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Preserving the autographic/allographic distinction

John Zeimbekis' title, "Why Digital Pictures are not Notational Representations", already suggests that we are talking past each other. The primary concern of our 2014 paper was not notation but the autographic/allographic distinction, not representations as such but works of art. As we see it, Zeimbekis's considerations do not ultimately undermine the position we advanced in 2014—but they do challenge an element of Goodman's own theory of notation that derives from his requirement of recoverability. That requirement can be abandoned without losing the explanatory power of the autographic/allographic distinction as we have refined it.

I. The autographic/allographic distinction

Zeimbekis is concerned primarily with whether pictures admit of a notation, and he is interested in the autographic/allographic distinction in relation to that. In "Are Digital Images Allographic?", we begin with the autographic/allographic distinction. We argue that the distinction makes sense of various otherwise puzzling facts about forgery, plagiarism, value, and duplicability of art works. Following

Goodman, we deny that amenability to notation defines the allographic.¹ Moving beyond Goodman, we offer a characterization of the distinction which is neutral on points of contention between Goodman, Levinson, and other philosophers of art.

Start with the example of a typical prose work. Such a work may be individuated as the product of a process of composition, so that the same work could have had slightly different words and phrases in it if the author had made different choices. Another way to individuate it is as a precisely specified string of characters, which might be generated elsewhere by independent processes. The former approach focuses on the provenance of the work, while the latter focuses on the structure. Borrowing terms from Joe Moore (2013), we call these the P-work and S-work respectively.² For artistic prose, philosophers disagree about whether the P-work or the S-work is the work of art. But just as a matter of ontology, a typical work of prose corresponds to distinct P-works and S-works.

Consider the contrastive case of a typical painting. Although one can describe the style and composition of a painting, the particularities of the painting always outstrip the description of it. Philosophical thought experiments about duplicability in paintings involve molecule-for-molecule copies of the entire painting precisely because there is no characterization short of that which is sure to capture every

¹ Goodman insists that, “for distinguishing allographic from autographic works, all that counts is whether or not the identity of the work [...] is independent of history of production” (Goodman, 1984, p. 140). See also section I.B of our paper.

² Moore introduces this terminology for musical works, and we have generalized.

relevant feature. There is no way of specifying the structure beyond saying that it is all the features realized in the P-work. As a consequence, there is no separate S-work.

We define a work as ‘allographic’ if there is both an S-work and a P-work corresponding to it and as ‘autographic’ if there is only a P-work.³ Relative to that refined characterization, we argue that digital images are (typically) allographic.

Zeimbekis’ argument applies most readily to Goodman’s theory of notation, but he also uses it to craft a dilemma for our distinction. We take up that dilemma in the next section. In the final section, we suggest that Zeimbekis’ argument effectively undercuts aspects of Goodman’s account which are not aspects of ours.

II. Paintings and digital images

We hold (as Goodman does) that there is no way of specifying which features of a painting are crucial for its identity. This is precisely why there is no S-work for a painting. Zeimbekis formulates this as a general principle about representation, “that the existence of any difference discriminable in principle between two representations precludes their identity as representations.” For his part, he assumes the opposite of this principle — he writes, “I assumed that representations essentially convey information, and that if two pictures designed to convey information to an end-user system of a certain kind convey exactly the same information to end-users of that kind, they will be identical *as representations*,

³ Alternately, we might define art forms as allographic if works of that form have both S-works and P-works; etc.

despite physical differences that cannot be detected by the end-user system.” We are not primarily interested in paintings or in digital images as representations, but rather as works of art.⁴ Images as works can but need not be representational. So the principle which matters for autographic works is that any difference discriminable in principle between two objects precludes their being instances of the same work.

Zeimbekis argues that our commitment to this principle poses a dilemma for us. If the principle held, then different display instances of a digital image would be distinct works; digital images would turn out to be single-instance, autographic works. If the principle did not hold, then a doppelganger of a painting would count as another instance of the same work; paintings would turn out to be repeatable, allographic works. In either case (Zeimbekis alleges) the distinction collapses. Zeimbekis tries to block any middle way. He writes, "The principle cannot be applied to all pictures *except* digital ones, since that would question-beggingly already treat digital pictures as replicable." Yet something like this middle way strikes us correct. It is independently motivated, we think, and so is not question begging.

Note that a single object may be considered as two different works of art. For example, an illuminated manuscript page may be composed of a string of words

⁴ In the final section of our 2014, we allow that digital *photographs* might have a different status than other digital images. If they do, it is precisely because they are directly representational or transparent in a way that other digital images are not.

which constitute a repeatable work (e.g., a poem), while the words are beautifully drawn and so also comprise a decorative illustration which is a single instance work. We can copy the poem by copying the string of characters, but we can only make a replica of the illustration. As an alternate example, a musical performance of a scored musical work consists of or includes a precise series of sounds. There is no way of specifying which features of that sound are crucial for the identity of the performance. Yet if the musician faithfully follows the score, then that is enough to make it a performance of the scored work. Another performance using the same score to generate the same notes will count as another instance of the work, even though it will not sound exactly the same.

This shows that the principle applies to some works (such as paintings, illustrations, performances) but not others (such as poems and works of scored music). Zeimbekis is wrong that the principle must apply to all art works or to none. And although he is right that we cannot simply presume that digital images are on one side rather than the other, we do argue the point. (See sections IV and V of our 2014 paper, which Zeimbekis does not engage.)

III. Music and digital images

Although this shows how our account escapes the dilemma Zeimbekis poses for us, it does not directly address his central argument. He argues in this way: In different display instances of a digital image, specific pixel activations will be slightly different sizes and slightly different colors. This follows simply from the facts that monitors vary somewhat from one another, and that physical sizes and light frequencies are continuous. There is no precise boundary as to how much variation

is allowable before a pixel would be a pixel activation of some other color or no pixel activation at all. From this vagueness, it follows that the relation “same pixel activation” fails to be transitive. Goodman requires that character-indifference in a notational system be an equivalence relation, and an equivalence relation must be transitive, so pixels cannot count as characters and digital images cannot count as notational.

It is striking that this argument does not rely on features unique to digital images. It applies just as well to musical notation. Although we can specify that middle C is exactly some specified pitch, few or no performed notes sustain that exact frequency. Different tuning standards assign middle C a different frequency anyway. Nevertheless, a performed note counts as a middle C because it is within an acceptable margin of the frequency specified by the tuning standard used for performance. Because frequency is continuous, there are vague boundaries between permissible middle Cs and permissible C sharps. There are some hopelessly ambiguous pitches in between. Zeimbekis’ argument *mutatis mutandis* would entail that music is not notational. Music, though, is the paradigm of an artform that admits of notation. To put it bluntly: If you think music doesn’t admit of notation, you do not understand what notation is.

What is crucial is that in practice the set of all the actual middle Cs is disjoint from the set of all the C sharps, the highest middle C is lower than the lowest C sharp, and so on for the rest of the notes. This comparative determination, distinguishing the middle Cs from the C sharps, can be made between notes on particular instruments and in particular performances. We do not need precise

boundaries between the utter totality of middle Cs and the totality of C sharps. Unfortunately, this is not enough for Goodman. He does want to hold up the totality of middle Cs against the totalities of every other note; he insists, "A character in a notation is a most-comprehensive class of character-indifferent inscriptions" (Goodman 1968, p. 132). This same passage is quoted by Zeimbekis, so we can charitably read Zeimbekis as just providing a critique of Goodman's theory of notation. Yet then he is not then entitled to the conclusion that digital images are not notational representations — just that they are not notational given Goodman's account of notation.

Just as we can make sense of the allographic nature of music in a way that would not make Goodman entirely happy, we make a parallel point for digital images. In 2014 we wrote, "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" (p. 421). As we explain, the point is especially clear if we consider low-resolution, one-bit images. Consider the extreme case of 1x1 one-bit images. The single pixel of the image can either be on or off. When displayed on a specific system, it will either look like one illuminated pixel on that system or like the unilluminated screen on that system. These two presentations are distinguishable from on or off pixels on a different display. On a green CRT, the illuminated pixel is a green dot, and the unilluminated pixel is the dark green color indicative of the monitor being turned on. There are physically possible illuminations of the screen which would be

somewhere in between, so as not to clearly be either one, but that would be a sign of malfunction rather than an indeterminate pixel. Pixels on a black and white LCD display look different than any pixel on a green CRT. Although 24-bit images allow gradations which cannot be distinguished with the naked eye, the various possible activations form distinct compliance classes on any given display.

There is a further feature of Goodman's account which makes our suggestion unavailable to him. He requires not just that the score for a musical work guide each performance in a specified way, but that it does so for all performances with such precision that each performance uniquely specifies the score. He writes: "A class is uniquely determined by a score, as by an ordinary definition; but a score, unlike an ordinary definition, is also uniquely determined by a member of that class. Given the notational system and a performance of a score, the score is recoverable. Identity of a work and of a score is retained in any series of steps, each of them either from compliant performance to score-inscription, or from score-inscription to compliant performance, or from score inscription to true copy" (1968, p. 178). His requirement that the score be *recoverable* from any performance forces Goodman to consider not just the way that a notated middle C is played in a particular performance context, but instead the population of all the middle Cs — as we have seen, that is what makes him vulnerable to Zeimbekis' objection. Because music is certainly notational, we take this is a *reductio* of Goodman's assumption that scores are necessarily recoverable from performances.

For digital images, we can treat the map of RGB values as the characters of the notation (see our 2014, p. 421). One cannot tell just from seeing a green dot on a

screen whether it is a one-bit pixel on a monochrome green monitor or a 24-bit pixel specified as a particular shade of green on a color monitor.⁵ Context matters, so the map of RGB values is not recoverable from just what appears on the screen. Contra Goodman, we deny that digital images are necessarily recoverable from what is displayed. It is enough that, for any specified device, all the activations of particular pixel arrangements can be distinguished.⁶

In 2014, we were primarily concerned to show that the distinction between autographic and allographic works makes sense of an array of otherwise puzzling phenomena. So we defended Goodman's distinction between (e.g.) painting and prose. We reject Goodman's further commitments to considering the most-comprehensive class of character instances all together and to notated works necessarily being recoverable from any performance. If we are right to read Zeimbekis as providing an argument against these latter commitments, then we have no objection to his argument. Perhaps that means we have talked past each other.

⁵ Or, for that matter, a cluster of anti-aliased pixels on a high resolution monitor.

⁶ It may matter for evaluating or preserving a work of art whether the work is just a digital image or an image intended to be displayed under specific circumstances. As Katherine Thomson-Jones (2015) observes, "It is common practice... when archiving net art, to have artists fill out a questionnaire in order to specify which features of a work are crucial for its preservation..."

Works cited

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