

Juan Gris' Compositional Symmetry Transformations

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Abstract

Cubist painter, Juan Gris, developed his compositions with at least four types of symmetry transformation. Unlike any other Modern artist, Gris rooted the radical and disorienting innovations of Cubist space in compositional traditions of symmetry. Through close analyses of works representative of the main phases of Gris' painting, the author demonstrates how symmetry operations were at the foundation of the artist's compositional methods and how those methods evolved. Translations, rotations, reflections, and glide reflections not only account for visual composition, but they also form the basis for Gris' creative objective of "visual poetry."

Introduction

Juan Gris (1887-1927), like Pablo Picasso, was a Spanish-born, expatriate artist who lived and worked in Paris during the early, pivotal years of Modern art. Among Gris' important contributions to Modern art in general, and to Cubism in particular, is his compositional rigor and clarity. Gris has been called the "classical Cubist" [2] and a "perfect painter" [1], acknowledgments that his work in some important ways stands in contrast to that of his contemporaries. Despite the recognition by art historians and art critics about the general merits and distinctiveness of Gris' Cubist works, little has been written regarding the specific characteristics of his compositional methods. It is Juan Gris' compositions that display these "classicisms" and "perfections" so clearly, and various strategies of symmetry lie at the foundation of most of his compositions.

Gris and Cubism

Juan Gris was born José Victoriano Carmel Carlos González Pérez in Madrid. He took the pseudonym Juan Gris ("John Gray") shortly before his permanent relocation to France in 1906. Gris' newly adopted name is ironically and perhaps intentionally at odds with his uniquely colorful Cubist paintings; further, the word *gris* is both Spanish and French, perhaps also an intentional choice of "word symmetry" to acknowledge his new, dual national identity. Soon after arriving in Paris, he met poets and artists of the avant-garde, including Pablo Picasso, who had been living and working steadily in Paris since 1904. Gris took a studio in the same building occupied by Picasso and others, and in this environment he witnessed the birth and early development of Cubism, arguably the most radical and important movement in art in the 20th century. In 1907, Picasso completed his monumental *Les demoiselles d'Avignon*, now generally considered to be the first Cubist painting.

Cubism constituted an artistic revolution in a number of regards, including the establishment of an unprecedented level of abstraction and the incorporation of multi-perspective views. But perhaps the most important of Cubism's innovations is that it changed a fundamental assumption that had dominated visual art since the beginning of the Renaissance: that a painting is a window onto an illusory space that is optically similar to and consistent with the viewer's own space. For over 500 years, artists had developed

and employed a sophisticated language of vanishing point perspective, light and shadow, naturalistic proportions, and a clear, visible distinction between objects (*figure* in perceptual terminology) and the space they occupy (*ground*), to create a world within, or behind, the flat picture-plane that is fundamentally similar in appearance to the world of objects and spaces that we experience day to day. While some artists and art movements prior to Cubism distorted, exaggerated, flattened, or otherwise made that space unusual, Cubism went farther than any preceding movement in art to dismantle Renaissance space and replace it with not just an unfamiliar representation of objects and spaces, but ultimately an “impossible” two-dimensional construction of objects and spaces that cannot exist in three dimensions (see Figures 1 and 2).



Figure 1:
Juan Gris, “Guitar and Flowers” 1912



Figure 2:
Georges Braque, “Pedestal Table” 1911

For example, earlier generations of still life painters would represent, say, a violin on a table more or less as they appear to the eye (or a camera), with all of the visual information necessary for the viewer to interpret the violin as physically whole and distinct from the table it rests upon, and likewise to interpret the violin and table as solid objects occupying the empty space of a room, each object visually understandable as complete and independently movable within that space. That is, traditional paintings offered information that was consistent with visual data we receive from the world for our practical interaction with the world: an inventory of recognizable, solid objects that are physically independent of each other and of the surrounding space they inhabit.

By contrast, the Cubist painter presents the violin and the table as dismantled into a multitude of rectangular and triangular planes, crowding and overlapping not in any familiar shape of a violin or a table, but as a general cluster that loosely resembles a still life. There are two critical features to this Cubist pictorial space: the violin and table are fused together in this cluster of planes, and the “solid” objects of violin and table are also fused with the “empty” space of the room. Distinctions of figure and ground are broken down in Cubism, and planes vie with each other for identity and for solidity. The categories of solid and empty, of figure and ground, of mass and space are no longer stable or easily resolvable in Cubism. Cubism no longer optically “re-presents” a pictorial space that is consistent with

our own 3D space, but instead confronts the viewer with an illusion of space that is irresolvable with the “facts” of our experience of space, and so can exist only in the “fictional” realm of the 2D plane.

It was this counter-logical space, among other things, that Pablo Picasso and Georges Braque were forging in their paintings during the years after 1906. Gris, six years younger than Picasso and new to these innovations, would over the next three years absorb the lessons of Cubism and begin producing his own experimental paintings and drawings. By 1910 he was exhibiting Cubist paintings and drawings that, in contrast to Picasso and Braque, possessed a distinctively regular geometric organization (compare Figures 1 and 2), and by 1912 he was embarking on a kind of Cubist composition involving symmetry transformations not practiced by Picasso, Braque, or any other artist of the time. He continued to develop, to clarify, and to expand these symmetric compositions until his premature death from illness at the age of 40 in 1927. Despite the compositional innovations that are the subject of this paper, Gris never gained the notoriety or status of Picasso, either during his lifetime or after. Yet Gris' originality was recognized and deeply defended by a number of contemporary artists and writers, including Daniel-Henry Kahnweiler, the most important proponent and art dealer of Cubist painters, and Gertrude Stein, the American writer and intellectual who befriended Picasso, Braque, Matisse, and dozens of other artists and poets of the Modern period. Kahnweiler characterized Gris and his work as “... one of the summits of pictorial art. A firm hand, serving a pure soul and a clear mind, created the supreme inventions of an ardent sensibility...” [2]. And Stein says of Gris, “...the only real Cubism is that of Picasso and Juan Gris. Picasso created it and Juan Gris permeated it with his clarity and his exaltation” [4].

Symmetry and Art

When artists and art historians speak of compositional symmetry in painting, almost always they are referring to bilateral reflective symmetry with a vertical axis located in the center of the compositional space, and usually those compositional symmetries are visually approximate rather than geometrically exact in their right-to-left repetitions. Reflective symmetry is among the earliest of compositional organizations in the history of art, visible even in the art forms of preliterate cultures. While the employment of symmetry has waxed and waned throughout the history of painting in the West, it nevertheless persists up to the present as a fundamental principle of composition in the creative arts. Owing to the predictability of its side-to-side balance, bilateral reflective symmetry typically carries connotations of solemnity, formality, authority, and stability. Familiar examples in Renaissance painting include Leonardo's *Last Supper* (1495-98) and Jan van Eyck's *Ghent Altarpiece* (1432). Of course, rotational and translational symmetries were also known and employed in the decorative arts (e.g., textiles, metalwork, architectural ornament, ceramic decoration, manuscript illumination, cathedral rose windows), but these symmetries were much more rare in the “fine art” of easel or mural painting. There are some powerful instances of translational symmetry as “shape rhymes” in compositions such as Rogier van der Weyden's *Escorial Deposition* (1435) and Georges Seurat's *Sunday Afternoon On the Island of la Grand Jatte* (1884-86), both surely familiar to Gris, but these translational symmetries occur as rather isolated parts and do not operate on a global scale in the compositions, as had reflective symmetry. So, compared to reflective symmetry, painters generally seem either not to have been cognizant of or not to have been interested in rotations, translations, or glide reflections. As we shall see, Gris is an exception.

As art developed generally and gradually towards more secular and naturalistic subjects after the Renaissance, compositions relied less and less upon symmetry; asymmetric compositions better conveyed the dynamic nature of the subjects of everyday modern life. Compositional geometry and symmetry were still taught in art academies, but by the 19th and 20th centuries, these formalisms were at odds with the varied aspirations of art movements such as Realism, Impressionism, Expressionism, and even Picasso's and Braque's Cubism. Yet in any given period, there were some artists who, by temperament or by training, continued to adapt geometry and symmetry to their current artistic milieu. Juan Gris did so for Cubism in the first quarter of the twentieth century.

Compositional Symmetry Transformations in Gris

A full treatment of Gris' compositional symmetry greatly exceeds the length of this paper. We will be necessarily limited to identifying the general categories of Gris' symmetry transformations and to examining those symmetries by way of only a few sample paintings. Further, there are other important mathematical features in Gris' paintings that deserve examination, but we can acknowledge them only briefly in this paper when they are germane to the symmetry discussions. Although compositional symmetries are vital to an understanding of Gris' paintings, a full interpretation of any painting must also include consideration of the complex of subject matters, word-play, illusory spaces, and metaphoric implications of his compositions and imagery; since these kinds of interpretations exceed the scope of this paper, the reader is encouraged to consult the references [1, 2, 3].

Rotational Symmetry Transformations. The earliest appearance of symmetry transformation as a compositional method in Gris' work occurred around 1913 with his employment of rotational transformations in paintings and collages. Before this, Gris, like Picasso and Braque, had "disassembled" still life objects into fragmentary planes and reassembled new and unusual objects by combining views of the objects from different vantage points in space (e.g., a cup made from a combination of plan and elevation views). This multi-perspective method became an effective and often-used convention of Cubist painters. When Gris began to employ rotational symmetry transformations, he added a new method for disassembling not just individual objects but groups of objects and sometimes even whole scenes.

For example, in the 1914 painting *Flowers* (Figure 3), Gris presents fragmentary and overlapping depictions of still life objects: flowers in a vase, a newspaper, cup and saucer, wine glass, pipe, and bottle on a marble tabletop. Curiously, there are two cups on saucers, two vases, and what appear to be two tabletops. And some objects have features quite similar to other objects: the leftmost cup, saucer, and vase are in a vertical orientation and are parallel to each other, while the rightmost versions are tilted but also parallel to each other. Further, the leftmost cup and saucer overlap both a newspaper above and the table-edge below, and similarly the rightmost cup and saucer are cut off by apparently abstract straight-edge shapes at exactly the same respective places at the top and bottom. These objects and their relationships to each other actually form two views of the same objects, offset by a rotation. The center of that rotation is the main flower in the vase, located above center in the composition. Figures 4 and 5 show selected object-shapes in their two rotational positions.

Gris seems to have employed a consistent rationale to this rotational method. The rightmost images, those rotated off of vertical, carry the shape and shading ("chiaroscuro") information of the objects, but not the texture or coloration ("local color"). This creates superimpositions and surprising re-combinations of objects and their attributes: a "marble cup" and a "marble vase." Additionally, the shapes of the table and newspaper that have no textural description appear as empty black spaces, a reversal of figure and ground, of solid and void. These characteristics are consistent with Picasso's and Braque's work of the same period; the Cubist fragmentations and multiple perspectives imply, if not describe, our perceptions while moving through 3D space. Yet Gris' rotational transformations also involve, in a specific manner, our perceptual motion through the 2D composition of the painting. Gris defines and combines two distinct motion contexts: motion in the world at large (the Cubists' investigation) and motion on the surface of the painting (rotational transformation). The effect of Gris' compositional method is to offer a larger, coherent structure to what appears to be a rather random break-up of the images. Rotational transformation provides the viewer opportunity for a perceptual re-integration that counteracts the tendency towards fragmentation. The multiple viewpoints and fragments in the work of Picasso, Braque, and the other Cubists, were not governed by a large-scale compositional method such as rotational transformation, but instead were ad hoc; the resultant effect of these other Cubist works is that the fragmentation of the objects is matched by a fragmentary, or at best "episodic," perceptual re-integration by the viewer. Gris continued to develop this rotational compositional method until 1916 or 1917, producing his own elegant and visually unique versions of synthetic Cubism.



Figure 3: Juan Gris, "Flowers" 1914

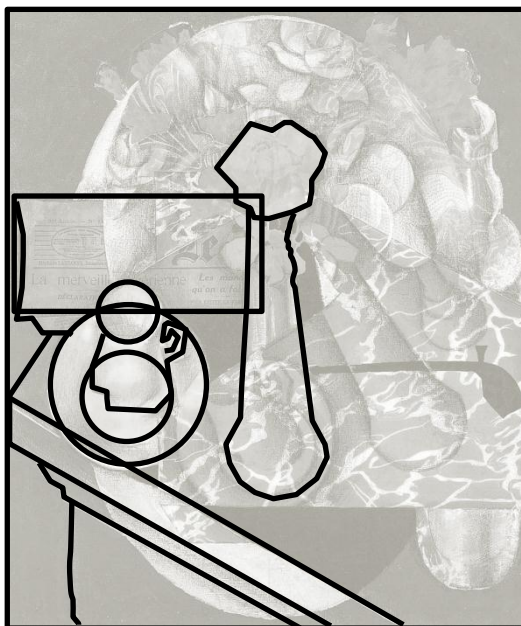


Figure 4: Newspaper, cup & saucer, vase, and table in original positions.

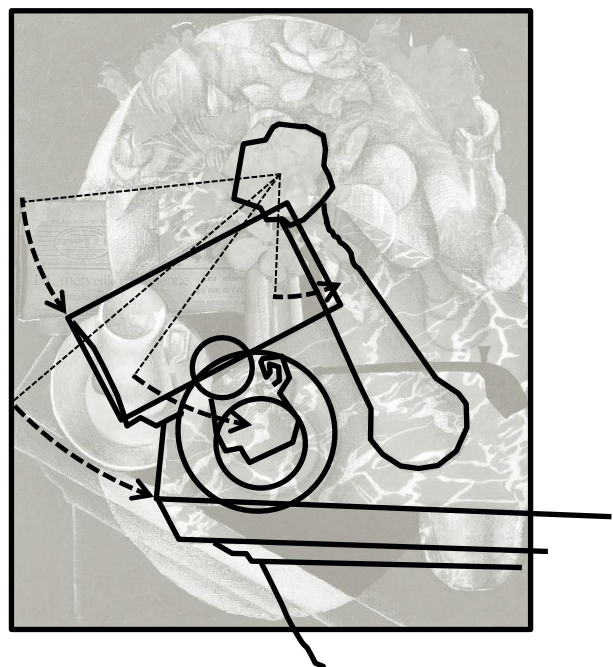


Figure 5: Same objects as Figure 4, rotated as a group to new positions.

Reflective Symmetry Transformations with Translation (Glide Reflection). In 1917 Gris began to experiment with reflective symmetry transformations. Gris was surely well aware of bilateral reflective symmetry in the history of painting, but his reluctance to employ simple reflection suggests that he held the view, as do many artists, that reflective symmetry is potentially static. Gris set about to solve this problem of stasis by combining bilateral reflective symmetry with changes in proportion, scale, or position. Beginning in 1917, his answer was to combine reflection with translation, making compositions based upon glide reflection transformations.

One of the first paintings to investigate the possibilities of glide reflection is *Fruit Bowl on Checkered Cloth* of 1917 (Figure 6). The painting, more abstract than most, depicts the checkered tablecloth as a tilted group of rectangles below and left of center. A cup or goblet is to the right of center, the base of a fruit dish is situated exactly at the center, with the main mass of the fruit dish rising and widening above that. In the fruit dish, near the top and right of center, is a bunch of grapes, identifiable from the clustering of ovals. Two corners of the table can be identified at the right and left, near the middle of each side of the canvas. The composition overall appears asymmetrical, yet closer examination reveals that a large number of shapes in the bottom half of the canvas are symmetrically related to the top half by a combination of reflection and translation. Perhaps the strongest clue is an apparent similarity between the checkered cloth below and the grapes above. It might, at first sight, appear to be rotationally symmetrical, but is, in fact, a glide reflection. Figures 7 and 8 show the significant shape relationships; the symmetry is confirmed by the ovals of the grapes fitting neatly in each of the rectangles of the checked cloth.



Figure 6: Juan Gris, “*Fruit Bowl on Checkered Cloth*” 1917

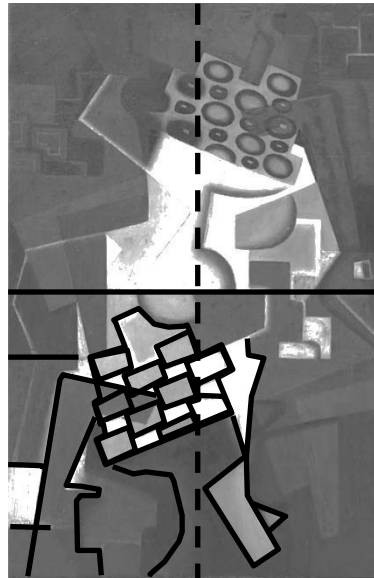


Figure 7: Checkered cloth and other significant compositional shapes.

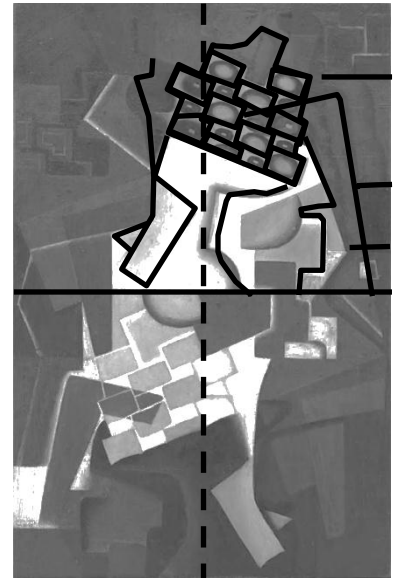


Figure 8: Shapes from lower half reflected and translated to upper half.

Reflective Symmetry Transformations with Enlargement / Reduction. Gris continued to expand his symmetry transformation experiments, apparently seeking further for ways to activate bilateral reflective symmetry. Beginning in 1921, Gris developed compositions of reflective transformations with dilation, making one side of the symmetry larger than the other. These scale changes are consistent with, and possibly emerged from, Phi-ratio (Golden Section) divisions (see [2] for Kahnweiler’s acknowledgment of Gris’ employment of the Golden Section). *Le Canigou* (Figure 9) is among the earliest and clearest expressions of this new enlargement/reduction reflective symmetry. The painting shows a still life with a guitar, a book, fruit on a plate, a fruit dish or a cup, and a cloth; the still life rests on a table before an

open window with a shutter. Beyond the window are snow-capped mountains and a blue sky. As with almost every Gris painting, our entry into the composition is in noticing shape similarities among the different objects. The shape and angle of the large window shutter at right is reflected in the smaller and darker shape of the table at the far left. And there is a noticeable similarity between the undulating shape of the white mountains above and the smaller shape of the side of the guitar. The upper corner of the table is paralleled below by a reflected, darker shape that can best be described as a shadow falling across the guitar and table. One of the strongest visual alignments is a vertical division from top to bottom, slightly left of center. That division is the central axis of a reflective symmetry, where the shapes at the lower left are smaller versions of shapes at the right (see Figures 11 and 12). That vertical division is also consistent with a Phi division of a large Phi rectangle (see Figure 10).



Figure 9: Juan Gris, "Le Canigou" 1921



Figure 10: "Le Canigou" with superimposed Phi rectangle.

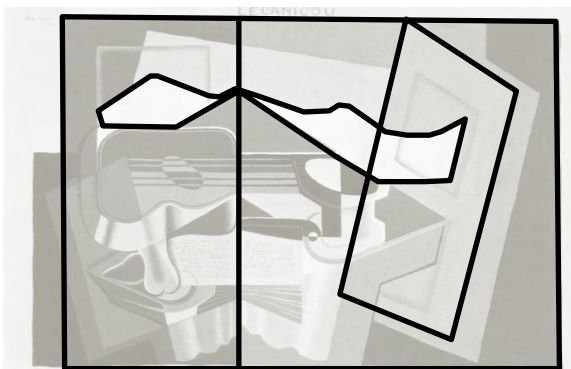


Figure 11: Shutter and mountain shapes.

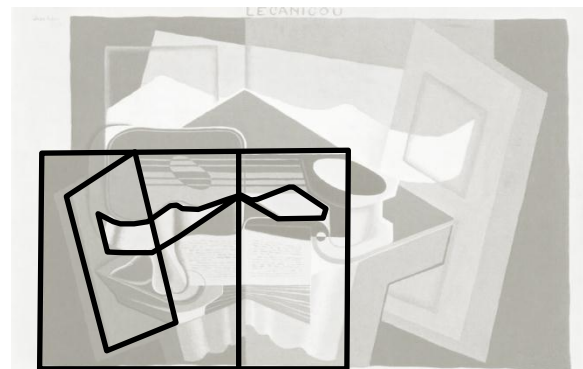


Figure 12: Table and guitar shapes.

Diagonal-Axis Reflective Symmetry Transformation with Proportional Change. In the last three years of his life, from 1924 to 1927, Gris developed reflective transformations employing diagonal axes; when utilized on rectangular canvases, the difference of length in the sides of the canvas yielded differently proportioned symmetrical shapes. *Woman With a Basket* (Figure 13) provides an elegantly simple example of this method. The composition is comprised of just over half a dozen large, flat shapes of color, configured as a woman wearing a tunic and holding a basket. A diagonal axis from lower left to upper right divides the shapes and lines into a reflective symmetry: The white tunic, combined with the green leaves and red fruit, form a symmetrical arrow-shape that is proportionally squeezed/stretched in accord with different lengths of the horizontal and vertical dimensions of the canvas. The warm, flesh

tone and earthy-colored shapes left of the axis are symmetrically matched by the brown shape and the basket to the right of the axis, but again proportionally narrower in the horizontal dimension than in the longer vertical dimension. This is a symmetry that is at once geometrically precise and naturally responsive to the particular shape of the compositional space.



Figure 13: *Juan Gris, "Woman with Basket" 1927.*

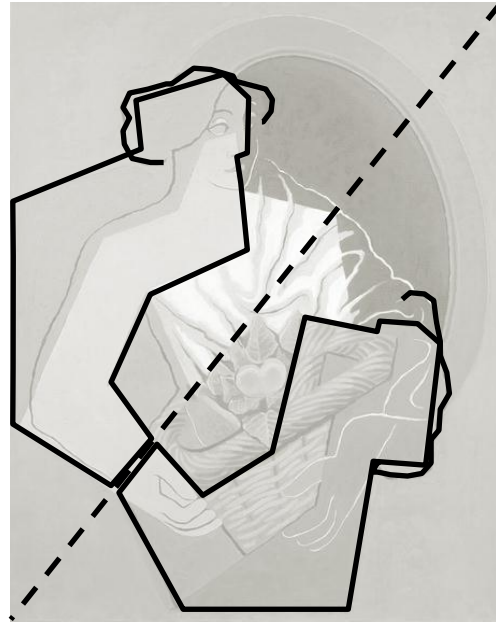


Figure 14: *Diagonal axis symmetry with proportional changes.*

Conclusion

Gris' symmetry transformations may be understood as visual equivalents to poetry; shapes are ordered by a geometric "meter" and echo one another in visual "rhymes." Gris himself offers just such an analogy in his own writings: "I consider that the architectural element in painting is mathematics, the abstract side; I want to humanize it. Cézanne turns a bottle into a cylinder, but I begin with a cylinder and create an individual of a special type: I make a bottle—a particular bottle—out of a cylinder....This painting is to the other as poetry is to prose" [2]. We may see in Juan Gris' compositions the enduring, traditional visual language of symmetry, but expressed with a modern voice in the idiom of Cubism.

Acknowledgements

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