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Four Theories of Inversion in Art and Music

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Issues about the nature and ontology of works of art play a central part in contemporary aesthetics.[1] But such issues are complicated by the fact that there seem to be two fundamentally different kinds of artworks. First, a visual artwork such as a picture or drawing seems to be closely identified with a particular physical object, in that even an exact copy of it does not count as being genuinely the same work of art. Nelson Goodman describes such works as being "autographic."[2]

Second, other artworks such as musical or literary works seem to be copyable without any such limitations: for example, two identical copies of a novel could each equally be a genuine instance of that novel; such works are "allographic," in Goodman's terminology.[3]

Nevertheless, it seems clear enough that a deeper understanding of both kinds of artworks requires the pursuit of *analogies* or *similarities* between them, in spite of their differences. Any such analogies that may be found will provide critical tests for more general theories about the nature of artworks.

For example, Arthur Danto famously argued that there could be several, physically distinct but qualitatively indistinguishable red rectangles, some of which were *distinct* artworks, while others were not artworks at all,[4] from which he concluded that autographic artworks could not merely be *physical objects* but that instead they must be partly constituted by the intentions and actions of their respective artists.[5]

Others have argued for a similar point as applied to *allographic* works such as novels or musical pieces: mere

textual or sonic qualitative identity is also not sufficient for artistic identity. For example, as Jorge Luis Borges in effect showed with his well-known example of a fictitious work by one "Pierre Menard," the text of which was word for word identical with the text of a section of Cervantes' *Don Quixote* but whose aesthetic qualities were quite different, we must distinguish the identity of a *literary artwork* from mere *textual* identity.[6]

And Jerrold Levinson has argued that similar points apply to musical scores and performances: two different composers might produce *textually identical musical scores*, which nevertheless would provide the textual basis for two *distinct* pieces of music—both because of the fact that there are two different composers involved and because of their differing artistic intentions concerning their respective musical works.[7] Thus, in spite of the differences between autographic and allographic artworks, the pursuit of analogies between them can clearly produce powerfully convergent requirements or constraints on acceptable theories of the nature of artworks.

In this paper I shall propose and argue for a novel analogy between autographic pictures and allographic musical pieces, which potentially could provide an even stronger set of constraints on acceptable theories of art. Whereas Danto, Borges, and Levinson used cases of *indistinguishable*—but nevertheless physically distinct—paintings, texts, and scores, I shall instead work with cases that stand in the relation of *inversion* to each other. More specifically, I shall be concerned with the questions of how spatially inverted and uninverted *paintings* or *pictures* relate to each other and of how nonspatially inverted and uninverted *themes* in music relate to each other as well.

I should emphasize that this approach seems not to have been investigated before, so that most of this paper is breaking new ground—hence there are no writings by others on the approach to which references could be given or comparisons made. However, I do discuss the general implications of this approach with respect other views in Sections 7 and 10.

Inversion is an example of a *structure-preserving* transformation. For example, no matter how a square or rectangle is rotated about a perpendicular horizontal axis through its midpoint, that transformation preserves the same square or rectangular shape intact. And on the face of it, the same applies to paintings or other pictures too—a painting has the same structure, including both geometrical and other formal elements, as well as color or textural relationships, no matter how it is rotated and no matter how complicated its design structure may be.

In the case of music, a theme is "inverted" when, in mirror-image style, the previous high notes are replaced with inverse

low notes and vice versa. Here too arguably the operation is structure preserving, in that the same *configuration* or *pattern* of notes is preserved, in spite of the different particular notes that result when a theme is inverted.

The basic issue in each case, of pictures or music, is whether these inherent *structure* preserving features of inversions are sufficient for the *identity* of the relevant inverted and uninverted artworks—or whether, as with Danto's rectangles or Levinson's scores, one must insist that artistically they are distinct.

Now in the case of pictures, the matter might seem obvious, for if a picture were simply a *physical object*, then of course it would remain the same, identical object through spatial inversion. But as Danto's "indistinguishable red rectangles" case showed,[8] we already have good reason to deny that assumption.

I have elsewhere proposed a more specific way in which to distinguish an artwork or picture from its associated physical object or substratum, which substratum is on my account a *design token*—where the design or structure is the class of perceptually indistinguishable objects that are tokens of the design in question.[9] Then the unique object that physically embodies a given picture is its *corresponding design token* or *CDT*. On this approach, one or more pictures may be conceptually distinguished from its, or their, physical CDT.

Here is how this distinction may be used in cases of spatial inversion. First, the *structural invariance* required for genuine cases of spatial inversion may be accounted for in terms of the *invariant design structure* provided by the design of the CDT—which design, of course, remains the same through any spatial rotation or inversion of the unique design token being discussed, which itself remains numerically identical through inversion.[10] And second, the issue can then be raised of how the one or more pictures *associated with a given CDT* is itself, or are themselves, affected in inversion-related ways by any spatial inversion applied to the CDT. This is a nontrivial issue, in spite of the triviality of the issue as applied merely to the physical CDT itself, about which much discussion is possible.

Indeed, there are no less than *four* different kinds of possible theories about the relationships of the respective pictorial or artistic inverted and uninverted items, along with ancillary issues about their relations to their CDTs that I shall explore in this paper. And I shall also show that there are a corresponding variety of theories about musical cases of inversion as well. I shall conclude by picking a provisional leading candidate from among our four theories and also briefly point out how my results provide significant *further* constraints on acceptable theories of the nature of artworks—in addition to those already provided by writers such as Danto and Levinson.

1. A Pictorial Example

Before saying any more about the relations of a picture, or pictures, to its, or their, CDT, it will be useful at this stage to "jump in the deep end" with a particular example of spatial inversion and see what can be made of it.

Here is the example. Harold, who is a traditional representational painter, had partly rearranged his paintings the previous night in his studio. But on entering the studio next morning, his eye is immediately caught by what looks to him like a picture of an upside down or inverted building. It takes a moment before he realizes that what he is seeing is not actually a picture of an inverted building but that instead it is one of his paintings—which in fact is a picture of a right side up or upright building—which painting he must have inadvertently turned upside down the previous night during his rearrangements.

My initial question is as to what kind of mistake, if any, had Harold made in this case. Harold himself, if asked to perspicuously describe what had happened, might naturally describe it thus: "Initially, I thought I was seeing a right side up picture of an inverted building, but then I realized that what I was actually seeing was an inverted picture of a right side up building."

For reasons of brevity and convenience, I shall abbreviate the relevant terms as follows: "U" for Upright or right side up, "I" for Inverted, "P" for a picture, and "S" for the subject or subject-matter of a picture. Then the two views above can be abbreviated as the UP–IS view (upright picture–inverted subject) and the IP–US view (inverted picture–upright subject).

First, then, if Harold did make an initial mistake, it cannot be located in the "objective visual appearance" of his picture, for the *appearance* of what Harold was looking at did not change during the events in question; instead, he merely changed his *interpretation* of what he was seeing, in changing from his initial UP–IS to his final IP–US view. To put it another way, such a supposed UP–IS case is *visually indistinguishable* from such an IP–US case, in some basic sense of perceptual indistinguishability, in spite of Harold's differing interpretations.

I take it, however, that we may agree with Harold that he did initially make a mistake of *some* kind and that, as suggested above, the mistake in question may naturally be described in terms of his having correct or incorrect *visual interpretations* of his painting. Thus in some more sophisticated or interpretive sense of perception, the picture did *look different* to Harold when he was interpreting it on the UP–IS model, versus when he changed his interpretation to that of the IP–US model, and the second way it looked to him was correct whereas

the first was not.[11]

Furthermore, what makes Harold's IP–US visual interpretation correct, as opposed to the incorrectness of his UP–IS interpretation, is something *about his painting itself*: specifically, it is because his painting is indeed *a picture of an upright building*—and not of an inverted building—that his IP–US interpretation counts as correct, and his UP–IS interpretation as incorrect.

Another conclusion that can be drawn is that a picture A of an upright building cannot be *identical* with a picture B of an inverted building, because each has at least one description true of it that is false of the other—namely, that A but not B is a picture of an upright building, and that B but not A is a picture of an inverted building.

2. More Inversion Theory

I shall now define, with the aid of the just-presented Harold example, various inversion-related concepts needed for subsequent discussion of the four theories to be presented. Here too we are breaking new ground.

To begin with, the introductory discussion of the structure-preserving concept of inversion applied that concept not to pictures themselves but only to their *corresponding design tokens* (CDTs), whose design serves as the appropriate invariant structure in cases of spatial inversion of a CDT. However, once pictures have been distinguished from CDTs, it also becomes necessary to consider issues of inversion as applied to pictures themselves.

The example of Harold's accidentally inverted picture in section 1 provides a potentially rich structure of inversion concepts as applied to pictures, as may already be apparent from the discussion in that section.

As an initial step, three different kinds of inversion need to be distinguished. The first kind could be called an *identity inversion*, which, as the name suggests, covers cases in which an item *retains its identity* through inversion, so that the item and its inverse are one and the same object. The initial case of a CDT and its (spatial) inversion is of this kind. Identity inversions will also be referred to as *cross-inversions* (X-inversions) for reasons of terminological distinctiveness—suggested by the fact that in such a case an item survives *through* or *across* the inversion process.

The second and third kinds require some discussion before being defined. Recall that Harold distinguished between his initial but mistaken interpretation of his accidentally inverted picture—as an upright picture of an inverted building (a UP–IS picture)—and his subsequent correct interpretation of it as an inverted picture of an upright building (an IP–US picture).

Now each of those pictures has *some* claim to be regarded as "an" inversion of Harold's original uninverted or upright picture (the UP–US picture), in that each is associated with the same physically inverted state of the CDT—which CDT is the same for each picture, of course. Hence there is room for a *generic* concept of inversion, which allows that both the UP–IS and the IP–US pictures are *generic inversions* of the UP–US picture.

However, clearly there is also room for a more specific concept of inversion, which is such that only the *IP–US* picture, and not the UP–IS picture, qualifies as the legitimate *specific inversion* of the UP–US picture, since—among other reasons, and in Harold's view—only that IP–US picture, and not the UP–IS picture, qualifies as the correct pictorial reading or interpretation of the inverted painting. Thus, in sum, we have three kinds of inversion: identity or cross-inversions, and both generic and specific inversions: X-inversion, G-inversion and S-inversion.

A desirable principle concerning inversions of any one of the three kinds considered is that if item A has as its inversion item (or items) B, C..., then A and items B, C,... are *symmetrically related*, in that A itself will (in turn) count as an inversion (of the relevant kind) of items B, C.... In the case of spatial inversion this principle is perhaps obvious, in that a single inversion (or rotation by 180 degrees) will produce inverted item(s), which may in turn themselves be inverted (or rotated by 180 degrees) to restore the original item(s) and orientation. In the case of music, it is also perhaps obvious that any theme is itself the inversion (of some kind) of whichever theme (or themes) serves as its own inversion. This principle could be called the *inversion symmetry* principle.

As to the relations among cases of X-, G-, and S-inversion, a plausible initial view is that the S-inversion cases are a proper subset of the G-inversion cases and that it is an open question, requiring further argument in a given case, as to whether or not any S- or G-inversion is also an X-inversion.

There is one further element required to round out the discussion of Harold's painting. It may have been noticed that so far there has been an asymmetry in the discussion of the painting, in that only *one* picture has been discussed in connection with the original upright state of the painting—namely the UP–US picture—whereas *two* pictures have been discussed in connection with the inverted state of the painting, namely the UP–IS and IP–US pictures. This asymmetry will now be rectified.

Recall that Harold initially saw—what looked to him like—an *upright* picture of an *inverted* building, namely the UP–IS picture. But so far no *specific inversion* of this picture has been identified—unlike the case of the IP–US picture, which is the specific inversion of the UP–US picture and which UP–US

picture correspondingly itself counts as the specific inversion of the IP–US picture, by virtue of the above inversion symmetry principle.

What is wanted as the specific inverse of the UP–IS picture is a picture that shares the same specific subject matter as it has, namely that of being an inverted building, while it also counts as being *an* inversion of the UP–IS picture—for when both elements are combined, the result will be a specific inversion of the UP–IS picture. Hence the desired picture must be an *inverted picture* with an *inverted building* as its subject matter: an IP–IS picture. And intuitively that result is correct, in that if Harold initially saw his—actually inverted—painting as *an upright picture of an inverted building*, then he would expect *that upright picture* to be inverted and, hence, to become an IP picture, if his painting were *again* inverted, yet to nevertheless retain *its inverted subject matter* (IS), hence producing the IP–IS picture.

3. The Four Theories

Here is an initial description of the four possible theories concerning the relations of inverted and uninverted pictures. The theories will subsequently be extended to musical cases as well.

First, recall the distinction in the introduction between a picture and its associated painting or other physical basis, which I called its *corresponding design token* or CDT. An initial need for such a distinction has already been demonstrated, in effect, in that Harold interpreted a single *painting* of his—initially and incorrectly—as being a picture of an *inverted* building and then correctly as a picture of an *upright* building—so that, in effect, *two* distinct potential pictures were being considered with respect to whether either of them was connected in some appropriately integral way with the painting or CDT in question.

Given the distinctions, both between different pictures and between a picture and its CDT, it is now possible to describe the issues and theories connected with any possible inversions of them.

First, if any of Harold's "interpreted" pictures can be inverted in space, then each such picture itself can exist or occur in more than one orientation in space. Now for a CDT, which is a physical object, this is a completely trivial issue, since of course one and the same physical object can exist or occur in any spatial orientation, as can its corresponding design, which is invariant through changes in orientation.

However, the matter is not so trivial for pictures, as distinct from their CDTs, as will become clear. In fact it will turn out that there are *two* ways in which a picture might fail to be spatially invertible: either what seems to be an *X-inverted*

picture is really *not a picture at all* (the subject of theory 3) or, as in theory 4, it is instead a *different* picture (so that again, a picture *itself* is not X-invertible without loss of its identity). I shall refer to such a non-X-invertible picture as being *fixed*—in that, since it is unable to survive through any orientation change such as inversion, it therefore has a *fixed* or unchangeable orientation.

Another related issue to be considered is that of *how many* pictures might correspond to a given CDT. In the present paper, I shall consider this question only with respect to inversion issues.[12]

To begin with, all four theories to be considered share a common feature, which will be presupposed from now on: It is that, whatever inversion or inversions a picture (and its CDT) may have or undergo, the *subject matter* of the picture (or pictures) does not undergo any corresponding inversion. For example, as already seen, if a picture is of an *upright building*, then it has the same uninverted subject matter—in this case, of an *upright* rather than *inverted* building—even if the picture itself is inverted. The reason for this common feature was explained in the previous section, in that it is based on the differing kinds of *structure-preserving invariances* characteristic of inversion cases.

The first theory (theory 1) to be discussed has two parts. Part one involves an initial claim that, for a given design token T, *at most one picture* is associated with it (so that T acts as the CDT for at most one picture). From this claim it follows that at most one picture is X-inverted when its CDT is inverted.

Part two of theory 1 claims that the (at most) one picture in question is indeed X-inverted when its CDT is inverted. As already noted, this identity-preserving co-inversion claim may seem too obvious to mention, but, as we shall see, theories 3 and 4 will deny it.

Thus, symbolically theory 1 could be referred to as the *OX* theory, in that it postulates that there is at most *One* picture P associated with a token T and that that picture P itself is *X-inverted* if its CDT is inverted. I take it that this is the usual, or traditional, view of paintings and other visual artworks.

Theory 2 differs from theory 1 only in its first part. According to theory 2, there could be *Many* (or More than one) picture associated with a given CDT T, rather than at most one as with theory 1, and *at least one of them* will itself be X-inverted if its CDT is inverted. Thus symbolically this could be described as the MX theory (*Many* pictures, at least one of which is *X-inverted* if the CDT is inverted).

As for theories 3 and 4, they share a common structure and, hence, will be considered together. But, as will become clear, each realizes that structure in fundamentally different ways, so it is appropriate to consider them as distinct theories.

Theories 3 and 4 each differ from theory 2 only in their second part. Thus both theories agree with theory 2 in holding that there could be *many* pictures associated with a given CDT T, but they differ from theory 2 in that they deny that any of those pictures are X-inverted when T is inverted. Hence theories 3 and 4 hold that pictures are *fixed* rather than X-invertible. Thus symbolically theories 3 and 4 could be described as MF theories (*Many* pictures, all of which are *Fixed* or not themselves X-inverted, if the CDT is inverted).

However, this specification leaves many issues unresolved, and, most significantly, as will become clear, the issue of the *ontological status* of inverted pictures. There are two fundamentally different ways of handling such pictures.

The first of these MF approaches to inverted pictures could be called the *eliminative* approach. It would deny that (strictly speaking) there are any inverted pictures and would seek to explain away apparent references to such pictures. This approach defines theory 3 (the MFE theory: *Many Fixed* pictures, *Eliminating* any inverted ones).

The second MF approach (the *inclusive* or *all-accepting* approach) would instead accept such references at face value. Thus, on this inclusive approach, there are inverted pictures, but none of them are identical with any upright pictures. This approach defines theory 4 (the MFA theory: *Many Fixed* pictures, inclusive or *All-accepting* of inverted ones).

4. A Musical Example

Given the complexity of the issues concerning theories 1–4, all that can be achieved in the remainder of this paper is the provision of some initial evidence, suggesting that theories 2, 3, and 4 are indeed live options to theory 1 in the case of visual artworks. I shall also introduce a musical example—closely analogous to the Harold painting example—both as supportive evidence for the pictorial cases and as raising interesting musical aesthetics issues in its own right.

Here then is a musical example that is structurally similar to the Harold UP–IS and IP–US pictures case as first described in section 1. Anne is a composer who likes to compose using computer software that enables her to directly type her compositions into the computer. Her software allows the use of various “shortcut” keys (including one key that inverts a given theme). Anne had been working on a new, original theme for her current composition the previous night. But on starting up her computer the next morning and replaying her original theme for the first time, she is mystified to hear (what initially sounds like) an entirely different theme, which embodies an inverted “falling” subject in place of the “rising” subject that characterized her original theme.

It takes a moment before she realizes that what she is hearing is not actually a theme with a falling subject but that instead she is hearing an inversion of her original theme (with its rising subject), which inversion she must have entered into the computer by accidentally pressing the "invert" key the night before, subsequent to her entering of her original theme.

As in the Harold inverted-picture case, my initial question is as to what kind of mistake, if any, had Anne made in this case. Anne herself, if asked to describe what had happened, might naturally describe it thus: "Initially, I thought I was hearing an uninverted theme embodying an inverted, 'falling' subject, but then I realized that what I was actually hearing was an inverted theme embodying an uninverted, rising subject."

A comparison with the Harold painting case will show that their respective structures are identical. Harold confused a UP–IS picture with an IP–US picture, while Anne confused a "UT–IS" theme (uninverted theme, inverted subject) with a "IT–US" theme (inverted theme, uninverted subject).

However, in music (unlike painting), a theme and its inversion (or inversions; see section 2) will be embodied in *numerically distinct* CDTs, in that the CDT for a theme—consisting most probably of a physical sound sequence token, whose design is specified by a particular printed sequence of notes in a score—will be a *different sound sequence token* from the corresponding CDT for any *inversion* of that theme, which would be another sound sequence token, whose design is instead specified by a differently printed passage in the score.[13]

Thus, for example, the appropriately modified theory 1 issue as applied to music is that of whether *at most one theme* corresponds to those distinct CDTs embodying the theme and any inversions of it.

5. Theory 1 (The OX Theory)

Now I shall start to draw on both examples in discussing theory 1 (the OX theory). In the case of pictures, it seems to have been taken for granted that theory 1 is true—even by those, such as Danto, who deny that pictures are identical with physical objects.

First, recall a point made in section 1 concerning Harold's UP–IS and IP–US pictures that a picture A of an upright building cannot be *identical* with a picture B of an inverted building, because each has at least one description true of it that is false of the other—namely, that A but not B is a picture of an upright building and that B but not A is a picture of an inverted building. Thus if both the UP–IS and IP–US pictures are genuine, then they must be *distinct* pictures because of their differing subject matter. And a similar point would apply to the musical example: if both the UT–IS and IT–US themes are genuine, then they must be *distinct* musical themes.

However, both the picture UP–IS and the music UT–IS case turned out to be *mistaken* interpretations of another picture (IP–US) or theme (IT–US). Is this sufficient to impugn their status as legitimate pictures or themes in their own right?

I suggest not because, in the case of Harold's initial mistake, it seems reasonable to say that in *some* sense Harold was "seeing a picture"—when he interpreted the painting as a UP–IS picture—even though his interpretation was wrong with respect to the actual artist-created picture or artwork, which was in fact associated with the *IP–US* picture. To put the matter in another way, *something* was presented to Harold in a pictorial way, even though that "something" came with no official artistic license, and failed to be identical with the single pictorial item—Harold's original intended UP–US picture—associated with its CDT, which *did* have an official artistic license. And similarly, Anne heard *something* that sounded like a musical theme when she heard the UT–IS theme.

Another way of shoring up the integrity of the "mistaken" pictorial and musical cases is as follows. As the original artists of the original works, either Harold or Anne could have decided to *adopt* the objects of their mistaken interpretations as new, legitimate artworks. Thus, Harold could have decided that he *preferred* to interpret his previous UP–US work as a new work—as an upright painting of an inverted building (UP–IS)—and so it would turn out that the object of his previous mistaken interpretation (the UP–IS picture) was now a legitimate, artist-intended picture after all.

But surely this could only happen if the UP–IS picture *was* indeed a picture prior to its promotion to legitimacy. Harold could hardly decide that he liked the UP–IS picture more than his original UP–US picture unless the UP–IS picture was, indeed, *a picture*. And similarly in Anne's case: her preferring the accidental UT–IS theme to her original UT–US theme could not happen unless the UT–IS theme was indeed heard by her as *a theme* in its own right, prior to her deciding that she preferred it to her original theme. Thus I conclude that these examples do indeed demonstrate the distinctness of the UP–IS and IP–US pictures and of the UT–IS and IT–US musical themes.

Thus it is already possible to conclude that theory 1 (the OX theory) must be *wrong* in its assumption that at most one picture (or theme) is involved in any given inversion case of the relevant pictorial and musical kinds.[14] This result is particularly striking for pictures, since it emphasizes their nonphysical nature in a novel and perhaps unexpected way, while at the same time the corresponding musical result seems also not to have been argued for previously. Thus attention now shifts to the remaining theories 2, 3, and 4.

6. Theory 2 (The MX Theory)

The next question to be addressed concerning our Harold and Anne examples is as follows. Given the distinctness of the UP–IS and IP–US pictures, and of the UT–IS and IT–US musical themes, what are the implications, if any, for the issue of whether or not the original UP–US picture and UT–US theme are themselves *cross-invertible*—that is, invertible with their identity preserved intact?

This issue is now important because a choice from the remaining theories 2, 3, and 4 depends on this issue. Theory 2 (the MX theory) claims that there is *more than one* picture or theme, *at least one of which* is X-invertible, whereas theory 3 and theory 4 (the MFE and MFA theories) *deny* that any items are X-invertible.

In the case of pictures, I assume that the most initially intuitive assumption would be that the original UP–US picture *is* X-invertible (identical with the IP–US picture). In this way the correctness of Harold's second interpretation of his painting—as an IP–US picture—would be explained as a case of his having correctly seen his original UP–US picture itself—even though, in thus seeing it, he was seeing it in an inverted position and, hence, seeing it as an IP–US picture. Thus this interpretation would support theory 2 over theories 3 and 4.

Things are not so intuitively clear, however, in the musical case. Recall the description of Anne's listening: "it took a moment before she realized that what she was hearing was not actually a theme with a falling subject but that instead she was hearing an inversion of her original theme (with its rising subject), which inversion she must have entered into the computer by accidentally pressing the 'invert' key the night before, subsequent to her entering of her original theme."

It is not obvious at all that Anne's hearing "an inversion of her original theme (with its rising subject)" could count as a case of Anne hearing *the original theme itself*, which is what is required if the original UT–US theme is to be X-invertible and, hence, identical with the IT–US theme that she indisputably does hear.

Almost certainly, if Anne were asked, she would insist that there is all the difference in the world between hearing a *theme* (and its subject), on the one hand, and hearing an *inversion* of that theme (and its subject), on the other hand. What is more, Anne would likely insist that the difference between those two hearings—of the UT–US and IT–US themes—was much greater than the difference between hearings of the (provably nonidentical) UT–IS and IT–US themes, where the difference is based solely on a difference in *interpretation* of (a token of) the *same* sound sequence, whereas in the UT–US and IT–US comparison, the sound sequences are entirely different. Hence I

conclude that, initially at least, such musical cases count strongly against the theory 2 assumption of the existence of X-inversion for themes.

Switching now back to visual cases, evidence can be found that counts against theory 2's X-inversion assumption. Consider a head-and-shoulders portrait or photograph of a loved one. That same portrait when viewed in an inverted position as an IT–US picture will have virtually none of the personal, affective, and aesthetic qualities possessed by the portrait when viewed right side up. Indeed, the qualitative differences between the two could be just as undeniably significant as those qualities that a composer such as Anne is likely to find significantly different in hearing a music theme and its inversion (as just discussed).

In sum, then, there are examples, drawn both from art and music, which strongly suggest that theory 2's X-inversion assumption may be *wrong*, so that the remaining theories 3 and 4, which deny the existence of X-inversion cases, have gained some significant initial credibility as live theoretical options.

7. Taking Stock: Issues of Interpretation

There are potentially far-reaching implications of our rejection of theories 1 and 2. In this section, I shall briefly discuss the implications for issues of *interpretation*, reserving broader implications as to allowable theories of art until after discussion of theories 3 and 4.

To begin, the Danto–Margolis debate on the nature of "basic" perception of objects versus "interpretive" perception of their associated artworks has already been noted.[15] But from the perspective of the current results, that debate has operated with an overly limited concept of artistic interpretation, that has taken no account of the *differing* ways in which a given physical object or event might be artistically interpreted as involving *distinct* artworks—including both veridical and nonveridical cases, such as Harold's initially incorrect interpretation of his inverted picture.

My basic arguments have been of two kinds. First, if an artwork is distinct from its physical substratum or CDT, and if that artwork is a broadly *representational* one that has a *subject matter*, that can in turn be *distinguished from* that artwork, then inevitably a *duality* of possible interpretation of that physical CDT results—for example, a CDT can be interpreted *either* as a UP–IS *or* as a IP–US picture (or a UT–IS or IT–US theme).

These novel interpretive possibilities are easy not to notice, because usually only one of those pictures or themes was initially intended or officially approved by the artist; however, as I have shown, the artist could decide to *adopt* the other

picture or theme as her own, hence showing their legitimate status at least as "found" or proto-artworks.[16]

My second argument has been that actual inversion of a CDT, whether in pictorial or musical cases, produces results that are, aesthetically or interpretively, typically so strikingly different from the corresponding uninverted forms that, again, it seems hard to deny that distinct artworks must be involved. Thus in this way too, a novel group of interpretive cases has been found.

Also, there seems to have been no previous commentary on the close, specific parallels between related *pictorial* and *musical* cases of interpretive perception, as established in the present work, in spite of their logical differences as autographic versus allographic art forms (see the introduction). The Danto–Margolis debate has primarily been focused on visual, *autographic* artworks, and so in that way too it is much too limited in its assumptions about the range of interpretive possibilities for artworks, whether they are autographic or allographic.

Potentially, then, the present discoveries might be as significant for aesthetic theory as have been some *already* recognized interpretively ambiguous cases, such as a *duck–rabbit* picture (that can be seen either as a duck or as a rabbit), which Ernst Gombrich used as one of the cornerstones of his theory of pictorial perception and ambiguity[17] and others such as Richard Wollheim have criticized.[18]

Such interpretive ambiguity cases have typically proved to be catalysts for provoking interesting aesthetic theorizing of a wide variety of kinds, and it seems reasonable to suppose that the present cases might also be fruitful in similar ways.

8. Theories 3 And 4 (The MFI and MFA Theories)

At this stage we have reached a theoretical crossroads. In the previous section, serious doubt was cast on theory 2's assumption that there are X-inversions, so that the common hypothesis of theories 3 and 4 (the MF hypothesis) is preferable to that of theory 2 (the MX theory). However, this decision leaves many issues unresolved—most pressingly, the issue of the status of *inverted* items such as the IT–US theme or the IP–US picture previously discussed.

The "theoretical crossroads" mentioned occurs because there are two fundamentally different potential ways of handling inverted pictures and themes, each of which would have deep and pervasive effects upon the present theory of inversion in art and music. For reasons of brevity, I shall primarily concentrate on discussing pictures for the remainder of this section, but similar points would apply to musical themes as well.

The first of these approaches to inverted pictures could be called the *eliminative* approach. It would deny that, strictly speaking, there are *any* nonupright pictures and would seek to explain away apparent references to such pictures. This approach defines theory 3 (the MFE theory: many Fixed pictures, Eliminating any inverted or nonupright ones).

The second approach (the *inclusive* or *All-accepting* approach) would instead accept such references at face value. Thus, on this inclusive approach, there are inverted pictures, but none of them are identical with any upright pictures. This approach defines theory 4 (the MFA theory: many Fixed pictures, inclusive or All-accepting of nonupright ones).

As before, it will be useful to begin discussion of these alternative MFE and MFA approaches through consideration of Harold's two pictures, namely the UP–IS (upright picture–inverted subject) and IP–US (inverted picture–upright subject) pictures.

According to the eliminative approach, only the UP–IS picture is genuine, and hence the other apparent IP–US picture must be *explained away*, since it involves an apparent reference to a nonupright picture. On the other hand, on the inclusive or noneliminative approach, *both* pictures may be accepted as genuine—and of course, neither is identical with the more usually seen UP–US (upright picture–upright subject) picture.

A plausible initial strategy for a eliminative approach is to analyze any references to apparent, inverted pictures as involving concealed references to (or some other use of) *their corresponding upright pictures*. Thus in the initial description above, its working strategy could be to argue that the sense in which the UP–IS and IP–US are distinct pictures is really just the sense in which the *UP–IS* and *UP–US* pictures are indeed distinct pictures.

Thus an eliminativist might argue that Harold's apparent seeing of an IP–US picture is not really a seeing of *any picture at all*, but instead it is an amalgam of (roughly) the following elements. First, Harold does see the *inverted CDT* that corresponds to the original UP–US picture. Second, on the basis of visual information he gathers while *identifying* that CDT as being inverted, he is able to deduce *which* original (upright) picture it *would* show if it *were* instead in an uninverted orientation. And third, having thus identified the appropriate upright picture, he is able to recall (roughly) what that original UP–US picture *looked like* (or would look like) when it was (or if it were) displayed by the uninverted CDT.

In brief, on the eliminativist view, to see an (apparently) inverted picture is to see an inverted CDT and to think of, or imagine oneself perceiving, the corresponding uninverted picture.

However, as long as it seems reasonable to retain the formulation of theory 3 in terms of *distinct pictures*—for instance on grounds such as that claims to perceive the upright (UP–US) and inverted (IP–US) pictures are justified to exactly the same extent as each other, so that each kind has an equally legitimate claim to being a genuine picture and to be capable of comparison with other pictures—then to that extent the eliminative approach will remain a significantly flawed competitor.

Turning now to the *all-inclusive* or noneliminative approach to Harold's pictures—defining theory 4, the MFA theory—according to that approach, as already noted, both the UP–IS and IP–US pictures may be accepted as genuine, and neither is identical with the more commonly seen UP–US picture. Thus, unlike the eliminative approach, there is no need for elaborate paraphrases to explain the supposed seeing of certain pictures as opposed to others, and all picture perception can be given a uniform account.

However, the main comparative strength of the inclusive approach is that it can account for visual aesthetic phenomena that necessarily must be dismissed or reinterpreted in an arguably unsatisfactory way by an eliminative approach.

For example, the eliminative approach is forced to regard any IP–US type inverse pictorial information as merely being *a set of clues to*—or as a mere means to the end of—deciding which *non*inverse picture is the relevant one, rather than being able to treat that aesthetic information, as can the noneliminative approach, as *an aesthetically interesting pictorial end in itself*. The IP–US picture which Harold saw, after realizing his mistake in initially seeing a UP–IS picture, itself has its own integral visual appearance and aesthetic effects *as* an IP–US picture, which are different both from those of the UP–IS picture *and* of the UP–US picture, of which it is a nonidentical inverted version.[19]

To strengthen the force of this point, consider again the corresponding musical example. It is hard to deny that an inverted IT–US theme has some auditory aesthetic qualities that are quite different from those of the original uninverted UT–US theme, while yet it is still true that one, in hearing it, can hear it *as* an inversion of the original theme, rather than its simply being the case that one hears (what happens to be) an inverted theme as a theme in its own right—that is, a hearing of the UT–IS theme—which would *not* involve hearing the sounds *as* an inverted version of the original theme.

Hence it seems that, on this very preliminary survey of the evidence for each theory, the MFA theory 4 emerges as the most plausible candidate for an adequate account of inversion in art and music.

10. Conclusion

To conclude, I shall, as promised, discuss the implications of our conclusions for allowable or defensible theories of art. Currently, the most common theory of the nature of allographic art forms such as music or literature involves a claim that such artworks are *types*, which have physical texts, scores, or performances as their *tokens*.[20] And some, such as Gregory Currie,[21] even claim that such a theory is universally applicable to *all* artworks, including apparently autographic ones. However, the current results serve to undermine *any* such type-theoretic approaches to the arts for the following reason.

It is part of the very nature of a type that two *distinct* types of the same general kind could not have a single physical token in common; for example, if a cow is one type of animal and a sheep is another distinct type, then there could not be a single physical animal that is *both* a cow *and* a sheep.[22] But the cases given in the present paper show that there can be *more than one* picture or musical theme associated with a given physical item, from which it follows that such pictures or themes *cannot* be types.[23]

Furthermore, this result arguably applies even to sophisticated type theories such as that of Levinson, who views a musical type as mediated by the intentions of its composer.[24] A composer could, I would argue, *intend* that a given thematic passage in her composition should be musically *ambiguous*, or *equally well* be interpretable as, either a UT–IS theme or an IT–US theme. On Levinson's type theory, such a compositional intention would be impossible to carry out, which is surely an intuitively unacceptable result. Thus, in sum, the evidence presented here shows the need to find a different, *nontype* theory of the nature of artworks.

What might such an alternative theory be like? I have argued elsewhere that one viable alternative is a *representational* theory of art, according to which a given physical object or sequence of sounds acquires artistic status by *representing* one or more artworks (rather than its being a token of the artworks, as on the discredited type theory).[25]

Such a view seems at least potentially to provide a workable explanation of the inversion cases discussed here, for there is no theoretical bar to a physical object having *multiple* sets of representational properties, so that the various kinds of *interpretation* of an object, or sound-sequence, as one artwork or another, would involve the activation of one or another such set of representational properties of the object. But for reasons of space, further development of that view will have to be pursued elsewhere.[26]

Notes

[1] See the references in the following footnotes.

[2] N. Goodman, *Languages of Art: An Approach to a Theory of Symbols* (Indianapolis: Bobbs-Merrill, 1968), chap. 3, sec. 3, "The Unfakable."

[3] Goodman, ibid.

[4] Arthur Danto, *The Transfiguration of the Commonplace* (Cambridge, Mass.: Harvard University Press, 1981), ch. 1.

[5] Others arguing against the "physical object" assumption include Richard Wollheim, *Art and Its Objects: With Six Supplementary Essays* 2nd ed. (Cambridge, New York: Cambridge University Press, 1980); Joseph Margolis, *Art and Philosophy* (Brighton, Sussex: Harvester, 1980); and a recent article of mine, "Artworks Versus Designs," *The British Journal of Aesthetics* 41, no. 2 (April 2001): 162–177.

[6] Jorge Luis Borges, "Pierre Menard, Author of the *Quixote*," in J. L. Borges, *Labyrinths* (Harmondsworth, Middx.: Penguin, 1985).

[7] Jerrold Levinson, *Music, Art, and Metaphysics: Essays in Philosophical Aesthetics* (Ithaca, N.Y.: Cornell University Press, 1990), chs. 4 and 5.

[8] Danto, *The Transfiguration of the Commonplace.*

[9] Dilworth, "Artworks Versus Designs."

[10] However, as will become clear, this is not so in the case of music inversion: this is one of the differences between autographic pictures and allographic musical themes.

[11] A recent (and ongoing) debate between Arthur Danto and Joseph Margolis usefully draws attention to various issues concerning "basic" versus "interpretive" perception. See Joseph Margolis, "Farewell to Danto and Goodman," *British Journal of Aesthetics* 38, no. 4 (October 1998): 353–74; Arthur Danto, "Indiscernibility and Perception: A Reply to Joseph Margolis," *British Journal of Aesthetics* 39, no. 4 (October 1999): 321–29, and Joseph Margolis, "A Closer Look at Danto's Account of Art and Perception," *British Journal of Aesthetics* 40, no. 3 (July 2000): 326–39.

[12] See my "Artworks Versus Designs" for a sculptural example of a single object that, because of the differing intentions of two artists, embodies two separate sculptures. A similar example could easily be constructed featuring one painting embodying two distinct pictures.

[13] However, the two (generic) inverses of the original UT–US theme, namely IT–US and UT–IS, will nevertheless have a single common sound sequence token as their CDT, which sound sequence token was interpreted by Anne first as an IT–US theme and then as a UT–IS theme.

[14] Other reasons for the wrongness of the OX theory will emerge as the paper proceeds.

[15] See note 11.

[16] In a similar manner to that in which an artist might use a "found" piece of driftwood as a sculpture.

[17] Gombrich, *Art and Illusion: A Study in the Psychology of Pictorial Representation* 2nd ed. (London: Phaidon Press, 1962).

[18] Richard Wollheim, *Painting as an Art* (Princeton, N.J.: Princeton University Press, 1987).

[19] Thus for example, an artist could deliberately choose to exhibit

one of her paintings *as* an IP–US picture by including suitable indications to the viewer that this was her intended interpretation—such as by including visibly unused inverted picture-hanging hardware items, or an inverted title, at the bottom of the exhibited painting, signaling that her picture was meant to be seen as an inversion of a now rejected prior picture. And the other inverted picture (the IP–IS picture) could be exhibited using similar visual cues.

[20] Support for a 'type' view as applied to at least some works of art is provided by (among others) N. Carroll, *A Philosophy of Mass Art* (Oxford: Clarendon Press; Oxford University Press, 1998), G. Currie, *An Ontology of Art* (Houndmills, Basingstoke, Hampshire: Macmillan, 1989), J. Margolis, *Art and Philosophy* (Brighton, Sussex: Harvester, 1980), and Wollheim, *Art and Its Objects*.

[21] Currie, *An Ontology of Art*.

[22] I discuss this issue in more detail in my "Artworks Versus Designs" and also in my article "A Representational Theory of Artefacts and Artworks," *British Journal of Aesthetics* 41, no. 4 (October 2001): 353–70.

[23] In the case of themes, it is arguable that any complete musical work is simply a *sequence* of such themes, so that if themes cannot be types, then neither can the *sequence* of themes that makes up a musical work.

[24] Levinson, *Music, Art, and Metaphysics*.

[25] See again my "A Representational Theory of Artefacts and Artworks," and also another article "The Fictionality of Plays," forthcoming in *The Journal of Aesthetics and Art Criticism*, in which I extend my representational view to theatrical and other works of fiction.

[26] My thanks to the Editor and anonymous referees for very helpful comments on earlier versions of this paper.