On Peirce’s Visualization of the Classifications of Signs: Finding a Common Pattern in Diagrams

The number above to the left describes the Object of the Sign. That above to the right describes its Interpretant. That below describes the Sign itself. 1 signifies the Possible Modality, that of an Idea. 2 signifies the Actual Modality, that of an Occurrence. 3 signifies the Necessary Modality, that of a Habit... (L463:146; EPII:491, 1908).

In a draft of a letter to Lady Welby dated 24–28 December 1908 (L463:132–146), Peirce designed the diagram shown above, and added the ensuing comments.

In this chapter we focus on Peirce’s diagrammatic method to visually model 10 classes of signs. As we know, this classification was developed from 1903, and represents a major refinement of the better-known division of signs into icons, indexes, and symbols, introduced in 1868, in “On a new list of categories” (CP 1.558, W2: 56), and in the 1903 Harvard Lectures on Pragmatism (CP 5.73–76). Although a number of philosophers and semioticians have shown interest, in recent years, for Peirce’s 10 classes of signs, the extended typologies of signs, specially the 66 classes, still seem obscure, structurally intricate and hard to apply to actual phenomena. Such classifications should be considered as an important advancement with respect to the task of modeling the variety of signs,

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and constitute one of the most important topics of Peirce’s mature semiotic. According to Houser (1992: 502), “a sound and detailed extension of Peirce’s analysis of signs to his full set of ten divisions and sixty-six classes is perhaps the most pressing problem for Peircean semioticians”.

An examination of Peirce’s manuscripts, from 1903 to 1908, reveals that he devoted considerable attention to research and development of visual models for the 10 classes of signs, a fact that should not be considered surprising, given his association of diagrammatic reasoning with abductive inference and creativity (see Paavola 2011). Starting from an analysis of two diagrams for 10 classes of signs designed by Peirce in 1903 and 1908 – respectively, the diagram included in his Syllabus (CP 2.264; EPII: 296), and one shown above – this chapter provides a diagrammatic method to explain Peirce’s strategy to design diagrams for ten 3-trichotomic classes of signs. Our main argument is that it is possible to observe a common pattern in the arrangement of Peirce’s diagrams of 3-trichotomic classes.

The diagram shown above and also in figure 1, which we will refer to as the Welby diagram, was reproduced in the Collected Papers (CP 8.376) and in the second volume of The Essential Peirce (EPII: 491).

![Welby diagram](image)

**Figure 1:** The Welby diagram (L463: 146), adapted from the versions published in the Collected Papers and in the second volume of The Essential Peirce (CP 8376, EPII: 491)

There are other versions of the Welby diagram among Peirce’s manuscripts. Some of them, found in a manuscript dated 27 December 1908 (MS 399D: 627, figure 2), seem to be free-hand sketches for this diagram, which was finally rendered, most probably, with the help of a ruler or a similar instrument. What
is more crucial here is the position of the numbers that identify each class. In
the sketch found in the lower part of the paper, the position of the classes and
the figures used to identify them are identical to those found in the Welby dia-
gram. Similarly, there are sketches for the diagram included in fifth section of
Peirce’s 1903 Syllabus (figure 4, MS 540:17; CP 2.264; EPII: 296) in his manu-
scripts (MS 540: 27–29, reproduced in figure 3; and MS 799: 2). All those sketches
show that Peirce was very concerned in finding a coherent way to diagrammatically
present the 10 classes.

Figure 2: Sketches for the Welby diagram found in a manuscript dated 27 December 1908
(MS 399D: 627)

In order to proceed with our argument, we must produce comparable versions of
the two diagrams. Figure 5 shows a simplified version of the Welby diagram,
where the triangles that are not occupied by a class have been eliminated. Figure
shows a version of the *Syllabus* diagram where the names of the classes were substituted for numbers, according to the notation for the divisions of signs commonly adopted by Peirce scholarship (e.g. Weiss & Burks 1945: 386; Merrell 1994: 180; Serson 1997: 134; Sanders 1970: 7; Jappy 1984: 19), and also found in MS 799:4 (321 for rhematic indexical legisign, 211 for iconic sinsign, etc.). If we compare figures 5 and 6, we can infer that both show the same 10 classes in the same relative position, although the structure is vertically flipped. This happens if we consider that the occupied cells in the *Welby* diagram also present the classes as numbers.

*Figure 3*: A draft for the diagram included in Peirce’s 1903 *Syllabus*, found in manuscript MS 540: 27.
Figure 4: Diagram found in Peirce’s manuscript (MS 540: 17) for his 1903 Syllabus

Figure 5: A modified version of the Welby diagram, created by the authors
Figure 6: A modified version of the Syllabus diagram, created by the authors

But this seems to be in disagreement with the description of the diagram given by Peirce in the letter to Lady Welby, once “the number above to the left” in the modified Syllabus diagram corresponds not to “the Object of the Sign” (as in the Welby diagram), but to the nature of the sign in itself (EPII: 291). In a similar way, the number below, in the modified Syllabus diagram, describes not “the sign itself”, but “the relation of the sign to its Object” (EPII: 291). There seems, however, to be a certain agreement in what regards the number “above to the right”. According to the note that appears next to the Welby diagram, this number “describes [the Sign’s] Interpretant”, and in figure 6 it describes the way in which “[the sign’s] Interpretant represents it” (EPII: 291).

Finding a common pattern in Peirce’s diagrams

Despite the conflict in what regards the location of the trichotomies within the cellules, and the consequences of this conflict, it is possible to observe a common pattern in the location of the classes in both diagrams. This common pattern can be found even if it is not possible to establish an exact mapping between the classes described by each diagram and the ordering of the trichotomies. If the ordering of trichotomies in the Welby diagram is (O-S-I), while in the Syllabus diagram the implied order is (S-O-I), the classes described by each diagram may not correspond to the same 10 classes of signs. We will argue, however, that both diagrams follow the same underlying diagrammatic principle.
In order to do that, let us consider the numbering of the classes as following triangular coordinates, where a triplet \((a, b, c)\) corresponds to the quantities of ‘ones’ \((a)\), ‘twos’ \((b)\), and ‘threes’ \((c)\) that form each class, given by an ordered set of integers that vary from 0 to 3. The sum of the quantities of ones, twos, and threes that form each triplet/class will always be 3 \((a + b + c = 3)\), once we are working with 3-trichotomic classes.

In the extreme corners of an equilateral triangle, we will locate triplets \((0, 0, 3)\), \((3, 0, 0)\), and \((0, 3, 0)\), corresponding to classes 333, 111 and 222. In the middle thirds of the sides of the triangle, we will arrange the triplets that correspond to the sequence that is given by considering each side of the triangle as an axis where the elements of the triplets vary from 0 to 3 in respect to the triplets located in the corners – so that, for example, in the side that has \((0, 0, 3)\) and \((3, 0, 0)\) as its endpoints, we will have the sequence of triplets: \((0, 0, 3), (1, 0, 2), (2, 0, 1), (3, 0, 1)\). Finally, in the center node, which can either be located by the crossing of the altitudes of this triangle or by uniting the nodes with line segments that are parallel to the sides of the triangle, we will place the triplet \((1, 1, 1)\), that corresponds to class 321 (figure 7).

![Figure 7: Creating a pattern of ten vertices from triangular coordinates](image)

Now, having this pattern of 10 vertices, we can draw triangles around them and ‘translate’ the corresponding triplets into classes: \((0, 0, 3) = 3\) threes = 333;

3 The diagrammatic strategy applied here has been inspired by Shea Zellweger’s (1991) approach to Peirce’s triadic logic.
(0, 1, 2) = 1 two and 2 threes = 332; and so on (figure 8). We obtain a diagram that corresponds exactly to figure 5, the modified Welby diagram.

Figure 8: The Welby diagram re-designed around the triangular coordinates

If we invert the quantities of ‘ones’ and ‘threes’ in the coordinates – so that (0, 0, 3) will correspond to 3 ones, and (3, 0, 0) to 3 threes – and build squares instead of triangles around the vertices, we will obtain exactly the position of the 10 classes as found in the Syllabus diagram (compare figure 9 with figure 6).

Figure 9: The Syllabus diagram re-designed around the triangular coordinates
This shows that the use of the diagrammatic method described above can explain the underlying principle of the design of Peirce’s diagrams for 10 classes of signs, despite the fact that those diagrams may refer to different classifications of signs. As far as we know, Peirce never designed diagrams for 28 or 66 classes of signs, but it is fair to believe that in order to do that he would have applied the same principles used for his diagrams of 10 classes.

In previous work (Farias & Queiroz 2003), we showed that the diagrammatic method described above not only explains the underlying logic of the diagrams designed by Peirce, but can also be applied as a method for the construction of diagrams for any n-trichotomic classification of signs. This has lead to the development of a computer program able to build equivalent diagrams for any n-trichotomic classification of signs (Farias & Queiroz 2004), which serves as a tool for the investigation of C.S. Peirce’s theory of signs (Farias & Queiroz 2006). Understanding the underlying principles of the diagrams for 10 classes designed by Peirce is an important step towards the comprehension of his sixty-six classes.