

The Language of Design in Baroque Architecture: Looking for ‘Connections’ through Francesco Borromini’s Works

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Abstract: This paper attempts to discuss how Francesco Borromini, an architect in the Baroque age, was able to ‘connect’ different disciplines to construct exceptional buildings that managed to communicate with visitors in a very strong manner. He devised a new methodology that, although initially misunderstood, ended up being a proper language of design. To do this, various elements will be analyzed and discussed. Borromini used spaces as concrete materials that he shaped and manipulated in an original way, managing to create the illusion of greater spaces; by using different geometric forms and intersecting them to create other more complicated designs, he had better flow and movement between the internal elements. He also made his imposing façades relate with the other surrounding buildings in the urban space outside, creating a pulsating force even between spaces that were mutually interdependent.

Borromini also utilized original and ingenious ornamentation, the installation of which involved great technical difficulty. He ‘connected’ his aesthetic vision for his buildings with his scientific knowledge as may be appreciated in his use of perfect proportions to scale and in his eye for detail manifest in every architectural element, be it a base, an angle, or a bend. He worked around a centre integrating the uniform vertical walls with it and then proceeded to create a relationship with the outside urban spaces. Borromini synthesized existing schemes such as the Greek cross, the circle, the octagon, and the Latin cross to come up with innovative complex spaces that expressed his innermost beliefs and feelings but which were also integral parts of the message and philosophy of the Baroque age.

Keywords: Baroque architecture, language of design, synthesis and connections

Whenever an attempt is made to reflect on the sensations experienced while enjoying exceptional examples of architecture, one remains in no doubt that an explicit visual language exists that communicates a definitive message to those open to receive it. This is not only determined by the aesthetic characteristics of the buildings but on other various mathematical and scientific considerations employed by the architect and, in certain occasions, dependent on the philosophical and theological ideas of the age. An architect's main focus when commissioned to design a building still remains the application of his technical knowledge to come up with a plan to create a stable structure within the economical restrictions imposed on him. From this point onwards the architect's creativity comes into play. The artist and the scientist in the architect need to come together for the conception of exceptional works. If there is one age where this is particularly true, this is the Baroque Age. During this period of great exaggerations, of excessive shows of powers by the Church and by the State, every medium was utilized, be it music, paintings, sculpture, and also architecture to pass on the message to the followers. The 'connections' between scientific and mathematical concepts, the language of design and the influence of the new philosophical ideas may be appreciated when analysing some of the most attractive and emotionally moving buildings of all times, the works of Francesco Borromini.

Borromini's works were chosen to demonstrate these 'connections' as his ultimate designs, more than those of other well-known architects, took the form of a very strong language, at the time not immediately understood, as most innovative ideas. He used a new methodology based on experimentation that evolved when he re-evaluated old techniques and amalgamated them with the new philosophical ideas of Rene Descartes and Euclid. Juan de S. Bonaventura first described the effect that Borromini's work when he spoke of the visitors to the little church of S. Carlo alle Quattro Fontane in Rome saying: 'And when they are in the church they do nothing but look above and all around them, for everything therein is so disposed that one thing leads to another'.¹ What is so special about these this Baroque architect whose works bring about deep emotions in his admirers? What new language that knows no boundary of time can communicate in this way?

1 P. Portoghesi, *Roma Barocca* (Rome, 1988), 375.

Francesco Borromini, the innovative and ingenious architect, was misunderstood during his lifetime and the following centuries and it was only after 1920 that German art historians began to re-assess his work; it took another twenty years before his genius began to be appreciated.² From being labelled an eccentric and psychotic individual, today he is considered as the purest of all Baroque architects and a truly professional one. His exceptional talent boils down to his vision and how he applied it when he designed his buildings and how he used his mathematical and scientific knowledge and integrated these with his aesthetic values. Essentially, architecture is building according to a set of conditions that may be functional, economical, political, or even social.³ Borromini had the ability to solve the problems he was presented with by what was considered as 'bizarre designs'. He was capable of doing this because he knew the vocabulary and the language of design and so could come up with a limitless range of possibilities that did not necessarily solve exclusively the functional problem but went beyond that. He explored 'connections' with other disciplines to manipulate and organize space and form, at the same time also focusing on the meaning his buildings would impart. Borromini could create unifying and coherent structures by integrating all the important elements and systems of architecture. To fully appreciate his talent, these elements need to be considered holistically.

Space and form

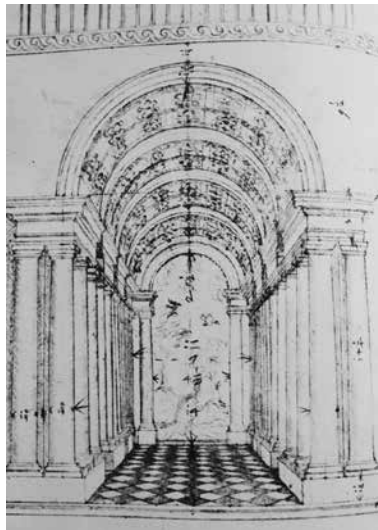
Borromini treated space as a concrete material that he shaped and manipulated. During the Renaissance and the Early Baroque periods, new building methods were being experimented with to express intense messages as part of the social and political conditions of the time. The 'abstract' relationship between plastic elements and their meaningful spatial distribution began to be contemplated. Even though Borromini did use some of these methods, he looked for more original and innovative ways to use his spaces. Renaissance architects worked with straight lines, volumes and the application of the classical canons using

2 J. Glancey, 'Borromini: the first architect', *The Guardian*, 5 February 2011.

3 F.D.K. Ching, *Architecture-Form Space and Order* (New Jersey, 2007), p. ix.

double columns, a combination of pillars and columns, the giant orders, and pediments.⁴

Borromini used much more complex designs that seemed to create an indivisible whole. He also tried to use his designs to create the illusion of space. The best two examples are seen in the cloister at S. Carlo where he gives unexpected breadth to his space by cutting off the corners and instead creating convex corners with pillars. He also tries something similar at the Galleria Spada where he showed that, by using geometry of curves, space could be modelled like a *rex extensa*, controlling it and dilating it.⁵ By slanting the roof downwards and the floor upwards and by displacing the columns which were not all the same height and projecting away from the wall behind, he created shadow play and an illusion of a much longer gallery. Even though Borromini started off his designs by visualizing what he could create with the space available, he ended up creating geometric forms inspired by simpler geometric shapes.



Borromini's Design of the
Perspective Gallery
at Palazzo Spada

Starting off with a regular shapes and forms like the sphere which is symmetrical and has an infinite number of lines of symmetry which could act as his axes, he would then transform it dimensionally, or add

4 C. Norberg- Schulz, *Baroque Architecture* (Milan, 1979), 97.

5 Portoghesi, 139.

on or subtract other elements. Thus he would create ovoid or ellipsoidal forms by elongating the sphere along its axis. Borromini did this with the space inside to form an elliptical dome as found at the church of S. Carlo alle Quattro Fontane where he was using his innovative method to respond to one of the problems he faced, that of restricted space.⁶ Being his first commission as an individual architect in Rome, it seems that it was his wish to be original. Borromini worked with geometric shapes just as Renaissance architects did but he intersected these geometric shapes to reduce the space required for the construction. Traditionally it was inconceivable to superimpose three different structures. By doing this he opened up the development of new architectural possibilities, later acquired by Guarino Guarini in Turin who became renowned especially for the plastic continuity of his domes.⁷



Elliptical Dome of the Cloister at San Carlo alle Quattro Fontane

What makes Borromini's architecture more baroque in essence than that of the other architects is the movement and the plasticity it portrays. Nothing seems to be static in his creations; in fact, they seem

6 Ching, 52.

7 U. Eco, *L'età moderna e contemporanea, Il Seicento*, Vol. 5 (Milan, 2012), 94.

to have a life of their own. Borromini goes from straight to curved lines to even more complex curved forms. This made his buildings look extraordinarily dynamic, especially when seen in relationship to the urban space.⁸ He took this further when he made his interiors interact with the exterior. This idea that when looking at the façade of S. Carlo and then entering inside, exterior and interior forces seem to be working together, the directional movement of the street outside and the expansive space inside. The façade varies the movement of the inside and then the variation continues all around the church.⁹ He was forever experimenting how he could use space and also how to create an illusion of even more space.

Borromini went even further when, because of restrictions of space, he had to work with several mutually interdependent spaces. He did not treat these as extensions to each other as was usually done by other architects but as interacting spaces with pulsating forces. One example is the convent and church of S. Maria dei Sette Dolori in which the vestibule seems to contract and the space in front of the concave façade seems to expand. This principle of pulsating juxtaposition was intrinsically different from spatial interpenetration which was the principle used by all other architects at the time. This new vision would in fact influence greatly the development of Baroque architecture, as a more complementary approach to different spaces began to be adopted, be it the interior and exterior or be they different spaces in a clustered organization.¹⁰

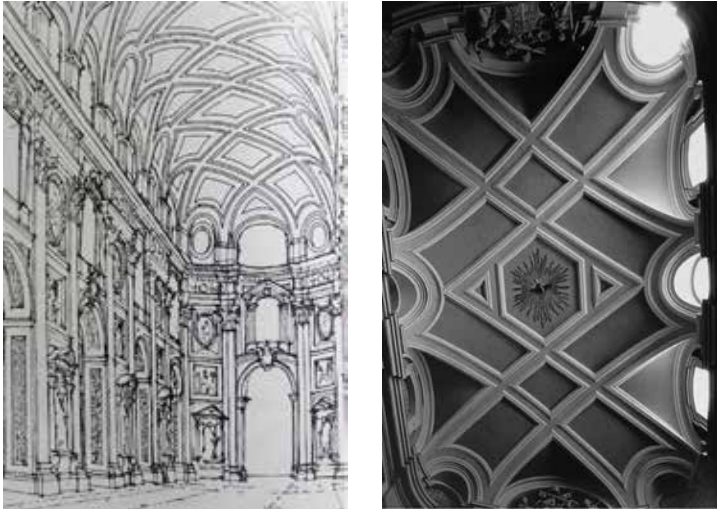
Proportion and scale

Most of the newly constructed buildings by Borromini were small in scale, which is probably why he tried to compensate with complex designs and plans with perfect proportions. He only received very few commissions as the more popular Gian Lorenzo Bernini clinched all the mega-projects. When Bernini's work is analysed, however, one can note that, even though he had many very large-scale projects, his

8 Ibid., 92.

9 Norberg-Schulz, 112.

10 Ibid., 113.



Centralized Organization and Vertical Integration – illustrated by the hypothetical reconstruction of the interior of San Giovanni Laterano, and the ceiling, on a much smaller scale, of the Cappella di Tre Magi at the Collegio di Propaganda Fide.

architectural forms are very simple. Bernini then used other art forms to create detail and compensate for this simplicity managing to create that sensation of awe that was characteristic of the Baroque age, whereas in Borromini's buildings this sensation is created through the architecture and feels like he meditated on each and every element, be it a base, an angle, or a band.¹¹

Borromini only got the chance to work on the design of a large church in 1646 when he was asked to restore S. Giovanni in Laterano, an Early Christian basilica. Limited with the actual structure, the available budget, and the imposed time frame (it had to be ready for the Papal Jubilee of 1650), Borromini encased pairs of existing columns in pillars creating arches that led to the aisles. This saw the creation of centralized small units with the concave corners typical of his work, forming a group of mutually interdependent spaces. His plan was to vault the nave and give it the same treatment he gave to the Propaganda Fide chapel but he was not allowed to do so owing to the cost the diagonally disposed ribs he wished to construct to join the walls would incur. In a

11 A. Munoz, 'La formazione artistica del Borromini', *Rassegna d'arte*, 19 (1919), 103–17.

sense the same harmony found in his other churches designed and built by him from scratch could not be replicated because of the limitations imposed of him. Still this is a fine example which illustrates what he would have been capable of doing had he been entrusted with larger projects.¹²

Centralized organization and integration vertically and with the urban space

In all his plans, when space permitted, Borromini always tried to work around a centre created with diagonal directions. In his first work in the Cappella del SS. Sacramento in S. Paolo fuori le Mura where he was assisting Maderno, the rectangular space had no pilasters in the corners so the concave shape was carried on in the vault for vertical continuity, giving a diagonal orientation to the space.

Borromini used the same solution in the Cappella dei Re Magi in the Palazzo di Propaganda Fide built after 1660. Here he also integrated vertically the uniform and perfectly continuous wall and even here the space creates the diagonal directions stressing the centralization process created on plan. This is repeated in the cloister of San Carlino, where again there are no corners but convex structures that form a unified space which integrates all the three dimensions around a central point.¹³ That Borromini understood the spaces around him and could see the bigger picture may be seen in his solution for the church of S. Agnese in Agone that Rainaldi had started with the Pampfili family and which then he was asked to complete. The problem that he faced was that the width of Piazza Navona was not wide enough to enjoy and appreciate fully when facing the church. His simple yet ingenious way of solving this problem was to build the dome in line with the recessed façade and, together with the belfries, he managed to create an illusion of grandeur. This feat was not an easy one considering that the very small area designated for the church was almost as long as it was wide. With his design, although at first glance one sees a traditional church following the Spanish model, it only looks so harmonious with the rest of the urban space because

12 Norberg-Schulz, 122.

13 Ibid., 98.

there is so much technical knowledge and thought behind the design. The dome of S. Agnese is like a large mass in the space of the piazza and Borromini managed to create a relationship between his building and the rest of the urban space in a truly Baroque fashion.¹⁴

Originality

What is considered as his most important work, the church of S. Ivo della Sapienza in Rome's old University La Sapienza integrates most of Borromini's original ideas. The area demanded a centralized structure at the end of an existing courtyard. Any other architect would have chosen a traditional scheme, such as an octagon plan or the Greek-cross plan but Borromini chose a hexagon with alternating apses and recesses with a convex fond which he then treated with his undulating walls. The six corners of the hexagon that were structurally the most important were given double pilasters with single ones in the apses and recesses. Then ribs from the top of these double pilasters rise to hold the ring of the lantern. Differentiating and transforming ideas of previous ancient builders, Borromini manages to create an integrated whole with vertical continuity, creating a complex ground plan and continuing it without interruption to the dome. Again the exterior is complementary to the interior. Borromini with this relatively small space managed to portray the Baroque spirit as no other architect, simply by his original and special solutions.¹⁵

With a larger space, as in the oratory and Roman house of the Congregation of S. Filippo Neri, Borromini was faced with the challenge of organizing a cluster around an already existing church and its large sacristy. He integrated the latter between a courtyard and a garden and, in so doing, had to move the main axis because of the irregularity. Borromini's façade is an exercise in complex volumes and involved surfaces, with a concave curvature in the centre. This was purposely designed to send an important message to all visitors: that of open arms waiting to welcome anyone who cared to enter.¹⁶

14 Ibid., 22.

15 Ibid., 117.

16 Ibid., 112.

Ornamentation

When it came to the decoration inside the churches, Borromini was creative, original, and ingenious. His favourite motif by far was the winged angels' heads that he then applied to the metamorphosis of abstract decorative architectural elements, such as the angel's wings on the pediment of the facade of S. Carlino or the ovolo of the cornice at S. Ivo replaced by little faces of angels flanked by wings.¹⁷ Another favourite were the bursting pomegranates found on the capitals of S. Giovanni Laterano and the baskets of pomegranates on the monument of Cardinal Guissano.¹⁸ And the doorway at Palazzo Carpegna with the hanging wreath of flowers and the Medusa head is among the most original, whilst the window cornices of Palazzo Barberini attributed to him were decorated with sea shells.¹⁹

Although, compared to Bernini, Borromini did not use much decoration in his buildings, mostly because his clients were, to say the least, not the richest, whenever he did, he had such an original way of creatively applying these to his structures, that his work was very easily identifiable and not easy to forget. A quick aerial view of Rome with the facility to zoom in, the lantern of the church of S. Ivo della Sapienza and the bell tower of S. Andrea delle Frate would surely leave an imprint on any mind.

Borromini's methodology

Borromini introduced a new methodology based on experimentation which required the presence of the architect at all times during the construction as all the phases had to be rigorously controlled and which had to proceed in a complementary way with the idea on plan. He re-evaluated old techniques used by other architects. Here Borromini is seen as superior and his maturity since his formative years in Lombardy working on the restoration of the Duomo in Milan became clearly manifest.²⁰ His inspiration came from the ancient builders and from the

17 F. Lemerle and Y. Pauwels, *Baroque Architecture 1600–1750* (Paris, 2008), 73.

18 A. Blunt, *Borromini* (London, 1979), 152.

19 Portoghesi, 165.

20 Eco, 94.

works of Michelangelo.²¹ He may have also been inspired by nature as it was during this time that philosophers like René Descartes were promoting this idea of nature's mathematization and Euclid's theories of geometry were being applied to cosmology. In a letter sent to Cardinal Camillo Pamphili regarding his villa with 32 windows, Borromini expressly writes that the whole building would be a study in applied mathematics.²² Borromini's best contribution to architecture although at first so poorly understood remains a new method of handling space. With this method he solved the various problems he faced using the principles of variation, interdependence, and continuity. With fusions and transformations of the classical orders he introduced a psychic dimension involving inside and outside forces that was innovative to say the least.²³

Borromini synthesized existing schemes such as the Greek Cross, the circle, the octagon, the Latin Cross, and the sequence of domed units to come up with innovative complex spaces. He developed the principle of pulsating juxtaposition, basing his work not only on his knowledge of mathematics and physics but on the contemporary philosophies, together with his own aesthetic vision. Making these 'connections' between these disciplines, one may conclude that Borromini was a truly exceptional Baroque architect who showed he was capable of incorporating these in his work in innovative ways, communicating in a distinctive language of design.

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21 Blunt, 29–37.

22 Ibid., 50.

23 Norberg-Schulz, 122.