

Are digital images allographic?

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ABSTRACT: Nelson Goodman's distinction between autographic and allographic arts is appealing, we suggest, because it promises to resolve several *prima facie* puzzles. We consider and rebut a recent argument which alleges that digital images explode the autographic/allographic distinction. Regardless, there is another familiar problem with the distinction, especially as Goodman formulates it: It seems to entirely ignore an important sense in which all art works are historical. We note in reply that some art works can be considered *both* as historical products and as a formal structures. Talk about such works is ambiguous between the two aspects. This allows us to recover Goodman's distinction: Art forms which are ambiguous in this way are allographic. With that formulation settled, we argue that digital images are allographic. We conclude by considering the objection that digital photographs, unlike other digital images, would count as autographic by our criterion; we reply that this points to the vexed nature of photography rather than any problem with the distinction.

The short answer to our title question is *yes*, but of course there are complications along the way.

We begin by discussing Nelson Goodman's distinction between autographic and allographic arts. There are several *prima facie* puzzles which the distinction promises to resolve (§I). We then consider and rebut a recent argument which alleges that digital images explode the autographic/allographic distinction (§§II-III). Regardless, there is another familiar problem with the distinction, especially as Goodman formulates it: It seems to entirely ignore an important sense in which all art works are historical. We note in reply that some art works can be considered *both* as historical products and as a formal structures. Talk about such works is ambiguous between the two conceptions. This allows us to recover Goodman's distinction: Art forms which are ambiguous in this way are allographic (§IV). With that formulation settled, we argue that digital images are allographic (§V). We then consider the objection that digital photographs,

unlike other digital images, would come out as autographic by our criterion. We reply that this points to the vexed nature of photography rather than any problem with the distinction (§VI).

I. The autographic/allographic distinction

The distinction between *autographic* and *allographic* arts is due to Nelson Goodman.² Although Goodman was the first to use these labels to distinguish two kinds of art form or work, he did not coin them as English words. 'Allograph' has a legal meaning dating back at least to the 19th century of a document written by someone other than the parties who signed it. In the 1950s, linguists began using the word to indicate distinct forms of the same grapheme; e.g. the lower-case 'a' and capital 'A' are allographs of the letter. Because those are both technical uses and because they are at most analogous to the usage in philosophy of art, there is little sense to trying to *analyze* the term. Rather, our task here is *regimentation* or *explication* — finding the interesting distinction in the neighborhood of what Goodman distinguished.

Some puzzling facts

Goodman initially proposes the distinction to solve a puzzle about the conditions under which a work of art can be forged. Suppose a student paints a duplicate of Edward Hopper's painting *Nighthawks*. If she attempts to offer it as a work by Edward Hopper, she is doing something illicit. Her copy, regardless of the degree to which it resembles the original, cannot actually be a genuine Hopper painting. Contrariwise: Suppose the student transcribes a duplicate of Ezra Pound's 'In a Station of the Metro'. If she attempts to offer it as a work by Ezra Pound, she is doing something banal. Her handwritten version is not a Pound manuscript, of course, but it is genuinely an instance of Pound's poem. It is evidence of the student's penmanship, but not of her poetic ability.

Goodman explains this difference by saying that painting is autographic but poetry is allographic. He writes, "Let us speak of a work of art as *autographic* if and only if the distinction between original and forgery of it is significant; or better, if and only if even the most exact duplication of it does not thereby count as genuine." A work is *allographic* otherwise.³ Goodman later insists that vulnerability to forgery is not what defines the distinction. Rather, the distinction "could obtain in a world of inventive angels free of imitative instincts or ill intent."⁴

There is also a puzzle about which works can be *plagiarized* that is a dual of Goodman's puzzle about which can be forged.⁵ If the student presents her transcription of 'In a Station of the Metro' as her own original poem, she is doing something illicit. She is attempting to claim that Pound's poem is her own work. Contrariwise: If she presents her study of *Nighthawks* as her own painting, she is doing something banal. She is claiming her painting as something that she painted. It is not just evidence of her brushwork and

painterly manner, but it is also a distinct painting with a different subject than the original. Hopper's painting portrays a diner in the middle of the night, but the student's portrays the painting *Nighthawks*.

With this in mind, we could twist Goodman's formulation around and introduce the distinction this way: Let us speak of a work of art as *allographic* if and only if the distinction between original and a plagiarized instance of it is significant in this way, as *autographic* otherwise.

There is also a related puzzle about the value we attach to specific objects. If the student accidentally smears peanut butter on *Nighthawks*, it is a matter of considerable concern. She might be jailed for her offense. Contrariwise: If she accidentally smears peanut butter on her handwritten copy of 'In a Station of the Metro', she is doing something banal. Her making a mess in the latter way might be annoying, but it is certainly not criminal. The instances of autographic works carry a special kind of value which the instances of allographic works do not.

This difference in value might be explained by the fact that there is only one *Nighthawks*, whereas the poem has many instances. Yet autographic works need not be single-instance. There are numerous castings of Rodin's *The Thinker*. If a new bronze object were produced by other means to match one of those, however, it would count as a copy rather than as another *Thinker*. So bronze sculpture is a multiple-instance autographic art. Similarly, there can be multiple copies of a woodcut like Albrecht Dürer's *Four Horsemen*, but each must be made from the original block. A visually indistinguishable object made by other means would count as a forgery. So printmaking, too, is a multiple-instance autographic art. The multiple instances of *The Thinker* and of *Four Horsemen* are a far cry from multiple instances of 'In a Station of the Metro'. Even though there are multiple instances of the statue and of the woodcut, further instances are not easy to make. The student might toss her handwritten copy of the poem into the trash if it gets peanut butter on it, because she can readily transcribe a new one. Making a new instance of the statue or the woodcut is either hard or impossible. It will be strictly impossible to produce a new instance of an autographic work if it is of a single-instance form or if it is of a multiple-instance form but the conditions for producing an instance have passed. There may be technical difficulties producing a new instance of an allographic work, but there are no philosophical barriers to doing so. So there is a further puzzle about the difference between works that are either hard or impossible to reproduce as opposed to those that are comparatively trivial to reproduce.

What should we make of these various facts about forgery, plagiarism, value, and duplicability? Rather than taking any of those binaries to define the autographic/allographic distinction, it seems better to take these puzzling facts to be explicable in terms of the distinction. The distinction, then, promises and requires that there is a common explanation for these various facts.

Goodman's distinction

Goodman himself elaborates the distinction in terms of notation. What makes it possible for an art form to be allographic is that there is a precise way of specifying the constituents of the work. The Ezra Pound poem, for example, is a specified string of English words and punctuation divided into two lines. A musical work is a specified string of notes which can be performed or notated on a score. Although scores might serve many functions, Goodman maintains that "every score, as a score, has the logically prior office of identifying a work."⁶

Initially, Goodman thinks, all art was autographic and so ephemeral. Literature has its origin in the oral and extemporaneous performances of bards. Music was performed and appreciated long before the existence of musical scores. What made it possible for these art forms to become allographic was the invention of notation. The notation allows the artist to specify precisely which qualities must obtain in order for something to count as an instance of the work and thus provides a principled way of distinguishing its essential or constitutive properties from contingent and non-constitutive ones. Some art forms, like literature and music, seem particularly well-suited to allographic expression. Others, such as dance, are less amenable — but there have been notable attempts, and the possibility of a notation for dance is one of the questions that structures Goodman's discussion.⁷

Levinson takes Goodman to have given two distinct definitions of 'autographic': one in terms of whether works of the artform can be *forged* and another in terms of whether works of the artform are specified in a definite *notation*.⁸ However, as Goodman later clarifies the distinction, neither of these is definitive. Notation is necessary but not sufficient for an art form to be allographic. What matters fundamentally is the "determination that a given object or event is an instance of a given work." Goodman writes, "for distinguishing allographic from autographic works, all that counts is whether or not the identity of the work... is independent of history of production."⁹

II. Zeimbekis on digital pictures

John Zeimbekis uses the case of digital pictures in an attempt to scuttle the autographic/allographic distinction.¹⁰ He argues that digital pictures ought to count as allographic but that they do not admit of a notation. It would follow that Goodman was wrong that being notational is necessary for being allographic. Moreover, Zeimbekis argues, the sense in which digital pictures turn out to be allographic is one which makes the distinction uninteresting. So he concludes that "we should preserve the distinction between notational and nonnotational representations, but abandon the distinction between autographic and allographic representations."¹¹

A digital image is comprised of pixels. It is encoded in a file and displayed on the screen of a computer, tablet, phone, or other device. Because there are different image formats, the same array of pixels might be stored in bit-wise different computer files. We take the candidate works or instances of works to be the images that appear on the screen when the file is displayed.

For any particular digital picture, there are finitely many pixels and finitely many values that can be assigned to each pixel. Consider, for example, a four inch by six inch 300 ppi true color image: The grid of pixels is 1200x1600, so there are more than 1.9 million pixels. The color of each pixel is specified by values for red, green, and blue (RGB); each value may vary from 0 to 255, so each pixel is assigned one of more than 16 million possible colors. These numbers are large but finite. So it seems that there are finitely many distinct possible digital pictures of this resolution, each unambiguously specified by the RGB values for its pixels. Zeimbekis calls this the "atomistic intuition", the idea "that digital pictures are made up of small identical building blocks that impose a lower limit on how such pictures can differ from one another."¹²

If we accept the atomistic intuition, it follows immediately that digital pictures are allographic. Much as the student may make a duplicate of 'In a Station of the Metro' by copying all the *words*, she may duplicate the file for a digital image by copying all of the *bits*. Because the copy is a genuine new instance of the work, she cannot forge the work by doing this but may (if she presents it as her own) plagiarize it. Just as she would not hesitate to throw away a spare handwritten copy of the poem, she would not hesitate to delete a duplicate copy of a file for a digital image.

There is an important difference, however. Whereas the student duplicates the poem by attending to each word, she never attends to the individual bits which encode the image. Perhaps she copies the file by dragging and dropping an icon. Even then, the bits alone are not the image.

So to consider a digital image, we need to consider different display instances: the same image which might be displayed at different times or on different devices. Here, Zeimbekis argues, the atomistic intuition breaks down. Considering adjacent pixels of similar color, he argues in this way:

[T]he light-intensity values (Red 0, Green 0, Blue 127) and (Red 0, Green 0, Blue 131) are phenomenally discriminable: if we place them side by side, we see a faint line of color stepping between them. So pixels tokening those intensities have phenomenally different colors. But pixels lit at the intermediate intensity (0, 0, 130) are indiscriminable both from pixels instantiating (0, 0, 127) and from pixels instantiating (0, 0, 131). Even when two regions uniformly colored with Blue 127 and Blue 130 respectively are placed side by side (without any other background color in between), we still cannot see any color stepping between them; the same applies to Blue 130 and Blue 131. Therefore, we cannot

exclude that the pixels lit at (0, 0, 130) token both colors, and this defeats the finite differentiation of the color types in respect of which pictures would have to be identical.¹³

Applying his reasoning to our example, Zeimbekis' argument is this: Although the student can make a copy of the file for the image, she cannot copy the image itself. Even with careful scrutiny, she will not know what to record as the color value for particular pixels. Moreover, her judgements of color identity will be nontransitive: She judges that a pixel of Blue 127 is the same color as a pixel of Blue 130 and that a pixel of Blue 130 is that same color as a pixel of Blue 131, but not that Blue 127 is the same color as Blue 131. The different possible RGB pixel values *as numbers* are finite and disjoint. The different possible pixel values *as display colors* shade imperceptibly into one another without sharp boundaries. To put this in Goodman's terminology, we can say that the system is syntactically articulate but not semantically articulate; i.e., that the *characters* of the system are differentiated but that the *compliance classes* are not.¹⁴ Although the various RGB values are disjoint and precise, the states to which the values correspond fail to be. So the bitmap for the digital image fails as a notation. Accepting Goodman's claim that having a notation is necessary for being allographic, it seems that digital images are not allographic after all.

Zeimbeckis adds that we can understand digital pictures as allographic, but only if we let go of Goodman's claim that notationality is required for allography. He suggests how it might still be possible to define conditions of type identity for digital images. The 24-bit value for each pixel specifies color more precisely than is required for two digital images to be identical. All that is required for identity, according to Zeimbeckis, is that the display pixels evoke the same color experience in a viewer. The same 24-bit value will do so at different times or on different devices because of the precision with which the devices are engineered. Copies of a digital image are made by copying the file and displaying them on an appropriate device, not by transcribing the displayed digital picture from the screen. New devices are manufactured not by copying old devices, but by careful design and consideration of how the device will effect a viewer. The crucial thing, according to Zeimbeckis, is that the system of encoding and the display device specify the color more precisely than a viewer can experience it. He writes, "The key point about the transitive groupings of light intensities... that preserve type identity for digital pictures is that they keep the differences in real magnitudes, which inevitably occur, well below some epistemically defined discrimination threshold."¹⁵

Digital pictures may be allographic, in this sense, because the precision of the bitmaps specifies the images beyond the limit of phenomenal discriminability. Yet one might do the same for other works of visual art. By taking careful measurements and carefully engineering new instances, one might make a phenomenally indistinguishable duplicate of a painting like *Nighthawks*. This would be different than the copy painted by the student whom we imagined in the previous section, because she could only copy to

the limit of what she could see. The engineered duplicate would be specified more precisely than anyone could see, just as the digital image involves color differences more precise than anyone can discern. Zeimbeckis explains that "by using the same principles (defining transitive subphenomenal sets of sufficient objective conditions), it is possible to make type-identical paintings and analog photographs."¹⁶

Now it seems as if we face a dilemma with respect to the distinction between autographic and allographic works. One horn is to refuse Zeimbeckis' suggestion as to how digital images might be allographic, even though considerations of forgeability (and so on) all suggest that they must be. The other horn is to accept Zeimbeckis' suggestion, but then the distinction collapses and even our paradigm autographic work (*Nighthawks*) turns out to be allographic. If these are our options, there seems to be no way around Zeimbeckis' ultimate conclusion that "we should... abandon the distinction between autographic and allographic representations."¹⁷

Fortunately, Goodman has resources to avoid this dilemma. We turn to these in the next section.

III. How to defend Goodman, up to a point

In discussing the autographic/allographic distinction, Goodman is keen to insist that the bounds of aesthetic experience are not determined by the perceptual abilities of the untutored audience. Quite the contrary, "the exercise, training, and development of our powers of discriminating among works of art are plainly aesthetic activities."¹⁸ If a painting and a doppelgänger of a painting were found to be identical in all discernable respects, Goodman insists that the doppelgänger would still not count as an instance of the same work of art. There might be some further aesthetic difference which we are not able to discern given the methods we are using now but which we might discern, given time and attention.

So Goodman would reject Zeimbekis' suggestion that all artwork becomes allographic once we were able to make duplicates which differ only in respects "below some epistemically defined discrimination threshold."¹⁹ As Goodman has it, there is no defensible threshold which marks the boundary between aesthetically relevant features and non-relevant ones.

One might worry that, for the pixels in digital images, there are differences beyond the limits of any possible expertise. Color differences that lie below the threshold of human color vision could not be seen even by the most attentive eye. But this would not concern Goodman. All that matters for a work's autographic status (on Goodman's account) is that discrimination is possible in principle. There need not be "an easy test", he explains, "after all, the definition of gold as the element with an atomic weight of 197.2 gives me no ready test for telling a gold piece from a brass one. The line drawn need only be theoretically manifest."²⁰ Perhaps, in some brave future, connoisseurs of painting will enjoy best what they see under a microscope.

Regarding Zeimbekis' claim that digital images are not notational: Goodman does require, for a system to be notational, that the compliance classes of two different characters be distinct. Yet this does not mean that human observers actually need to be able to discern the distinction. Even if a tone-deaf audience member cannot hear the difference between a *c* and a *c*-sharp, there is still a difference between the two notes. A performed musical note either complies with the mark on the score or it does not. That would be true even if every human were tone-deaf so that nobody could tell the difference. All that Goodman requires for semantic articulation is that the discrimination be "theoretically possible."²¹ His definition of 'notation' makes no requirement of practical legibility.²²

So Goodman could, contra Zeimbekis, accept digital images as notational. A computer monitor of sufficient quality generates different spectra when displaying a pixel of Blue 127 than it does when displaying Blue 128. So there is a well-defined distinction between the two compliance classes. Although the possible frequencies of blue are continuous, the activations allowed in a 24-bit digital image are not. The intermediate shades that could not unequivocally be counted as either Blue 127 or Blue 128 are not possible pixels, except on a malfunctioning monitor.

Here we are treating maps of the RGB values for pixels as the characters of the notation. This means that different computer files might encode the same character using different image file formats. One could instead treat the bits of the computer files as the characters of the notation. There would then be a family of related notation systems — namely, different encoding schemes which store the same RGB map in different ways. Either way, there are well-defined characters and compliance classes.

Independently of what Goodman would or could have said, Zeimbekis' fixation on the limits of visual acuity strikes us as a red herring. It presumes that, in order to count as instances of the same digital picture, two screen displays must be indistinguishable. On the contrary, two screen displays of the same digital picture might be readily distinguishable. This is most striking if we consider the monochrome displays which were typical of computers in the 1980s. Rather than having 24-bits for each pixel to specify precise color, a monochrome image has 1-bit for each pixel to specify whether that pixel is on (illuminated) or off (dark). Depending on the monitor, illuminated pixels might be white, blueish-white, green, or amber. Someone looking at a green monitor could hardly confuse it for an amber one, but this is no barrier to a given monochrome digital image being displayed on both. For each type of monitor, there are articulated compliance classes for *on* and *off*. With contemporary 24-bit digital images, the difference between monitors is less striking — but there are still differences. What matters is not that (as Zeimbekis would have it) that every display of Blue 130 look precisely the same but rather that *on a particular device* a pixel activation of Blue 130 is physically different than activations of Blue 129 or Blue 131.²³

Even having escaped Zeimbekis' dilemma, there are familiar worries about the autographic/allographic distinction. Critics of Goodman, notably Jerrold Levinson, deny that any works count as allographic in Goodman's sense. The two sides rely on competing intuitions. We struggle with these intuitions in the next section and attempt to articulate a condition for being allographic which can accommodate both; in the section after that, we return to the case of digital images.

IV. Making out the distinction

As we saw in §I, Goodman's preferred definition is that a work is *allographic* if and only if identifying an instance of it is independent of the object's history of production, and a work is *autographic* otherwise. He elaborates:

What distinguishes an allographic work is that identification of an object or event as an instance of the work depends not at all upon how or when or by whom that object or event was produced. An inscription of a poem, for example, however produced, need only be correctly spelled; and two inscriptions of the same poem need only be spelled alike.²⁴

For an allographic work, "[t]o verify the spelling or to spell correctly is all that is required to identify an instance of the work or to produce a new instance."²⁵ Of course, he is speaking of 'correct spelling' in a metaphorical as well as a literal sense. For the poem, it includes punctuation and (where relevant) line breaks. And he applies the same constraint to musical scores: "The alphabet is different [but] correct spelling, in only a slightly expanded sense, is still the sole requirement for a genuine instance of a work."²⁶ All that is required for an object to count as an instance of a particular allographic work is that it has the right form, he insists, and this form is the one specified in the notation for the work.

For works of literature, a stock example comes from a short story by Jorge Luis Borges in which the character Pierre Menard attempts to write a novel which is word-for-word identical to Cervantes' *Don Quixote*.²⁷ Goodman thinks that, if Menard had succeeded, then an instance of Menard's novel would obviously count as an instance of Cervantes' novel. Goodman writes, "To deny that I have read *Don Quixote* if my copy, though correctly spelled in all details, happens to have been accidentally produced by a mad printer in 1500, or by a mad computer in 1976, seems to me utterly untenable."²⁸ Jerrold Levinson considers the case but draws the opposite conclusion. Levinson writes, "The story of Pierre Menard and 'his' *Quixote* clearly shows that works that are perceptually indiscernable are not necessarily identical; in fact, such works can be dramatically different in meaning, significance, or content." Levinson takes this as a reason to think that there are no works for which the identification of instances depends only on spelling; he continues, "Therefore, even a given series or

configuration of notes or words, however complex it may be, is not sufficient to fix or uniquely individuate the musical or literary work in question." What matters, according to Levinson, is that the instance stands in an appropriate relation to the author. He concludes that "individuation must rest on the unique identity of the artist...."²⁹

Levinson's intuition seems the most prevalent among contemporary thinkers. However, it is worth noting that if you discovered an abandoned computer with a word processor document which perfectly matched *Don Quixote*, then you would think that it was just a copy Cervantes' novel. You would, we think, strenuously resist any suggestion that someone had written the words independently. Even in Borges' story, Pierre Menard merely *tries* to write such a doppelgänger and fails to do so. Borges asks us not to imagine the doppelgänger directly, but instead just to imagine a man who imagined the doppelgänger. We philosophers can specify the scenario precisely in words, more directly than Borges does, but we cannot turn off the intuitive response we would have to the abandoned computer. With outlandish thought experiments, it is vexed as to how we tease apart the various contributions to our gut reaction. So we suggest intuitions about this case should not be taken to be decisive.

For shorter works of prose, the scenario is less outlandish and it is less obvious what to say. Imagine two comedians, working independently. One writes on a sheet of white paper, "A recent study shows that 4 out of 5 people make up 80% of the world's population." The other, across the country, types into a word processor the same string of characters. They have certainly written the same sentence, and it is tempting to say that they have also devised the same joke.

Consider also works of music. Intuitions differ more markedly than they do for prose works. Imagine someone improvises a performance which coincidentally conforms to the score of a work which was unknown to them. Is their performance an instance of that work? Imagine two composers, working independently, who each devise short works which are syntactically identical. Have they each hit upon the same work? Some philosophers have clear intuitions on one side or the other of these questions, but many admit to being unsure. Joseph Moore suggests that this is because our ordinary concept of *musical work* is ambiguous between what he calls S-work (which is determined by having a specific structure) and P-work (which is determined by having a specific provenance).³⁰ Where two performances are *both* the same S-work *and* the same P-work, we determinately consider them to be of the same work. Where two performances are *neither* the same S-work *nor* the same P-work, we determinately consider them to be of different works. So, in most of the cases we encounter, the ambiguous concept yields a determinate answer. Yet if two performances are the same in one respect but different in the other, then it is indeterminate whether they are of the same *work simpliciter*.

In a sense, all Moore does is pit one intuition against another. However, the existence of these inconsistent intuitions is precisely the

reason to think that our ordinary talk of 'a musical work' does not refer univocally to one thing. Rather, we typically use 'work' talk when both the structure recurs and the recurrences stand in a single causal history. Edge cases presented in different ways cue conflicting intuitions because the concept does not precisely apply when one of these obtains but not the other.

Although Moore does not extend this suggestion to works of prose, we can easily do so. Consider the joke again. As an S-work, the one-line joke is a sequence of characters. Any sequence which is spelled the same, in Goodman's extended sense, counts as an instance of the same S-work. So the comedians' inscriptions are instances of the same S-joke. Considered as a P-work, what matters is the causal connection to the author. The two comedians worked independently, so their inscriptions are instances of different P-jokes.

If you have a clear intuition that the two comedians simply have written the same joke, then you might think that the concept of *joke* is unambiguously the concept *S-joke*. This would be too hasty. Considering modal flexibility can make the P-work seem more relevant. Suppose that the first comedian considers several variant wordings before writing anything down; she considers writing "Scientists in Albany have shown..." rather than "A recent study shows..." The joke she has written depends on her authorial decision, in a way that the joke on the second comedian's computer does not. If the first comedian had written the former formulation instead, then we might still see her joke as the same as the one she actually ended up writing — but different than the second comedian's joke. This would be to treat it as a P-work, identified by having the same author and creative context.

Regardless of our intuitions about whether 'work' is ambiguous, the objects corresponding to the S-works and P-works all exist. For music, Moore suggests that each S-work is a sound structure and each P-work is a tradition-thread of producing sounds like that. Tradition-threads can be understood as historical individuals, in a sense elaborated by Guy Rohrbaugh.³¹ Rohrbaugh argues for the ontology of artworks as historical individuals based on considerations of modal and temporal flexibility, and it is precisely those kinds of considerations which Moore uses to elicit intuitions which favor P-works.

For the joke, the S-work is a string of characters, and each P-work is a tradition-thread. It may seem grandiose to describe the two P-jokes as 'tradition-threads', but all we mean is that they are causal sources for different retellings. If the first comedian tells the joke to a friend, the words of the friend's retelling depend on what the first comedian wrote on her paper and not on what the second comedian wrote on his computer.

So the disagreement is not over ontology (what exists) but instead over which of the two, the S-work or the P-work, constitutes an art object or is worthy of aesthetic attention. Goodman would say it is the S-work, Levinson would say it is the P-work, and Moore says it is 'the work' in a sense which is ambiguous between the two. Without attempting to settle the disagreement, note that posing the question is only possible if we can

distinguish between the S-work and the P-work. For novels, we can distinguish S-novel and P-novel; for jokes, we can distinguish S-joke and P-joke; and so on. There is no such divergence for paintings, because there is no way to elaborate a sense of S-painting. All instances of a particular painting must be the single instance produced by the painter, so the only *painting* concept is P-painting.

We can say that an art form is 'allographic' if works of that form have, as a matter of ontology rather than as a matter of aesthetics, both a corresponding S-work and a corresponding P-work. If we take this as a definition, then we should say that a form is 'autographic' if and only if works of that form exist only as P-works.³²

Before returning to the question of digital images, we consider some general objections to thinking of the distinction in these terms.

One might object that we have not actually shown that S-works are at all relevant to considerations of *art*. To answer this worry, it suffices to show that S-works are at least sometimes objects of aesthetic interest. We do sometimes attend to the purely formal properties of art objects. Since objects which are instances of the same S-work share all of their formal properties, it makes sense to say that when our attention is focused exclusively on form we are attending to the S-work rather than to the P-work. It is common to focus critical attention on the formal properties of music, which is why Moore can so easily pose cases that tempt us to think in terms of the S-work. And there are at least some cases of poems and visual works that invite us to think in this way. For images that might be considered artworks, it is typical or at least common that the formal properties are aesthetically interesting.

One might take this reply to suggest another worry: Paintings have formal properties, too, so what blocks there being an S-work even for autographic works? As we discussed when defending Goodman from Zeimbeckis, there is no principled way to exclude any feature of a painting from those that are constitutive of it. There is no well-defined boundary separating the formal properties from the merely physical ones, so there is no separate S-work apart from the individual object in all its particularity. Yet one might press the objection by imagining a future artworld in which robots ape every brush stroke that a painter makes, so as to replicate every mark on separate canvasses, after which all the canvasses are shipped out to museums and galleries. In this future artworld, nobody distinguishes the canvas produced by the artist's own hand from the others.³³ Perhaps in such a world the historical connection to the artist's motions would still be deemed indispensable. Then painting would still not have an S-work, but would instead be like print-making in having a P-work that allows for multiple instances. But perhaps not. More importantly, when critics in that artworld say 'painting', they would not mean what we mean by our word 'painting'. Just as the invention and adoption of musical notation changed music as an art form, radical institutional and technological changes could change painting. But the fact that canvasses with pigment on them could be

instances of an S-work does not show that a painting, in the present sense of the word, has any corresponding S-work.

To repeat our criterion before moving on: An art form is 'allographic' if works of that form have both a corresponding S-work and a corresponding P-work.

V. Digital images

We turn finally to our title question: Are digital images allographic?

Imagine someone in Canada opens a drawing program, creates a new document, and doodles some gray splodges onto the background. The Goodmanian intuition is that you see the same digital image if you see a display of any pixel-for-pixel identical image, regardless of whether the file was generated by doodling in Canada or randomly generated by a computer in China — as Goodman says, by "a mad computer". This intuition is to consider *digital image* as S-work.

One might resist the Goodmanian intuition on these grounds: The file generated by the mad computer, although it coincidentally happens to be pixel-for-pixel identical to the doodled file, does not carry the same information. Suppose, for the sake of concreteness, that the upper-left pixel of the image is a dull gray (65,65,65). This is true of both the doodle and the randomly generated image. Yet what *explains* this fact about each is different. The fact that the upper-left pixel of the file from Canada is Gray 65 is explained by the color selection and doodling of the user. The fact that the upper-left pixel of the file from China is Gray 65 is explained instead by details of the program used to generate it. Moreover, the coincidence between the two files is unreliable. If the person making the doodle had been in a different mood, then the pixel in her image might have been some other color — but that change would have not have made a difference to the Chinese image. Similarly, a different result from the pseudo-random algorithm of the Chinese computer would have made the upper-left pixel different in the Chinese image but would have made no difference to the Canadian doodle. These causal-historical considerations distinguish the two digital images, treating them as distinct P-works.

It seems, then, that digital images can be construed both as S-works and as P-works, depending on which approach we take. So, by our definition, digital images are allographic.

As we promised at the outset, the answer to the question posed in our title is *yes*, and there were complications along the way. There is a further complication about digital *photographs* which we take up in the next section.

VI. The problem with digital photographs

Imagine someone goes on vacation to San Francisco and takes a picture of the fog. The scene is mostly various shades of white and gray.

Taking the picture produces a graphics file which, when displayed on a computer, is a digital photograph. Suppose that the resulting image is pixel-for-pixel identical to that of the Canadian doodle and the random Chinese file, our examples from the previous section. The upper-left pixel is Gray 65, but this fact about the image from San Francisco is explained by the dimness of the scene and by the sensitivity of the camera. If the fog had been a bit thinner, then the pixel in the photograph would have been a brighter gray. The picture is importantly — one might say *essentially* — a photograph of that fog. Pixel-for-pixel identical images formed in other ways do not have this connection, so they cannot be the same work as the photograph.³⁴

Note that the point is not just that the color of the pixels in the photograph carry information about the fog. In the case of the Canadian doodle, the Gray 65 carries information about the color choice of the person making the doodle, but the doodle is not *about* the color choice. Chemical facts about *Nighthawks* might indicate things about where Hopper bought his paints, but the painting is not about that. If we imagine him having gotten his paints from somewhere different, we might still imagine him painting *Nighthawks*.

The worry about digital photography could be elaborated in either of two different ways: (1) One might say that photographs necessarily represent. The photograph in our scenario represents the San Francisco fog which was in front of the camera when the picture was taken. The doodle and the random image do not represent anything. (2) Following Walton, one might say that photographs are transparent.³⁵ We literally see the fog when we look at the photograph from San Francisco. By contrast, we just see a spread of color if we look at the doodle or the random image.

Either elaboration entails that a digital photograph *qua* photograph is necessarily connected to an object which appears in it. The difference is just whether the object is represented in the photograph or appears directly. In either case, the digital photograph is essentially historical. So it exists as a P-work but not as an S-work. It is therefore, by our criterion, autographic.

One might resist this conclusion by denying that photographs are essentially historical. It is possible to treat a photograph purely as an image, a formal play of shape, intensity, and color. Some genres of photography invite this kind of treatment. Certain kinds of abstract photography, for example, resist being interpreted as of anything identifiable. For a digital photograph, the formal features are fully specified by the pixels. So there is a corresponding S-work, and digital photography is allographic.³⁶

Depending on how these matters are resolved, digital photography might be autographic or allographic. Although we are not entirely of one mind on the subject, our criterion seems adequate in any case. The instability is not a problem for the autographic/allographic distinction, but a result of our uncertainty regarding the nature of digital photography. Depending on how those matters are settled, digital photography will be on one side or the other.

VII. Conclusion

At the outset, we discussed some curious and interconnected facts about forgery, plagiarism, value, and duplicability. It is possible to recognize those facts without accepting any specific philosophical theory about them. The prospect of a unified explanation of those facts, over and above any historical concern with Goodman or Levinson, provides a motivation for posing the distinction between autographic and allographic works. Zeimbekis' explication of the distinction makes it collapse into triviality, and Goodman's own explication would be question-begging against Levinson. So answering our title question fairly required an explication that avoided those pitfalls. We hope not only to have shown that digital images are allographic, but also that the question and the distinction it assumes are worthy of attention.

¹ This paper was entirely collaborative, and authors are listed in alphabetical order. We would like to thank Robert Howell and Ron McClamrock for helpful feedback in the course of this project.

² Nelson Goodman, *Languages of Art: An Approach to a Theory of Symbols* (The Bobbs-Merrill Company, 1968).

³ Goodman, *Languages of Art*, p. 113.

⁴ Nelson Goodman, *Of Mind and Other Matters* (Harvard University Press, 1984), p. 139.

⁵ Flint Schier, *Deeper into pictures: An essay on pictorial representation* (Cambridge University Press, 1986), p. 29.

⁶ Goodman, *Languages of Art*, p. 128. Goodman uses the word 'score' in a broad sense to include any specification of what instances of a work must be like, including musical scores but also architectural plans. He writes, "A score... has as a primary function the authoritative identification of a work from performance to performance."

⁷ Goodman, *Languages of Art*, especially pp. 211-218.

⁸ Jerrold Levinson, "Autographic and allographic revisited," *Philosophical Studies* 38(1980): 367-383.

⁹ Goodman, *Of Mind and Other Matters*, p. 140.

¹⁰ John Zeimbekis, "Digital pictures, sampling, and vagueness: The ontology of digital pictures," *Journal of Aesthetics and Art Criticism* 70 (2012): 43-53.

¹¹ Zeimbekis, "Digital pictures, sampling, and vagueness," p. 52.

¹² Zeimbekis, "Digital pictures, sampling, and vagueness," p. 44.

¹³ Zeimbekis, "Digital pictures, sampling, and vagueness," p. 46-7.

¹⁴ Goodman, *Languages of Art*, ch. 4.

¹⁵ Zeimbekis, "Digital pictures, sampling, and vagueness," p. 51.

¹⁶ Zeimbekis, "Digital pictures, sampling, and vagueness," p. 52.

¹⁷ Zeimbekis, "Digital pictures, sampling, and vagueness," p. 52, quoted above.

¹⁸ Goodman, *Languages of Art*, p. 111.

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- ¹⁹ Zeimbekis, "Digital pictures, sampling, and vagueness," p. 51, quoted above.
- ²⁰ Goodman, *Languages of Art*, p. 128.
- ²¹ Goodman, *Languages of Art*, p. 152.
- ²² Goodman, *Languages of Art*, p. 154.
- ²³ Although Zeimbekis claims that his "conclusions also apply to other epistemic forms of identity" including "the eight colors generated by 3-bit pixel displays", it is not at all clear how he intends the generalization to work. (Zeimbekis, "Digital pictures, sampling, and vagueness," p. 44.) The colors in a 1-bit or 3-bit display are easier to distinguish even than musical notes, which are Goodman's centerpiece example of a notational system.
- ²⁴ Goodman, *Of Mind and Other Matters*, p. 140.
- ²⁵ Goodman, *Languages of Art*, p. 116.
- ²⁶ Goodman, *Languages of Art*, p. 117.
- ²⁷ Jorge Luis Borges, "Pierre Menard, author of the *Quixote*," in *Labyrinths*, eds. Donald A. Yates and James E. Irby (New Directions Publishing Corporation, 1964), pp. 36-44.
- ²⁸ Goodman, *Of Mind and Other Matters*, p. 141.
- ²⁹ Jerrold Levinson, "Indication, abstraction, and individuation," in Christy Mag Uidhir, ed. *Art & Abstract Objects* (Oxford University Press, 2013): 49-61; p. 55.
- ³⁰ Joseph G. Moore, "Musical works: A mash-up," in Christy Mag Uidhir, ed. *Art & Abstract Objects* (Oxford University Press, 2013): 284-306.
- ³¹ Guy Rohrbaugh, "Artworks as historical individuals," *European Journal of Philosophy* 11(2003): 177-205. See also P.D. Magnus, "Historical individuals likes *Anas platyrhynchos* and 'Classical gas'," in Christy Mag Uidhir, ed. *Art & Abstract Objects* (Oxford University Press, 2013): 108-24.
- ³² There is then a logical possibility for what we might call 'heterographic' art forms, the works of which only exist as S-works — but it is not clear whether such a thing could actually exist.
- ³³ Gregory Currie poses a similar scenario involving a super xerox machine that duplicates paintings and, in parallel fashion, imagines doppelgänger canvasses painted by Twin Earth Picasso. He tries to raise problems for the distinction between autographic and allographic works, but his resolution entails that the canvasses are not works of art or even tokens of works. On his view, a work of art is an action type which Picasso and Twin Earth Picasso can equally well perform. So it seems that he would reject the very ideas of S-work and P-work which frame our explication of the distinction. It is beyond the scope of this paper to engage such highly revisionary possibilities. Gregory Currie, *An Ontology of Art* (Macmillan Press, 1989).
- ³⁴ Digital cameras now typically include metadata specifying the shutter speed, whether the flash was fired, when and where the picture was taken, and so on. So the file for the digital photograph will be different than the file for the doodle. This is a difference that does not matter for consideration of

the two images, since the metadata makes no difference to what appears on the screen.

³⁵ Kendall L. Walton, "On the nature of photographic realism," *Critical Inquiry* 11 (1984): 246-277.

³⁶ One might reach the same conclusion by different means. Christy Mag Uidhir argues that the connection between photography and printmaking precludes digital screen images from counting as *photographs*. So-called 'digital photographs' would best be thought of as a different kind of thing. Their nature would not be determined by the nature of photographs but instead by the nature of digital images. And, as we argued in the previous section, non-photographic digital images are allographic. Christy Mag Uidhir, "Photographic art: An ontology fit to print," *Journal of Aesthetics and Art Criticism* 70 (2012): 31-41 — see fn. 7, p. 40.