

Surreal space in René Magritte's *Le Blanc-Seing* (1965)

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“The function of painting is to make poetry visible... to render thought visible.” René Magritte

Pictorial art reveals some of the visual brain's “neural rules” and processing hierarchy. This article examines one salient exemplar drawn from the vast *oeuvre* of the great Belgian surrealist, René Magritte (1898–1967). The painting *Le Blanc-Seing* (1965) is a virtual course in perception, with many elements illustrating figure-ground segregation, object identification, cues for depth perception, Gestalt Laws of occlusion-continuation, and visual scene organization. *Le Blanc-Seing* is visually stunning, beautifully rendered, and, at first glance, otherwise unremarkable. However, Magritte has embedded several jarring surreal effects in the painting that provide clues about the visual brain's visual processing hierarchy in scene construction. This includes elements whose alternation between two incompatible percepts cannot be explained in terms of local spatiochromatic statistics (Ritchie & van Buren, 2020). Finally, I provide a plausible pictorial inspiration (never before demonstrated) for the painting in a brief scene from a 1924 German silent film.

Introduction

Magritte depicts a pastoral forest scene with horse and a smartly dressed woman rider passing through a stand of trees. It appears to be early autumn, with brown, orange, and reddish leaves intermingled with the grass receding into the background between the trees. The painting clearly evokes implied motion. The horse appears to be in a jog or slow trot, based on its leg and hoof positions and its upright stance. There is no evidence of wind disturbing the leaves, branches, or the woman's hat or clothing, and thus the scene has a certain tranquility. The source of light is from high to the right based on the shadow information at the base of the trees and horse's legs. One can even venture a guess as to the socioeconomic status of the smartly dressed equestrian.

Each element of *Le Blanc-Seing* is painted masterfully and realistically, but otherwise most of the scene is unremarkable at first glance: there are no melting clocks, as in Dali's famous *Persistence of*

Memory (1931). Magritte's pictorial design establishes a vivid depth hierarchy of all the elements in the painting, enlisting six monocular depth cues: (1) size and relative size (near trees larger than far), (2) texture gradients (leaves and grass underneath the horse vs. in the background), (3) contrast and atmospheric haze (objects in the distance have lower contrast), (4) perspective (the arrangement of trees appears to recede due to the combined effect of the above cues with the approximately linear perspective arrangement of the trees, as highlighted by the trajectory of the arrow at the base of the trees), (5) shape-from-shading (cylindrical tree trunks), and (6) occlusion/completion.¹

Use of these cues are not unique to Magritte, of course. But in *Le Blanc-Seing*, the vividness of the three-dimensional (3D) scene he constructs does “double duty” because the robustness of the 3D quality elicited also serves as the (complementary) percept, the salience of which heightens the *surreality* of three key elements that violate the very space he so meticulously created: (1) impossible tree no. 3, (2) the impossible left rear leg of the horse, and (3) the apparent (impossible) occlusion of the front-mid section of the horse, as well as the left hand of the rider and part of the reins, by open-space-leading-to-background!

Surreal effects 1 & 2: Impossible tree no. 3, impossible left rear leg of the horse

These two surreal elements are intertwined (literally and metaphorically). The pictorial features that imbue tree no. 3 with a surreal quality also enhance the surreality of the horse's left rear leg. This is readily visualized by comparing Figures 2A and 2B, where tree no. 3 has been manipulated to look “normal” (Figure 2A) versus the original painting (Figure 2B).

Impossible tree no. 3

If you look at the base of tree no. 3 (tree that passed in front of the horse's torso and the rider's right side)

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Figure 1. *Le Blanc-Seing* (1965) with five trees numbered as discussed in the text. An arrow illustrates the alignment of the bases of some of the trees along a rough perspective line receding toward the scene background. Original image © 2023 C. Herscovici/Artists Rights Society (ARS), New York.

near the forest floor in Figure 2B, the construction of space forces us to see it as substantially further from us than the bases of either of its two neighbors, trees no. 1 (the larger neighbor) or tree no. 4. Near the top of the tree (where it is partly occluded by the upper branches of tree no. 1), it is also perceived as distant, well behind tree no. 1. Yet, somehow it “magically” ends up *in front* of the horse and right arm and shoulder of the rider, much closer to us. The net effect is that Magritte’s design leads many viewers to eventually see this whole tree as convex, bowed toward us in the middle (half of 16 normally-sighted adult viewers interviewed saw the tree as convex, and the rest saw it as straight).² In fact, perceiving the tree as “normal,” unbowed, or straight, is itself somewhat surreal: the tree’s base is perceived as substantially distant vis a vis the base of tree no. 1 or the front of the horse (11/11 (100%) interviewees who responded to this question perceived the base of tree no. 3 as further). And so perception of this tree as straight-vertical defies logic and cognitive understanding of the scene layout.

The “impossible” qualities of this tree derive from two interacting factors: the vivid spatial layout in depth, and our priors about such trees. It is improbable that

there would be a *convex* tree in a stand of such trees: a tree that is distant at its base and top but substantially closer to us in the middle. For those who see the tree as bowed toward them, the apparent convexity is maintained even as our gaze scans the full length of the tree, implying perceptual integration and maintenance of the effect across gaze shifts over a large portion of the visual field.

Based on the vertical trajectory of its trunk around the level of the horse’s mid-section, if it were a “normal” tree among this group of trees, its base would have to have been much closer to us, in front of both the horse and rider as in the manipulated version of the painting (Figure 2A). Notice that the “corrected” tree no. 3 now seems like a smaller-diameter tree (especially in the region where it intersects the leg) compared with the version in the original painting (Figure 2B). In Magritte’s version, it is perceived as a slightly larger distant tree, possibly induced by the influence of perceived distance on perceived size.

Impossible left rear leg

The vivid spatial layout of the whole scene, and in particular the placement in depth of the lower portions of trees no. 1 and 3, forces us to see the leg as impossibly contorted (Figures 1, 2B). If Magritte had not succeeded in generating such a vivid 3D layout, the leg would not appear contorted and stretched (9/13 [69%] of interviewees perceived the leg as a partially occluded part of the horse but distorted or stretched). As perceived in the original painting (Figure 2B), that leg appears to traverse a long distance to end up in front of the large, closer tree no. 1. Of course, our perception of the spatial layout and perceived distance between the trees contribute to the surreal quality of this leg in another manner: i.e., by requiring a striking violation of our priors about physically realizable horse anatomy. But again, the improbability of the leg depends heavily on our visual brain accepting Magritte’s spatial layout of the scene elements.

These features highlight the visual brain’s prioritization of object integrity and continuity (e.g., we cannot help but see the leg as belonging to, attached to the horse despite its contorted appearance). The two regions of the leg have the same coloration and brightness, and they remain linked as one object, occluded by tree no. 3, by the Gestalt continuity “rules” of the visual brain. The occlusion and spatial ordering is bolstered by four T-junctions (Nakayama & Shimojo, 1992; Nakayama, He, & Shimojo, 1995; Rubin, 2001). They also highlight the brain’s prioritization of the depth information over object form: the vividness of the depth cues in the scene can even “warp” familiar objects (e.g., distortion of a familiar straight vertical tree into an unlikely convex tree). And the perceived

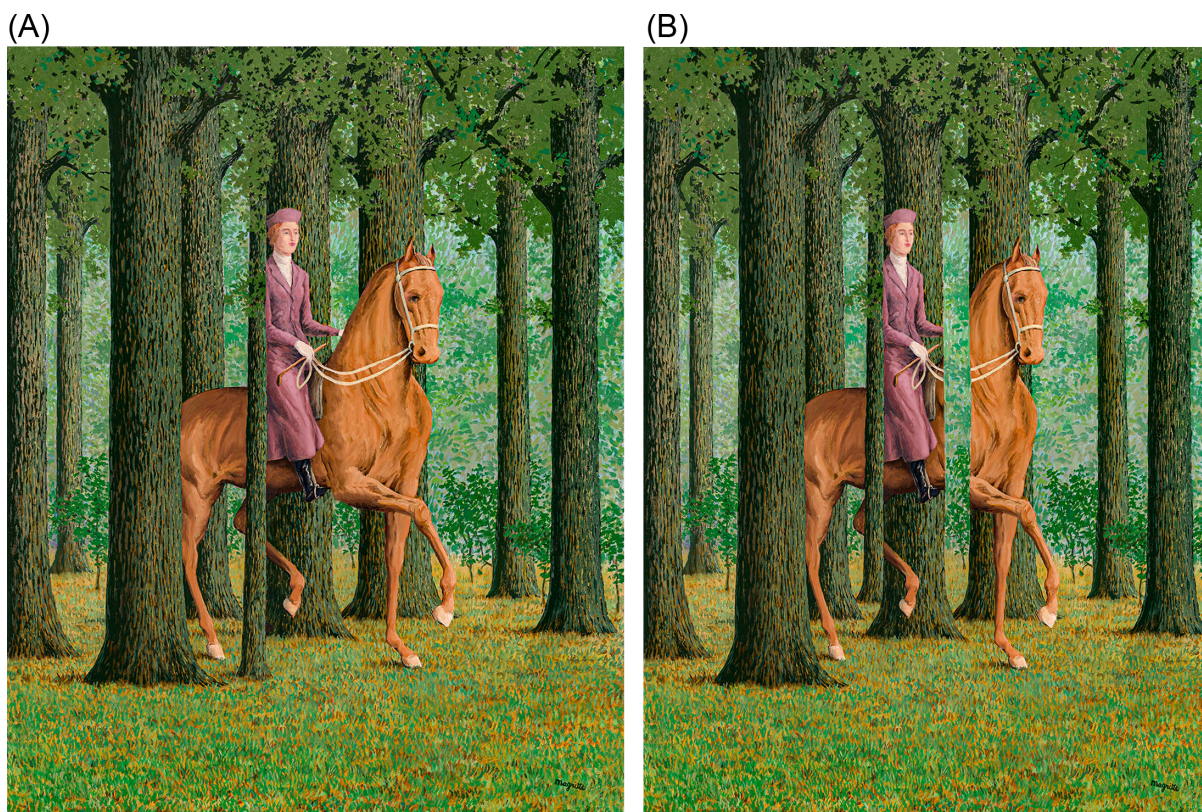


Figure 2. (A) *Le Blanc-Seing* with the tree no. 3 from Figure 1 manipulated to appear realistic, and the surreal gap in the horse's front section corrected versus (B) the original painting for ease of comparison. © 2023 C. Herscovici/Artists Rights Society (ARS), New York.

depth relationships of the trees and horse are what lead to the left rear leg's surreal "stretched" quality.

Surreal effect 3: Empty space become opaque occluder

At first glance, it seems that Magritte has "severed," or interrupted, the front portion of the horse with what appears to be an opening to the distant background foliage. This leads to the most jarring, surreal element of the painting, because our perception can be drawn to see a single, complete horse completed behind some sort of (impossible?) occluder: empty-space-become-occluder. In these moments, our visual system has been "tricked" into perceiving distant background foliage in the gap between trees no. 1 and 2 as an *occluding object* (like an opaque, "foliage-patterned ribbon") in the foreground, in front of the horse's torso paradoxically appearing to occlude part of the horse's reins and the rider's left hand. Above the level of the rider's hand and below the horse's torso, this same spatiochromatic texture is often perceived as merging with the distant background foliage. Six of 15 respondents (40%) saw it this way, but nine (60%) saw it as alternating between background

and foreground compatible with the foliage pattern in the region of the horse's torso.

Magritte's construction of this region of the painting engages the "middle-vision" mechanisms that prioritize the parsing of scenes into surfaces of objects (e.g., Nakayama et al., 1995). Yet this striking, surreal effect is unstable: 14 of 15 (93%) interviewees perceived the textured pattern between trees no. 1 and 2 as foreground in front of the horse's torso or as alternating between foreground and background, and of those (3/15) 20% clearly saw it as foreground, in front of the horse. The similarity between the spatiochromatic texture in the region of the horse's torso and the regions above and below the horse biases us to see it all as background, which "severs" the horse. However, the amodal completion of the horse, reins, and rider's hand may act to draw our perception back to seeing that same texture as an opaque occluder (like a textured opaque ribbon). The latter details, as well as the disappearance of the end of the riding crop, also may bias our perception toward seeing an (impossible) occlusion by the spatiochromatic foliage texture in the space between trees no. 1 and no. 2. In this way, what would otherwise readily be seen as distant, background foliage converts into a foliage-patterned occluding object, like the surface of an occluding patterned ribbon.

An additional factor that may contribute to a perception of the foliage pattern appearing as an occluding object in the foreground could derive from artists' "tricks of the trade," namely that they will tend to paint objects in the foreground as significantly brighter than or darker than the background. However, Magritte appears to deliberately ambiguate this region of the painting by making the foliage pattern in the region of the torso approximately equal in "value" (the artists' term for brightness) to the background foliage in the distance.

There are several pictorial T-junctions that would tend to bias us to perceive the foliage pattern in the region of the horse's torso as an occluder (Nakayama & Shimojo, 1992; Nakayama et al., 1995; Rubin, 2001). They occur most notably at the right and left edges of the pattern where they exit the horse's body at the top and bottom. However, unlike T-junctions in real occlusions of real objects, or images of objects (real or abstract), these T junctions are unstable: they only act like "ordinary" T junctions during the moments when our perception has "flipped" to see the foliage pattern as an occluding object. In that state, the left and right vertical borders of this region are seen as crisp edges of an (occluding) object, not as open space between objects.

The "victory" of amodal completion, however transient, and its impact on our percept of the foliage in the region of the horse's torso highlights our visual system's prioritization of maintenance of object integrity and assignment of surfaces to objects. Nakayama et al. (1995) discussed the importance of perceiving surfaces as part of the process of object identification and segregation in the overall process of scene understanding.

The perception of an "occluding" ribbon implies that, in the moments when that percept is experienced, the spatiochromatic texture has perceptually coalesced into a surface, an object with a distinct border. Research on primate cortex supports a working hypothesis that surface texture and border ownership may be coded in mid-level visual pathways (V2, and human analog to primate V4; Zhou, Friedman, & von der Heydt, 2000; Pasupathy & Connor, 2001; Pasupathy, Kim, & Popovkina, 2019).

Area V2 in visual cortex has been proposed to play a role in figure-ground segregation in that it contains cells that are "side-of-figure selective" (e.g., Zhou et al., 2000; Sugihara et al., 2011; Qui et al., 2005). However, it seems that the perception of this region of the painting cannot be explained simply by such mechanisms. The spatiochromatic texture in this region of the painting can only "own the borders" during the moments when it is perceived as an occluding object, like a textured (opaque) surface. This percept is bi-stable to a greater or lesser degree from viewer to viewer and, across viewing time, for each viewer.

An additional surreal effect may emerge. In principle, the open-space-become-occluder could be subject to the same perceptual effects that caused tree no. 3 to appear somewhat convex. After viewing this painting many times, to my eye, when I perceived the spatiochromatic texture as an "occluding ribbon" in front of the horse, the whole texture-become-occluder between trees 1 and 2 began to appear convex, curved toward me, because just above and below the horse it appeared to be distant background. Fourteen of 15 (93%) interviewees saw this region of the painting closer to them in the horse's torso region some of the time (11/15 saw this region as alternating between foreground and background). Such a percept implies that the whole strip between trees must arc from distant background at the tree bases and near the tops of the trees, passing closer to us in the horse's mid-section.

Shadows seen and shadows missing. Subtle painterly gesture: When small details have large perceptual impact (perceptual "amplifiers")

There are six shadows visible on the grass-leaf forest carpet: small horizontal shadows to the left of the base of four trees, plus two small shadows on the grass behind the left front and right rear hooves. The placement and length of these shadows imply sunlight coming from high up and to the right, shortly before or shortly after noon.

It is somewhat remarkable how many other potential or physically likely shadows Magritte deliberately avoided depicting. Missing are any shadows from the rest of the horse (e.g., no shadows from the head and torso or from the elevated right front leg are depicted). There are no shadows on the forest floor cast from the foliage or large branches above the horse and rider. Yet these omissions tend to go unnoticed. Thirteen of 15 (87%) of interviewees failed to notice any missing shadows in the painting until they were asked about them.

As an artistic, aesthetic choice, this was probably a wise one. Too many shadows on the floor of the forest, or cast onto horse and rider from the leaves and branches above, would have cluttered the scene. The six shadows Magritte chose to display were simple, and their "shadow ownership" (Casati & Cavanagh, 2019) was unambiguous: the objects that cast them were unambiguous, which is not always the case in complex scenes (e.g., shadows of foliage) (Casati & Cavanagh, 2019).

Artists are masters at knowing what we won't notice, what omissions or errors or violations of physics/optics will pass unnoticed (Cavanagh, 2005). That is, they know what is essential to achieve the perceptual effect they seek. In this sense, Cavanagh (2005) has characterized art as “science by looking” and sees our 40,000-year record of human art as a massive data set that can augment the study of human visual perception.

On the other hand, two small shadows that Magritte included served an important perceptual function: the shadows behind the horse's left front and right rear hooves. They illustrate what I call “the power of subtle painterly gesture” or “perceptual amplifiers.” In this instance, these two small shadows have the potential for an outsized perceptual impact. Their presence anchors the horse and rider to the ground (the plane of the grass and leaves), imbuing weight to the horse and rider. Without these shadows, the horse and rider would seem to be floating above the ground. Moreover, it is possible that they exert their effect even if we do not consciously notice them (a subset of the effect strikingly illustrated by the “ball-in-a-box” illusion by Mamassian, Knill and Kersten (1998) in which the path of the ball in a perceived 3D space is profoundly transformed by manipulation of a dynamic shadow).

Implied movement: A surreal effect evokes the dimension of time and movement

The static scene design and associated surreal effects in relation to the space between trees no. 1 and no. 2 allude to a dynamic perceptual bi-stability analogous to the dynamic visual effects when viewing a real 3D horse and rider moving through a real 3D forest as they pass in and out of visibility:

“If somebody rides a horse through a wood, at first one sees them, and then not....In ‘Carte Blanche,’ the rider is hiding in the trees, and the trees are hiding her. However, our powers of thought grasp both the visible and the invisible—and I make use of painting to render thoughts visible.” (René Magritte, in Paquet, 2015). The empty space between those trees is empty now but may be filled in the next moment.

Possible pictorial inspiration for *Le Blanc-Seing*: Cross-medium “pollination”?

In her 1992 tome, *Magritte*, Sarah Whitfield suggested a potential, arcane pictorial inspiration for *Le Blanc-Seing*, citing the painter Patrick Hughes'



Figure 3. Screenshot from Fritz Lang's film *Siegfried* taken at 16 minutes 11 seconds.

suggestion that *Le Blanc-Seing* was reminiscent of a scene in Fritz Lang's 1924 silent film, *Siegfried* (Whitfield, 1992). On a whim, I entered “Siegfried Fritz Lang” in the YouTube search window. And there it was—a 4.5-hour silent film.³ Not knowing what to expect, or when in the long film I might see anything relevant, I let it play. As luck would have it, I only had to watch for about 16 minutes. Figure 3 is a still photograph screenshot taken from a scene starting at 15:15, and then captured at 16:11.⁴

The likeness between the painting and this moment in Lang's film is more readily visualized when viewing a video in Supplementary Video. In this brief video, a grayscale version of *Le Blanc-Seing* fades in and out overlain on top of the still-shot from the film.

The match between Magritte's painting (1965) and the still-image from *Siegfried* (1924) is remarkable despite some differences (inexact alignment of the trees and different positioning of the horse) (Figure 4). However, the similarities are striking: even the odd hat on the woman's head is similar to the hat or headpiece on the horse-person's head in the still-shot; the horse's right front leg is in approximately the same position as the leg of the horse in the film; and three or perhaps four of the trees in the film image are roughly, if not exactly, aligned with trees in the painting.

Although this is by no means “proof” of the cross-art pollination, it is plausible that this brief scene served as pictorial inspiration for Magritte's magnificent painting. This likeness has never before been demonstrated and is thus a noteworthy historical observation that was missed by the many scholars who have poured over Magritte's works for many decades.



Figure 4. A grayscale version of *Le Blanc-Seing* is overlaid on top of the screenshot from Lang's film.

Conclusion

Le Blanc-Seing (1965) is an iconic masterpiece by Magritte. It is aesthetically striking, with beautifully rendered scene elements laid out in a meticulously constructed 3D scene. But Magritte has designed into the painting some surprises that elicit a surreal experience. These surprises emerge out of deliberate manipulations of, and resulting “violations of”, the very space so carefully constructed. Overall, the surreal effects in the painting highlight that our perceptual understanding of surfaces and objects that “own” them, and their spatial arrangements in a perceived 3D scene are primary.

For example, the perceived surreality of the left rear leg of the horse is induced by an impossible arrangement of the trees it winds through. Yet the visual system's prioritization for surface and object integrity maintains the horse's ownership of that limb, even violating prior knowledge of physically realizable horse anatomy and the “non-stretchiness” of bones.

The most bizarre element of *Le Blanc-Seing* is the *open-space-become-occluder* that “tries” but fails to bisect the horse in two. It fails because the neural elements that extract surfaces and objects, segregate objects, and organize elements into a perceived 3D scene, are confused, ambiguated, by Magritte's scene construction. Moreover, figure-ground ambiguity also tends to be drawn toward “figure” by the visual system's prioritization for maintaining object integrity, amodally completing the horse and broken reins. The completion seems to occur “behind” the surreal conversion of that open space and the distant foliage into an opaque occluding object (stippled “ribbon”)

perceived intermittently as foreground. The percept of occlusion is somewhat bi-stable; it can also be seen as an opening to the scene in the background. However, Magritte's design biases us to see it, at times, as an uncanny occluding object rather than as an open window to a “scene” in the background (this percept would “sever” the horse).

Because any bi-stability in the perception of this particular scene element occurs without a change in the stimulus, its appearance cannot be explained by its image statistics *per se*. Thus, the competing perceptions of this region of the painting highlight our brain's active mechanisms that instantiate image segmentation and figure/ground assignment. These, and not bottom-up image statistics, determine whether the stippled region in the middle of the horse is processed as a “material” (opaque ribbon) or a “scene element” (background foliage) (Ritchie & van Buren, 2020).

Finally, I provide pictorial evidence that the pictorial inspiration for *Le Blanc-Seing* may have been inspired by a five-second sequence in a 1924 German silent film (*Siegfried*, part of *Die Nibelungen*, by Fritz Lang).

Keywords: René Magritte, surrealism, neuroscience and art, *Le Blanc-Seing*, object segregation, figure-ground, surface representation, image statistics, scene processing, depth perception in 2D art, gestalt principles, Fritz Lang, film, *Siegfried*, cross-medium influence, creativity, pictorial art

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Footnotes

¹Obviously, there is no actual occlusion in a two-dimensional painting—nothing is “in front of” anything else. The perception of occlusion in a painted scene requires that our visual system first identify and segregate the objects and then place them in context in a three-dimensional arrangement of the scene.

²Sixteen normally-sighted individuals responded to a series of multiple-choice questions about the various elements of the painting discussed here. The questionnaire can be viewed in Supplemental Materials. The interview/questionnaire format of inquiry helps clarify the general perceptual experiences based on the participants' honest self-reporting. However, a controlled psychophysical approach was not

implemented here. As such, the interview data here are not conclusive but are nevertheless informative qualitative data.

³See <https://www.youtube.com/watch?v=4-rVkjME9CE> ('Die Nibelungen 1924', which contains 'Siegfried'; 4h 34min).

⁴When I showed this to Patrick Hughes at the 2018 meeting of VSAC (*Visual Science And Art Conference*) in Trieste, Italy, he was flabbergasted and had no memory of this scene. He also had no recollection of suggesting Lang's film as the visual inspiration for the *Le Blanc-Seing*. But apparently he (or someone else) had suggested this to Sarah Whitfield, and the likeness we see here and in the Supplemental brief video suggest that the film may have, indeed, inspired a connection between the two disparate works of art in Magritte's imagination.

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