

RICHARD BEAUDOIN AND ANDREW KANIA

A Musical Photograph?

This article compares two objects: a photographic negative made by William Henry Fox Talbot in 1835 and the score of a solo piano work composed by Richard Beaudoin in 2009. Talbot's negative has come to be known as *Latticed Window (with the Camera Obscura), August 1835*, and Beaudoin's musical composition is called *Étude d'un prélude VII—Latticed Window*. As suggested by their titles, the composition owes a debt to the negative and thereby joins a long list of musical compositions indebted to particular visual images.¹ However, the relationship is deeper, and by explicating their respective ontologies, we hope to show that these two objects are strikingly analogous to each other across their respective media, so much so that we suggest the score of Beaudoin's *Étude d'un prélude VII—Latticed Window* should be considered a sort of musical photograph—a photograph of a musical performance.²

We begin by describing the origins and characteristics of both Talbot's photographic negative and Beaudoin's score and offering our basic argument that the latter is a musical photograph (Sections I and II). In Section III, we compare Beaudoin's score to other things one might consider contenders for the title of "musical photograph"—musical recordings, sonic spectrographs, ordinary musical transcriptions, and typical musical scores—and argue that it has at least as good a claim to the title as any of these and a better claim than most. In the final section, we consider an argument based on the transparency of photographs, which allows us to recapitulate our main claims.

I. WILLIAM HENRY FOX TALBOT'S *LATTICED WINDOW (WITH THE CAMERA OBSCURA), AUGUST 1835*

In 1835, Talbot made numerous images of his home in Wiltshire, England, including a series depicting the central window in its South Gallery, using a technique that he called "photogenic drawing." The process involved building a camera obscura out of a large box, fixing a glass at one end, and using that glass to project an image onto the opposite end. Sensitive paper mounted at the point of the projected image would, given time, capture the light allowed it. Talbot gives a detailed account of his materials and methods in his privately published 1839 paper, "Some Account of the Art of Photogenic Drawing, or, The Process by Which Natural Objects May Be Made to Delineate Themselves Without Aid of the Artist's Pencil," which was presented at the Royal Society of Great Britain on January 31, 1839.³ In his account, Talbot also reflects on the implications of his discovery for such areas as portraiture, microscopy, and the rendering of sculpture. The essay includes remarkably poetic descriptions of the act of photography, as when Talbot describes images of the exterior of his house: "And this building I believe to be the first that was ever yet known *to have drawn its own picture.*"⁴

As seen in Figure 1, *Latticed Window* is accompanied by a text in Talbot's own hand, likely produced to accompany the image when it was exhibited by Michael Faraday at the Royal Institution on January 25, 1839. Beside the image, which is roughly one inch square, Talbot wrote: "Latticed Window (with the Camera Obscura), August

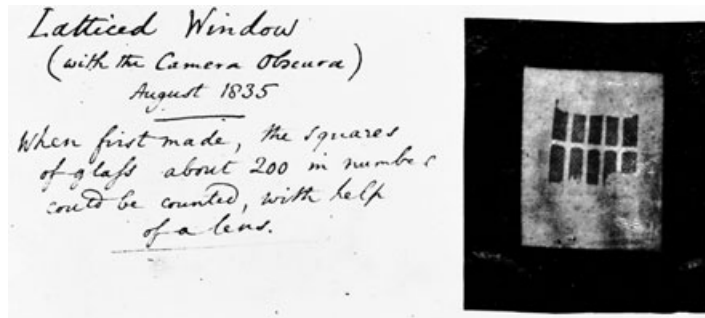


FIGURE 1. William Henry Fox Talbot, *Latticed Window (with the Camera Obscura) August 1835*, (1835). Courtesy of the National Media Museum/SSPL.

1835—When first made, the squares of glass about 200 in number could be counted, with the help of a lens.” Two significant facts emerge from Talbot’s concise inscription: (1) Talbot encourages viewers to marvel at the precision of the image by inspecting it with a magnifying glass and (2) by the phrase “when first made,” Talbot acknowledges that his technique of fixing the light patterns to paper was unable, over time, to preserve every detail of the actual image.⁵ Of course, even when first made, the image did not capture every detail of the scene photographed, a feature of photography that persists, if on a different scale, even in our digital age.

II. RICHARD BEAUDOIN’S *ÉTUDE D’UN PRÉLUDE VII—LATTICED WINDOW*

While only 1’51” in duration, Beaudoin’s *Étude d’un prélude VII—Latticed Window* is the result of months of labor, not only by the composer but also by a small team of acoustic researchers. The piece originated from data collected using LARA (The Luzern Audio Recording Analyser), developed by Dr. Olivier Senn and his colleagues at the Hochschule Lucerne in Switzerland. In 2008, Dr. Senn’s team spent months measuring the exact moments of pitch onset in Martha Argerich’s celebrated recording of Chopin’s Prelude in E minor, op. 28/4 (Deutsche Grammophon 415 836–2, recorded in Munich, October 22–25, 1975).⁶ These onsets (the exact moments in time when each note comes into being) were charted at the level of the millisecond. The coordinates of each onset were recorded relative to all others, allowing for an extremely detailed picture of Argerich’s

rhythmic interpretation of Chopin’s score. Senn also measured the sound energy (or volume) of each onset, to the level of the decibel.

Collaborating with Senn in April 2009, Beaudoin devised a method of taking LARA’s numerical output (the onset times in milliseconds and the sound energy in decibels) and transcribing it back into standard musical notation. This discovery became the framework for a series of compositions based on the Chopin–Argerich material, called *Études d’un Prélude*, twelve of which were completed in 2009–2010. Most of the works in the series altered the original Chopin material, applying techniques of elongation or distortion, or applying techniques borrowed from photography.⁷

Étude d’un prélude VII—Latticed Window is unlike any other work in the series, in that its length in performance is the same as the length of Argerich’s recording (1’51”). There is a sense in which a good performance of Beaudoin’s *Latticed Window* is a kind of altered re-performance of Argerich’s Chopin interpretation (though the alterations are not insignificant). In this way, Beaudoin’s score reveals itself as a graphic representation, or visualization, in standard musical notation, not just of another score, but of a specific performance of another score. (Figure 2 shows Chopin’s original Prelude, while Figure 3 shows Beaudoin’s score.) In this regard, it is, to our knowledge, unique within the field of music composition. In order to understand the way in which Chopin’s Prelude (and Argerich’s performance of it) have been transformed by Beaudoin into his *Latticed Window* and how that transformation is informed by Talbot’s image, consider the following four networks of similarity and difference.

The image shows a page of a musical score for Chopin's Prelude in E minor, op. 28/4, page 11. The score is in 4/4 time, marked 'Largo'. It features a melody in the right hand and a dense accompaniment in the left hand. The score includes various musical notations such as dynamics (p, f, pp), articulation (stretto, smorz.), and fingerings. The piece concludes with a double bar line and a final chord.

FIGURE 2. Chopin, Prelude in E minor, op. 28/4. Public domain, accessed at [http://imslp.org/wiki/Preludes,_Op.28_\(Chopin,_Fr%C3%A9d%C3%A9ric\)](http://imslp.org/wiki/Preludes,_Op.28_(Chopin,_Fr%C3%A9d%C3%A9ric)).

First, Chopin's left and right hands have been switched in Beaudoin's work, meaning that the melody is now below the accompaniment. This is inspired by the fact that Talbot's *Latticed Window* is a photographic negative. Whereas light and dark are reversed in Talbot's image, in Beaudoin's

work the left and right hands, melody and accompaniment, figure and ground, as it were, have been reversed.

Second, Chopin's music, which was written in the middle register of the piano, has been moved to the instrument's extreme high and low registers

a mix and Olivier Sève

étude d'un prélude VII LATTICED WINDOW

after the 1835 photographic negative made by William Henry Fox Talbot

à la mémoire de Frédéric CHOPIN
d'après Martha ARGERICH

Richard BEAUDOIN
2009

W. H. F. T. Latticed Window (with the Camera Obscura)—August 1835
When first made, the squares of glass about 200 in number could be counted, with help of a lens

R. B. Latticed Window (with LARA)—August 2009
When first measured the total events, initially about 225 in number, were filtered to include those >0.748° (ch.) and >0.540° (lh.)

Fast but very calm* [$\text{♩} = 120$]

right hand always sounding one octave higher than written (gr)

left hand always sounding one octave lower than written (gr)

The musical score consists of six systems of piano notation. Each system includes a right-hand staff (treble clef) and a left-hand staff (bass clef). The right-hand part is consistently an octave higher than written, and the left-hand part is an octave lower. The score is in 3/4 time with a tempo of quarter note = 120. Dynamic markings include *pp*, *p*, *mp*, *mf*, and *f*. Performance instructions such as *gr* (grace notes) and *gr* (grace notes) are present. The score is marked with measure numbers 4, 12, 20, 28, and 36.

* The bar lines act only as guidelines, and do not convey the rhythmic structure of the music.

** The dynamics are given separately for each hand throughout.

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FIGURE 3. Richard Beaudoin, Score of *Étude d'un prélude VII—Latticed Window*. Copyright 2009 by the composer; all rights reserved.

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BEAUDOIN : étude d'un grêlade VII—Latticed Window

44

52

60

67

76

83

90

96

104

p *pp* *ppp* *pp* *p*

mp *f* *mf* *mp*

f *mf* *f*

ff *f* *mp* *p* *mp* *mf*

ff *f* *mf* *f*

mp *p* *pp* *p* *pp*

mp *p*

pp *pp*

p *pp*

[131]

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Book 17: Latticed Windows, 17 pages, 2009

FIGURE 3. Continued.

by Beaudoin. The shift of register is a response to Talbot's negative being in black and white and follows the analogy between color and music articulated by the French composer Olivier Messiaen: "When I move the same chord from midrange up one octave, the same color is reproduced shaded toward white—which is to say, lighter. When I move the same chord from midrange down an octave, the same chord is reproduced, toned down by black—which is to say, darker."⁸ By recasting Chopin's music into the piano's extreme high and low registers, *Latticed Window* uses only the "lightest" and "darkest" sonorities available on the instrument.⁹

Third, the key has been changed from Chopin's original E minor into E-flat minor in Beaudoin's composition. This change was made simply because E-flat minor is a historically (and some would argue, aurally) darker key than E minor, just as Talbot's image is darker than the sunlit window it depicts.

There exists one further cluster of relationships between these objects, which is alluded to in the texts that Beaudoin and Talbot supply to accompany their respective objects. In the text accompanying *Latticed Window*, Talbot admits that the image fails to capture all of the details of the scene he photographed. Beaudoin's score is headed by the words 'Latticed Window (with LARA)—August 2009. When first measured the total events, initially about 225 in number, were filtered to include those >0.748 seconds (r.h.) and >0.540 seconds (l.h.)' This highlights a fourth difference between Argerich's performance of the Chopin and Beaudoin's work: any event in Argerich's performance whose duration was below a certain time threshold (separately chosen for each hand) was simply left out of the transcription. Just as Talbot's negative loses the details of the light that the negative was not sensitive enough to retain, so Beaudoin's score loses the details of Argerich's interpretation of the Chopin that fell below his chosen durational threshold. This purposeful "imperfection" in the preservation process from Chopin to Beaudoin via Argerich is the very thing that allows the score to be readable and performable by a musician, as we discuss further below.

The primary result of Beaudoin's labors is a musical work that is intended to be performed, which in this respect is no different from a typical piece of Western classical music (such as Chopin's orig-

inal Prelude). As with most such pieces, the work is physically embodied in a score—a set of instructions to the performer about what to do in order to produce a performance of this work. But because of its unique origins, we argue that the score is unique in that it is a *musical photograph* of Argerich's performance of Chopin's Prelude.¹⁰ Just as Talbot (with the aid of the camera obscura) used the light present during a span of time in 1835 to fix a two-dimensional image, mechanically counterfactually dependent on and visually similar to the scene that can be recognized in it, Beaudoin (with the aid of LARA) used the sounds produced during Argerich's 1975 performance to fix a two-dimensional image, mechanically counterfactually dependent on those sounds and in which can be recognized a performance of Chopin's prelude.¹¹ We thus focus on two features usually taken to be essential to a representational photograph: (1) it must be *mechanically counterfactually dependent* on its target, and (2) this dependence is reflected in *visual similarity* between the image and its target.

Is Beaudoin's score *really* a musical photograph? Of course, to some extent, this is "just semantics"; the relationship between Beaudoin's score and Argerich's performance is like that between a photograph and the object or scene it represents in certain ways and unlike it in other ways. Whether or not we ultimately decide to call the score a musical photograph is not as important as the ways in which thinking about these relationships illuminates the media of both photography and music and the aesthetic implications of those media. Nonetheless, we do believe that the similarities are significant enough to defend the claim that Beaudoin's score is a musical photograph as more than just a thought-provoking metaphor.

III. COMPARISONS WITH OTHER MEDIA

i. Recordings. When one thinks of musical media analogous to photography, one might first think of sound recordings. For instance, one might say that if anything is the musical equivalent of a photograph of Argerich's performance, it is the original recording with which Senn and Beaudoin began. But there are a number of disanalogies here. Perhaps most striking is the fact that a musical recording, appropriately experienced, has a perceptible

and meaningful temporal length. That is, it takes time to unfold, its musical events occurring in a predetermined order.¹² In this respect, a recording is more like a moving image, such as a film, than a photograph, which represents (usually) a short temporal slice of some scene in an atemporal way (in the sense that there is no predetermined order in which one must experience the different elements of a photograph, nor any specific length of time an appropriate experience of the photograph should take). On the other hand, while a score is a visual representation, it is at least linear, in that it is appropriately read in a particular order. And it might be argued that it is temporal insofar as it is appropriately “viewed” or read at the same tempo as a performance of it. (Of course one *could* look at different parts of the score in any order one liked, but one could similarly listen to bits of a recording in different orders. The point here is about the *appropriate* mode of experience of these things.)

A second disanalogy between the musical recording and a photograph (closely related to the first) is that the recording is not a visual but a sonic representation. That is, the sounds of a recording (played in an appropriate way), including many musically important audible features, such as timbre, pitch, and rhythm, are mechanically counterfactually dependent on the sounds of the recorded performance. Moreover, the sound of the recording being played is *aurally*, not visually, similar to the sound of the original performance: we can *hear* Argerich’s performance *in* the played recording; we do not *see* it there.

What is the relevance of these disanalogies, though? Recordings are to be heard rather than to be seen and are thus different from photographs. But this is because recordings aim to represent musical events, which are audible rather than visible. Thus, it might be argued that at a deeper, structural level, a recording is more like a musical photograph than Beaudoin’s score because sound recording bears the same relations to musical events that photography bears to visible objects. We have no objection to the idea that musical recordings could be considered musical photographs for the above reasons. What is interesting about Beaudoin’s score is that it shows that there are other possible kinds of representations of musical events that could equally well be called musical photographs—kinds that have heretofore gone undiscussed. Beaudoin’s score is

less like a musical photograph than a recording in that it is “cross-modal”—it represents sounds visually, while a recording represents them sonically. But it is more like a musical photograph in that it is a visual representation. It is no surprise that musical events can be represented sonically, in a mechanically counterfactually dependent way. It is perhaps surprising that musical events can be represented visually in a mechanically counterfactually dependent way and that they can be represented using artistic techniques, such as filtering, that have analogues in photography.

ii. *Spectrographs*. However, there are other ways of visually representing musical performances in two dimensions than with a musical score. One is by means of a spectrograph. Consider the data delivered by LARA in analyzing Argerich’s performance. Such data can be (and initially are) represented numerically or linguistically; that is, it is an array of numbers representing the time, frequency, energy, and so on, of every sound event included on the recording. But these data can be displayed visually. Figure 4 shows a spectrograph taken by LARA of the first 21 seconds of the performance, the x-axis representing time (in seconds) and the y-axis showing frequency (in hertz). Could we thus consider a spectrograph a musical photograph of Argerich’s performance as captured on the recording?

Such a spectrograph may be considered a photograph of a musical performance in some sense: it is a visual representation of a musical performance that is mechanically counterfactually dependent on it. Even if such a spectrograph may be considered a *sonic* photograph, however, it should not be considered a *musical* one. A spectrograph represents *sounds*, or vibrations in the air, but not *music*, which requires perception of a uniquely human sort. The distinction between sounds and music is difficult to limn precisely, but there is general agreement that human beings (unlike dogs, say) *hear* music *in* certain sounds, just as we see three-dimensional objects *in* certain two-dimensional arrangements of pigment.¹³ Illustrative differences between sounds and music (at least Western tonal music) include the following: (1) When we hear sounds as music, we hear the sonic spectrum as divided into octaves—notes that *repeat* at different “heights.” This phenomenon is not an intrinsic feature of the sonic spectrum. We hear octaves in sounds with frequencies separated

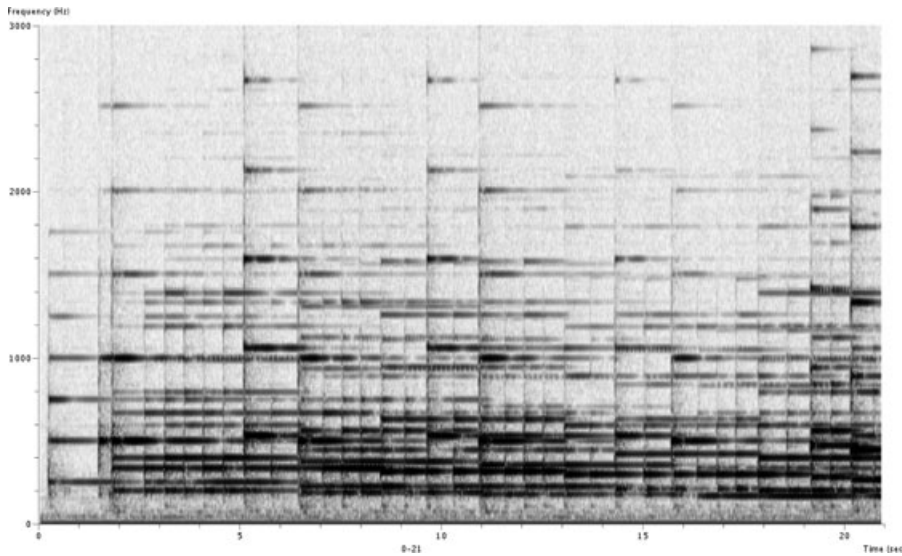


FIGURE 4. Spectrograph of Chopin's op. 28/4 in Martha Argerich's 1975 interpretation (seconds 0–21), created with the Lucerne Audio Recording Analyzer (LARA).

by a factor of two, but pairs of sounds whose frequencies are related by other factors (three, five, and so on) are just as objectively present in the sound spectrum. The repetition of notes at the octave is a response-dependent feature of sounds and seems to be culturally universal.¹⁴ (2) When we hear sounds as music, our perception is “categorical,” as it is when we hear sounds as language. Just as we hear any of a wide range of sounds as a certain phoneme (for example, /pa/) when we hear it as language, but past a certain threshold we hear intrinsically very similar sounds as a different phoneme (for example, /ba/), we hear all sounds within a certain range as a certain note (for example, C#) when we hear it as music, but past a certain threshold we hear intrinsically very similar sounds as a different note (for example, D).¹⁵ This general phenomenon also seems to be culturally universal, though of course not all cultures divide the octave into the same pitch classes. (We also do not mean to imply that all musical sounds are actually, or perceived as, pitched.) Though these two features relate to pitch, similar points could be made about rhythm and other musical features of sound.¹⁶

A spectrograph of Argerich's performance, then, is not a *musical* photograph of it because the musical features of the performance cannot

be *seen* or *recognized* in the spectrograph; only the sonic features can. In some sense, of course, the spectrograph contains musical information. Thus, if we understand “visual representation,” in a thin sense, to mean something like “carrying information in a visual form,” then the spectrograph could be said to represent Argerich's performance. But when we talk of photographs and other pictures being representational, we typically mean something more than this: we mean that features of what is represented can be “seen in” the visual array. (Compare a JPEG file on your hard drive. There's visual information there, but it cannot be *seen* until interpreted by a piece of software that projects or prints an *image*.)

There is an interesting distinction to be made here between the score and an ordinary photograph, however. Musical notation is largely conventional in a way that ordinary depictions (such as typical photographs) are not. (For example, untutored children can understand the content of many photographs, but not of any scores.) This might lead us to say that the disanalogy between the spectrograph and a photograph is located more in our perceptual systems than in the representations.¹⁷ Whatever its source, however, the disanalogy is there, supporting our argument in this section that Beaudoin's score is a better

candidate than a spectrograph for being a musical photograph of Argerich's performance. On the other hand, to the extent that musical notation is *linguistic*, it detracts from our claim that the score is a musical photograph. There is something to the notion that we *see* the music *in* the notation, as we *see* an object *in* an image. Musical notation is not wholly linguistic; it is partly iconic. Nonetheless, the analogy is imperfect. Part of the problem is the cross-modal nature of the representation of music in notation, a point we return to below.

Is Beaudoin's score mechanically counterfactually dependent on Argerich's performance, as the spectrograph is? As discussed above, Beaudoin made many decisions in the production of his score that had implications for how Argerich's recording was represented in it, such as, for example, the decision to represent the sounds Argerich produced with her right hand, higher in the musical register, with notes lower in the musical register, which the performer of Beaudoin's work would play with his left hand. It would be a mistake to think that this detracts from the mechanical counterfactual dependence of the score on its target, though, just as it would be a mistake to think that a photographer's choice of lens or printing technique detracts from the mechanical counterfactual dependence of her photograph on its target. Such decisions result in less visual similarity between the resulting object and its representational target, but visual similarity is distinct from counterfactual dependence.

However, there is an intentional connection in the chain of counterfactual dependence linking Beaudoin's score with Argerich's performance: Beaudoin transferred "by hand" the information from LARA into his score. He did so "mechanically" in a loose sense, that is, in strict accordance with predefined, unambiguous rules; but this part of the process was mediated by beliefs, and thus was not mechanical in the sense required for a strict analogy with photography. We will ignore this break in the chain, however. Because both the LARA data and the resulting score are made up of discrete, discontinuous bits of information, it is easy to imagine a mechanical process that does what Beaudoin in fact did intentionally. For the purposes of this article, then, we consider a close counterpart of Beaudoin's actual score—one in which the chain of coun-

terfactual dependence between Argerich's performance and Beaudoin's score is continuously mechanical.

iii. Ordinary transcriptions. Beaudoin's *Latticed Window*, by contrast with a spectrograph, employs musical notation and thus visually represents the musical features of the performance, albeit in a distorted way. It is thereby, in part, a musical transcription of Argerich's performance. Considering the reasons for the distortions can help us develop the analogy with photography in more detail. Given the technology available to Beaudoin, one might ask why he did not produce a more accurate, less distorted transcription of Argerich's performance. Part of the answer, obviously, is that he was engaged in an artistic, not a reportorial project. But another part of the answer is that there is no way to represent the musical details of such a performance in a way that would be useful for Beaudoin's purposes. Western musical notation has been developed to represent something like musical works for performance, works that require performative interpretation.¹⁸ It has also been put to other uses, such as transcribing improvised performances, but because of the purposes for which it was designed, no doubt in combination with basic perceptual and cognitive limitations, such transcriptions tend to represent something like the work of which the improvisation would have been a performance, were it a performance of a work.¹⁹

Given the remarkable precision of LARA's rhythmic measurements (pinpointing the onset of each note at the level of the millisecond), transcribing Argerich's performance into standard notation involves a complicated balance between the richness of the data and the limits of human perception. It is possible, say, to create a mapping such that each millisecond in Argerich's recording is represented by one 512th note in the transcription. (A 512th note is one with seven flags attached to its stem.) Such a transcription could be helpful for those engaged in performance studies, since it would represent musical details in a form any trained musician could understand, allowing for the comparison, for instance, of the rubato applied in different measures. However, although one could study such a score, one could not "take it in" in the ordinary way, due to its overwhelming detail.

For the same reason, such a transcription could not be performed. At the tempo of Argerich's performance of the Chopin, this transcription would confound almost any human pianist; even if a pianist could handle such a notation cognitively, it would be nearly impossible to obtain the motor control to execute it. This presents a problem for a composer wanting to use such data to produce a new piece that is realistically performable. Beaudoin's solution, in *Latticed Window*, is to use a remarkably fast (but humanly possible) tempo alongside an unusually large time signature. This, together with the filtering out of the smallest events of the recording, represents a compromise between LARA's spectrographic richness and our cognitive and motor limitations.

By analogy, suppose it were possible to take an incredibly detailed photograph of the Mona Lisa, such that its molecular structure were somehow captured visually. In order for us to see these details, perhaps the photograph would have to be the size of a planet. Such a photograph would be useless to us as a photograph of the painting, because we could not see the painting in it, for reasons analogous to why we cannot see the molecular structure of the painting when standing in the Louvre. A representation in musical notation of Argerich's performance, of the sort described above, even if possible, would be useless to us as a musical photograph of that performance in a similar way. There are two basic ways to produce a more useful (that is, comprehensible) musical photograph of a performance using microtiming data, both of which have been employed by Beaudoin. One is to stretch the data out across time, to produce a kind of slow-motion transcription of the performance. Beaudoin did this in many of the pieces in the *Étude d'un prélude* series, including the first piece in the series, *Chopin desséché*, which expands the time axis from 1'51" to 7'25". The other is to put the data through a coarse filter, retaining only durations that are discriminable by the human eye and ear. This is one of the transformational techniques Beaudoin uses in *Latticed Window*, as described in Section II. We have already mentioned how this technique reflects the limitations of Talbot's photographic technology, but, of course, photographers from the very birth of the technology have used such limitations, whether dictated by the contemporary state of the technology or freely chosen, for artistic ends. One might con-

sider the history of artistic photography a history of the invention and use of such limitations.

iv. Musical scores. Since we have argued that Beaudoin's score for *Latticed Window* could be considered a musical photograph, it is worth asking whether traditional musical scores could be too. For instance, why not say that Chopin's score for his Prelude in E minor, op. 28/4, is a musical photograph of Argerich's performance? There are two main reasons why we should not say this. The first, of course, is that Chopin's score is not counterfactually dependent on Argerich's performance, since the score predates the performance by over a century. Just as any object within the frame of a photograph will be captured by the camera whether the photographer wills it or no, every event in Argerich's performance is captured by LARA's processes, whether or not Beaudoin (or anyone else) wills it. Unlike LARA's output, Chopin's score is impervious to Argerich's performance. She, and any other number of performers, could have interpolated as many extra notes as they wished; this would not affect the number of notes in Chopin's Prelude.

This leads us to the (related) second main difference between Chopin's and Beaudoin's scores. Chopin's score is not a transcription of a performance; it prescribes how certain performances—those of this prelude—should be, rather than describing any particular performance. In this respect, it is more like the circuit diagram an engineer produces for a new electrical component than a photograph of such a component. It tells others what they ought to do in a generic fashion, rather than showing them what some particular thing is like. Of course, Beaudoin's score is prescriptive, too, but before it was prescriptive it was descriptive.²⁰ Beaudoin took a transcription (or, more accurately, helped produce a transcription with certain features) of a certain performance (Argerich's) of a given work (Chopin's) and transformed it into the prescription for producing performances (anyone's) of a different work (Beaudoin's). Such a process is as unusual in the visual arts as in music, but we can easily imagine analogues (and works of this sort probably exist). Suppose an artist takes a photograph of a lithographic print that was designed by a second artist and executed by yet a third. Then suppose the first artist "publishes" the photograph, clearly

indicating, LeWitt-like, that the photograph itself is not her artwork, but that other artists should execute instances of her work by painting images of the print captured in the photograph. The fact that the artist uses the photograph to prescribe what others should do in producing instances of her artwork does nothing to take away from the fact that it is a photograph. Beaudoin's score prescribes what a performer should play in order to perform *Latticed Window*, just as our imagined artist prescribes what others should do in order to produce instances of her work. Thus, we argue, the fact that Beaudoin's score is prescriptive does nothing to detract from the reasons for thinking that it is a musical photograph.

IV. TRANSPARENCY

Throughout this article, we have made reference to two features of representational photographs widely discussed in the literature: mechanical counterfactual dependence and visual similarity. These features have been most widely discussed in the context of the transparency of photographs, that is, the question of whether, in looking at a photograph of some object you thereby see (indirectly) the object itself, *through* the photograph.²¹ Now consider the following argument. Typical photographs are transparent. Thus, if Beaudoin's score for *Latticed Window* is a (musical) photograph, by looking at it one thereby sees Argerich's performance (or the recording of that performance) *through* the score. But we do not see Argerich's performance (or the recording of it) through the score. Therefore, it is not a photograph.

One might reject this argument by rejecting the supposition that photographs are transparent, but this does not seem very promising. The point of the argument is to show an important dissimilarity between the score and photographs; that dissimilarity remains even if photographs are not transparent. What is the dissimilarity? It is not a lack of counterfactual dependence, the most widely discussed feature of transparency. Beaudoin's score is counterfactually dependent on the recording of Argerich's performance and thereby on the performance itself, since the recording is counterfactually dependent on the performance. What the score lacks that a photograph possesses is *visual similarity* with what it represents.²² Consider, as

others have done, a machine that mechanically produces a linguistic description of the visual appearance of a scene.²³ No one argues that such descriptions enable us to see the scene represented, precisely because the scene is not *depicted*. Musical notation, as a quasi-linguistic form of representation, is similarly not a form of depiction, which is one reason we cannot see a musical performance through Beaudoin's score. Another, perhaps more obvious, reason is that a musical performance is not a visual entity. It is something appropriately heard, rather than seen.²⁴ Thus, no visual representation of a musical performance can be a depiction of a musical performance, nor a fortiori a musical photograph.

We have said three things relevant to this objection already. First, we do not claim that the score of *Étude d'un prélude VII—Latticed Window* is *simply* a photograph, in exactly the same sense as a photograph by Cartier-Bresson or this month's cover of *Vanity Fair*. Our argument is not that Beaudoin's *Latticed Window* has relinquished its status as a piece of music, nor that its score should be hung alongside Mapplethorpe prints. Rather, having outlined their respective ontologies, we argue that the similarities between Beaudoin's score and Talbot's *Latticed Windows* make it more than metaphorical to call this score a musical photograph.

Second, given that this is an extended use of the term 'photograph,' it does not follow from the fact that Beaudoin's score lacks some feature ordinary photographs possess that the score is not a photograph in an extended sense. Musical recordings are sometimes referred to as musical photographs, though there are obvious, clear differences between the media of sound recording and photography. What we hope to have shown here is that there is another, at least equally good candidate for the title "musical photograph" that has thus far been overlooked.

Third, though it is true that Beaudoin's score is not, and could not be, visually similar to Argerich's performance in the way an image is visually similar to a visual object, it is still true that one can *see* that performance *in* the score, just as we might say we *hear* an emotion *in* a musical passage, even though emotions have no sonic features. The visual similarity of photographs (and other depictions) to the things they represent is surely important in large part because it grounds our seeing those things in the images. Thus, the fact that

we can see Argerich's performance in Beaudoin's score lends plausibility to the claim that it is relevantly like a photograph.

The score of Richard Beaudoin's *Latticed Window* is mechanically counterfactually dependent on a particular musical performance of another musical work, a performance one can see in the score.²⁵ These features lead us to describe Beaudoin's score as a musical photograph of that performance—an extended use of the term 'photograph,' to be sure, but not a capricious one. On the other hand, the score is not visually similar to the performance in the way ordinary photographs are visually similar to the objects one can see in them. This makes the analogy imperfect. But the best alternative candidate for a musical photograph of a particular performance, a sound recording, is also imperfectly analogous to ordinary photographs. Though recordings are mechanically counterfactually dependent on their sources, they are not visual entities; one does not see anything in them, nor are they visually similar to their sources. Of course, they are sonically similar to their sources, and we can thus *hear* those sources in recordings.²⁶ To claim that either a recording or a score like Beaudoin's is a musical photograph is to use the term 'photograph' in an extended sense. What we hope to have shown here is that Beaudoin's compositional process generates a new kind of musical object, one that warrants this extension of the term into the domain of notated music.²⁷

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1. Other such works include Modest Mussorgsky's *Pictures at an Exhibition* (1874), Franz Liszt's *Von der Wiege bis zum Grabe* (1881), Sergei Rachmaninov's *The Isle of the Dead* (1907), Paul Dessau's *Guernica* (1937), Gunther Schuller's *Seven Studies on Themes of Paul Klee* (1959), and Henri Dutilleux's *Timbres, espaces, mouvements* (1978).

2. This claim has, in fact, already been made, but not extensively argued for, in Richard Beaudoin, Stephen Davies, and Jonathan McKeown-Green, "Micro-measured Interpretations as Material for Composition" (unpublished manuscript).

3. Reprinted in: William Henry Fox Talbot, "Some Account of the Art of Photogenic Drawing, or, The Process by Which Natural Objects May Be Made to Delineate Themselves Without Aid of the Artist's Pencil," *Photography: Essays and Images: Illustrated Readings in the History of Photography*, ed. Beaumont Newhall (New York: The Museum of Modern Art, 1980), pp. 23–31.

4. Talbot, "Some Account," p. 28.

5. Geoffrey Batchen points out that there are at least twice as many squares of glass in the window as suggested by Talbot, in "A Latticed Window," in *Singular Images: Essays on Remarkable Photographs*, ed. Sophie Howarth (London: Tate Modern, 2005), pp. 15–21.

6. The methodology for these measurements can be found in Olivier Senn, Lorenz Kilchenmann, and Marc-Antoine Camp, "Expressive Timing: Martha Argerich plays Chopin's Prelude op. 28/4 in E minor," in *Proceedings of the International Symposium on Performance Science 2009*, ed. A. Williamon, S. Pretty, and R. Buck (Utrecht: European Association of Conservatoires, 2009), pp. 107–112.

7. For instance, *Étude d'un Prélude VI—The Real Thing* (string quartet, ca. 5'30", August 25, 2009) was composed in response to a 2000 painting of the same name by the UK artist Glenn Brown, who uses photography and Photoshop to produce, in oil on board, versions of iconic paintings; while *Étude d'un Prélude VIII—Kertész Distortion* (string quartet, ca. 7'30", August 25, 2009) was inspired by André Kertész's 1933 photograph, "Distortion No. 172." For a summary of the compositional process and descriptions of several of the works, see Davies, Beaudoin, and McKeown-Green, "Micro-measured Interpretations," and Richard Beaudoin, "The Principles of Microtiming and Musical Photorealism" (unpublished manuscript), available at <http://nrs.harvard.edu/urn-3:HUL.InstRepos:3415685>.

8. Olivier Messiaen, *Music and Color: Conversations with Claude Samuel*, trans. E. Thomas Glasow (Portland, OR: Amadeus, 1994), p. 64.

9. For a philosophical introduction to musico-visual synesthesia, see Kathleen Higgins, "Visual Music and Synesthesia," in *The Routledge Companion to Philosophy and Music*, ed. Theodore Gracyk and Andrew Kania (New York: Routledge, 2011), pp. 480–491.

10. Beaudoin's score is unique in this respect as far as we know. But the uniqueness claim is a contingent one; there is no reason why Beaudoin or future composers could not produce further such musical photographs.

11. It is possible to make a musical score in standard notation that preserves every rhythmic and dynamic aspect of a performer's interpretation (a sort of *Latticed Window* without any alterations to key, handedness, or detail); such experiments were in fact part of the process of making *Latticed Window*. While such a work might be a simpler example of a musical photograph of the sort we are discussing, such true imitations of performances were not Beaudoin's aim; moreover, the alterations made in *Latticed Window* strengthen the analogy with Talbot's image. We return to these points below.

12. For more on the temporality of artworks, see Jerrold Levinson and Philip Alperson, "What Is a Temporal Art?" *Midwest Studies in Philosophy* 16 (1991): 439–450.

13. Andrew Kania, "Definition," in *The Routledge Companion to Philosophy and Music*, pp. 3–13.

14. Thomas Stainsby and Ian Cross, "The Perception of Pitch," in *The Oxford Handbook of Music Psychology*, ed. Susan Hallam, Ian Cross, and Michael Thaut (Oxford University Press, 2009), pp. 47–58.

15. Christopher Mole, "The Motor Theory of Speech Perception," in *Sounds and Perception: New Philosophical Essays*, ed. Matthew Nudds and Casey O'Callaghan (Oxford University Press, 2009), pp. 211–233. Of course (in the musical case, at least), we hear the different sounds as different (for example, we hear the C#s as progressively sharper), but we still hear them as falling into the pitch-class C#.

16. For an introduction to such matters, see Roger Scruton, "Rhythm, Melody, and Harmony," in *The Routledge Companion to Philosophy and Music*, pp. 24–37.

17. Thanks to Joseph Moore for bringing this point to our attention.

18. Stephen Davies, "Notations," in *The Routledge Companion to Philosophy and Music*, pp. 70–79.

19. For some examples of transcriptions that capture more detail than most, yet still clearly illustrate the gap between musical event and transcription, see Paul F. Berliner, *Thinking in Jazz: The Infinite Art of Improvisation* (University of Chicago Press, 1994), pp. 505–757.

20. One might think that Chopin's score is still descriptive, not of a performance of his prelude, but of the various playings he engaged in while composing the work (whether actual, or "in his head"), or of some preexisting, eternal sound structure. (Similarly, one might think a diagram of a novel circuit is descriptive of a preexisting, eternal circuit structure.) We think this is a rather odd way of conceiving of composition, but even if it is correct, Chopin's score is still not a musical photograph in the sense we have been

defending, because (i) it does not transcribe a single performance (let alone a performance of a preexisting work) and (ii) his "description" of these musical items is intentionally mediated in a way that disqualifies it from being mechanically counterfactually dependent. Thanks to the editors for raising this issue.

21. For an introduction to this literature, see Nigel Warburton, "Photography," in *The Oxford Handbook of Aesthetics*, ed. Jerrold Levinson (Oxford University Press, 2003), pp. 614–626.

22. It lacks aural similarity, too, since the score makes no sound.

23. Kendall L. Walton, "Transparent Pictures," reprinted in *Marvelous Images: On Values and the Arts* (Oxford University Press, 2008), pp. 105–109.

24. At least, the aspects able to be captured in musical notation are appropriately heard rather than seen. Jerrold Levinson, for instance, argues that we must understand the gestures that occur in musical performances in order properly to appreciate those performances (for example, the caressing nature of the cellist's bowing) ("Authentic Performance and Performance Means," in *Music, Art, and Metaphysics* [Cornell University Press, 1990], pp. 393–408). And seeing musicians perform is the most obvious way of gaining such understanding. However, even if this is true, it does not affect the argument, since musical scores do not look like, say, performing cellists.

25. Or, strictly speaking, the score of the close counterpart we have been considering has these features.

26. Perhaps we do not just hear these sources in recordings, but literally hear the sources; that is, perhaps musical recordings are transparent. This would be a further argument for considering recordings to be musical photographs. On the transparency of musical recordings, see Andrew Kania, "Musical Recordings," *Philosophy Compass* 4 (2009): 22–38.

27. For helpful discussion, we thank Stephen Davies, Joseph Moore, Olivier Senn, Michael Schreyach, and the editors of this issue.