Among the representational systems, which of them are pictorial, and what conditions must a representational system satisfy for it to be pictorial? In what respects are pictorial systems different from and similar to diagrammatic and linguistic representational systems? And what is it about linear perspective that makes it such a paradigmatic example of a pictorial system?

Over the last thirty years, there have been two prominent approaches to answering these questions, with one of them clearly dominant. The dominant one has it that the best way to understand what makes a representation pictorial is in terms of facts about how we can perceive it, the experiences it is disposed to elicit, and so on.1 Perceptual accounts are quite plausible ways to engage with the questions put forth above for a number of reasons. First, representational systems are human artifacts that no doubt bear significant relationships to their makers. Second, pictures are a richly perceptual kind of representation. Of course we perceive all of the representations that we use, pictorial or otherwise, but intuitions have it that what pictures are about depends in an important way on how we can perceive them. There are many interesting facts concerning the perception of pictures, and perceptual theorists try to show that what pictorial representation is can be defined, at least partly, in terms of those facts.

In addition, perceptual accounts tend to take at least some of the following features of pictures either as explananda or as explanans.2 Pictures are an essentially visual form of representation in that pictures must be seen to be understood and one can only depict what can be seen. In addition, everything that is depicted is depicted from a certain point of view, though it may often be difficult to determine just what that point of view is. Third, the contents of pictures are necessarily exceedingly determinate, especially in comparison with the contents of descriptions and other kinds of linguistic representations. For example, although one can describe an object as being square without saying anything more determinate about it, any depiction of an object as being square often also depicts the object as having a color, a brightness, an orientation vis-à-vis other objects, and so on. And fourth, there is a very close relationship between one’s ability to recognize and identify an object and one’s ability to understand pictures of that object. This relationship is often explicated in terms of similarities in the experiences evoked by pictures and their objects, experienced similarities between pictures and their objects, or a mobilization of the same perceptual resources in identifying pictures and their objects.

An alternative approach, and the one favored here, seeks to differentiate the pictorial from other representations in terms of structural features of the systems to which they belong. Crucial to understanding what pictures are, according to this line, is learning how pictures relate to one another syntactically and semantically within a system. Nelson Goodman was the main proponent of this approach, and while his work generated much discussion, it found few supporters.3 One important reason for this is that the account fails to capture and accommodate our intuitions concerning what pictures are in the way that perceptual accounts do. Since structural accounts are not articulated in terms of perceptual facts, they do not appeal directly to our intuitions concerning the perception of pictures and Goodman’s account, in particular, classifies many systems as pictorial despite very
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strong intuitions to the contrary. In addition, Goodman was adamantly opposed to the intuitively appealing claim that similarity and resemblance play a semantically significant role in pictorial representation.

On the other hand, no amount of implausibility associated with Goodman’s account should be taken as a vindication of perceptual approaches to the problem. Insofar as such accounts focus on the perception of pictures, they run the risk of missing whether pictures and images form an interesting structural kind of representational system. The following explicates four structural conditions that are necessary and sufficient for a representational system to be pictorial: relative repleteness, relative syntactic sensitivity, semantic richness, and transparency. These conditions not only characterize pictorial systems, but also serve as a framework within which representational systems can be structurally distinguished from one another more generally. This account accommodates intuitions concerning which representational systems are pictorial in a more satisfying fashion than Goodman’s does, including showing the respects in which similarity is relevant to the semantics of pictures. The plausibility of the account endures despite the fact that it has the consequences that being a picture has very little to do with how a representation can be perceived, that pictures are not an essentially visual form of representation (indeed, we use audio pictures everyday), that pictures need not depict from a point of view, and that pictures actually depict quite indeterminate states of affairs.

One advantage of approaching the topic in this way is that it provides a new perspective on the fact that pictures seem to form a special perceptual kind. If we can understand what it is to be a pictorial representation independently of how such a representation is perceived, then we need to ask why this structural kind seems to form such a special perceptual kind as well. One tantalizing answer is that our perceptual systems make use of structurally similar kinds of representations. A popular view in cognitive neuroscience and philosophy of psychology has been that the visual, auditory, and somatosensory systems make use of imagistic representations. Without an account of what makes a representation an image, such claims cannot be straightforwardly evaluated. Furthermore, perceptual accounts of what makes a representation an image are hopeless in this context since they use perceptual facts as explanans. Since we do not perceive our brain states in normal circumstances, it cannot be facts about how we perceive them that makes them imagistic, hence, the need for a structural account of images.

I. REPRESENTATIONAL SYSTEMS AND SYNTACTICALLY RELEVANT PROPERTIES

To provide structural conditions that are distinctive of pictorial representational systems, it is important to have a general account of what a representational system is. In each system there is a set of possible physical objects that count as token representations. These objects are grouped under orthographic types and syntactic types. In general, if two objects differ syntactically, then they differ orthographically. Cases of genuine ambiguity—for example, the words “bank,” “minute,” and “pen”—are orthographic types that are assigned more than one syntactic type while each syntactic type is assigned a different semantic type. In formalized languages, all differences in syntax are marked by differences in orthography, and for simplicity’s sake, I assume that in representational systems generally differences in orthographic types correspond to differences in syntactic type. The complications introduced by ambiguities are not important given the goals of this paper. Finally, all syntactically identical representations are semantically identical, though semantically identical representations need not be of a kind syntactically.

Let the syntactically relevant properties of tokens in a certain system of representation be those properties on which the syntactic/orthographic identities of the tokens supervene. A change in the syntactic identity of a token requires a change in the instantiations of its syntactically relevant properties, though there can be changes in a token’s syntactically relevant properties that do not affect its syntactic identity. Shape, for example, is a syntactically relevant property of most alphabets. One can change the shape of a letter without altering its syntactic identity, but if one wants to change a letter’s syntactic identity, one must change its shape. Two tokens of a certain letter written in
different hands, for example, are quite different in terms of their instantiations of syntactically relevant properties. Many of the properties of the token letter such as its mass and chemical composition, however, are not syntactically relevant, since these properties as such have nothing to do with its syntactic identity. The syntactically relevant properties are the realization bases of the multiple realizable, higher-order properties, such as being of a certain syntactic type. For pictures, the shape and color of every patch of the picture surface are relevant. Any change in such properties can result in a change in the syntactic identity of the picture.

A full characterization of a system’s syntactically relevant properties is a set of just enough properties to constitute a supervenience base for the syntactic identities of all of the possible tokens of the system. The set of determinate planar shapes is a full characterization of the syntactically relevant properties for an alphabet, since the identity of any token letter supervenes on its shape. Incomplete characterizations of syntactically relevant properties are those that do not suffice in the way just indicated. For example, being square, being circular, and having corners is not a full characterization for an alphabet since token representations could be of a kind with respect to those properties though not of a kind syntactically. Also, a full characterization of syntactically relevant properties contains “just” enough properties to constitute a supervenience base, because if a set of properties counts as a supervenience base, so does that set augmented by any properties one likes. Since the sets in question are supposed to include only syntactically relevant properties, it is best to avoid sets that include more properties than are necessary to suffice as a supervenience base. Finally, full characterizations of a system’s syntactically relevant properties are generally very large sets: there are uncountably many determinate planar shapes, for example.

Furthermore, since syntactically relevant properties are supervenience bases and since supervenience is a transitive relation, there are many full characterizations of the syntactically relevant properties of any particular representational system. If there turn out to be properties that are necessary and sufficient for a token representation to instantiate a particular syntactic type in a certain system, then there is a characterization of that system’s syntactically relevant properties such that any change of them changes the syntactic identity of the token. On the other hand, in such cases there could be other perfectly accurate characterizations of that system’s syntactically relevant properties such that not any change of them results in a change in syntactic identity. Two of the following conditions compare representational systems with respect to their syntactically relevant properties, but because there are many characterizations of the syntactically relevant properties of any system, the comparisons are made with respect to characterizations that share members. If one cannot characterize the syntactically relevant properties of two representational systems in such a way that they share members, then those systems are not directly comparable with respect to the conditions presented below.

II. RELATIVE REPLETENESS

The first condition that distinguishes pictures from other kinds of representational systems is a revised and improved version of one introduced by Goodman: relative repleteness. The general idea behind repleteness is that more properties are relevant to the syntactic identities of token representations in some systems than in others. Goodman tried to make this idea explicit in the following, problematic way. Representational system A is more replete than representational system B just in case there are full characterizations of the syntactically relevant properties of A and B, $S_A$ and $S_B$, respectively, such that $S_B$ is properly included in $S_A$. A good example due to Goodman is the distinction between diagrams and pictures: more properties are relevant to the identity of a picture than are relevant to the identity of a diagram. In diagrams the shapes of lines in coordinate spaces are syntactically relevant properties, but often the color of the background and thickness of the lines are not relevant while in pictorial systems all such properties are relevant. Pictures differ in a similar fashion from linguistic representations. Since characterizations of the syntactically relevant properties of diagrammatic and linguistic systems are properly included in characterizations of pictorial
systems’ syntactically relevant properties, pictorial systems are the most replete among them.

Goodman’s attempt to make the intuitive notion of repleteness explicit has some problems, however, especially when formulated in terms of syntactically relevant properties. Consider the case in which the intersection of $S_A$ and $S_B$ is not identical to either $S_A$ or $S_B$, but in which the intersection is a better part of the one set than it is of the other. In such a case it is still reasonable to characterize one system as being more replete than the other one. According to Goodman’s version of the condition, however, neither system is more replete because neither set of syntactically relevant properties is a proper subset of the other. This suggests that repleteness should not require something so strong as proper inclusion of one set of syntactically relevant properties in another. On the other hand, Goodman was right to insist that the systems being compared have something in common, which means that some syntactically relevant properties should belong to both $S_A$ and $S_B$. In other words, $S_A \cap S_B$ should not be empty. Finally, I noted above that full characterizations of a system’s syntactically relevant properties are often very large sets. If repleteness is to capture the intuitive idea that more properties are relevant to one system than to another, then it should be able to do so for two systems that both have an infinite number of syntactically relevant properties. Let us say, therefore, that representational system $A$ is more replete than system $B$ just in case:

(i) $S_A \cap S_B$ is not empty, and
(ii) The cardinality of $S_A - (S_A \cap S_B)$ is greater than that of $S_B - (S_A \cap S_B)$.

Condition (i) simply requires that the systems being compared are characterizable and characterized in such a way that they share syntactically relevant properties. It does not make sense to compare phonographs with diagrams, though it does make sense to compare photographs with diagrams since we can characterize the latter two in comparable terms. The second condition captures the intuitive idea that the more replete system is the one in which more properties of the tokens are relevant to their syntactic identities. It is a bit complicated for two reasons. First, we saw above that proper inclusion of one set in another does not work, and second, since many representational systems have an infinite number of syntactically relevant properties, a direct comparison of the sizes of $S_A$ and $S_B$ will not work either. On the other hand, if $S_A \cap S_B$ is itself infinitely large, it can turn out that only a finite number of members remain when $S_A \cap S_B$ is removed from each of $S_A$ and $S_B$. One of the remainders may have a greater cardinality than the other even though this is not true for $S_A$ and $S_B$ themselves.

For example, imagine two systems that include a certain countably infinite number of the determinate planar shapes among their syntactically relevant properties. One of these systems also includes being red and being green among its syntactically relevant properties, while the other includes being orange but neither being red nor being green. It is in the spirit of relative repleteness to classify the one that includes two colors as more replete than the one that includes just one, since they are otherwise alike. According to Goodman, neither system is more replete, since neither set of syntactically relevant properties is a subset of the other. Furthermore, each set of syntactically relevant properties has the same cardinality, so it is of no avail comparing $S_A$ and $S_B$ directly. However, the cardinalities of the remainders as in (ii) above are different, greater for the system with two syntactically relevant colors than for the system with just one. If $S_A$ and $S_B$ both have an infinite number of members that they do not share, then it makes perfect sense to say that neither one is more replete than the other. This explication of repleteness therefore respects the intuitive notion better than Goodman’s does.

III. SYNTACTIC SENSITIVITY

With such an explication of syntactically relevant properties and relative repleteness in hand, the following question is well posed, and not trivial. What changes in the syntactically relevant properties of a token in a certain representational system are sufficient for a change in its syntactic identity?\textsuperscript{16} Syntactically relevant properties are supervenience bases for the syntactic identities of token representations, so they can change though the syntactic identity of the token does not. For example, removing serifs or making other small
changes in the shape of a token letter does not alter its syntactic identity, though each change constitutes a change in the syntactically relevant properties that the letter instantiates. The syntactic identities of pictures, on the other hand, are much less tolerant of changes in their syntactically relevant properties, so we can say that pictures are more sensitive to such changes. Representational systems differ from one another with respect to the sensitivity of the syntactic identities of their tokens to changes in their syntactically relevant properties. In general, one representational system is syntactically more sensitive than another if and only if the changes in syntactically relevant properties sufficient for a change in syntactic identity in the latter are properly included among the changes in syntactically relevant properties sufficient for a change in syntactic identity in the former. The more sensitive a system, the less tolerance the syntactic identities of its token representations have for changes in their syntactically relevant properties. (See Figure 1.)

How does one make a comparison between two systems with respect to sensitivity? First note that the comparison of two systems A and B with respect to syntactic sensitivity involves the syntactically relevant properties that the two systems have in common, that is, those included in the set $S_A \cap S_B$. Once the systems have been appropriately characterized, imagine grouping sets of possible representations in each system according to their syntactic type, and for each token generate the set of syntactically relevant properties that it happens to possess. The less sensitive system is the one with the greater number of tokens that are syntactically alike but have different instantiations of syntactically relevant properties that belong to $S_A \cap S_B$ for each syntactic type. That is, in the less sensitive system, each syntactic type tolerates more variation in instantiations of syntactically relevant properties than in the more sensitive system. This strategy leaves it open that it might be quite difficult to tell, for some pairs of representational systems, which is the more syntactically sensitive, but the foregoing explication of sensitivity suffices for the coarse-grained distinctions between pictures, diagrams, and languages.

Notice that if the syntactic types in a representational system each have certain features essentially, then there is a characterization of the syntactically relevant properties of that system such that any change in them results in a change in the syntactic identity of the token in question. Furthermore, it is reasonable to think that for at least many representational systems there are essential characteristics of syntactic types, even if these characteristics are difficult to articulate, disjunctive, or vague. For example, one could presumably come close to articulating necessary and sufficient conditions for a letter to be an “a” even though the characterization is likely to be complicated and disjunctive. Doing the same for

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**Figure 1.** Syntactic Sensitivity. The transformation of the letter above does not affect its syntactic identity. A similar transformation of the picture (of an inscription of a letter) does affect the picture’s syntactic identity. The pictorial system is more sensitive than the alphabet.
all the other letters, and including only these complicated, disjunctive properties in a set of syntactically relevant properties results in a full characterization of the system’s syntactically relevant properties such that any change in them so characterized results in a change in a token’s syntactic identity. Does this mean that every representational system is equally syntactically sensitive? No. The judgment of relative syntactic sensitivity is made with respect to characterizations of systems’ syntactically relevant properties that have members in common, and with respect to the syntactically relevant properties they actually share: the members of the set $S_A \cap S_B$. One can therefore make many comparisons with respect to sensitivity for any given pair of representational systems. It is likely that if two representational systems are such that at least one pair of characterizations of their syntactically relevant properties has a nonnull intersection, then one can find other characterizations that have members in common as well. What is important for syntactic sensitivity is that there is a characterization of the syntactically relevant properties of each system such that they share members and one turns out, as articulated above, to be more sensitive than the other.

Sensitivity is a dimension along which pictures differ from languages, though not from diagrams. Diagrams are very much like pictures with respect to sensitivity, since changing the shape of a curve on a graph, even a little, results in a different diagram. Although fewer properties tend to be relevant to the identity of a diagram than to the identity of a picture, the identity of a diagram is just as sensitive to changes in the properties that do matter. Pictures and diagrams differ with respect to repleteness but not sensitivity, while pictures differ from languages with respect to both repleteness and sensitivity.

IV. SEMANTIC RICHNESS

In addition to sensitivity and repleteness, a simple but important semantic condition that most representational systems satisfy is semantic richness. To motivate this, notice there could be a very syntactically sensitive and replete representational system that distributes only a handful of denotations across its many possible syntactic types. For example, we could take the system of all pictures in linear perspective, but say that each photograph represents one of only a handful of possible scenes. Despite the rich set of syntactic types of this system, each type gets only one of a few possible denotations assigned to it. No matter how we decide to distribute these denotations, the system is not intuitively pictorial in the sense that the richness of the syntax is not matched by a richness in the semantics. Semantic richness captures this idea. A representational system is semantically rich when there are at least as many possible denotations in the system as there are syntactic types in that system. Languages, diagrams, and pictures satisfy this general and rough condition, so it does not distinguish pictures from these other kinds of representations. While many denotations are picked out by syntactically different words in a language, the number of possible denotations is at least as great as the number of possible syntactic types. In general, systems with a very rich syntax are not ideally suited to representing delimited classes of objects. So, while representational systems are generally semantically rich, this can at times fail to be the case.

An interesting example in which semantic richness is lacking is iconic art, which is a complicated topic that I can only gesture at here. In iconic art there are at least two ways in which one semantically individuates representations, one is rich, the other is not. One can take an icon merely as a picture, in which case the semantics associated with it is rich. On the other hand, in assigning the picture to an iconic kind, one is assigning one of a quite limited number of denotations to it, for example, one scene or another from the lives of the saints. In this sense, iconic art makes use of both rich and not so rich semantic schemes. Notice also that the choice of “icon” to pick out the little graphics on one’s computer desktop is quite apt. There is a sense in which they are pictorial, depicting folders, trashcans, and the like, but their usefulness depends on their picking out one of a very delimited range of objects.

V. ANALOG VERSUS DIGITAL

It is common for discussions of what makes pictures different from languages to focus on
the fact that pictures are analog representations while linguistic and other symbolic representational systems are digital. In addition to relative repleteness, Goodman introduced only two further conditions—semantic and syntactic density—that are meant to capture the idea that pictures are analog. For Goodman, analogicity and repleteness capture fully the structure of pictorial representations. One prima facie problem with this is that very many pictorial representations from newspapers, on television, and so on, seem to be digital. It is a stretch, furthermore, to claim that such digital representations are only pictorial insofar as we interpret them as analog representations. Whether we can do without density depends, of course, on whether different distinctions can accomplish largely the same goals. Sensitivity and richness do just that. In contrast to Goodman’s account, repleteness, sensitivity, and richness accommodate comfortably the claim that there are bona fide digital, pictorial representational systems in addition to suggesting the proper place for the analog/digital distinction in understanding the structure of representational systems.

All pictorial representational systems are relatively replete, syntactically sensitive, and semantically rich. Digital systems that seem pictorial also satisfy these conditions, and they should therefore be counted among the pictorial systems as well. On the other hand, these conditions make it difficult to compare digital and analog systems with respect to repleteness and, especially, sensitivity. Analog systems are generally more sensitive than digital systems, because digital systems are usually designed so that tokens of each syntactic type are easy both to produce and to recognize. For tokens of a certain syntactic type to be easy to produce, they cannot be terribly sensitive to variations in syntactically relevant properties. The foregoing does not, however, impugn the claim that digital pictures are more sensitive to changes in their syntactically relevant properties than letters. This suggests that among the analog representational systems, the pictorial ones are exceedingly replete, sensitive, and rich while likewise among the digital systems the pictorial ones are exceedingly replete, sensitive, and rich. The analog/digital distinction sorts representational systems into comparison classes, within which we can make judgments about repleteness, sensitivity, and richness.

VI. PROBLEMS SO FAR . . .

Although repleteness, sensitivity, and richness plausibly constitute necessary conditions for a representational system to be pictorial, they are not sufficient, and two examples suffice to show this. The first, due to Wollheim, is a picture scheme like linear perspective, say, except for the fact that the pictures resulting from the perspective projection are broken up into many pieces and reshuffled according to some rule. Systematically shuffling up pictures has no effect on their syntactic sensitivity, repleteness, or semantic richness. On the other hand, this system is not pictorial, at least not intuitively, and the more pieces into which the pictures are broken the stronger the intuition against the system being pictorial. The second example, also discussed by Wollheim as well as Goodman, is a picture scheme like linear perspective except for the fact that colors stand for their complements. In this system, pictures of green grass are red, and pictures of the blue sky are yellow. Intuitions about such a system are certainly mixed, with some, like Goodman, happy to classify it as being pictorial and while others, like Wollheim, loathe doing so. What is uncontroversial is the intuition that there is something strange about the way this putatively pictorial system represents color, and that this calls into question whether the system is pictorial at all. This system, like the shuffled up system, is just as replete, syntactically sensitive, and semantically rich as linear perspective, which no one denies is pictorial.

What these examples suggest is that we need to do further work in distinguishing pictorial from nonpictorial representational systems. At this juncture, it is tempting to appeal to a condition that is defined in terms of perceptual facts. This approach is eminently plausible considering that what makes the above cases seem nonpictorial is that we cannot engage with them visually in the same ways that we can engage with more everyday kinds of pictures. Despite their plausibility, the goal here is to avoid explaining what makes a representation pictorial in terms of how it is perceived. What follows, therefore, is a further structural condition, transparency, that effectively narrows the class of syntactically sensitive, relatively replete, and semantically rich systems to a class
VII. TRANSPARENCY

The best way to get at transparency is by taking a look at a common representational system that exhibits it and that is also taken to be a paradigmatic example of a pictorial representational system: linear perspective. For the present purposes, linear perspective is a system of representation in which pictures are made by performing the equivalent of the following. Consider a point that we can call the projection point, and a bounded section of a plane. Let’s call the plane the picture plane and the bounded section of it the picture. The projection point can be anywhere but in the picture plane. Project rays from the point through the picture to the world beyond. Take the first object that a bundle of projected rays meets and make the corresponding region on the plane the same color as the corresponding region of the object from the point of view determined by the projection point. Doing this for all bundles of rays from the projection point through the bounded section of the plane yields a linear perspective picture (LPP).\textsuperscript{14} (See Figure 2.)

Representations in linear perspective are paradigmatic examples of pictures and, more specifically, of exceedingly realistic pictures. In addition, linear perspective is a transparent representational system, which means that its representations are structured so that they represent one another in a very special way.

**Transparency**: A representational system S is transparent just in case for any token representation, R, in S, any representation of R in S is of the same syntactic type as R.

Roughly, given a representation of some object X, the result of iterating the process by which one gets the representation of X is another representation that is just like the representation of X one got in the first place, as far as its syntactic identity goes. Imagine the case in which a clear, focused photograph is made of another picture. As long as the photographic plane and the plane

\[\text{FIGURE 2. LINEAR PERSPECTIVE. Project rays from P through a plane to some object. Color the picture plane in such a way that the color of every region of the object that is intersected by a bundle of rays from P is matched by the picture in the region intersected by that bundle of rays.}\]
of the picture are parallel to one another the resultant photograph is just like the original picture with respect to the determinate shapes and colors of all regions on the picture surface.15 Photography is a useful example not only because it is the most common way in which people make pictures, but also because photographs approximate LPPs. (See Figure 3.) Although the preceding example is intuitive enough, it does not suffice to show that linear perspective is in fact transparent. Transparency as defined requires that any picture of another picture in linear perspective is of the same syntactic type as the original, and we need to do more work to show that this is the case. It certainly need not be the case that two picture planes are parallel for one picture to count as a picture of another, and the best way to get a feel for what transparency requires is to see just how linear perspective satisfies it.

Transparency is a claim about syntactic identity, and since syntactic identity supervenes on representations’ syntactically relevant properties, a full characterization of the syntactically relevant properties of linear perspective can help show in what respects it is a transparent system. Given a full characterization of a system’s syntactically relevant properties, if two token representations are alike with respect to them, then they are alike syntactically. So, if making a picture of another picture in linear perspective is such that the resultant picture shares all syntactically relevant properties with the original, then linear perspective is transparent. One reasonable way to characterize the syntactically relevant properties of linear perspective is as the determinate planar shapes and the determinate colors. That this suffices as a supervenience base for the syntactic identity of any linear perspective picture means that once one has determined the determinate shapes and shades of all regions of a plane, one has done all that one needs to do to determine the pictorial, syntactic identity of that plane. Other properties of the plane, such as its mass and temperature, are irrelevant to its identity as a picture.

When we make a picture of this picture in linear perspective, as in the special case above, the result shares all determinate shapes and shades with its object and is thus indistinguishable, as a picture, from its object. So under certain circumstances—viz., those in which the picture planes are parallel—making a picture of a picture in linear perspective results in a picture shaped and colored in the same way as and, hence, syntactically identical to its object. On the other hand, since nothing about linear perspective is such that the resultant picture shares all syntactically relevant properties with the original, then linear perspective is transparent. One reasonable way to characterize the syntactically relevant properties of linear perspective is as the determinate planar shapes and the determinate colors. That this suffices as a supervenience base for the syntactic identity of any linear perspective picture means that once one has determined the determinate shapes and shades of all regions of a plane, one has done all that one needs to do to determine the pictorial, syntactic identity of that plane. Other properties of the plane, such as its mass and temperature, are irrelevant to its identity as a picture.

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When we make a picture of this picture in linear perspective, as in the special case above, the result shares all determinate shapes and shades with its object and is thus indistinguishable, as a picture, from its object. So under certain circumstances—viz., those in which the picture planes are parallel—making a picture of a picture in linear perspective results in a picture shaped and colored in the same way as and, hence, syntactically identical to its object. On the other hand, since nothing about linear perspective is such that the resultant picture shares all syntactically relevant properties with the original, then linear perspective is transparent. One reasonable way to characterize the syntactically relevant properties of linear perspective is as the determinate planar shapes and the determinate colors. That this suffices as a supervenience base for the syntactic identity of any linear perspective picture means that once one has determined the determinate shapes and shades of all regions of a plane, one has done all that one needs to do to determine the pictorial, syntactic identity of that plane. Other properties of the plane, such as its mass and temperature, are irrelevant to its identity as a picture.
perspective itself requires the two planes to be parallel, there are cases in which one makes a picture of a picture with the result not shaped and colored exactly like the original. This is not a refutation of the claim that linear perspective is transparent, but it is an important challenge to it. While the class of determinate shapes and shades is a full characterization of the syntactically relevant properties of linear perspective, it need not be the case that any change in the syntactically relevant properties so characterized results in a syntactically distinct picture. Pictures that differ with respect to their determinate shapes and colors could nevertheless be syntactically identical. To establish transparency we need a characterization of the syntactically relevant properties of linear perspective such that any change in them so characterized results in a syntactically distinct picture. Pictures that differ with respect to their determinate shapes and colors could nevertheless be syntactically identical. To establish transparency we need a characterization of the syntactically relevant properties of linear perspective such that any change in them so characterized results in a syntactically distinct picture. Transparency, after all, is a condition that deals with syntactic identity, and though linear perspective is a quite syntactically sensitive system, it is not necessarily sensitive to the highest degree with respect to all characterizations of its syntactically relevant properties.

It turns out that there is a plausible characterization of linear perspective’s syntactically relevant properties such that every picture of a picture in linear perspective is syntactically identical to its object. To see this, first note that linear perspective is a projective system and that there are well-known results from projective geometry concerning invariants under projective transformations. Points are mapped to points, lines to lines, conic sections to conic sections, and so on. One plausible characterization of the syntactically relevant properties of linear perspective, then, is the set of properties that are invariant under these projective transformations. Since the projective invariants strictly speaking involve exclusively geometric features of the scene, we need to include the determinate colors in the characterization as well. If this characterization of the syntactically relevant properties of linear perspective is reasonable, and if making a picture of a picture in linear perspective is simply applying the perspective projection to a picture, then a picture of a picture is of the same syntactic type as the original picture. Planes related by a linear perspective mapping share by definition the invariants of such a mapping. In addition, facts about the projective invariants and the determinate colors supervene on facts about the determinate shapes and colors. Adopting this suggestion therefore does not require abandoning the claim that the determinate shapes and shades are also syntactically relevant properties of linear perspective. Finally, although one can change the determinate shapes and shades of a linear perspective picture while leaving its projective invariants unchanged, linear perspective is still quite syntactically sensitive, as all pictorial systems must be. One cannot haphazardly change the determinate shapes and shades of a picture plane and expect to preserve its projective invariants. This is in contrast to letters and the like, which are much less sensitive to relatively haphazard changes in their determinate shapes and shades. (See Figure 4.)

Although it clearly shows that linear perspective is transparent, is this choice of syntactically relevant properties plausible on independent grounds? There is, after all, a whiff of circularity here, and if not that, then at least a worry that the choice of syntactically relevant properties is motivated only by the conclusion that is being sought. It is certainly intuitive to call pictures that share all determinate shapes and shades alike syntactically and, hence, semantically, but pictures that differ in the ways that they can under arbitrary perspective maps do not intuitively share content. One motive for calling two possible tokens in a representational system syntactically distinct is that it is possible for them to be representations of different things: syntactically identical representations cannot be representations of different things. Whether the projective invariants are a reasonable choice of syntactically relevant properties for linear perspective, then, depends on whether there is a notion of the content of a picture according to which all pictures that share projective invariants share content.

The rules for producing LPPs are such that many different scenes can result in the same picture. The simplest example of this is the special case above in which a picture of a picture is just like the original with respect to its determinate shapes and shades. In that case, the original picture could be a picture of anything one likes—say a dog—and both the picture of the dog and the dog itself result in syntactically identical LPPs. If any scene from which one
could produce a particular linear perspective picture counts as a part of the picture’s content, then any two pictures that share all perspective invariants, however much they differ in other respects, have the same content. Two possible scenes that differ in some respect but not in terms of their perspective invariants from a certain projection point do not differ from one another with respect to perspective projections from that point. The notion of content here—viz., that whatever scenes could have resulted in a particular linear perspective picture via a perspective projection count as parts of the content of the picture—is quite abstract and has a lot in common with Haugeland’s “bare-bones content” of a representation. Though abstract, bare-bones content is a plausible way to articulate what pictures can be about and thereby establish conditions under which two pictures differ syntactically. If we choose the projective invariants to be the syntactically relevant properties of linear perspective, then linear perspective is a transparent representational system.

Systems that satisfy transparency not only have quite indeterminate bare-bones contents, but the indeterminacy is of a particularly special sort. For example, part of the content of any linear perspective picture is a plane that is colored and shaped exactly like the linear perspective picture itself. Since such a plane counts as a picture in linear perspective we can say that for any X included in the bare-bones content of a linear perspective picture, a picture of X is also a part of that linear perspective picture’s content. Also, many colored planes that a linear perspective picture can reasonably be taken to be a picture of—specifically, all of those that are related to it via a perspective transformation—when interpreted as LPPs, have the same content as the particular linear perspective picture in question. In this sense, representations in a transparent scheme are blind to one another. Making a picture of a picture results in a picture with the same content as the original since such pictures are syntactically identical to the original. Notice that if one were to insist that the contents of LPPs were of the more determinate variety that are commonsensically ascribed to them, then one would not be in a position to see the respects in which linear perspective is transparent. Furthermore, notice that insofar as the perception of pictures motivates claims about their contents being quite determinate, it is only by eschewing the use of perceptual facts as explanans that one is in a position to see the respects in which linear perspective is transparent. In fact, so far nothing has been said about the perception of pictures, whether pictures must be

![Figure 4. Transparency, the General Case.](image-url)

In the general case, a picture of a picture does not need to be parallel to the original. The result (on the left) is not identical to its object with respect to the determinate shapes of all of its regions, though the two are related by a perspective transformation.
visual, or what role point of view plays in pictures, if any, but more on these topics later.

Transparency is a structural condition that limits the class of syntactically sensitive, relatively replete, and semantically rich representational systems to those that are intuitively pictorial. It should come as no surprise, therefore, that neither the color complement system nor the shuffled up picture system introduced above straightforwardly satisfies transparency. In the color complement scheme, skies of blue and fields of green are represented by expanses of yellow and red respectively. This scheme fails to be transparent with respect to representing objects’ determinate colors. As one makes pictures of pictures in this system, the colors of the resultant pictures keep jumping back and forth between complementary pairs. Create a picture of a picture of a green object and the result is a (green) picture of a red object, and so on. In this scheme, a picture of a green object cannot also be a picture of a red object. Therefore, the fact that a picture of a picture of a green object is itself a picture of a red object indicates that the picture of a picture is not syntactically identical to its object and transparency fails.

On the other hand, if we ignore color entirely as a syntactically relevant property of the system, and concentrate on shapes, then the system is transparent and pictorial, just not with regard to colors. Discounting color as a syntactically relevant property also means that these pictures do not represent facts about the colors of objects. In a related vein, a grayscale picture system in which pictures have regions of varying brightness but not hue is also transparent. In addition, one can include color properties among the syntactically relevant properties of the color complement system and have it come out transparent, but at the cost of the system only representing very odd color properties, not the standard ones we expect from a pictorial scheme. Specifically, if we take the disjunctive properties red-or-green, blue-or-yellow, and so on to be syntactically relevant properties of the system, then the result is a transparent pictorial scheme. A picture of a picture of a red-or-green object, in this scheme, is itself a (red-or-green) picture of a red-or-green object, and so on. This scheme does not, however, represent objects as having determinate colors. Rather, it represents objects as having disjunctions of complementary pairs of colors, which is nonstandard to say the least. Transparency shows in what respects the complement system is pictorial and in what sense it fails to be so, which accommodates the divided intuitions associated with such systems.

The shuffled up picture system is also just as syntactically sensitive, replete, and semantically rich as linear perspective, but it conspicuously fails to be transparent. In this system, a picture of a picture of a horse does not include a horse as part of its content, but a jumbled up assortment of horse parts. Since the picture of the picture does not have the same bare-bones content as the original picture, it is syntactically distinct from it and transparency fails. Imagine what goes on as one iterates the representational process in such a system. First, make a linear perspective picture of a horse and shuffle it up. Then make a linear perspective picture of the shuffled up picture and shuffle up the result. The result is basically a reshuffling of the original picture, which is a syntactically distinct representation. Transparency restricts the class of syntactically sensitive, relatively replete, and semantically rich systems to a class that we intuitively take to be pictorial.

VIII. MIMESIS, RESEMBLANCE, AND TRANSPARENCY

In the foreground of all the intuitions surrounding pictures and how they differ from other kinds of representations is the thought that in some sense pictures resemble what they depict. One simple way of fleshing out this intuition is to claim that the intrinsic characteristics of the possible objects of pictures are systematically related to the intrinsic characteristics of the possible pictures of them. Furthermore, that pictures are similar to their referents is in some way relevant to the pictures having the referents they do: similarity drives semantics. The account of pictorial representation worked out above provides a new look at just where these intuitions stand, but before we get to that, some distinctions need to be made.

There are at least two senses in which one object might be judged to resemble another, and the differences between them need to be kept clear. Objects may be judged to look alike, in the sense of being apparently similar or experienced as similar to one another, or they may be
judged to be *genuinely* similar in that they share specified properties. Apparent similarity is a psychological notion that can be and has been explicated in a number of ways by most proponents of perceptual theories of depiction. Not every case of genuine similarity between objects counts as a case of apparent similarity. Furthermore, not every case of apparent similarity is underwritten by an easily ascertainable genuine similarity. One object might look like another while one is left in the epistemic dark concerning whatever genuine similarities underlie the apparent similarity. Judgments of genuine similarity, by contrast, are always made with respect to specified properties of the objects in question. It is illicit, notice, to explain apparent similarity in terms of the supposed genuine similarity generated by ascribing inverse intentional properties to the objects compared. One might be tempted, for example, to say that objects that look alike actually are alike in that they share the property of *looking a certain way, W,* to a subject S. That does not explain or underwrite but just restates the claim that the objects look alike. Explicating apparent similarity must involve attributing genuine and not inverse intentional properties to the objects in question. The problem of pictorial mimesis framed here concerns genuine, systematic similarities between pictures and their objects.

Now, there are very strong restrictions on what a picture in a transparent scheme can be like if it is to count as a picture of another picture. As stated, transparency straightforwardly entails that a picture of a picture is similar to its object with respect to many of its syntactically relevant properties; in linear perspective they are the projective invariants. More generally, is a picture of an X similar to that X in systematic, semantically relevant respects, regardless of whether X is itself a colored plane, and if so, in what respects? As it turns out, all transparent representational systems are mimetic, so their representations exhibit systematic similarities to what they represent. Furthermore, although transparency entails mimesis, and mimesis entails systematic similarities between representations and what they represent, neither of the converses holds.

Before mimesis in representational systems can be defined, a few remarks are in order about the properties a system can represent objects as having. First, the properties of objects come at many levels of abstraction. For example, all of the following characterizations of the table in front of me are accurate: a rectangle whose sides are in the ratio 2:1, a rectangle, a parallelogram, a quadrilateral, and a cornered figure. Each says less and less about the table, but is no less accurate in its ascription for being less informative. Similar considerations apply for colors, relative orientations, relative locations, and so on. Second, a representational system can very well represent an object as being cornered while remaining silent regarding any more determinate details of the object like the number of sides it has. So, while being cornered is not a determinate shape—like, for example, being a rectangle with sides in the ratio 2:1—one can represent determinately that an object has that indeterminate shape. Similar considerations hold for colors. I can be told that some book has a blue cover without being told that it does or does not have a sky blue cover. To bring in the discussion of similarity from above, two objects can be similar insofar as they share the property of being cornered and blue, even though they share no more determinate properties than that. Furthermore, it is useful to think in terms of classes of properties that are mutually exclusive and of systems as representing the members of such classes. The idea is that a system can represent objects as being trilateral, quadrilateral, and so on without representing its objects as having a more determinate shape than that. Likewise, a system can be mimetic with respect to quite abstract properties like laterality without being mimetic with respect to any more determinate properties. With that in mind, we are now in a position to define mimesis.

A representational system S is *mimetic* with respect to a set of properties C if and only if it satisfies the following four conditions:

(i) All the members of C are syntactically relevant properties of S.

Clearly, a system cannot be mimetic if the properties with respect to which the system is supposed to be mimetic are not syntactically relevant properties of that system.

(ii) All the members, P, of C are such that representations in S can determinately represent their objects as being P.
This condition is also more or less obvious. S must be able to represent objects as being P if it is to have a chance of being mimetic with respect to P. The term “determinately” distinguishes between representing an object as being P and remaining silent as regards the P-ness of an object. According to (ii), not only is it consistent with all interpretations of representations in S that their objects are P but for at least some representations in S it is inconsistent with their interpretations that their objects are not-P. Given (i) and (ii), what are the relations between the syntactically relevant properties of S and the contents of representations in S?

(iii) All representations in S that determinately represent their objects as being a member, P, of C are themselves P.

All representations in S that represent objects as being, for example, quadrilateral are themselves quadrilateral. In this case, it need not be that rectangles are represented with rectangles or, of course, that 2:1 rectangles are represented with 2:1 rectangles, since all one needs for mimetic representation of being quadrilateral is systematic similarity with respect to four-sidedness itself. Pictures in linear perspective, for example, share perspective invariants with their objects, but these invariants are quite abstract properties. Not all LPPs of square objects are themselves square, but they are all quadrilateral. Sometimes one can only find mimesis in a representational system if one is willing to look at fairly abstract properties, like laterality. Finally, (iii) leaves it open whether there are representations in S that are P but nonetheless fail determinately to represent their objects as being P, so we need to state that

(iv) All representations in S that are P determinately represent their objects as being P.

These four conditions are necessary and jointly sufficient for mimesis with respect to a set of properties in a representational system. This account does not entail that all representations in S of objects that are P are themselves P. Only representations that represent their objects as being P or are themselves P are considered in the definition. It is therefore unproblematic that there might be an object O that is P, such that O is represented in S, but the representation of O itself is not P, so long as the representation does not determinately represent O as being P.

Mimesis is first and foremost a feature of the semantics of representational systems. If a representational system is mimetic with respect to the class of n-laterals then whenever a quadrilateral surface is represented as such, that representation will also be a quadrilateral, and, hence, an instance of the same member of the class—quadrilaterals—as the object represented. Mimesis therefore entails similarity and the similarity entailed is semantically significant. There may be many ways in which a particular representation is similar to what it represents and there may even be many ways in which representations are systematically similar to what they represent, but not all of those similarities are instances of mimesis. Furthermore, similarity with respect to some property or other is necessary for mimesis, but this does not entail that similarity is either necessary or sufficient for some object to be a representation. This analysis is therefore immune to Goodman’s objections to the idea that similarity can help explain what makes certain objects representations. Systems whose members exhibit systematic similarities to the members of a class of objects are ideally suited to representing the members of that class, but that is not to say that being a representation consists in being similar to some object. Finally, no mention is made of looking like, or apparent similarity, though it is reasonable to expect that mimesis with respect to perceptible properties is such that those representations are experienced as being similar to their objects.

With an account of mimesis on the table, it is possible to show that transparency entails mimesis. Consider a familiar example: the radar images on the nightly weather report in which the color of a region corresponds to the intensity of precipitation in that area. The radar is sensitive to different densities of the atmosphere at different distances from the antenna, and these densities are directly correlated with the severity of precipitation in that area. This system of representation is an interesting mix of nontransparent, mimetic, and nonmimetic representation.

First, regions of uniform color in the image represent regions of uniform intensity in the
storm. Additionally, a region of uniform color has the same shape as the region of uniform intensity that it represents. Part of the point of this system is to pick out the locations and shapes of regions of stormy weather, and this system is mimetic with respect to the shapes and relative locations of these regions. On the other hand, the system is not transparent with respect to these properties. It is, of course, practically impossible to make a radar image of another radar image, but even if we bracket this practical difficulty, transparency fails. The radar represents relative densities of the atmosphere, and accordingly an image of another image would record the relative densities of the original image itself. Since it is the colors of the radar image that correspond to densities in its object, there is no reason to think that the densities of the parts of the image bear any interesting relation to the densities it represents its object as having. Hence, an image of another image differs from its object with respect to the colors and shapes of its surface, which means that it is syntactically distinct from its object.

To make this system transparent we could change its syntactically relevant properties. The problem for transparency in this system is that the densities of one image bear no interesting relation to the densities in the situation that it represents. Colors are used to carry information about density. If, however, we retool the system so that regions of uniform density in the representation are made to correspond to regions of uniform density in the atmosphere, we would be one step closer to a transparent representational system. The extent to which this new system is transparent depends on the character of the relation between the density of the representation and the density of what it represents. For example, if regions of density D represent regions of density D, then the system is transparent with respect to the shapes and determinate densities of what gets represented. This is easy to see because the representation itself matches the density of what it represents so that a representation of this representation in the same system likewise matches its density in a similarly shaped region. If regions of density cD represent regions of density D, where c is some constant multiple, then there is no transparency with respect to determinate densities but there is transparency with respect to relative densities of regions and shapes of regions of uniform density. Because of the special relationship that transparency demands between representations and representations of representations in a system, making a system transparent with respect to certain properties entails making it mimetic with respect to those properties. On the other hand, it is not the case that all mimetic systems must be transparent, as the normal radar shows.

Although the radar images do not meet the conditions of being pictorial, they are called images for a good reason. Specifically, in addition to the full-blown pictorial representational systems, there is the broader class of systems that are replete, sensitive, rich, and mimetic, though not necessarily transparent. This class corresponds to what can be called the imagistic representational systems. Pictorial representational systems are a subclass of the imagistic systems: the transparent ones. This proposal has the advantage of fitting well with our ordinary usage of the terms “picture” and “image,” since everything that intuitively counts as a picture counts as an image, though not everything we are willing to call an image deserves to be called a picture.

IX. AUDIO PICTURES?

Repleteness, sensitivity, richness, mimesis, and transparency are quite general conditions that make no reference to specifically visual modes of representation. It is an open question, then, whether some common nonvisual representational systems fit the bill for being pictorial. The existence of such systems would show why, in part, it is valuable to work out a structural account of pictures and images and why perceptual accounts that take the visual nature of pictures for granted are fated to mischaracterize what it is to be a picture. According to the account offered here, playbacks of audio recordings are pictures of things and their audible properties just as visual pictures depict things and their visible properties.

First consider the difference between the audio tape that records “ticks,” say of a Geiger counter, and one that is meant to record all of the sounds in a room. In the former case, all that matters to the representation is that a tick
happens at such and such a time. One could change the audible quality of the tick in any way one likes without affecting the representational content of the tape, even inserting background noises as long as those noises do not obscure the ticks. Such a recording is akin to a diagram on which a dot is placed along an axis that represents time each time an event occurs. Both such systems are syntactically sensitive since arbitrarily small differences in the timing of the tick on the tape or its position on the diagram correspond to different representations in each system. The tape, like the corresponding diagram, is not very replete, since many additions and changes in the character of the playback that represents the ticks are not relevant to the representation of the events in question: they are not relevant to the timing or presence of the “ticks.”

When recording all of the sounds in a room, however, things are quite different. The system is indeed syntactically sensitive, since arbitrarily small changes in the magnetic field on the tape, and, hence, of the playback characteristics of the tape, are sufficient for syntactically distinct representations. All of the representations that are syntactically distinct (have different playback patterns) are semantically distinct since if the playback is different, then the sound represented by the tape is different. Therefore, this system is semantically rich. Also, the recording of all the sounds in the room differs from the diagrammatic recording with regard to relative repleteness. The aspects of the playback that are relevant to the syntactic identity of the tick recording are a proper subset of the aspects of the playback that are relevant to the syntactic identity of the ambient sound recording. Both recordings are quite sensitive, but more aspects of the playback matter to the recording of ambient sound than matter to the recording of ticks at particular times. In the ambient case, all of the nuances of all of the sounds matter. In addition, both of these systems are semantically rich. In general, the analogies between audio representations and visual representations are quite tight vis-à-vis repleteness, sensitivity, and richness.

Transparency, just like sensitivity, repleteness, and semantic richness, is a very pronounced and often exploited characteristic of these systems of audio representation. Under certain specifiable circumstances, a playback of a recording of a recording of X is syntactically identical to a playback of a recording of X. It is a familiar fact that making a recording of a recording, under ideal circumstances, results in a duplicate of the original recording, that is, a recording that shares all syntactically relevant properties with the original. In general, because of imperfections in audio equipment, a recording of another recording is not identical to the original, just like a photo of another photo might not be identical to it. If a recording is noise-laden because of bad equipment, poor reception, or what have you, then making recordings of recordings on the same equipment results in worse and worse recordings. However, the better and better the equipment is—the less and less noise that intrudes—the clearer the recording gets. That is to say, the better the equipment, the less noise laden are the recordings and the closer the system comes to being transparent.

To sum up, first, the systems of audio representation of the kind here articulated bear many striking analogies to systems of visual representation, especially LPPs. Second, those audio representational systems that stand in the strictest analogy to pictures are themselves syntactically sensitive, relatively replete, semantically rich, and transparent. They are therefore appropriately taken to be pictorial representational systems. Naturally, audio recordings are pictorial representations of the audible properties of things, not of their visible properties. It is a virtue of structural accounts of pictorial representation that they are not bound to a particular medium. The system mentioned earlier in which densities are the syntactically relevant properties shows that not every pictorial system has to be visual in nature. On the other hand, the fact that among those systems that are perceptually accessible and nonvisual—the auditory systems of representation—one finds transparent, sensitive, replete, and rich systems is a welcome result.

X. CONCLUSION

Structural accounts of pictorial representation can do a lot more work than many have thought. While Goodman deserves the credit for being the first to work out such an account, he also deserves some of the blame for their relative
unpopularity. Goodman relished what he called the “open heresy” of classifying the likes of the color complement system and the shuffled up picture system as pictorial while withholding the honor from digital pictures and refusing to admit that similarity can play any semantically significant role in representation.

By contrast, the four conditions offered above show that a structural account can cleave quite closely to the class of representations that we intuitively take to be pictorial as well as to the class that we take to be images. Digital pictures fit within the account while the color complement and the shuffled up systems receive novel treatments showing the respects in which they are and are not pictorial. Furthermore, in order to formulate transparency it was necessary to appeal to a version of Haugeland’s bare-bones content, according to which pictures turn out to determinately represent only quite indeterminate states of affairs. Although the contents of pictures are rather indeterminate in this sense, transparency makes room for systematic and semantically significant similarities between picture and depicted, and the account in general enjoys the important advantage over perceptual accounts of being quite broadly applicable.

Any system that satisfies the structural constraints articulated above is pictorial. An interesting example of this is that audio recordings turn out to be pictures of audible properties in much the same way that photographs are pictures of visible properties. Furthermore, it is a straightforward consequence of this account that many pictorial and imagistic systems are not the kinds of things that we can perceptually interact with at all because none of their syntactically relevant properties are perceptible properties. No one can see or hear densities, but a system that represents densities with syntactically relevant properties that are themselves densities can turn out to be pictorial, as we saw earlier. Although perceptual accessibility is not a condition of being pictorial, it raises interesting questions concerning the perception of pictures. There is little point to denying that some pictures, both auditory and visual, are special perceptual kinds. What is it about the structure of these representations, then, that makes it such that they are so special? It would be a minor miracle if it were mere coincidence, so the next step is to determine in what ways the structural considerations articulated herein relate to the perceptual accounts that dominate the discussion of pictorial representation.27

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2. This list closely follows Robert Hopkins’s from his “Explaining Depiction” and Picture, Image, and Experience, which are the most careful attempts so far to spell out exactly what we should expect from a theory of depiction. What follows shows that if so far as one insists on explaining these facts, one actually misses an important sense in which pictures form a special kind of representational system.


4. We can bracket concerns that pictures do not exhibit interesting syntactic relations to one another. The point of syntactic individuation is that it is nonsemantic and defined over properties intrinsic to the token representations. In this regard, see also Scholz, “A Solid Sense of Syntax.”

5. For Goodman’s articulation of this condition, see his Languages of Art, pp. 229–230. To make the comparison clearer, I articulate Goodman’s condition in terms of
syntactically relevant properties rather than what he called character constitutive aspects, which are features of representations such that any change in them results in a change of the syntactic identity of the representation in question. Syntactically relevant properties need not satisfy this condition.

6. For Goodman, the corresponding question is trivial. Goodman’s character constitutive aspects are essential features of syntactic types: any change of CCAs results in a change in syntactic identity.

7. As noted above, there are in general many characterizations of the syntactically relevant properties of any given system. The judgment of relative syntactic sensitivity makes sense when one characterizes the syntactically relevant properties of two systems such that the characterizations have members in common. I discuss some complications with this below.


9. See, for example, Goodman and Elgin, Reconceptions in Philosophy, pp. 123–131.


12. Ibid., and Goodman, Languages of Art.

13. For example, one could adopt Wollheim’s seeing-in, Peacocke’s F-relation, or Hopkins’s experienced resemblance in outline shape.

14. This characterization falls short of being complete. Pictures of objects behind glass when the glass is itself reflecting something, or pictures of objects under water, taken from above the surface, and so on, are not included. Little turns on these details, though, so they are best left aside. Also, special thanks to David Hilbert and Aaron Meskin for their helpful comments and suggestions on this section.

15. This result can be proved geometrically, but for now it can be left aside.


17. John Haugeland, “Representational Genera,” in Philosophy and Connectionist Theory, ed. William Ramsey, Stephen Stich, and David Rummelhart (Hillsdale, NJ: Lawrence Erlbaum, 1991), especially pp. 74–77, works out the details of bare-bones content differently than I do but the notions are similar, and I find his terminology quite apt. This notion of content leaves it open, of course, that there are more determinate contents associated with pictures. Bare-bones content is interesting because it helps one get some purchase on the structure of pictorial systems. Also, it is against the backdrop of such a notion of content that further questions concerning more refined and determinate contents of pictures, like those employed by perceptual theories of depiction, become interesting.


19. In what follows “resemblance” is often better suited to many contexts than “similarity” but unless otherwise noted I mean genuine and not just perceived similarities when I use “resemblance.”


21. Neander, in “Pictorial Representation: A Matter of Resemblance,” also advocates something like this view of the place for resemblance in depiction and of the significance of Goodman’s criticisms. On her account, the relevant metric of resemblance depends on the pictorial system that one is considering: cubist portraits, children’s drawings, photographs, and so on. Neander’s emphasis is on experienced similarities, however, while I want to focus on genuine similarities between picture and depicted.

22. The reason the Doppler radar image is useful is that it uses colors to stand for densities, the former being readily perceptible. A system that uses densities of representations to represent densities of objects would not be terribly useful because, in general, human beings cannot perceive densities on their own terms. Though not terribly useful, the system is nevertheless pictorial. It seems wrong to build into the definition of what makes a representation pictorial that it is useful, or easily apprehended. Once we have a sense of the structure of pictorial systems, we can discuss which of them are particularly useful and which are not. Though a bit counterintuitive on the surface, it is a great advantage of this approach that it does not make any assumptions about the particular medium and mode of pictorial representational systems. Notice, by the way, that a written language just like English but written in invisible ink is plausibly both representational and linguistic, despite not being very useful.

23. This is another example in which we get transparency and mimesis with respect to a fairly abstract property like relative density while mimesis fails for properties like determinate density.

24. Peter Kivy, in Sound and Semblance (Cornell University Press, 1984), discusses some supposed examples of auditory depiction. He does not sign on to any particular account of depiction, though in an afterword to Sound and Semblance (1991) he discusses the relation of his view to Wollheim’s—from, for example, Art and Its Objects—in relation to Jenefer Robinson’s “Music as a Representational Art,” in What is Music? An Introduction to the Philosophy of Music, ed. Philip Alperson (New York: Haven, 1987). Robinson thinks that a variant of Wollheim’s seeing-in relation—hearing-in—can be applied to musical works to determine which, if any, are pictorial. It is beyond the scope of this paper to evaluate this proposal.

25. It is important to note just what the audio representation is here. It is not the pattern of magnetic fields on the tape, but rather each playback of the tape that counts as a pictorial representation of the sounds recorded. The tape itself, like the CD and the DAT, is simply a way of producing such representations whenever one wants to do so. The way in which the fields on the tape or the marks on the CD encode the sound is not pictorial, but the playbacks are.

26. The question of mimesis naturally arises in the context of recordings as well, and it can be addressed in a fashion similar to that in which it was addressed for linear perspective above.

27. Thanks to Murat Aydede, Anne Eaton, Stephen Glaister, Alan Goldman, David Hilbert, Robert Hopkins, Dominic Lopes, Aaron Meskin, Jesse Prinz, Guy Rohrbaugh, Josef Stern, and Andrea Woody for helpful comments on earlier versions of this paper.