

Original Contributions - Originalbeiträge

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Psychologists and artists: perceptual phenomena and representational strategies

1. Premise

In previous articles (Messina-Argenton & Prest, 2022, 2025) we have briefly sketched the figures of four Italian psychologists and artists, namely Alberto Argenton, Paolo Bozzi, Gaetano Kanizsa and Manfredo Massironi, trying to show how their lives were marked by the need to engage in research in the “two cultures”: scientific and artistic, to borrow the terminology of Snow (1964).

Having in common their being university professors and belonging to the same disciplinary scientific field, General Psychology, three of them, Argenton, Kanizsa and Massironi, were also active in the visual arts while Bozzi primarily composed music, but also produced some significant contributions in literature and, marginally, in graphic art.

All four favoured the study of perception, adopting a similar theoretical approach of a Gestalt matrix and directing their attention to perceptual phenomena that occur in daily life or in the art world: decidedly centred on graphic-pictorial art was the scientific research of Argenton, the only one of the four and among the few in Italy to teach Psychology of art; Massironi was equally attracted by the two domains, while Kanizsa was much more interested in everyday life, though with remarkable contributions on pictorial perception, in the same way as Bozzi, to whom, however, we owe relevant studies on musical perception.

In the same articles cited above, we had also mentioned the generative importance of their scientific and artistic heritages for the opportunity they offer to build cultural, formative, educational paths, oriented at the very least in a twofold direction: to deepen the relations between perceptological science and art; to exercise those faculties of the mind that are fundamental to knowing and trying to understand the world, also to imagine “the new”, and which cut across all “cultures”.

With respect to the last mentioned direction, we referred primarily to perception: the primary process of selecting and organizing stimuli from the external world, which constitutes “the foundation and driver of cognitive activity”

(Argenton, 2019, p. 41), and thus also of imagination and creativity, and to which attentional and observational capacities are closely related; capacities that need to be ‘educated’ and ‘cultivated’ and, in the digital age in which we live, also with a certain urgency, to try to balance the frenetic and often aimless stimulation to which they are subjected.

As for the first direction, attempts to recompose the schism between art and science are being intensified, looking for connections and analogies and from multiple angles: from the benefits of their relationship for human well-being to the artistry of galaxies or the translation of scientific algorithms into artistic artifacts and so on. In the same way the relationships between the science of vision and art are increasingly becoming a topic of reflection, and symposia or exhibitions are being organized on this topic. In one of them, a recent exhibition involving two of the four protagonists of this article, the perspective adopted seems to suggest that the psychology of perception finds in optical or kinetic art the “right” art to which it can be applied¹. A perspective that could be shared, if it were based on the assumption that the psychology of perception is the privileged partner not only obviously of optical art, but of all art: to borrow Kanizsa’s words, the two domains, art and psychology of perception, “complement each other” (Kanizsa, 1991, p. 83).

And this complementarity, as we understand it, is also to be identified in the possibility of enabling a dialogue between the scientific precision of psychology and the creative but always rigorous freedom of art, considering the rich cognitive potential that can result from the comings and goings between the two fields. This perspective, which guides our research work (e.g., Messina-Argenton & Prest, 2016; Messina-Argenton, Prest & Verstegen, 2022) and the design of some exhibitions (Messina-Argenton & Prest, 2019a, 2019b), can also be traced in the one we will briefly report below.

2. An exhibition of dialogue between art and science

The exhibition in question – “Art and perception in the visual works of Alberto Argenton, Gaetano Kanizsa, Manfredo Massironi and in the music of Paolo Bozzi” – was curated by the authors of this article together with Tiziano Agostini, Mauro Antonelli, Ivana Bianchi and Ian Verstegen and was held in the spaces of the FrancoAngeli Academy from September 24 to October 11, 2024. The exhibition constituted one of the special events of the 23rd Scientific Conference

¹ We are referring to the section of the exhibition “Trick of the Eye” dedicated to “The Gruppo N and the Psychology of Perception”, which was held in Padua, Italy, in the Palazzo del Monte di Pietà from September 24, 2022 to February 26, 2023 and was curated by Guido Bartorelli, Andrea Bobbio, Giovanni Galfano and Massimo Grassi.

of the Society for Gestalt Theory and its Applications (GTA), organized together with the Department of Psychology of the University of Milano-Bicocca.²

The arrangement of the exhibition, calibrated in relation to the gallery spaces, presented a panel introducing the exhibition itself, four panels illustrating the scientific and artistic path of each of the four artist-psychologists, similarly to how they were described in the works to which this article is related (Messina-Argenton & Prest, 2022, 2025), and a selection of visual artworks by Argenton, Kanizsa and Massironi, about twenty each, accompanied by musical pieces composed by Bozzi and played on a loop.

The exhibition of the artworks was structured by themes, corresponding to some perceptual phenomena studied in psychology – amodal completion, completion by frame, anomalous figures, perceptual transparency, concavity-convexity, and good continuation – and to analogous representational strategies. Specifying clearly, in the presentation of the exhibition, that the artworks exhibited “were not to be understood as demonstrations of the above perceptual phenomena”, which can be found in the exhibited works “with the freedom of artistic invention, just as they are in the production of many other artists, being phenomena universally present in all domains of reality” (Agostini et al., 2024, p. 1).

To this caveat must be added another equally essential one, concerning the artists’ representational intents: while some of Massironi’s artworks take up, with appropriate elaboration, phenomena studied experimentally by Gestalt psychologists (Massironi, 1988), and while at least two of Kanizsa’s exhibited artworks, those concerning anomalous surfaces, *Orologi 1* and *Orologi 2* (see Figure 8), are believed to constitute an artistic transposition of the phenomenon discovered in science (<https://www.gaetanokanizsa.it/b-superfici-anomale>), in the case of Argenton’s artworks, it must be excluded that they may have been dictated by the intent to transpose into art perceptual phenomena studied in psychology; the representational strategies he devised and employed in his artworks were elaborated in function of the compositions³ he conceived through his perceptual reasonings.⁴

The exhibition arrangement was designed in such a way as to show side by side the artworks of Argenton, Kanizsa and Massironi sharing a common theme and, in the caption accompanying each work, a thematic keyword corresponding to

² The exhibition was realized with the contribution of the Department of Psychology of the University of Milano-Bicocca and under the patronage of the Museo diffuso Bicocca (MuDiB), the Centro interdipartimentale di ricerca per il Patrimonio artistico e culturale (BiPac) and the Society for Gestalt Theory and its Applications (GTA).

³ Here we use the term “composition” with the meaning given to it by Leon Battista Alberti in his *De pictura* and recalled by Argenton (2019, p. 53): “composition is that rule in painting by which the parts of what is seen fit together in the painted work”.

⁴ This statement finds confirmation in an autobiographical essay by Argenton (1990) (<https://www.albertoargenton.it/theme-and-variations-by-alberto-argenton>).

the prevailing perceptual phenomenon identifiable in the work itself was also indicated. Obviously, the perceptual phenomena identifiable in each exhibited artwork are more than one, but it was preferred to indicate only one in order to focus the visitor's attention on its essence and the different artistic results, determined by the artists' personal style.

At the entrance to the gallery, visitors found a free, concise bilingual (Italian and English) catalogue⁵ containing a brief introduction to the exhibition, corresponding to the presentation panel, the texts of the four panels illustrating the scientific and artistic path of each of the psychologist-artists, a selection of artworks by Argenton, Kanizsa and Massironi relating to the themes of the exhibition (24 out of a total of 58 works in the exhibition), and a brief analysis of the relationship between perception and music in Bozzi's composition, which we cannot deal with here for reasons of space. In addition, the catalogue contained two glossaries. Glossary 1 provided definitions of perceptual phenomena related to the six themes of the exhibition, accompanied by scientific images illustrating the phenomena themselves; glossary 2 provided definitions of some core concepts included in the presentation of the exhibition, namely Gestalt Psychology, Psychology of art, Phenomenal reality/Phenomenal experience, Perceptual aspects of the artistic work, and Expressive properties.

These two glossaries were also placed at the disposal of visitors, one printed on the front and the other on the back of a plastic-coated sheet, which they could take and consult during the visit for an immediate comparison between the scientifically studied phenomena and the configurations they assumed in the representational strategies devised or used in artistic creation, given the stylistic peculiarities of each artist.

An explanation, albeit very brief, of the six themes of the exhibition, through examples of exhibited artworks (even some not reproduced in the catalogue) and scientific stimuli illustrative of the considered perceptual phenomena, should clarify the aims of the arrangement and the potentialities of the exhibition itself.

2.1. Amodal completion

Amodal completion – an expression introduced by Albert Michotte and Luke Burke (1951) – refers to “a phenomenon that occurs when a portion of the visual field, although hidden by an occluding object, is nevertheless perceived to be completed behind the occluder. The term *amodal* accounts for the fact that one part of a figure hidden behind another can be seen even if there is no corresponding sensory stimulation” (Agostini et al., 2024, p. 14). The stimulus

⁵ The concise catalogue can be consulted here: <https://www.albertoargenton.it/argenton-kanizsa-massironi-e-bozzi-catalog-of-the-exhibition-art-and-perception>

reproduced in Figure 1 – and inserted in the glossary 1 – is drawn from one of the countless scientific papers on the topic and shows the phenomenon of amodal completion; in it “completion occurs in the arc of a circle” (Kanizsa & Massironi, 1989, p. 146), thus shaping the part of the irregular curvilinear outline occluded by the square.

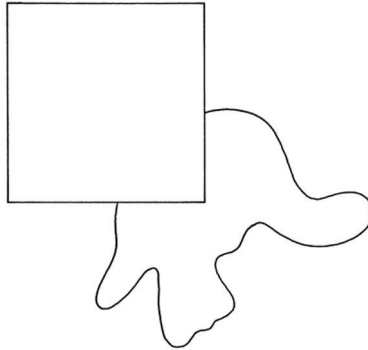


Fig. 1. Example of amodal completion. Figure adapted from Kanizsa & Massironi, 1989, p. 146.

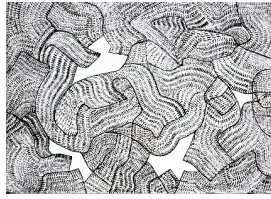
Actually, psychology has ‘simply’ observed a perceptual phenomenon that also corresponds to a representational strategy used by artists since the dawn of time, giving a scientific explanation that integrates with the pictorial ‘reasons’: it is surprisingly true that in cases of overlapping, retinally not present elements are amodally present, and in this process a stratification of planes occurs: from the first plane of the occludent to the underlying plane of the occluded or to further underlying planes, if there are several forms superposed on each other. On the one hand, the pictorial strategy of overlapping forms serves to give local and global spatial depth to a composition, this being one of the pictorial depth indexes, and on the other hand, the phenomenal layering directs the observer’s attention mainly toward what conceals/is concealed, if other entirely visible forms are present.

The artworks reproduced in Figure 2 constitute stylistically different examples of the use of this strategy.

The strategy entirely permeates Massironi’s artwork, *Doppia piegatura*, even though the intention is not to ‘play’ with amodal completion, but to induce an experience of folding; it is diffused in Kanizsa’s artwork, *Testura*, with several points locally more evident, as may be the case of the ‘tab’ at the top left that overlaps the part below with an inverted course of the prints left by the brush, extending over the white part; it is present only in a few parts of Argenton’s artwork, *Omaggio al violino o a P. G.*: the green ‘wedge’ occluded by the half outline of the violin that gradually thins out and changes its colour to yellow; the golden



Alberto Argenton, *Omaggio al violino o a P.G.*, 2012, pastel, acrylic, collage on straw paper, 29.4 x 29.4 cm. Courtesy of the heirs of Alberto Argenton.



Gaetano Kanizsa, *Testura*, 1980, oil on canvas, 50 x 70 cm. Courtesy of the heirs of Gaetano Kanizsa.



Manfredo Massironi, *Doppia piegatura*, 1991, wood and cardboard, 77.5 x 52.5 x 6 cm. Courtesy of the heirs of Manfredo Massironi.

Fig. 2. Thematic keyword: amodal completion.

rectangle that is completed under the hypothetical ‘lines of a stave’; the small orange rectangle that is completed under one of the two f-holes – if observed alternatively to the other f-hole it should be easy to verify experientially both the depth effect and the attractiveness resulting from such a representational strategy.

2.2. Completion by frame

While pictorial amodal completion can stimulate the imagination, inducing one to imagine occluded forms⁶, a particular type of completion, the *completion by frame*, ‘demands’ it. This is a locution introduced by Argenton (2008, 2019) “to refer to the type of completion that occurs beyond the borders or limits within which a pictorial image is confined. These limits are usually defined by a frame” (Agostini et al., 2024, p. 14). The pictorial device consists in the “cut” the painter gives “to the overall configuration of the picture and, in particular, to the figural elements next to its perimeter boundaries. [...] The perceptual result is always that of the completion of an incomplete form [...] and of its location in depth” (Argenton 2019, p. 116). The borders of the painting mark the end of the composition, but thanks to cuts made by the artist the represented space extends beyond the borders themselves. In short, this representational strategy is functional also to the expansion of the represented space and it may also fulfil specific “expressive and semantic purposes” (Argenton, 2019, p. 118).

To exemplify this perceptual phenomenon, glossary 1 of the catalogue presents the image of one of the paintings included by Argenton among the examples he studied to define the phenomenon itself, a fresco by Giusto de’ Menabuoi (Figure 3), where the cuts on the left and right of the fresco contribute to dilate

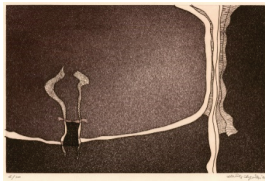
⁶ It is opportune to remember, as Kanizsa (1988, 1991) does, that there are two types of completion: one perceptual and the other mental, which are not always clearly distinguishable.



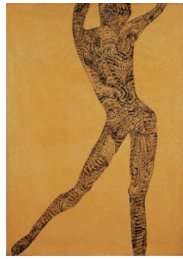
Fig. 3. Giusto de' Menabuoi, *Bacio di Giuda*, 1375-76, fresco, Battistero del Duomo, Padua. Courtesy of the Diocesi di Padova, Padua.

and increase the size of the crowd of people witnessing the episode of the Kiss of Judas, which one is led to imagine continues beyond the frame.

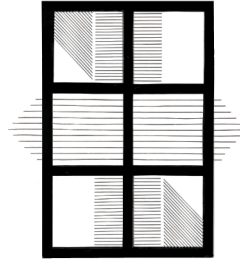
Figure 4 presents three of the artworks on this theme in the exhibition: in Argenton's artwork, *Senza titolo*, the cut by frame on the two lateral borders induces the viewer to imagine the continuation of this 'landscape' indefinitely and the cut on the upper and lower borders to imagine possible developments of the cut 'shrubs'; in Kanizsa's artwork, *Omenone*, the use of this representational strategy seems to be dictated by the intention to accentuate the size of the protagonist; in Massironi's artwork, *Struttura visiva*, certainly with no intention to represent the phenomenon considered here, there is nevertheless the plastic representation of the phenomenon itself in the central part of the work. While, in the upper and lower parts, the observer is led to complete, on the basis of the phenomenon of amodal completion, the horizontal lines under the central black occluding band and, on the basis of completion by frame, the diagonal lines cut from the upper and lower and left and right borders of the frame, in the central horizontal part the artist already offers a ready-made depiction of completion by frame, consisting of the wedge-like shapes protruding beyond the frame and cut from the side borders of the frame; cuts that, at the same time, can lead to complete amodally the entire central part, shaping it as a hexagon.



Alberto Argenton, *S.T.*, 1974, etching, aquatint, 20 x 30 cm
Courtesy of the heirs of Alberto Argenton.



Gaetano Kanizsa, *Omenone*, 1977, oil on canvas, 70 x 50 cm.
Courtesy of the heirs of Gaetano Kanizsa.



Manfredo Massironi, *Struttura visiva*, 1980, blackaluminium with metal rods, 66 x 62 x 1 cm.
Courtesy of the heirs of Manfredo Massironi.

Fig. 4. Thematic keyword: completion by frame.

2.3. Anomalous figures

Anomalous figures are characterized by borders that are visible but not physically given: “there is no quantitative or qualitative change in the stimulus that might justify the presence of such a border” (Kanizsa, 1979, p. 194). In figure 5, “according to a geometrical description, there are only three black sectors and three outline corners symmetrically located on a completely uniform white ground. However, all observers clearly see a white triangle upon an outline triangle and three black disks” (Kanizsa, 1955/1987, p. 44). The white triangle “is, to all intents and purposes, perceptually an opaque surface, standing in front of the other figures and partially occluding them. In painting it is a device used to suggest contours of shapes without introducing differences in reflectance” (Agostini et al., 2024, p. 14).

Figure 6 presents three of the artworks in the exhibition, whose stylistic differences in the use of representational strategies employed and different representational

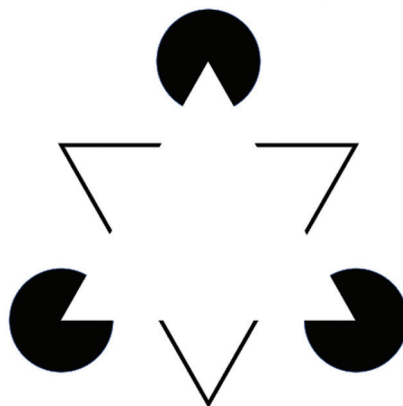


Fig. 5. Kanizsa triangle. Figure adapted from Kanizsa, 1955/1987, p. 44.

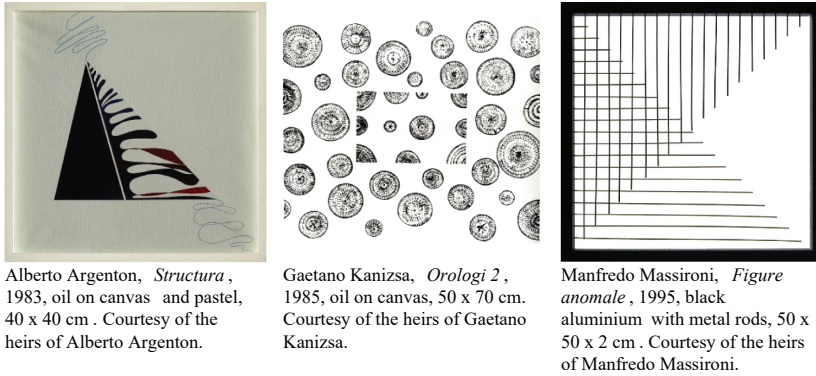


Fig. 6. Thematic keyword: anomalous figures.

intents can be immediately seen. In Kanizsa's artwork, *Orologi 2* – which, as already written, is believed to be an “artistic transposition of the phenomenon discovered in the scientific domain” – an anomalous rectangle is ‘supported by the collinear borders of truncated disks. The “brightnesses” of the rectangle “region and its surround appear different, with colour in the foreground always more pronounced than in the background” (<https://www.gaetanokanizsa.it/b-anomalous-surfaces>).⁷ Similarly, in Massironi's artwork, *Figure anomale*, the internal area of the square is organised in four triangles, one of which – the white one – is given by the anomalous contours generated by the repeated bars that form the other three triangles. In Argenton's artwork, belonging to the *Structura* series, one of the two flanking triangles, the one on the right, is perceptually generated by the progressively degrading succession of sinuous red and blue shapes – basic signs of his alphabet – truncated by a perfect ‘oblique line’, in reality given by a minimal chromatic difference between the grey of the shapes that are interspersed with the coloured shapes (moreover in a concavity-convexity alternation) and the grey of the background. The representational intent here, as in other works in this series, may be to suggest the coexistence of opposite dimensions, such as geometric rigour and fantasy or, we might dare to say, scientific precision and artistic freedom.

⁷ The two “Orologi” shown in the exhibition are believed to be part of a series, which originated from a particular episode: Kanizsa often went to a wine bar, in Friuli Venezia Giulia (a region located in northeastern Italy), owned by Mr. Ermacora. One day Kanizsa found him very distressed because thieves had taken everything they could, including some timepieces that he cared about. On a subsequent visit to the tavern, Kanizsa gave Ermacora as a gift a painted canvas (or more than one canvas?) to hang on the walls, telling him that they were “timepieces for Ermacora”. A nice gesture to help Ermacora overcome the affliction of the theft and to try to compensate him for the stolen clocks. The wording “Orologi per Ermacora” is written on a work preserved in the University of Trieste and reproduced in a catalogue edited by Silvia Kanizsa (2024, p. 260). The episode reported in this note was told to us by Silvia Kanizsa (26 December 2024). Riccardo Luccio also recalls the episode and, in a paper on the Trieste group of scholars “heirs of Gestalt Psychology”, referring to their informal meetings, also mentions Ermacora: “a great innkeeper with a passion for painting and timepieces” (Luccio, 2006, p. 97).

2.4. Perceptual transparency

Perceptual transparency (Figure 7) is that phenomenon whereby “one perceives transparency when one sees not only surfaces behind a transparent medium but also the transparent medium or object itself” (Metelli, 1974, p. 91)⁸. As Rudolf Arnheim specifies (1974, p. 253), transparency is “a special case of superposition”. In this case, “the occlusion is only partial in that visual objects are seen as overlapping each other, yet the occluded object remains visible behind the occluding one” (Arnheim, 1974, p. 253). Painters are masters in using this representational strategy, which “is the device by which color meets the exigencies created by a conflict of shapes” (Arnheim, 1974, p. 255). The strategy is determined by several factors, the most prominent of which are the addition or subtraction of colour (Arnheim, 1974, p. 341) and the brightness: “the brightness of the transparency area is also one of the factors determining which of the competing shapes is seen as lying in front” (Arnheim, 1974, p. 256).

Figure 8 shows three artworks in the exhibition that exemplify perceptual transparency: in Argenton’s artwork, *Butterfly*, the strategy is based on the aforementioned conditions, i.e. subtraction of colour and brightness, and creates a dynamic symphony of forms; in Kanizsa’s artwork, *Corrugazione*, one perceives more of a Renaissance-style veiling, bordering on the phenomenon of reflection; in Massironi’s artwork, *Griglia sagomata in trasparenza*, the perceptual transparency determined by the lyrical overlapping of several forms coexists with physical transparency, given the type of material used.

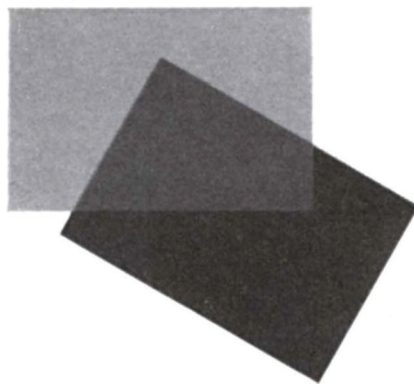
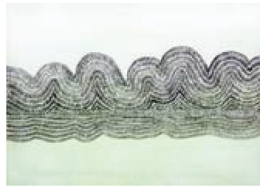


Fig. 7. Example of perceptual transparency. Figure adapted from Metelli, 1974, p. 92.

⁸ As Metelli (1974, p. 92) specifies, the term transparency “has two meanings. If we are referring to the fact that light can pass through a thing or a medium, then the meaning of “transparent” we intend to convey is physical; if, on the other hand, we mean to say that we can see through something, then the meaning we intend to convey is perceptual”.



Alberto Argenton, *Butterfly*, 1984, oil, acrylic and pastel on canvas, 55 x 75 cm. Courtesy of the heirs of Alberto Argenton.



Gaetano Kanizsa, *Corrugazione*, 1990, oil on canvas, 50 x 70 cm. Courtesy of the heirs of Gaetano Kanizsa.



Manfredo Massironi, *Griglia sagomata in trasparenza*, 2008, fine weave wire mesh, black wooden frame, 64 x 64 x 6 cm. Courtesy of the heirs of Manfredo Massironi.

Fig. 8. Thematic keyword: perceptual transparency.

2.5. Concavity - convexity

Edgar Rubin (1921) proved that figure-ground segregation obeys certain conditions, one of which is the convexity or concavity of the margins. “Convex regions tend to be perceived as figures displaced in front of a background and provided with contours, whereas concave regions do not appear to have their own contours (due to the one-sided function of contour) and seem to extend behind the convex regions” (Agostini et al., 2024, p. 15). In Figure 9, in all four squares, the tendency is to see “the area with convex rather than concave margins as the figure” (Kanizsa, 1980, pp. 42-43). From an expressive and dynamic point of view, “convexity and concavity are not only mutually exclusive, they are also opposites dynamically, the one actively expanding, the other passively withdrawing” (Arnheim, 1974, p. 225).

Of the three artworks in Figure 10, Kanizsa’s *Corrugazione*, we do not know whether intentionally or not, appears as an emblematic artistic transposition of

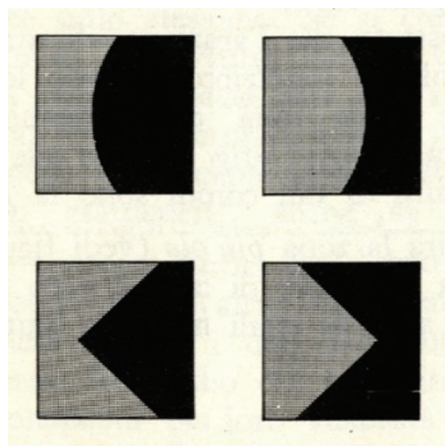
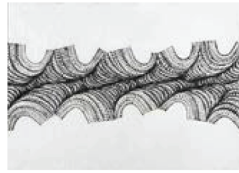


Fig. 9. Convex region is seen as figure. Figure adapted from Kanizsa, 1980, p. 42.



Alberto Argenton,
Cratere/Eruzione 1982,
watercolour on paper, 37.5 x 37.5
cm. Courtesy of the heirs of
Alberto Argenton.



Gaetano Kanizsa *Corrugazione*
1987, oil on canvas, 50 x 70 cm.
Courtesy of the heirs of Gaetano
Kanizsa



Manfredo Massironi,
Cilindri più sfere 1966-
2005, enameled brass,
steel wire, lacquered wood
base, 54 x 33 x 33 cm.
Courtesy of the heirs of
Manfredo Massironi.

Fig. 10. Thematic keyword: concavity-convexity.

the essence of concavity-convexity phenomenon. In Argenton's artwork, *Cratere/Eruzione*, the representational strategy used effectively renders the peculiarities of the phenomenon indicated by Kanizsa and Arnheim, bringing out the coloured convex forms, although the central white form can also emerge in the foreground, generating an alternation of the percept. In Massironi's artwork, *Cilindri più sfere 2*, the cut (black or white) concave-convex metal sheets, "anchored to a vertical axis, [...] generate the appearance of phenomenal spheres and cylinders" (Bianchi & Savardi, 2007, p. 56).

2.6. Good continuation

The similarities between psychology of perception and pictorial art can be found not only in complex perceptual phenomena and representational strategies, but also in reference to the basic factors of perceptual organisation identified by Max Wertheimer. Figure 11 shows one of the Gestalt factors of perceptual unification discovered by Wertheimer (1923). This factor explains how elements are unified into segregated structures. In figure 11, "A is unified with D and B with C, although other organizations are *theoretically* possible too, for example A + B and C + D. These other organizations can be thought of, but they are not perceived. Good continuation dictates, in this case, the unification of lines that show minimal changes in alignment, segregating two units: a horizontal wavy line and an oblique one" (Agostini et al., 2024, p. 15).

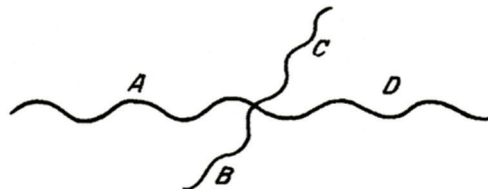
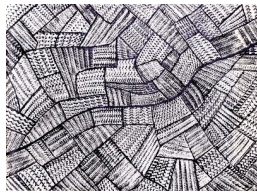


Fig. 11. Example of good continuation. Figure adapted from Wertheimer, 1923, p. 322.

In painting, the use of such a representational strategy helps to configure perceptual units, when parts of the composition align with each other. As exemplified by the artworks in Figure 12, shown in the exhibition, the viewer's gaze is induced to explore the various parts of the entire compositions following their alignment. This strategy, just like the strategies and phenomena previously mentioned, can associate with, or compete with, other perceptual aspects; for example, in Argenton's watercolour, *Studio*, which is part of the *Serie dei racconti* (<https://www.albertoargenton.it/c/english/galleries>), perceptual units can also be configured through a segmentation by colour, and in this work many of the strategies considered in the exhibition can be found, from amodal completion, to completion by frame, to transparency, to concavity-convexity. But similar considerations could be made for all the other artworks examined here.



Alberto Argenton, "Studio"
Serie dei racconti, 1987,
watercolour on paper, 17 x
17 cm. Courtesy of the heirs
of Alberto Argenton.



Gaetano Kanizsa, *Testura*, 1980,
oil on canvas, 50 x 70 cm.
Courtesy of the heirs of Gaetano
Kanizsa.



Manfredo Massironi, *Struttura
Rottura di costanza*, 1969-70,
iron profile, 20 x 28 x 28 cm.
Courtesy of the heirs of
Manfredo Massironi.

Fig. 12. Thematic keyword: good continuation.

As already noted, it is very rare to identify a single perceptual phenomenon or factor, or a single representational strategy, in artistic works; usually they are multiple, conceived or employed by artists to realise the imagined composition. To use the words of Bozzi (1989, pp. 40-41), we can say that artistic works "possess a complexity in which the play of ingredients observable in the laboratory is dispersed or watered down". We might add that "the 'play' of ingredients in an artwork very rarely occurs in 'mathematical' conditions – with all the problems that this causes, for the perceptual analysis of those complex objects that are, precisely, artistic works" (Messina-Argenton et al., 2022, p. 95).

3. Considerations

The thematic examples presented in the exhibition, in our opinion, should have been sufficient at least to intrigue visitors and induce them to further explore the proposed perspective and should also be sufficient to formulate some considerations and proposals, which we would summarize in three dimensions.

Analogies. The six themes dealt with in the exhibition constitute a minimal anthology of perceptual phenomena studied in psychology and representational

strategies used in the graphic and pictorial arts. Boundless horizons would open up if we wanted to undertake the exploration of analogies between the two domains from this perspective, and certainly reference examples would not be lacking. To stay with the scholars mentioned, we can think of Kanizsa's scientific works aimed at showing the role of perceptual devices in the realisation of pictorial works (e.g., Kanizsa, 1988; Kanizsa & Massironi, 1989) and we can well imagine the productivity that his 'grammar' (Kanizsa, 1979, 1980) could have when projected onto the world of art. Or let us think of the various research works by Massironi and, one for all, his extensive study on drawing from the point of view of its communicative aim in relation to perceptive-cognitive processes, with very frequent focus on artistic works (Massironi, 2002). Or let us think of Argenton's scientific works on the artistic phenomenon (Argenton, 1996) or on expressivity (Argenton, 2008, 2019) based on the analysis of artistic works and, in the latter case, of extensive systematic repertoires of artistic works. Or again, let us think of Arnheim's 'encyclopedia' (1974), which is full of demonstrations and confirmations of visual phenomena relevant to the arts and examples drawn from the arts.

This would take a systematic review, starting with the fathers of Gestalt Psychology, who have always shown an interest in art, which, we believe, would generate a very rich collection of possible analogies between perceptual phenomena and representational strategies invented for, and used in, the arts. Of course, the review could also start from systematic historical-artistic studies, such as that of Lucien Rudrauf (1949) on "variations of a plastic theme", namely, the *Annunciation*, in which he showed how differently the famous encounter has been interpreted and realised.

Diachronicity. In the exhibition described above, we have compared perceptual phenomena and representational strategies by setting side-by-side artworks by three artists of the same period and characterised by very different personal styles. The horizons would be even more boundless if we were to adopt this perspective to retrace the history of art and the history of perceptology. Here again, there is certainly no shortage of examples to refer to, albeit limited to single perceptual-representational facts. Staying again with the scholars mentioned, one can think of Argenton's research on the "dynamics of obliquity"⁹, in which obliquity, understood as a representational strategy, is studied through the analysis of paintings depicting timepieces and windmills produced between the 15th and 20th centuries (186 works and 515 works respectively), obtaining significant data on the occurrence of the corresponding perceptual phenomenon (Argenton, 2019, pp. 134-201). At the same time, a systematic review of the stimuli

⁹ By 'dynamics of obliquity', Argenton (2019, p. xx) refers, in the context of pictorial production, to "the widespread use of oblique direction to maximise the dynamism and expressiveness of either a whole composition or of individual forms depicted in it".

devised by perceptologists over more than a century of research to study one and the same perceptual phenomenon would produce remarkable repertoires of invented and millimetrically calibrated forms, making analogies and differences between perceptual phenomena and representational strategies evident even diachronically.

Drag. In the studies mentioned in this section, the prevailing tendency is to identify in artistic works perceptual phenomena and factors studied in psychology. And when Kanizsa states that scientists' research on visual perception and painters' research "complement each other and, since the results emerging from these two fields cannot be in contradiction, one is a testing ground for the other" (Kanizsa, 1991, p. 83), he is referring to the results that each of the two domains pursues within itself.

The perspective underlying our work assumes, first of all, that there can be a "mutual drag" between the two domains, to use the words of Primo Levi, chemist and writer¹⁰.

It is true, as Kanizsa (1991, p. 83) maintains, that painters have discovered how to realise phenomenal transparency or chromatic contrast "without having to wait for the results of studies" by perceptologists and it is also true that a painter knows which "devices" to use [...] to represent the three-dimensionality of objects and spatial depth". However, the artists' search for, or use of, representational strategies to achieve such effects could not fail to be enriched – also in terms of awareness of their own work – by the knowledge of perceptological studies on the devices through which they are realised and by the observation of the myriad of stimuli invented by perceptologists to study such phenomena.

Conversely, findings of perceptual phenomena or factors can emerge precisely from the study of the representational strategies used by painters; an example of this is the phenomenon of "completion by frame", included among the six themes of the exhibition, which was defined through a systematic study especially of the panels of the Scrovegni Chapel painting cycle in Padua, as well as the

¹⁰ "... I have often set my foot on the bridges that unite (or should unite) scientific and literary cultures, crossing a chasm that has always seemed absurd to me. There are those who wring their hands and call it an abyss but do nothing to fill it; there are also those who strive to widen it, as if the scientist and the literary man belong to two different human sub-species, mutually incomprehensible, destined to ignore each other and not engage in cross-fertilisation. It is an unnatural, unnecessary, noxious schism, the product of remote taboos and the Counter-Reformation, when it does not date back to a petty interpretation of the biblical prohibition against eating a certain fruit. It was not known by Empedocles, Dante, Leonardo, Galileo, Descartes, Goethe, Einstein, nor the anonymous builders of Gothic cathedrals, nor Michelangelo; nor do today's good craftsmen, nor physicists hesitating on the brink of the unknowable. Sometimes I am asked, with curiosity or even gruffness, why I write even though I am a chemist. I hope that these writings of mine, within their modest limits of commitment and size, will show that there is no incompatibility between the 'two cultures': there is instead, at times, when there is a good will, a *mutual drag*" (Primo Levi, 16 January 1985, Introduction to *L'altrui mestiere*, Turin, Einaudi, p. VI, our italics).

“dynamics of obliquity” (Argenton, 2008, 2019), which we mentioned above and would like to recall once again because these studies are in fact the main reference for the design of the exhibitions we have been dealing with (Messina-Argenton & Prest, 2016, 2019a, 2019b; Messina-Argenton, Prest & Verstegen 2022).

3.1. Potentiality

Certainly, the dimensions mentioned foreshadow a considerable enterprise, which may discourage, but may also enthuse, should one embrace the value and scope of such a cultural investment and its potential of propagation. Many pages would be needed to outline the cultural, formative, educational opportunities that could be generated by the synergy among the three dimensions, while here we can only mention two value aspects that can permeate any situation.

We could summarise the first again with the syntagm “mutual drag”, transposing it, however, into cognition and referring to the cognitive comings and goings that would result from observing perceptual stimuli, variations on a theme, and artistic works, variations on the same theme; in both cases, different representations of a same “fact”, as Bozzi puts it, but also ideas, suggestions, ‘seeds’ that can generate cognitive opportunities of various kinds and degrees. To give just one example, think of the theme of perceptual transparency and the myriad of laboratory stimuli devised by perceptologists to study the conditions of its occurrence and the myriad of works created by artists to try to render it pictorially, and the possibility of wandering through repertoires on the theme, reasoned and calibrated in relation to different contexts and multiple cultural, formative, educational situations and to different purposes – purely by way of example, from literacy, to managerial training, to the promotion of well-being (e.g., Bodo & Sacco, 2017; Cicerchia & Seia, 2023) – tangibly experiencing the infinite possibilities of dialogue between the scientific precision of psychology and the creative freedom of art, albeit in its rigorousness¹¹.

The second aspect can be summarised in the ‘educability of perception’ or, if this should bother some perceptologists, in the ‘educability of the gaze’. Synthetically, what we mean can be found encapsulated in a personal note by Bozzi (1978/2019, p. 235), which we find eloquent in itself and with which we like to conclude: “I am rather blind to the figurative arts, except perhaps for architecture; but if someone explains to me certain things that are in a painting, I see them. I do not actually see them take shape: they do not come into being before my eyes

¹¹ Ramachandran and Hirstein (1999, pp. 17, 23) maintain that “artists either consciously or unconsciously deploy certain rules or principles (we call them laws) to titillate the visual areas of the brain”, and that ‘principles such as figure-ground delineation, closure and grouping by similarity’ can be in themselves a source of ‘aesthetic experience’. This refers to a further scenario that can be explored, of considerable relevance to the interchange between art and science.

by suggestion; but it is by prompting that I discover them, like when someone points out to me a person walking amongst others down the street”¹².

Summary

This article is related to previous works by its authors addressed to the figures of the same four scholars: Alberto Argenton, Paolo Bozzi, Gaetano Kanizsa, and Manfredo Massironi. The interest in these scholars, who devoted their lives to both teaching and scientific research in psychology and artistic research, also lies in the potential offered by the heritages they handed down to combine science and art. An exemplification of the potentialities we are referring to here is provided by a recent art exhibition dedicated to the four scholars, the precise aim of which was to link the representational strategies they employed in their artistic works with phenomena studied in the fields of Psychology of perception and Psychology of art, of a Gestaltist matrix. The description of the exhibition allows us to make some considerations and proposals aimed at deepening the relations between the two domains, seen also in a cultural, formative and educational perspective.

Keywords: Arts, Psychology of art, Psychology of perception.

¹² Bozzi's personal note is contained in an important article in which he describes the interobservational method – a considerable innovation in psychological methodology – which, moreover, appears to be the main way to orientate the above-mentioned mutual dragging. It is not possible to examine the interobservational method here, so we refer to Bozzi (1978/2019, pp. 198-206) for its explanation and to Argenton (2008/2019, pp. 11-13) for its applicability in research in the Psychology of Art. In essence, the method proposed by Bozzi is based on observing together and verbally describing an object present in the 'perceptual theatre', on the basis of certain parameters, and on negotiating meanings until arriving at a shared definition of the object itself. It is a method that has considerable potential in education and training, unfortunately rarely practised (Messina, 2005, pp. 93-96). Moreover, Bozzi's personal note includes at least two relevant aspects. The first refers once again to a method, the "ostensive" method of which Arnheim (1992, p. 181) writes: 'the pointing with the index finger, the "Don't you see that ...?", the productivity of which emerges clearly in the reading of images. The other refers to the *generativity* that arises from the relationship between people, experts and peers, involved in the interobservation.

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