

Peircean semiotics in the context of design praxis: Abduction and perception in dialogue

Renira Rampazzo Gambarato

National Research University Higher School of Economics, Moscow
Faculty of Media Communications
Building 5, 2/8 Khitrovskij Pereulok
101990 Moscow, Russia
e-mail: rgambarato@hse.ru

Abstract. This paper discusses design process as a creative activity along with conceptual correlations of the semiotics developed by Charles Sanders Peirce. The central aim of this paper is to examine one of the most important concepts in Peirce's theory related to design praxis: the concept of abduction. Abduction is the driving force behind creation and a way of producing new ideas. Peirce's original concept is fundamental in order to maintain constant commitment to innovation required by design. To transmit messages in a creative way it is more efficient to intensely work with associations by similarity in order to obtain signs rich in information and analogies. Design communicates by all its constituent elements: shape, function, colour, material, technique, technology, etc. Therefore, signs of design share peculiar values of artistic signs as well as those of communicative ones. The associated information is as much aesthetic (shape) as it is semantic (content). The appropriation of Peircean concepts contributes to the understanding of the creative process, which in turn is crucial for understanding new possibilities by means of design.

Keywords: Peircean semiotics, abduction, perception, design innovation.

1. Introduction

Semiotics of design reflects on the communicative potential of objects: the transformation of objects into signs. This paper shares the standpoint of Max Bense (1971), Roland Barthes (1980), and Bernhard Bürdek (1991) who consider design as a language, a sign system. This particular characteristic of design will be discussed to conclude that the basic purpose of design lies in a sense of freedom, the absence of conditioning, and an elimination of the obvious. Thus, the fundamental focus here is Charles Sanders Peirce's concept of abduction. In the aesthetic universe, abduction behaves as a set of hypotheses, of possibilities. Abduction includes every "process of generation, criticism, and possible acceptance of explanatory hypotheses" (Josephson, Josephson 1994: 9). The moment of formulation of a new hypothesis is poetic because at this point creativity is generated. Abduction was Peirce's creation: previously, just induction and deduction had been considered methods of reasoning. The theory of abduction, in its more complete description, dates from 1901 and comes from Peirce's manuscripts (CP 7.202–219). The term "abduction" was developed in substitution of the word "hypothesis" because Peirce, as he moved forward in the studies of scientific investigation, identified another step in the process through which ideas and theories are engendered (CP 5.590). This led him to reject "hypothesis" and introduce the term "abduction" instead (Santaella 1992: 91).

It is pertinent to highlight that *discovery* happens when a hypothesis made has been proven true. However, in the aesthetic realm the objective is not to search for hypotheses that are proven true; it is just a set of hypotheses contained in the universe of possibilities. It is intrinsic to abduction, though, to point at a true hypothesis with enough theoretical foundation to indicate a direction, which is probably true. According to Peirce, abduction has the tendency of raising correct hypotheses due to man's natural instinct, or Galileo's *il lume naturale* (CP 6.477). The human mind is part of nature and there is no duality between mind and matter. Therefore, there is co-naturalness between mind and nature and both are developed together. The instinct for the truth is natural. The human capacity to guess correct hypotheses is the notion of "insight" in Peirce's theory (CP 5.181). Moreover, he stated: a) insight is not an immediate premise; b) truth is not an individual consciousness; and c) insight is not indubitable.

In spite of its instinctive character, abduction is a logical inference and the important question that derives from it is which premises would be the ones of abduction. There are no exact rules for the occurrence of abduction because freedom is its main characteristic. Abduction does not follow a logical formula, but initiates explanatory forms. This makes plenty of sense, considering that no rule or pre-established structure could provide the appearance of something actually new.

2. Abduction and perception

Abduction is not innate; it presupposes a cognitive elaboration, but its first premises are unconscious. At this point, it is necessary to delve into Peirce's theory of perception to locate the first premises. The Peircean theory of perception was elaborated in the first years of the 20th century with the purpose of solving impasses of semiotics related to the connection between language and reality. It was structured proceeding from a triad of logical elements (CP 7.642–681):

- *percept*: it is external; it is what we observe; it comes and it continues. The *percept* is “what we immediately perceive and is the reality” (CP 5.568). It behaves as the dynamic object of the sign in the process of semiosis. The *percept* is related to what is apprehended by the *perceptive act* (Santaella 1998: 54);
- *percipuum*: It is the *percept* as it is interpreted by the *perceptual judgment* (CP 7.629). It is the way the *percept* will be received by our sensory-motor system. Thus, the *percipuum* behaves as an immediate object, shaping the *percept*. It is the interface between the mind (*perceptual judgment*) and the world (*percept*) (Santaella 1998: 59);
- *perceptual judgment*: It is the flow of thought; it is what will process things we are discerning. It is the mental schemes of what we are endowed with. It is a sign. The perception is determined by the *percept*, but the *percept* can only be known through the mediation of the sign, which is the judgment of perception (Santaella 1998: 64). The *perceptual judgment* is a logical inference and Peirce considered it as a peculiar type of inference: abduction (CP 5.180).

Consequently, it is possible to establish similarities and differences between abduction and *perceptual judgment*. Both are endowed with general principles that drive them; they are hypothetical and, therefore, they can be fallible. The main difference is that, although fallible, the *perceptual judgment* is indubitable (CP 5.442). We would not endure always doubting every moment of our judgments of perception. However, as concerns abduction, it is necessary to always criticize it.

There is no absolute creativity; abduction occurs on pre-existing premises. Intuition comes from these previous premises (inferences). Santaella (1993: 41) underscores that Peirce, arguing that we can never know with certainty if cognition is, in fact, original, maintained his conviction that any cognition is determined by other cognition, which meant an attack on the Aristotelian-Cartesian postulate that the first premises of demonstration are not demonstrable. Cartesianism is docked in the safe harbour of intuition. It founds knowledge on intuition, considering it certain and infallible, because the reasoning should have an origin not deduced from any other intuition. If that kind of original proposition is undoubtedly right, it is because an intuitive and instantaneous mental act was reached. These sources

of propositions either cannot be demonstrated or do not need a demonstration because they satisfy what is requested to get to the certainty of knowledge (Santaella 1993: 42).

Peirce totally disagreed with the above statement. For him, cognition comes as a continuous process expressed by means of deductive, inductive and abductive inferences, not having a specific origin of the process. Inferences “are movements of thought within the sphere of belief. The function of inference is the acceptance (or sometimes rejection) of propositions on the basis of purported evidence” (Josephson, Josephson 1994: 12). Peirce (EP 2:348) divides inference into the following trichotomy: (a) conscious reasoning resulting from guiding principles; (b) informal reasoning without the recognition of the guiding principles; and (c) unconscious and uncontrollable mental operations. While denying the innate ideas or original premises, Peirce considered the unconscious inferences (abduction) as knowledge formative of – and responsible for – our innovative ideas.

In this context, the term “play of musement” is introduced as the beginning of abductive thought, of the conjecture of instinctive reasoning. Peirce developed this idea in 1908 in the manuscript *The Neglected Argument for the Reality of God* (CP 6.452–485). Musement does not have an *a priori* purpose, but it can be the principle of the appearance of innovative ideas. It is a deep reflection in order to articulate signs by means of possibilities of composition. The new thought was born free and it is formulated from the associations of ideas by:

- contiguity that corresponds to an elementary reasoning, a familiar knowledge (CP 7.218) in which ideas are associated because they are close; they are suggested by daily experience, which impoverishes the originality and the creative production of ideas;
- similarity that is a higher reasoning; it is a conscious process in which ideas are approached by some equality, some analogy. Peirce considers icons as signs that stand for their objects by similarity or resemblance (CP 2.247; CP 2.276; CP 8.335). Similarity emphasizes the creative aspect because it is not the resemblance between ideas or facts that allows the association, but it is the association, as control of the reasoning, that produces the resemblance. Similarity can occur by resemblance of quality, juxtaposition or mediation. The first one happens when identity of qualitative characteristics exists among parts of the sign; when the parts, in their physical and sensitive materiality, present qualities. Secondly, there is the resemblance of juxtaposition. In this case, in spite of elements being different, the proximity among them gives rise to resemblances. Ideogram is an example of this sort of association. The third way, characterised by mediation, happens when a third term produced in the mind that can unite two states of consciousness, for instance, verbal and visual metaphors.

These two main terms (similarity and contiguity) were developed by David Hume (1711–1776) in the 18th century, but it was Peirce who identified similarity as a special way to produce ideas. Accordingly, it would be possible to relate similarity with musement. There is no accident in the association of ideas; there is a harmonious tendency, in Peirce's words "affection" (CP 6.307) that takes charge of creative associations generated by the play of musement. For Peirce, "play" is a lively exercise of our power because pure play does not have rules, except the true law of freedom. If our observations and reflections have the opportunity to specialize, the play will transform itself into scientific study (CP: 6.458).

Peirce makes use of the idea of play developed by Friedrich Schiller (1759–1805), the German poet and philosopher who studied aesthetics. Schiller's reflections concerning beauty tend to be built not upon subjectivity, but upon universal reasoning. Schiller developed the concept of *aesthetic play*, which is linked to the feeling of free sequence of ideas; of free flow of images to the detriment of external impressions. The idea of play is the idea of freedom. For Schiller, creative activity can reach a quality close to the ideal only through the independence of reality. The philosopher builds up his concept of aesthetic play starting from the definition of three impulses (or *drives*)¹ that are part of it: (a) the sensitive impulse (*Sinnestrieb*); (b) the formal impulse (*Formtrieb*); and (c) the playful impulse (*Spieltrieb*).

The sensitive impulse – or sensuous drive – is action and reaction in the real world. It is instinct and materiality. The sensitive impulse wants modification to happen; it wants to be determined; it wants to receive its object. The sensitive impulse excludes spontaneity and freedom. The formal impulse is abstract and rational.

The formal impulse wants time to be suppressed; there is no modification; it wants to determine its object. The formal impulse excludes any dependence and passivity. These two ways converge in the playful impulse or the play drive which is a mediator between the sensitive and the formal, and generates aesthetic play. The playful impulse recovers freedom and accentuates artistic beauty (Schiller 1954). It can be recognized that the aesthetic play of Schiller, based on the playful impulse, is similar to the Peircean play of musement. Both concepts, therefore, can be characterised as the genetic atmosphere of abduction. Abduction is the driving force behind creation and the way of producing new ideas. The original concept of Peirce's is fundamental for the maintenance of the constant commitment to the inherent innovation required by design.

¹ Schiller's pivotal book *On the Aesthetic Education of Man in a Series of Letters* was first published in 1794 as *Über die ästhetische Erziehung des Menschen in einer Reihe von Briefen*. He argues that it is possible to elevate people's moral character by touching their souls with beauty. In the book, he goes beyond the dualism between *Formtrieb* and *Sinnestrieb* proposing the notion of *Spieltrieb*. The German word *Trieb* could be understood as drive, impulse, or instinctive need.

3. An icon to the wise is sufficient

Design as language – this is the particularity of design to be investigated. Language is the ability to represent. Representation occurs by means of signs. A sign is in real substitution with its object and from this substitution an interpretant is generated (CP 1.346). The several kinds of languages are systematised by their codes or sets of signs. Each language possesses its own specific rules. From this dialogue among codes, messages are established and organised. Design depends on language operators, who will use new technologies, materials, and characteristics of the consuming market and so forth to operate translations of languages in order to develop products.

Products can be qualified as signs as anything can be a sign for somebody (CP 2.228). Products, placed in a social repertoire, ought to communicate their function and emit their message. To transmit messages in a creative way, by means of design, it is efficient to intensely work with associations by similarity in order to obtain signs rich in information and analogies. Design communicates by all its constituent elements: shape, function, colour, material, technique, technology, etc. Therefore, signs of design join peculiar values from artistic signs as well as from communicative ones. The associated information is as much aesthetic (shape) as it is semantic (content).

According to Peirce, all signs congregate three categories of his phenomenology presenting characteristics of firstness, secondness and thirdness. However, through the classification of signs in his semiotics, he draws attention to the fact that, despite their coexistence, one of the categories always prevails. In this sense, firstness is the predominant essence of the iconic sign (CP 2.276). We could perceive that designing is a process of genesis in which the designer wields an endless repertoire of elements capable of defining aesthetic and functional specific characteristics of products. The act of designing is, therefore, selective. In other words, to make an object that exists and works in the material world, it is necessary to choose some constituent elements at the expense of others to define its conditions of existence. In order to select the constituent elements, associative processes are used, as discussed above. The richness of the icon is directly related to the association by similarity that offers plenty of communicative possibilities and analogies. An icon by similarity produces a rhetorical figure called metaphor. In the context of Peircean semiotics, the metaphor is considered as a peculiar sort of *hypoicon* (CP 2.276). Hypoicons are subdivided according to the kind of firstness they take part in. The kind of hypoicon called metaphor is one that portrays the representative character of the sign through the representation of a parallelism with something else (CP 2.277). In terms of metaphoric sense, the message-product acquires rich interpretative possibilities. Undoubtedly, metaphors play an important role nowadays due to the fact that visual

analogy can improve the practical functions of products (Bürdek 1991). Therefore, in order for a visual analogy to increase the practical functions of products, a great elaboration of syntax is necessary to create the suspension of meanings, which means promoting the ambiguity, promoting relativity, and removing the absolute sense of the sign (Turin 1992: 44).

Design needs this ambiguity (characteristic of art) to escape from the creation of merely conventional products that are already known. It is necessary to establish unexpected relations that are neither obvious and nor previously accomplished. In order to produce such an effect of ambiguity as regards the consumer the sign must be tied to the interpretant. Objects carry their own information which is reflected in the ways of using them. The task of the designer is to make objects speak for themselves. As it has been argued, it does not mean designers should always work with symbols (in the Peircean sense) only, in order to be understood by the consumers. Designers' work should contribute to the improvement of the users' repertoire, as they transmit different messages, and project immateriality. It is necessary to create intelligible objects capable of establishing the communication process and not just to develop mere copies of objects that already exist or are thoroughly known.

4. Conclusion

The basic purpose of design or the language of design lies in the sense of freedom, lack of conditioning, and elimination of the obvious. In order to achieve this goal, designers should focus on designing iconic signs:

Icons are also necessary to create new ideas, since the only way to conveying new ideas is by means of a "complexus of [...] icons". We can only create new ideas by transforming existing images. Only by means of a conjunction or a disjunction of icons can we arrive at "composite images of which the whole is not [yet] familiar" (CP 3.433). (Nöth 2000: 26)

It is important to find similarities and analogies in order to escape the conventional and the arbitrary. This is the beginning of creation, i.e., conscious creation. Consciousness works with relations of substitution, the relations between sign/object/interpretant. Consciousness is processing incessantly with constant alteration. It is a dynamic process of generation of interpretants which are neither absolute nor static, otherwise the conservatism, the stagnation of the creative process will be favoured. This kind of substitution process by new interpretants is called infinite semiosis (CP 1.339, CP 2.303). The creative process in design has the objective of associating signs and generating new interpretants.

Certainly, each consumer will produce different interpretants related to the same object according to his/her informational level and within his/her own repertoire. The variability of signification is a desirable characteristic of design. The generation of interpretants that are constantly being updated can transform the iconic character of the object into a symbolic character by means of the simplification of its social use. The appropriation of Peircean concepts contributes to the understanding of the creative process, which in turn is crucial for understanding new possibilities by means of design. An icon to the wise is sufficient.

References

- Barthes, Roland 1980. *La chambre claire: Note sur la photographie*. Paris: Gallimard.
- Bense, Max 1971. *Zeichen und Design: Semiotische Ästhetik*. Baden-Baden: Agis.
- Bürdek, Bernhard 1991. *Design: Geschichte, Theorie und Praxis der Produktgestaltung*. Cologne: M. DuMont Schauberg.
- CP = Peirce, Charles S. 1931–1958. *Collected Papers of Charles Sanders Peirce*. Cambridge: Harvard University Press. [Hartshorne, Charles; Weiss, Paul (eds.), 1931–1935; vols. 7–8. Burks, A. W. (ed.) 1958; In-text references are to CP, followed by volume and paragraph numbers].
- EP = Peirce, Charles S. *The Essential Peirce: Selected Philosophical Writings (1893–1913), Volume 2*. Bloomington: Indiana University Press. [Peirce Edition Project (eds.); In-text references are to EP, followed by volume and page numbers].
- Josephson, John; Josephson, Susan (eds.) 1994. *Abductive Inference*. Cambridge: Cambridge University Press.
- Nöth, Winfried 2000. Semiotic foundations of iconicity in language and literature. In: Fischer, Olga; Nänny, Max (eds.), *The Motivated Sign*. Amsterdam: Benjamins, 17–28.
- Santaella, Lucia 1992. *A Assinatura das Coisas*. Rio de Janeiro: Imago.
- 1993. *Metodologia Semiótica: Fundamentos*. São Paulo: PUC.
 - 1998. *A Percepção: Uma Teoria Semiótica*. São Paulo: Experimento.
- Schiller, Friedrich 1954. *On the Aesthetic Education of Man: In a Series of Letters*. [Snell, Reginald, trans.] New Haven: Yale University Press.
- Turin, Roti 1992. *Aulas*. São Carlos: EESC/USP.

Семиотика Пирса в контексте практического дизайна: диалог абдукции и перцепции

Процесс дизайна как творческое действие рассматривается в статье в рамках семиотики Чарльза Пирса. Главная цель статьи – рассмотрение концепта абдукции, который наиболее тесно связан с практическим дизайном. Именно абдукция включает творческий процесс и является одним из способов создания новых идей. Для творческой передачи сообщений необходима интенсивная работа с ассоциациями, в результате чего получают богатые информацией и аналогиями знаки. Коммуникация в дизайне производится посредством всех составляющих его элементов: форма, функция, цвет, материал, техника, технология и т.п. Таким образом, в знаках дизайна соединяются художественные и коммуникативные ценности, передаваемая информация является одновременно и эстетической (форма) и семантической (содержание).

Peirce'i semiootika disainipraktika kontekstis: abduktsiooni ja pertseptsiooni dialoog

Artiklis käsitletakse disainiprotsessi kui loomingulist tegevust mõistelises korrelatsioonis Charles Sanders Peirce'i semiootikaga. Artikli keskseks eesmärgiks on uurida üht Peirce'i teooria kõige olulisemat disainipraktikaga seotud mõistet: abduktsiooni mõistet. Abduktsioon on loomingut käivitavaks jõuks ning üheks uute ideede loomise viisiks. Peirce'i originaalne mõiste on fundamentaalne, hoidmaks alal disaini poolt nõutavat jätkuvat pühendumust uuenduslikkusele. Selleks, et sõnumeid loominguliselt edastada, on tõhusam intensiivne töö sarnasuse kaudu toimivate assotsiatsioonidega, et saada tulemuseks informatsiooni- ja analoogiterikkaid märke. Disaini kommunikatsioon toimub kõigi seda moodustavate elementide – vormi, funktsiooni, värvuse, materjali, tehnika, tehnoloogia jne – kaudu. Seega ühinevad disainimärkides kunstilistele märkidele omased väärtused kommunikatiivsete märkide omadega. Ühendatud informatsioon on samavõrra nii esteetiline (kuju) kui ka semantiline (sisu). Peirce'i mõistete kasutuselevõtt aitab kaasa loomeprotsessi mõistmisele, mis on oluline disaini abil uutest võimalustest aru saamise protsessis.