its diagrammatic structure. Every student comes from different *Lebenswelten* and they need to develop a common grammar, so as to develop semiosically a *Lebenswelt*. Iconic signification is the symptom of personal compatibilities. An inner relation of the regional ontology (*Lebenswelt*) enhances the educational potential, the real possibilities of free discovery, if and only if it is agapic. As agapic it is characterized by (proper, fluent) argumentation. Even if such a signification is argumentation, a personality is available to another as pure Icon. That the teacher is available to a student means that the teacher has nothing to hide towards the student and, as such, the teacher as personality is *operational* for the student. The agapic fulfilment among composing parts (diagrams) assures the iconic syntax of the whole *Lebenswelt*. As agapic, the *Lebenswelt* is in ecosemiotic harmony, each composing part (student, group of students) being expressed as personality. When a diagram that represents

the learning phenomena of the classroom is possible then that classroom is a coherent *Lebenswelt* with no obstacles towards intersubjectivity (personal suprasubjectivity).[35] Learning, in this case, is, in Peirce's terms, a real possibility. Only as such the possibility of growth is evoked, since personality is a specific character of the human *Lebenswelt* which implies the understanding of a self as dynamic and infinitely projected in the future (Chapter 5, CP 6.157). Understanding another self as personality, as local plurality in her own right, leaves room for evolution in the future, the relation between self and non-self not being saturated in the present (satisfied) by necessity, as a phenomenon of Secondness, but fulfilled agapically in the infinitely distant future, as argument. This is the very integration of non-self into self. This integration of selves assures the diagrammatic character of the *Lebenswelt* in which the life forms (local pluralities) share a common life.

Such a semiotic analysis of classroom phenomena can easily identify educational problems. They are manifested as a diagrammatic unfitting, and, as such are understood as a denial of engaging into relation with other selves (other students, teachers) and the impossibility of constituting a *Lebenswelt* together. Such situations are denial of life itself, as life has the purpose of agapic fulfilment.

The issue of the intelligibility and sensibility of reality brings forth a third reason for the collaboration of the Peircean and Husserlian traditions. It consists in the recognition of *Lebenswelt* as a result of the analysis of the constituting parts of *Umwelt*. This is an inheritance from the scholastic idea that the physical environment is of itself sensible but not intelligible. Deely clearly linked the account of suprasubjective reality with the idea of diagrammatic coherency (though he did not express this in terms of diagrams or grammar):

"Hence the objective world, seen in relation to itself, already consists of a mixture of mind-independent and mind-dependent relations. But these relations are undistinguished as such. They are not explicitly recognized as mind-dependent, but simply function in accordance with their objective mutual equivalence as relations within the apprehension constitutive of *Lebenswelt*." (2000a, p. 54)

The suprasubjective and the mental and non-mental undistinguishing within *Lebenswelt* becomes all the more clear in Heidegger.

B. Martin Heidegger and Charles Peirce: retaking of medieval philosophy of education

Heidegger's work can be used in further research along the principles set by the Peircean Theory of Learning for the above mentioned reason. It directly envisages diagrammatology. Deely observed that the Heideggerian *present-at-hand* explains the (Peircean) category of Firstness:

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[35] It is needless to specify that the self-conscious signs (pupils) partaking in a Lebenswelt (classroom) are vividly expressing their personality. It is not merely their freedom to express *personal tastes* or *personal preferences*. This is a matter of semiotic ontology, namely that agapic semiosis manifests selves as personalities by placing them in dialogue. Personality is revealed in relation to personality.

"Thus the first action of the understanding is to apprehend its objects in such a way that they *can eventually* be understood critically, and this is to apprehend the objective world under that mind-dependent relation which allows its contents to appear, truly or falsely, as present-at-hand and not merely ready-to-hand (as they appear to the animals which are not human).

Whence, to Heidegger's question, "Why does Being get 'conceived' 'proximally' in terms of the present-at-hand *and not* in terms of the ready-to-hand, which indeed lies *closer* to us?", the answer lies in the difference between zoösemiosis as common to animals and anthropo semiosis as unique to linguistic animals. *Ens ut primum cognitum*, "Firstness", which constitutes the species-specifically human mode of apprehension underlying the exaptation of language for communicative purposes and at the root of the transformation of *Umwelt* into *Lebenswelt*, does no more than establish the foundation for the eventual arising thematically of questions of the form, "What is that?" Ready-to-handness neither requires nor admits of any such thematic development, for it contains no apprehension of otherness in the required sense." (Deely, 2000a, p. 54-55)

Signification of Firstness is mostly iconic (Icons signify their Object by means of similarity – the element of Firstness). Therefore, intelligibility of reality – that which makes learning possible – is accounted by both Peirce and Heidegger in the same manner. Deely suggests that the common root of this similarity between Peirce and Heidegger stems from the scholastic medieval idea of *primum cognitum*. Certainly, Peirce and Heidegger's thorough scholarship in medieval philosophy and appreciation of Duns Scotus is a common ground for both of their detachment from modern philosophy. Peirce's Icon accounts for the same phenomenon as Heidegger's *present-at-hand*. The Icon contains a direct (present) apprehension of otherness, as iconicity describes the way in which a Representamen stands for a Second, its Object. The second of the sign is a matter of otherness. This does not contradict the Icon's belonging to Firstness, because the way in which it signifies otherness – the Second – is a matter of Firstness, namely similarity. Similarity is sharing of qualities and, *quality* is a resource that the sign itself (the sign's Representamen) possesses. Thus, the Icon is present-at-hand – the self's (First) similarity to another (Second). The mediation itself, which happens via similarity, is the Third of the Sign, the Interpretant.

From the perspective of iconic turn semiotics this approach is problematic in one aspect, though. Deely's strong distinction between zoösemiosis and anthroposemiosis, following on the lines of Heidegger's anthropocentric existentialism, is not coherent with the biosemiotic project underpinned by the continuity of semiosis among the various self consciousnesses. Biosemiotics acknowledges that the semiosis of which a human being is responsible is species specific because the semiosis of which a dog or an amoeba are responsible are species specific in their turn. This difference among the species is justified in biosemiotics by the obvious remark that an obviously different *signifying body* shapes a particular *Umwelt*. Thus, if the *Umwelten* of two dogs can never be

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identical, surely their *Umwelten* are more similar than the *Umwelt* of a dog and that of a human being. This is because the *semiotic bodies* of two individuals of the same species are more similar than the semiotic bodies of two individuals of different species. The problem has no easy reconcilliation and Heidegger's antropocentrism has often been the target of critique.

In what concerns pedagogy, Heidegger's stand is very close to that of Peirce. Following each of these two authors' thought, learning (observation generally) can only be understood as it happens, as the present activity of a self, as semiosis, a phenomenon belonging intimately to a certain My-Now instance of reality. Philosophy, at least in its coenoscopic stage, already belongs to any human being prior to her initiation in any systematic education. In both Peirce and Heidegger there can be noticed an emphasis on the idea that any educational system needs to develop its teaching practices in awareness of this. It stems explicitly in *Being and Time* that the usual *everyday* experience by which acquisition of things proceeds (the semiosic expansion of the self) shapes Dasein:

"This way in which things have been interpreted in idle talk has already established itself in Dasein. There are many things with which we first become acquainted in this way, and there is not a little which never gets beyond such an average understanding. This everyday way in which things have been interpreted is one into which Dasein has grown in the first instance, with never a possibility of extrication. In it, out of it, and against it, all genuine understanding, interpreting and communicating, all re-discovering and appropriating anew, are performed. In no case is a Dasein, untouched and unseduced by this way in which things have been interpreted, set before the open country of a 'world-in-itself, so that it just beholds what it encounters." (Heidegger, Being and time, p. 213, SZ 169)

The coherent iconic syntax (diagrammatic character) between one self's coenoscopic understanding and certain idioscopic aims is this self's disposition to learning a certain subject (for a semiotic approach to the concept of disposition in education see also Pikkarainen 2013 and 2014). On this semiotic account, disposition, as the coherent iconic syntax between Icon and Index in the case of a learner, can be identified with the Heideggerian *openness*, "which belongs to every being according to its subject matter and according to its own ways of Being, prescribes the specifically determinate, possible and appropriate ways of access to the beings that are to be apprehended." (Heidegger G29/30 135 in Ehrmantraut, p. 155)

Ehrmantraut (2010) considers that from Heidegger's understanding of the relation between *philosophy* and *Dasein* a pedagogical philosophy stems. As in the case of the Peircean Theory of Learning, Heidegger found that the rationale of teaching is the *care* for the *other*. According to Ehrmantraut, in *Being and Time* it occurs that the teacher's leadership is, actually, a 'following' (p. 44). In the same manner, the agapic evolution of the teacher-student relation brings the teacher to the position of seeing the student as *neighbour* (this is the term used by Peirce, CP

6.288), one to whom she is close, to whom the self has the impulse of fulfilling her highest desires (Chapter 8).

Heidegger's philosophical pedagogy is determined by the assumption that *philosophy* belongs to *Dasein* and that *Dasein* is immersed in *philosophy*. In the same way, according to Peirce the self is immersed in philosophical induction (coenoscopy). Philosophy is experienced reality. In Chapter 4 it was presented that for Peirce philosophy takes place, coenoscopically at first, in every man's *waking hour of life* (CP 1.241) and, thus, this is from where education takes a student further into an observational discipline. Also, philosophy, science, and any potential object of liberal education pertains particularly to, in Peirce's terms, "*flesh and blood*" (CP 1. 337, CP5.424, see Chapter 7) or, in Heidegger's terms, to "our choosing, willing, doing, and letting." (G275-6, in p. 31 in Ehrmantraut, p. 31) Philosophy, or knowledge in the broadest sense, is not an abstraction but, life concretely. For both Peirce and Heidegger it is essential that there can be no philosophy without the philosopher (see Chapter 4). It characterizes a human's *Lebenswelt*, not only generally but "our Dasein now and here, in this moment [*Augenblick*] and in the perspectives which this moment has, in which we prepare ourselves to act from out of philosophy." (G275-6 in Ehrmantraut, p. 31) Philosophy characterizes *Dasein*. It appears that Heidegger's understanding of *philosophy* mostly coincides with Deely's semiotic concept of *Lebenswelt*: it is a human being's existential environment. As explained throughout the present thesis, the phenomenon of learning always happens as the activity of a self-aware web of signs (a local plurality). On both accounts, Peirce and Heidegger, learning is experiential and the position to teaching practices is the result of the general understanding of philosophy. Ehrmantraut (2010) noticed that for Heidegger the introduction of students to a new subject should consist in "awakening latent possibilities within the student, not of conveying new information." (p. 41) This can be seen as a statement for liberal education in the sense intended in the present thesis, as promoting knowledge for the purpose of knowing (growth of signification).

The Peircean Theory of Learning developed in the present thesis states the same: education envisages the evolution of the student's *Lebenswelt* in relation to taught subjects. The Peircean Theory of Learning affirms that the student and the teacher have to constitute an agapically evolving system of signification. Thus, the student's horizon of real possibilities (*openness*) expands towards that of the teacher. This growth of *Lebenswelt* aims at enhancing the student's possibilities of discovery within a curricular topic rather than the mere providing of new information on the topic.

Following both Peirce and Heidegger, education aims at cultivating something more specific (idioscopic science, in Peirce's terms) than every day observation (coenoscopic science, philosophical everyday induction). The student can be aware only of idioscopic possibilities which are in iconic coherency with her coenoscopy – with her everyday awareness. That is why the first purpose of the

teacher is to expose her own *Lebenswelt* to the student: so that the student can observe new possibilities. This line of thought is shared by Peirce and Heidegger. It is safe to assume that it is an inheritance from the medieval liberal education *Lebenswelt*.

Peirce's semiotics and Heidegger's existential phenomenology can be joined in the argument for the importance of a liberal curriculum. Heidegger did use the term *re-discovery* to describe *genuine understanding*. The present Peircean Theory of Learning, as well, assumes that any genuine apprehension is a *discovery* of meaning, under the form of a re-cognition of *Lebenswelt*. Such is generally the aim of liberal education, seeking new hermeneutical potentialities from the students, not a mere melioration of certain practices required by society. However, one must keep in mind that in some regards (e.g. anthropocentrism) these two approaches are irreconcilable.

C. Emmanuel Lévinas and Charles Peirce: Otherness

In this section I develop a brief analysis of the relation between self and non-self by using a joint approach, bringing together Levinas' phenomenology of the face and Peirce's schematic semiotics. This analysis emphasizes the relevance and fertility of Peirce's concept of *Icon* for intersubjective relations.

In previous chapters I explained that Levinas' phenomenology should be an interesting concern for a Peircean scholar generally and, all the more, particularly for the endeavour of developing a Peircean educational philosophy (Chapter 1, section B and Chapter 3, section C.ii). It is interesting generally for Peircean semiotics because of the general reasons for which phenomenology is of interest, but, also, because in different terminology and coming from different paradigms, the cornerstone of Levinas' and Peirce's philosophies appeals to be the same: the ontological structure of the world is determined by the relation between self and non-self. It is curious that so far, apart from Stevens (2009) where Levinas' ethics and Peirce's semiotics are integrated in an ethical-aesthetics, there is no literature offering a thorough comparison of these two, while the other 20th century major phenomenologists have been analysed in regard to Peircean semiotics: Husserl's logic by Stjernfelt (2007), Heidegger's existentialism by Deely (2001a), and Merleau-Ponty's phenomenology of the body in the context of biosemiotics, by Stjernfelt (2007 and in Nöth 2006) and by Elke Müller (in Nöth 2006). The project of comparing Peirce's agapism with Levinas' phenomenology of the face should be pursued, particularly within philosophy of education.

Below I briefly translate a Levinasian approach to intersubjective relations in Peircean semiotic terms. The aim here is to argue a certain compatibility between Peirce and Levinas and, on this basis, emphasize the relevance and insights that Peirce's semiotics brings. If the analysis presents some conceptual dilemmas it is because the purpose is not to find equivalent concepts between Peirce and Levinas. The concepts are not equivalent, but the analysis proceeds rather in the spirit of critical common sense.

What for Levinas is *phenomenology of the face* can be regarded as a manifestation of Peirce's agapistic principle of evolution. As Heidegger, throughout his philosophical work Levinas focused on human relations. However, his phenomenology of the face is not the result of an anthropocentric philosophical perspective. His focus on human relations is simply the consequence of an interest, as it is in human intersubjectivity that we, as human beings, can notice the ultimate expression of love. This comes down to a denial of the typically modern or classical theories of knowledge, whereas proper knowledge has to be free of the self's intervention in knowledge:

"Truth is in effect not separable from intelligibility; to know is not simply to record, but always to comprehend." (Levinas, 1961, p. 82)

As Stjernfelt argued about Merleau-Ponty that he noticed the prefiguration of intersubjectivity in the life of non-human animals, so it can be argued about Levinas that he anticipated the importance for ontology that the account of suprasubjectivity in the phenomenological school will have (e.g. it gave iconic turn semiotics the awareness of a phenomenological semiotics). He considered that Husserl's intention theory is a new gateway for ontology:

"This possibility of conceiving contingency and facticity not as facts presented to intellection but as the act of intellection – this possibility of demonstrating the transitivity of understanding and a "signifying intention" within brute facts and data (a possibility discovered by Husserl, but attached by Heidegger to the intellection of being in general) constitutes the great novelty of contemporary ontology." (Levinas, 1998, p. 2)

In other words, Truth stands in the Interpretant; it is a matter of evolution, which reveals it, and of adaptation, as life forms adapt to the truth, and, as such it is a matter of interpretation. By adapting to the truth, being presents a certain intellection. The Interpretant to which evolution tends is an Argument and it is always infinitely distant (see Chapter 1).

If for Peirce *life first came about* due to semiosis (Chapter 1, CP CP 6.322), Levinas uses the above concept of intellect to explain life, which is tied up to Husserl's concept of *signitive acts* (intention theory) and, thus, an account of suprasubjective ontology. Like semiosis, *intellect* is continuous and circular. This perspective, not surprisingly, leads to the dismissal of concepts such as *misunderstanding* or *misinterpretation*:

"We exist in a circuit of intelligence with the real; intelligence is the very event articulated by existence. All misunderstanding is simply a deficient mode of understanding." (Entre nous, p. 4)

By mentioning a *circuit of intelligence with the real* Levinas should gain the attention of biosemiotics research. For this reason, for a Peircean approach to education, which is committed to the iconic turn take on Peirce, Levinas is mostly interesting. Levinas developed a phenomenology essentially centred on the *other* and the *I/Thou* relation and his work has been explored already and extended within philosophy of education.

Another reason that should stir the interest of Peirceans towards Levinas is that, while western philosophers, they both had a thorough knowledge and appreciation of Scripture. Of course, it is the case of Christian literature for Peirce and Judaic literature for Levinas. However, some similarities stem from this, particularly concerning the 'Golden Rule,' the cornerstone of Peirce's evolution theory. To develop a proper Peircean-Levinasian educational research framework it would be another project in itself, which is not the attempt here. A framework bringing Peirce's semiotics and Levinas' phenomenology together already started being developed by Stevens (2009) who explained that Peirce's semiotics and Levinas' phenomenology of the face can be integrated in an ethical aesthetics. On the basis of the same observation I only highlight the directions on which a Peircean educational philosophy can also benefit from the phenomenology of the face.

The *I/Thou* relation, the matter of relating to the *Other*, and *Face* are metaphysical matters in Levinas' work, having cosmological dimensions. Only in the face-to-face encounter can there be an ethical fulfillment of a teleological cosmology. In the same time, his metaphysics is focused on the simplicity of life, which is an event of existence, prior to any concepts. For instance, *face* is the authentic face available only in the genuine face-to-face unrepeatable situation; it would be wrong even to analyse it as a phenomenon. The phenomenology of the face is a more comprehensive philosophical account than anthropocentric existentialist approaches to self, otherness, and such relations. It stems from a cosmological endeavour, not being a tool or concept meant to explain social relations, human communication, or, generally, mere anthropological phenomena. Standish (in Egéa-Kuehne 2008, p. 56) found several potential dangers that might stem from applying Levinas' metaphysics to approach social and psychological concerns, without having a firm consideration of the real nature and interest of his metaphysics, such as multiculturalism, the assimilation of *Other* in "a politics of recognition," "a psychology of dialogical relations," and generally in communication. Peirce's semiotics presents similar dangers when applied to areas such as culture, social dynamics, or communication.

Levinas' phenomenology reaches beyond the limitations of the continental tradition because of his joining together of western philosophy and a thorough scholarship in Scripture and Talmud. Thus, in Levinas, 20th century western metaphysics is fertilized by Judaic literature. If in some aspects western metaphysics, the entire vast tradition, might have its doorways towards skepticism, towards *eparhe*, in these slippery places Levinasian philosophy is invigorated by the eschatological optimism typical of the Judeo-Christian tradition. As a result, it leads to the same general conclusion for philosophy at which Peirce arrived in his metaphysical quest through the reading of Scripture: agapism, that love (αγαπη) for the Other (for the neighbour) is the sole rationale of wisdom (σοφια) and the principle of all reality. Peirce's pragmaticism, his trust in critical common-sense and his evolution theory, the belief that evolution is ultimately driven and fulfilled agapically, is arguably a similar way out of

skepticism. That it is in the nature of a semiotic Universe not to be subject only to chance and necessity brings hope for freedom to the western mind, a way out of modern skepticism. That chance and necessity are transcended by and into love is the sort of hypothesis that the skeptical philosopher would be most inclined to be skeptical about.

Peirce's lifetime investigation of signification led him to the conclusion that the principle of *agapic* evolution is active in the entire Universe of signs, the Argument being characterized and fulfilled by overwhelming, self-denying love for the neighbour that transcends chance and necessity (Chapter 7) and that, therefore, the purpose of life is love for another consciousness. This is explained as the integration of non-ego into self through semiosis, the phenomenon by which life came about. Levinas' argues for the same self-denial (love) for the Other, focusing mostly on this relation. On both accounts, the rationale of existence is love. Peirce noticed it in signification generally, Levinas noticed it particularly in human relations, on which he focused, but in both cases the stake is a metaphysical principle of existence.

Levinas' account of *face* leads to a *phenomenology of face* which is an ethical account of the *physiology of arguments.* Therefore, *face* is accessible as Icon. *Face* gives access to the genuine Other, situated in front of the self:

"It is primarily a matter of our finding a vantage point from which man ceases to concern us in terms of the horizon of being, i.e., ceases to offer himself to our powers. The being as such (and not as an incarnation of universal being) can only be in a relation in which he is invoked. That being is man, and it is as a neighbour that man is accessible: as a face." (Entre nous, p. 9)

Like a pure Icon, *face* is prior to any conceptualization of it:

"The face is the very identity of being; it manifests itself in it in terms of itself, without a concept. The sensible presence of this chaste bit of skin with brow, nose, eyes, and mouth, is neither a sign allowing us to approach a signified, nor a mask hiding it." (Entre nous, p. 33)

By *sign* Levinas here does not mean Peirce's sign-relation, relational being, but rather the sign (signifier) implying a signified, the concept stemming from the Saussurean tradition. The features of the face – *chaste bit of skin with brow, nose, eyes, and mouth* – can be understood as Peircean Qualities that form the Icon that Face is. These Qualities are in relation, which means that they have an inner iconic syntax. Face has its own grammar, that is. This grammar makes it re-cognizable. This is not an analytic approach to *Face* or to the *Other*, it is not an attempt at conceptualizing the non-conceptual personality of otherness. The fact that iconic relations give an insight towards the Other is a cosmological matter. As semiosis fulfilled agapically is the rationale of the emergence of life, it "upset the meaning and plot and philosophical rank of ontology." (Entre nous, p. XII-XIII) It is "a uniqueness indiscernible by logic, in responsibility for the other person, an undeniable election, bearing love in which the other, the loved one, is to the *I* unique

in the world." (Outside the Subject, p. 3) While acknowledging the difference between what Peirce generally means by *logic* – the cooperation of triadic relations – and what Levinas means by it here – a method of argumentation, linked to ontology as it might be – it is interesting that this statement stands in both cases. Firstness is not governed by the laws of logic. The Other as Icon is *indiscernible by logic*, because the pure Icon in itself does not reach the order of logic because it is not a Predicate (Rheme) yet. When the Icon becomes Predicate the *I* remembers itself because it is conceived as subject (Secondness) of the Other.

To arrive at the Other as Icon, at the Other as First in her own right, presents the same difficulty as grasping Firstness generally: any thought (concept) about it is false to it. In the previous chapters the fulfilment of agapism was presented as Thirdness, as an Interpretant which is an Argument. This is so, but the chance to evolve together agapically springs from the giving up of the sense of *I* as First in favour of the other. Within the semiosis between *I* and *Other*, the *Other* is the Representamen predicating, *I* is Object, to translate Levinas in Peircean terms. This is to say, as Levinas, that "Conscience welcomes the Other." (Totality and Infinity, p. 84)

It does not suppose a complete oblivion of self, of the *I*, but simply following Peirce's 'Golden Rule,' by giving to the Other (to the neighbor) the semiosic primacy. Levinas did not argue for the oblivion of the self, but the willingness to sacrifice for the other:

"To welcome the Other is to put in question my freedom." (Totality and Infinity, p. 85)

The denial of the self for the Other needs to be "even to the point of sacrifice, even to the possibility of dying for him or her" (*Entre nous*, p. xii). To acknowledge the Other as First and the self as Second, as Object of the Other as Representamen, can only occur fugitively, of course, in the *imaginary moment* (Chapter 5, part C), when one can operate on another as on an Icon. By being predicate for the other and, in turn predicating with the other, semiosis can evolve by the principle of agaspism, towards I-Thou as argument. When I-Thou is argument and there are no dichotomies in the teacher/student relation, symmetry and asymmetry are no longer issues. In accordance with Levinas, from the perspective of the self, *I* died in the face of the *Other*, for the *Other*, choosing not to kill the *Other*, not to replace her with apperceptive otherness. Therefore from each of the selves' perspective the relation is asymmetrical, Thou prevails (on the asymmetry of I/Thou as teacher-student in Levinas see Joldersma 2002). Thou is First. However, this asymmetry does not last as I/Thou evolves as one sign into Argument. There is no more teacher and student, there is one sign, *us*, and as a diagrammatically coherent whole this sign evolves.

I consider that this analysis, managing to approach in terms of signification phenomena the I/Thou intimacy, confirms the fertility of Peirce's semiotics, pointing out what should become an object of research for Peircean scholars generally and semiotics of education particularly.

Chapter 10
Possible Objections

In this chapter the Peircean Theory of Learning developed in the present thesis is contrasted with different approaches to education. I critically compare the theory with three mainstream approaches by answering to the divergences that occur. These three approaches are (1) (mainstream) pragmatism (Dewey and James' strand of pragmatism, in its contemporary form exemplified by Koopman), (2) humanism, and (3) instructionalism. I consider that by answering to the immediate objections that would stem from these schools the epistemological position of the theory is clarified and strengthened. Below I treat each of these approaches individually.

1. Pragmatism

From the mainstream understanding of pragmatism as theory of knowledge there might stem one immediate critique. In the perspective of a of strand pragmatism developed on the lines of James' extreme (radical) empiricism, the Peircean Theory of Learning might seem to be founded on a theoretical inquiry, not paying attention to experience and thus betraying its pragmatic stand. The logical exploration of sign cooperation, of an almost analytic fashion, might be suspected of ignoring real life experience. I explain that, because the very nature of Peirce's *sign* concept places any analysis within phenomenology, this is not the case.

Strand (2014) argued that it is pointless to describe Peirce's philosophy as a *philosophy of experience*, but rather "we are dealing with a philosophy *in* experience." (p. 436) I argued that according to Peirce all knowledge is experience. As such, all sciences are observational and idioscopy is not possible without coenoscopy (Chapter 4). This could not be stated more clearly than in Peirce's words: "and there is no knowledge antecedently acquired in the light of which experience is to be interpreted. The interpretation itself is experience." (CP 7.527) The identification of interpretation and experience is the key to Peirce's non-dualistic philosophy. By this firm consideration mind and body (organism) become synonymous. Perhaps there might be a difference of emphasis between these words (mind emphasizing the characteristics of *Innenwelt* and body those of *Umwelt*), but they both refer to an organism's life. Experience is not reduced to an account of mental activity that ignores sensitivity or the organism's other functions. Experience is not reduced to mere computation because it is understood as *life*. All mentality is manifested in and continuous with life itself: "experience is the entire cognitive result of living, and illusion is, for its purposes, just as much experience as is real perception." (CP 7.527) From here Peirce developed the three phenomenological categories (Firstness, Secondness, Thirdness), which aim precisely at accounting for a notion of *experience* which essentially includes thoughts, dreams, sense perceptions, and so on. Concisely, experience is "the total cognitive result of living, and includes interpretations quite as truly as it does the matter of sense." (CP 7.538) Therefore, we can analyse the cooperation of meaning phenomena. This analysis is

diagrammatic, since Peirce's threefold list of phenomenological categories accounts for the Universe as semiotic, a physiology of arguments, with a grammar that has its coherency assured by iconic syntax.

The conclusion is that pragmaticism brings a more comprehensive account of experience which allows the analysis of life itself, otherwise ungraspable in its wholeness by pragmatism as extreme empiricism (James) or as meliorism (Koopman). Pragmatism, unlike pragmaticism, did not focus on developing a suprasubjective ontology, whereas relation is being. Suprasujective ontology allows the mereological analysis of life. After all, Peirce criticized James' conception of experience which, even though not identical with sense-perception, is bounded to sensations and their patterns (Strand 2014, p. 436). This reduces the richness and wholeness of life:

"For me *experience* is what life has forced upon us, – a vague idea no doubt. But my *phaneron*[36] is not limited to what is *forced* upon us; it also embraces all that we most capriciously conjure up, not *objects* only but all modes of contents of cognitional consciousness." (NEM 3.834)

In the present thesis the conjuring up of modes of contents of cognitional consciousness was termed *re-cognition*. It constitutes a semiotic take on what in our entire experience is considered, in the most general sense, learning. Of course, there is nothing in experience that is not learning, but experience is not identical with learning. The learning that occurs (only) by experience is our re-cognition of the Umwelt or Lebenswelt.

Having this semiotic notion of experience in mind, it appears that the Peircean Theory of Learning does not focus on either theory or practice. The argument stems clearly from that semiosis is experience. Also, as a consequence of this, pedagogy is accounted for as a practical science (Chapter 4). The Peircean Theory of Learning actually argues that teaching can only be meliorated through practice. This explains also the refrain from giving practical advices, apart from the main argument, namely that love evokes learning. This is a non-dualist approach, theory and practice being two inseparable aspects of semiosis, not a dichotomy. This study might be subject to skepticism coming from pragmatism, since it is not sustained by any empirical data. However, this is so precisely because of its pragmatic nature. In its own terms, it is mostly an abductive study and at this level it would be unscientific and not pragmatic to search for laboratory empirical evidence. At this stage, laboratory examination would only deviate the study away from real life experience. Of course, since it claims to bring a theoretical insight the study itself is an idioscopy; it is a close look, with the aid of specific philosophical tools, at learning phenomena. Nevertheless, as an idioscopy it is in its abductive stage: it only advances the hypotheses that prepare the ground for a philosophical paradigm, namely the

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[36]*Phaneron* (φανερός) is another term which, semantically correct, Peirce used for *phenomenon* (φαινόμενον). Peirce's use of *phaneron* coined the term in philosophy (see CP 1.284).

Peircean branch of semiotics applied to education, in the context of the emerging edusemiotics and of the Peirce renaissance and the iconic turn.

2. Humanism

One might remark that the learning theory developed in this thesis, as in Peirce's philosophy generally as well, uses a language that appears technical, detached from genuine human life. This technical language might seem to betray the assumption that the theory is a doctrine of critical common sense (pragmaticism). Therefore, from the perspective of humanism there appear to rise two immediate issues that require clarification: (1) that the Peircean Theory of Learning is logocentric – a logic based philosophy which forces the richness and subtleties of human life, phenomena such us love and compassion, to fit in the rather narrow conceptual patterns of a system of argumentation – and (2) that the technical language of biosemiotics refuses to see the differences between learning in the human and in the non-human world, which are otherwise easily accounted for by common sense. Below I answer to these possible objections.

i. Logocentrism

In the 20th century semiotics and semiology came as a way out of the logocentrism of analytic philosophy and, generally, of late modern western metaphysics (see Derrida, 1967). At a first glance Peirce's semiotics, its tools employed in developing the present thesis, appears logocentric: it is a system of logic, having as cornerstone the Argument, which is the fully developed and only genuine type of signification. This would generate a conflict: previously there have been presented some similarities between Peirce's suprasubjective ontology, his theory of evolution and Deleuze and Guatari's *rhizomatic* structure (1980). This rules out the possibility of it being arborescent (logocentric). Even its discourse on love (agapism) is developed by the means of this system of logic: love is Argument. This might raise the suspicion that it does not take a full account of rather complex phenomena, such as *love*, and that it is not a holistic account of life, human or otherwise.

The aim of this section is to explain that Peirce's semiotics is not logocentric. It does not intend to comment on other anti-logocentric philosophies, such as the cases of Derrida or Deleuze. Derrida's account of logocentrism is mentioned below only for demonstrating that Peircean semiotics does not fit in such a description. This is an important aspect of Peirce's semiotics, particularly in regards to a learning theory, as it would not require the development of logocentric skills of argumentation from the students.

To begin, Peirce's semiotics is rather icono-centric, not logocentric. I explained that the Peircean sign is not bound to any perceptive modality (Chapter 1). Also, the Peircean sign does not even suppose a mode of existence of its Object:

"By an *object*, I mean anything that we can think, *i.e.* anything we can talk about." (MS [R] 966)

The Object is a possibility of the Sign: it is the *thing*, synonymous with *anything* and *no-thing* (Chapter 6). The Sign is the triadic relation within which two of the termini (Representamen and Interpretant) are signs in their turn and the other one (the Object) can be *anything*; it does not even need to be a sign, it suffices to be a sign potentially. There is no stress on words and linguistically articulated argumentation in Peirce's semiotics. It is not an argumentation theory *sensu stricto*, as to be mistaken for a logocentric doctrine, but, as explained in Chapter 1, it accounts for a *physiology of arguments*. As such, the present Peircean Theory of Learning is not a logocentric educational philosophy, but an evolutionary approach to learning through signs. In the perspective of semiotics, such an evolutionary approach recommends itself as an educational philosophy altogether, as it explains learning as a stage, result, and aim of evolution, which enhances semiosis.

Nevertheless, there is an essential difference between Peircean semiotics and Derrida's account of anti-logocentrism. Derrida regarded the metaphysics of presence as implied by and connected with logocentrism:

"The system of language associated with phonetic-alphabetic writing is that with in which logocentric metaphysics, determining the sense of being as presence, has been produced." (1967, p. 44)

There is no doubt that for Peirce semiotics is not associated with phonetic alphabet writing. At the most, it can be suspected that Peirce, a western modern man, subconsciously inherited the structures of a phonetic alphabet. However, his philosophical thinking is detached from logocentrism. On a Peircean account, humans learned to use an alphabet, phonetic or otherwise, from the natural doctrine of signs. Signs, such as icons or propositions, constitute the Universe of living beings (see Stjernfelt 2011). Peirce's semiotics is a conscious effort of detaching from western modern logocentrism. On the other hand, Peirce's semiotics is a metaphysics of presence, not of absence. Even though accounting for a relational ontology, the represented is present in the relation:

"The first character of a general idea so resulting is that it is living feeling. A continuum of this feeling, infinitesimal in duration, but still embracing innumerable parts, and also, though infinitesimal, entirely unlimited, is immediately present. And in its absence of boundedness a vague possibility of more than is present is directly felt." (CP 6.138)

This is justified by Peirce's idea of continuity and because the entire existence, since things have being only as in relation, is continuous. Since the Universe is continuous, *all of a piece*, it is suprasubjective, not supporting dichotomies. This, for Peirce, is the main refutation of nominalism:

"Second, in the presence of this continuity of feeling, nominalistic maxims appear futile. There is no doubt about one idea affecting another, when we can directly perceive the one gradually modified and shaping itself into the other. Nor

can there any longer be any difficulty about one idea resembling another, when we can pass along the continuous field of quality from one to the other and back again to the point which we had marked." (CP 6.139)

The similarities among qualities that assure the continuity and coherence of being are the grammar of the Universe, its iconic syntax, the inner diagrammatic character of the Universe.

Also, it is typical for logocentric metaphysics (e.g. analytical philosophy) to manifest an appreciation for clarity and precision, at least as a rhetorical virtue. This is not the case with Peirce's semiotics, where the vagueness of meaning is accounted for. In a semiotic mindset, to the extent that meaning is vague, existence itself can be vague. Signs and the termini composing them do not have clear boundaries. Vagueness is a necessary condition for the possibility of sign growth, according to Nöth and Santaella (2011). For this reason, on a Peircean account vagueness can be a rhetorical virtue:

"Vagueness is not only a rhetorical vice but also a virtue. We can never hope to reach absolute precision, and even if we could, we would not want to; for were we able to express ourselves with absolute precision, nothing would be left to speak about." (Nöth and Santaella, p. 247)

To aim for a total precision of signification would be wrong because, within the physiology of arguments, signs are dynamically evolving. The exigency of absolute precision would imply to deny one of the main assumptions of Peirce's pragmaticism, namely that Truth is always infinitely distant (see Chapters 1 and 2). In the same way, an absolute skepticism that would qualify any attempt to any level of clarity as futile would contradict Peirce's understanding of Truth. The evolution of signs occurs by pursuing the infinitely distant Truth. This pursuit proves to be fertile: wherever it happens it constitutes growth (be it in educational learning, personal relations, semiosis between organs of the body).

This awareness should have immediate and profound consequences for education, contrary to an educational system developed on the basis of logocentric philosophy. The Peircean Theory of Learning not only does not require identity of knowledge between teacher and student, but, with this awareness, the teacher would not be necessarily seeking for clarity and precision in her student's discourse. Rather, she would appreciate her student's play of musement, the student's creativity and her own play on the vagueness, clarity, and meaning subtleties of discovered predicates.

The Peircean Theory of Learning is not logocentric. It is true that it approaches human activity via logic, but the very concepts of Peirce's (semiotic) logic are adequate for an analysis of intimate personality and personal relations. Using Peirce's concepts, the Peircean Theory of Learning places teaching situations in the broader context of the semiosis of the Universe, and, therefore, it does not separate human life from non-human life. Because of the nature of the Peircean concepts by which the theory is developed, the account is not logocentric.

Peirce's *sign* concept, the sign types (Icon, Index, Symbol, Rheme, Proposition, Argument, etc.), and the ten classes of signs are not bound in any way to a linguistic logic. The evidence that this is not a logocentric account stands in that it is obviously a *schematic* account: iconic, diagrammatic, and metaphoric signs stand at the basis of this theory's approach to learning. The theory explains that learning is not necessarily a matter of articulated human language. This is so because semiotics is a relational logic which has as main concept a suprasubjective entity, the sign, which, while it can explain language insightfully, is not subject to human language.

ii.   Human and non-human learning

The principle of agapism is active in the entire Universe and semiosis occurs among all living beings, human or not. Modern education tended to be anthropocentric in an ideological manner. Biosemiotics brings a fresh reconceptualization by which life is accounted for as continuous. Differences among species do not suppose ontological interruptions in life.

To point out precisely what is specifically human and what is not it is a difficult, if not false, endeavor in the first place. This is so because we do not know what non-human is (Stables, 2012). Deely (2009) proposed to regard the human species as distinctively metasemiotic: we are aware of semiosis. This proposal is still controversial and debated.

However, a peculiarity of human education can be noticed. It is explained as a result of synechistic evolution: the human species discovered that indexical signification builds up to agapism, and thus we index (*point out*) to further generations what was already learnt. The cognitive sciences drew upon the same idea. Tomasello (1999, 2008) found intentionality and joint attention, and the indexicality that stems from it, as the main cognitive capacity that distinguishes human communication and culture. Even though I argue that indexicality gives an insight towards human specifics of semiosis, I do not account it on cognitive, but on semiotic aspects. What particularly characterizes human life, the specific human Lebenswelt, does not stand in mere gestures of pointing and the cognitive capacity of joining attention. I argued that indexicality, and more complex signification that requires indexicality, such as propositions, are forms of semiosis that mandatorily occur in other species as well (Chapter 1, see also Stjernfelt 2011, 2014). To explain the particularity of human life by what is evoked by mere indexical gestures would reduce the complex meaning phenomena of the human life to cognitions of a certain kind. The human specific character of learning stands in regarding education as Synechism, which is not just mere indexicality, but the continuous manifestation and implications of necessity (Secondness) in a continuous abduction-deduction-induction type evolution. In the case of humans, Synechism brought forth a peculiarly systematized method of enhancing learning by indexicality. This is

precisely the understanding of education that this thesis brings. This peculiarity in its wholeness, the subject of another investigation in its own right, is, in Peirce's words "beyond our ken" (CP 5.119, see Chapter 6). In itself it is an example of vague signification.

This indexicality (education) is only a means, as learning properly happens only at the agapic stage, where the Interpretamen appears as Argument. It is essentially impossible to tell whether this semiosis is the same in the case of other species. It is nevertheless possible to analyse the human specific Lebenswelt, not by negative comparison to other species' Umwelt, but by taking into awareness the insight about it that we, as humans, have from within. In accordance with the hypothesis of iconicity, in the regards in which we are similar to other species, it is obvious (e.g. humans and most fish tend to have two eyes); in the regards where it is not yet obvious it is unknown, as it implies that the similarities have not yet been discovered (e.g. what family does the platypus belong to). The unraveling of unknown similarities does not necessarily consist in the positing of new conclusions, but, by abduction, it implies the reshaping of our (on some cases entire) scientific *Lebenswelt*. A new such re-cognition that sets the direction for the evolution of the scientific *Lebenswelt* has powerful consequences for the educational system (e.g. a curricular change), as it brings a new understanding of lifefrom within.

C. Instructionalism

The Peircean Theory of Learning directs the focus on the teacher-student personal relation instead of the content to be taught. The semiotic expression of a teacher-student harmonious personal relation is the key to a healthy growth of signification. This statement might seem controversial, especially for the instructionalist approach to education. The Peircean Theory of Learning developed in this thesis opposes the instructinalist paragdigm.

An exponent of pedagogical instructionalism is the pedagogy of Vasilii Vasil'evich Davydov (2008), developed within a Marxist mindset, upon the psychological pedagogies of Vygotsky and Piaget. Davydov considers that the crucial question for education is whether certain capacities can be instructed to a person:

"Can we, by means of instruction and upbringing, develop in a person certain psychical capacities or qualities that previously did not exist?" (p. 13)

From a Peircean point of view the question is wrongly placed. The aim of education is not to develop psychical capacities or qualities in another person. The educational system should not be interested at all in developing some particular features in a person. Education is a cosmological matter, not strictly social, and certainly not individual. Because it is a cosmological matter it is personal, in contrast to individual (which is a matter of Secondness and thus cannot be agapic), as personality is an evolutionary agapic development (the

semiotic account of personality was introduced in Chapter 5, section C, and further explored in respect to agapism in Chapter 8). As a personal matter, the possibility of learning resides in the personal relation.

Instructionalism is mostly a psychologistic approach, while this thesis brings a semiotic approach to education. Not only that the Peircean account denies the instruction of capacities as being the purpose of education, but according to instructionalism, these capacities are psychical.

Besides this epistemological difference, there is a contradiction between Peirce's teleology and that of Davidov. The latter considers that "Just like any natural process, goal-directed, conscious human activity is an *objective* process." (Davydov 2008, p. 21) For Peirce *objectivity* is not a goal. Objectivity is the definition of Secondness. According to Peirce teleology is triadic. Signification is *telos*. The Interpretant, the mediation, is the goal. An objective teleology, like accounted by Davydov, is subject to the biosemiotic critique to mechanical philosophy (see von Uexküll 1926, Gough and Stables 2012, Kull in Bundgaard and Stjernfelt, Henning and Scarfe in Chapter 1). According to Davydov, labor is such a goal:

"Practical, object-oriented productive activity – labor – is the basis of all human cognition." (p. 85)

Learning is first of all developed by play of musement, random observation. As such, this theory opposes the widespread idea that learning and teaching require effort. This might appear surprising to some practising teachers. The assumption that the learner is supposed to make an effort leaves room for the teacher's self justification in the case of the learner's failure. The teacher can always argue that the learner failed the exam because she did not put enough effort in the process. The present theory opposes this attitude to teaching. The answer is rather that the learner could not have learned anyway if her semiosis with the teacher was preponderantly anancasticist,that is mostly driven by struggle (effort), without evolving further towards an agapic Interpretant. Since struggle is a terminus of the semiosis (Secondness, the anancasticist element), the theory explains that effort is necessary in learning from both teacher and student, as the semiosis of learning reaches an Argument as Interpretant only as agapism. This implies an overcoming of effort, struggle, or labour.

The hypothesis of this thesis is that for proper, cosmological learning to develop, the teacher and the learner should focus on cultivating an agapic personal relationship instead of focusing on the curricular information. Labour is not essential, certainly not a goal. Instead, Peirce considered "the great evolutionary agency of the universe to be Love." (CP 6.287) Love is the simple action by which learning becomes simple and does not appear as labour anymore. If the student and the teacher love each other, they will learn each other. Learning the curricular subjects is rather a means to the goal of loving (Chapter 8). However, love itself makes possible and facilitates learning. It is a challenging statement for the modern educational paradigm. However, the argument of the Peircean Theory of Learning is that the proper understanding of a

curricular object is a natural consequence of a teacher and student agapasm. The key stands in that indexical signification precedes symbols, metaphors, and arguments. Agapasm is the mediation of tychasm and anancasm. This implies that the education's indices signifying the curriculum, the teacher's drawing of attention towards certain subjects, is mandatory for the relation's agapasm. As it is essential that the student's play with icons is not inhibited by the teacher and that the teacher builds her indices, as much as possible, upon iconic relations available for the student (Chapter 6), so it is important that the argument they pursue is developed upon these indices. However, to develop this argumentation, which is the learning itself, the teacher and the student need to transcend the learning stages of chance and necessity and attain freedom of learning. According to Peirce, this happens in agapasm, namely by personal love for one's neighbor. This is the justification for which it is easier to learn from a teacher than by oneself: the student receives a potential neighbor in flesh and blood, one that she can love. Thus, the indices are not imposed from an impersonal educational institution or system, but instead they are to be discovered in another self-conscious sign. Loving this non-self is the key to accessing these indices that signify the curriculum and, thus, it is the key to learning.

The Peircean Theory of Learning concludes in that a relation's agapic character is the real *telos* of education and that the learning of curricular objects is always a means to the much wider purpose of cosmological evolution. By denying the Other and refusing to fall in love, the possibility of learning is obscured. The egocentrism of the self traps the self in itself, obscuring the possibility of growth. An agapic teacher-student relation, the focus on the personal dimension of the relation, will not compromise the curricular objects, because it is agapic evolution in the first place that employed learning as its method. This also gives an insight to the abductive restructuring of the curriculum because if the curricular object is denied by the agapic principle, then it was a wrongly chosen object.

Conclusions

The argument developed by this thesis is that personal love is the foundation and rationale of education. Because education is a means to enhance learning towards proper research, it needs to follow the teleological evolution of the Universe of signs.

The principles of the modes of evolution, in Peirce's semiotic account, are chance, necessity, and love. At first, we learn by chance, iconically. Further on, out of chance, learning proves necessary, and so we focus on learning specific matters. This indexicality proves to be a struggle, an effort. Its results are often unexpected. The struggle of necessity and the determination of chance and necessity are transcended by the principle of love. Love is the only principle of growth (Chapter 6, CP 2.287), and it is liberating. Growth is best expressed by personality (Chapter 5, Section C, CP 6.157), as agapism, the principle of evolutionary love, has its expression among personalities (Chapter 8, CP 6.288). An agapic student/teacher relation is understood, in Peirce's terms, as Argument. Thus, learning is the passage from Icon to Argument. If the teacher does not accept the student's icons, learning is artificially imposed and it becomes an empty formalism. Its structures of signification can be described as iconless symbols. If the student does not accept the teacher's indices, learning remains spontaneous and it might become idle. The mediation of chance and necessity is the personal engagement with the other. It is the going out of the self, which we refer to as love. Applying Peirce's phenomenological categories to education, and explaining learning in terms of phenomena of signification leads to a rigorous semiotic account of the common sense idea that love enhances learning.

It might seem surprising that the cornerstone and rationale of existence, for a logician such as Peirce, is love. Actually, this idea is present throughout most of Peirce's work, even though he only stated it explicitly in 1893. Peirce's philosophy is not dualistic, denying even a dichotomy between love and science. Often in his work he referred to the *love for truth*, or *the love of the scientific man* (1.49, 1.255). This is proper love, not just an aesthetical appreciation that the scientist experiences in her research: "For it is not knowing, but the love of learning, that characterizes the scientific man." (CP 1.44) Learning is characterized by a burning desire, "true scientific Eros" (CP 1.620), similar with Levinas' idea of metaphysical desire. The scientific community, being driven by agapism, is a welcoming community; all that is required to enter is one's desire:

"If a man burns to learn and sets himself to comparing his ideas with experimental results in order that he may correct those ideas, every scientific man will recognize him as a brother, no matter how small his knowledge may be." (CP 1.44)

Learning is a search for the Other. Learning by herself the student might be filled with scientific Eros (still unsaturated Predicate), but it is the teacher that opens the possibility for Agapism (Argument as Interpretant).

To describe Firstness, as much as it is possible, Peirce used a reference to Scripture, to the book of Genesis, explaining that Firstness is like *what the world*

was to Adam on the day he opened his eyes to it (CP 1.357, see also Chapter 2, section D). Using a similar analogy, another passage from Genesis can be employed to express the idea of Other as First, namely *what Eve was to Adam on the day he opened her eyes to her*. According to Genesis, when Adam first saw Eve (the Other), awoken from a trance, he said: "This is now bone of my bones and flesh of my flesh. She shall be called Woman, because she was taken out of Man. For this reason a man shall leave his father and mother and be joined to his wife; and the two shall become one flesh." (Gn 2:23-24)

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