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**Enrique Granados's Performance Style.**  
**Visualising the Audible Evidence<sup>1</sup>**

Published scores and manuscripts are often treated by musicians as a complete representation of a composer's intentions. Some musicians are even convinced that they are betraying the composer if they interpret a passage differently from the written text. However, performing music requires a high degree of personal involvement to be able to assimilate the emotional expressiveness that should then be communicated to the audience. It is true that the score is the principal tool available to composers for communicating their musical ideas, but this tool has limitations. A score is unable to describe all the composer's indications, being instead "an approximation which no two people can interpret in precisely the same way."<sup>2</sup> In 1895, Carl Reinecke (1824–1910) pointed out that written texts could never preserve subtle details of past styles, claiming that "there still remains much to be read between the lines which no composer can convey by signs, no editor by explanations."<sup>3</sup>

Scores and manuscripts should be explored, but they should not always be taken as the definitive source. Enrique Granados (1867–1916) offers us an example why. When examining in detail his original manuscripts held in the collections at the Biblioteca de Catalunya, the Museu de la Música and the Palau de la Música in Barcelona, one has the feeling that the manuscripts are just a 'draft' of Granados's musical ideas. His artistry was in continuous development, and his works were always in the midst of a process of modification and transformation. Apart from changes made to the musical text by Granados himself, his published scores are in any case not always reliable. Even new, revised editions of his works are not always faithful to either the original manuscripts or recordings made by the composer. Musical elements such as slurs, accents, tenuto marks and other notational matters in the published editions fail to correspond to either the original manuscripts or to Granados's recordings. Furthermore, we need to be cautious when following editorial suggestions in a published score, as these can be filtered through the

- 1 For their help and suggestions, I am grateful to Nicholas Cook, Rex Lawson, Peter Phillips, Thomas Gartmann, Daniel Allenbach, Marc Widuch, Lea Jobson and Chris Walton, as well as to the anonymous reviewers of this paper.
- 2 Harold Bauer: *His Book*, New York 1948, p. 267.
- 3 Carl Reinecke: *The Beethoven Pianoforte Sonatas. Letters to a Lady*, trans. E. M. Trevenen Dawson, London 1912, p. 139.

artistic personality of the editors themselves. For example, Boileau's<sup>4</sup> was the first critical edition of the complete piano works of Granados (appearing in 18 volumes). But while its general editor was officially Alicia de Larrocha, a former student of Frank Marshall and thus a 'granddaughter' student of Granados, most of the suggestions made in the edition were authored by the American musicologist and pianist Douglas Riva and the Spanish pianist Carlota Garriga, not by Larrocha herself.<sup>5</sup> Apart from the manuscripts, only a selection of Granados's piano rolls and acoustic recordings was analysed for the Boileau edition, and these analyses only used traditional methods. This meant that some musical matters that are too complex to document by simply listening to them were disregarded – such as pedalling and subtleties of articulation.

Despite all these issues with the written sources, they still offer valuable insights for performance, and so should be examined carefully. Respecting the musical 'intentions' of the composer thus does not necessarily mean playing a musical text exactly as it is written, since the published score might not be always reliable. The truth is that performance is an expressive art realised by individual artists in the moment. Musicians are a conduit between the composer and the audience. Performing music therefore demands more than merely reproducing what is notated. This is the reason why music students learn to master their instrument through individualised, intensive training, often augmented by studying written texts about style. For example, exploring both the published scores and books written by Granados's direct students might help us to get a better idea of the demands he made as a teacher and what he wanted as a pianist.<sup>6</sup> Granados's instructive writings and conference papers offer pedagogical insights into his methodological approach.<sup>7</sup> However, information found in written sources about interpretation might not be fully understood without musical references, and therefore "it is impossible

4 Enrique Granados: *Integral para piano* [Complete works for piano], ed. by Alicia de Larrocha and Douglas Riva, Barcelona 2002, 18 vols.

5 Douglas Riva, e-mail to the author, 3 March 2015.

6 Paquita Madriguera: *Visto y oído. La estrella del alba*, Buenos Aires 1947; Pablo Vila San-Juan: *Papeles íntimos de Enrique Granados*, Barcelona 1966; Antonio Fernández-Cid/Joaquín Calvo Sotelo: *Granados*, Madrid 1956; Juan Llongueras: *De cómo conocí al maestro Enrique Granados*, in: id.: *Evocaciones y recuerdos de mi primera vida musical en Barcelona*, Barcelona 1944, pp. 108–118; Guillermo de Boladeres Ibern: *Estudio sobre la sonata "Patética" de Beethoven para piano*, Barcelona 1940; id.: *Estudio sobre la sonata de "Claro de luna" de Beethoven*, Barcelona 1936; id.: *Enrique Granados. Recuerdos de su vida y estudio crítico de su obra por su antiguo discípulo*, Barcelona [1917].

7 Enrique Granados: *Método teórico práctico para el uso de los pedales del piano*, Barcelona 1905; id.: *Integral para piano*; id.: *El pedal. Método teórico práctico*, Barcelona 1911; id.: *Reglas para [el] uso de los pedales del piano. Nuevo método corregido y aumentado*, Barcelona [ca 1913].

to appreciate many of the features of past performing styles that were transmitted aurally and taken for granted.”<sup>8</sup>

The performance style of individual pianists is shaped by their circumstances. Teachers pass on a legacy that cannot be described only in words, but in sound. Leech-Wilkinson states that teachers are crucial, as they pass on techniques inherited from their own teachers that were accepted in the musical context of their generation. And he goes on to point out that advanced students will choose their teachers according to their own stylistic affinities. In this sense, the teachings of the great pianists of any era will faithfully transmit the traditional style in which they have themselves been raised.<sup>9</sup> However, other authors believe that it is not possible to trace the influence of a particular teacher on a student, because “if everyone played as he was taught, musical style would never change at all. Pupils play not as their teachers did, but as their reactions to their teachers (imitative, rebellious, progressive, myriad), and to their musical environments, dictate. And they do not play in the style that was current when they were trained, but rather in the style that was being developed among the twenty-year-olds when they were trained.”<sup>10</sup>

Granados himself offers us such an example, for he reacted against his own teacher, Joan Baptista Pujol (1835–1898). Pujol’s students have often described him as a devoted and loving teacher who cared deeply for his students, but he also had an authoritarian personality. Granados writes in his memoirs: “We pupils admired him for a long time and we defended his theories with passion. He knew how to make a big impression and how to assert his authority. He didn’t let us have our own opinions; rather, he imposed his own. For quite some years now, I have not been in accordance with this method of proceeding. In my own teaching I have tried not to impose my own personality on my students, especially those who already show genuine and defined character traits.”<sup>11</sup> However, this reaction by Granados against Pujol seems to be more related to his methodology than to the content of his teaching.

- 8 Neal Peres Da Costa: *Off the Record. Performing Practices in Romantic Piano Playing*, Oxford 2012, p. xxvii.
- 9 Daniel Leech-Wilkinson: *Recording and Histories of Performance Style*, in: *The Cambridge Companion to Recorded Music*, ed. by Nicholas Cook, Eric Clarke, Daniel Leech-Wilkinson and John Rink, Cambridge 2009, pp. 246–262, here pp. 248 and 256.
- 10 Will Crutchfield: *Brahms, by Those Who Knew Him*, in: *Opus. The Classical Music Magazine* 2 (1986), No. 5, pp. 12–21, here p. 14.
- 11 “Sus alumnos le admiramos durante mucho tiempo y lo defendimos con ardor. Se supo dar importancia. Hacía valer su autoridad. No nos permitía tener criterio; nos imponía el suyo. Yo no he estado conforme con este modo de proceder desde hace ya bastantes años. He procurado no imponer mi personalidad a discípulos que han presentado caracteres y rasgos de algo propio y definido.” Vila San-Juan: *Papeles íntimos de Enrique Granados*, p. 57; English translation by the present author.

Pujol was considered the father of the Catalan Piano School. He was highly regarded for his pianistic virtuosity and pedagogical approach, training over a generation of pianists including Carles Vidiella (1856–1915), Joaquim Malats (1872–1912), Isaac Albéniz (1860–1909), Ricardo Viñes (1875–1943) and Frederic Lliurat (1876–1956). Lliurat also studied under Granados, as did Paquita Madriguera<sup>12</sup> (1900–1965), Guillermo de Boladeres, Juan Llongueras (1880–1953), Conchita Badia (1897–1975) and Frank Marshall (1883–1959). Marshall suffered from stage-fright and had to quit his career as a concert pianist. But he was highly esteemed by Granados and subsequently became his assistant at the academy. Marshall soon became a distinguished pedagogue and continued Granados's legacy at the Granados Academy, where he taught Mercedes Roldós,<sup>13</sup> Rosa Sabater (1929–1983) and Alicia de Larrocha (1923–2009). Marshall also taught Albert Attenelle, Carlota Garriga and María Teresa Monteys, all of them born in the same year, 1937. Today, Attenelle is still giving recitals in his eighties. His recent recording of *Goyescas* is a jewel of the CD catalogue,<sup>14</sup> and his concerts offer us a living connection to the old Catalan school of pianism.

Marshall's last three students participated in the present writer's research through numerous meetings held between 2012 and 2015, during which they shared insights into their instruction under Granados's former pupil. During these meetings we listened to certain performances by Granados, discussed them and reflected on their style and art of interpretation. This was followed by practical sessions in which the pianists themselves put their thoughts and word into music.

These testimonials by Granados's direct followers and students were then examined carefully with regard to their different approaches to his piano works and the personal musical gestures that characterised their individual artistic personalities. Although their pianistic styles differed dramatically, they nevertheless all seemed to possess an equal degree of authenticity. I felt from this experience that assuming that only one voice could be authentic would not be the right approach to studying this pianistic tradition.

We also examined the original instrument used by Granados, a 1911 Pleyel grand piano, which is located in the Sala Llevant of the Biblioteca de Catalunya.<sup>15</sup> This was

12 Of all his students, Granados seems to have the greatest fondness for Madriguera – an internationally acclaimed pianist and composer at only 16, who gave up her career when she married; see Madriguera: *Visto y oído*, p. 31.

13 Her exact years of birth and death remain unknown.

14 Albert Attenelle: *Enric Granados. Goyescas o Los majos enamorados* [CD], 2016, Columna Musica.

15 This piano was a gift from Ignaz Pleyel to Granados on the occasion of his concerts at the Salle Pleyel in Paris in April 1911. There are two handwritten signatures inside the piano. One of them reads: "Avec admiration, Enrique Granados, Y. Pleyel, 5 avril 1911." However, its authenticity is not certain. The

invaluable, as we were able to explore the morphology of the instrument, including the response of the mechanism and the full range of its sonorities. The mechanism of this piano is rather slow in comparison to a modern instrument. However, the light touch of the keyboard, the fullness of its tone and its colourful harmonic resonance together produce a unique sound in which melodic lines ‘sing’ with an incredible richness. The resultant sound is very different from that of a modern instrument.<sup>16</sup> Playing original instruments assists us to understand their sonority and acoustic response, which in turn helps us to understand better the written sources (id est the original manuscripts). Emulating Granados’s recordings on his original instrument can also help us to understand his stylistic gestures from a performer’s point of view.

Several interesting examples already exist of early recordings being recreated by professional performers such as David Milsom,<sup>17</sup> Neal Peres Da Costa<sup>18</sup> and Sigurd Slåttembrekk.<sup>19</sup> The purpose of this type of research is to find new ways of making interpretative choices. Nicholas Cook states that “the Elvis impersonation approach” is a valuable research method that can only be carried out by professional performer-scholars.<sup>20</sup>

After trying to emulate Granados’s piano works on his original instrument, assisted by the testimony of Marshall’s students, it was clear that Granados’s recordings might be perceived in a different way. His musical gestures not only help us to make well-informed performance choices, but can also unveil musical elements not found in the score. It can also be worthwhile to explore recordings by his students, because he sometimes gave them instructions that diverged from the printed score. When giving concerts in and around New York in 1916, and after recording piano rolls for Aeolian, Paquita Madriguera received heavy criticism for playing differently from the printed score – and urged Granados (who was also in New York at the time) to plan a revised edition of his *Danzas*

second signature is written by Granados’s daughter and is in the harp of the piano. This is a genuine signature that reads “Natalia Granados, París, 9 de novembre de 1911”.

- 16 On 9 July 2014, I made a recording of Granados’s *Allegro de concierto* on the Pleyel concert grand piano that had belonged to Granados, held today by the Biblioteca de Catalunya. My performance was informed by listening to a recording by Paquita Madriguera, a pupil of Granados (Duo-Art roll No. 5830), which was made while both she and Granados were in New York. See [www.youtube.com/watch?v=kPxNZmT4mnk](http://www.youtube.com/watch?v=kPxNZmT4mnk) (accessed 4 January 2019).
- 17 See [www.leeds.ac.uk/music/dm-ahrc](http://www.leeds.ac.uk/music/dm-ahrc) (accessed 31 March 2018).
- 18 David Milsom/Neal Peres Da Costa: Expressiveness in Historical Perspective. Nineteenth-Century Ideals and Practices, in: *Expressiveness in Music Performance. Empirical Approaches Across Styles and Cultures*, ed. by Dorottya Fabian, Renee Timmers and Emery Schubert, Oxford 2014, pp. 80–97.
- 19 See *Chasing the Butterfly*, [www.chasingthebutterfly.no/?p=25](http://www.chasingthebutterfly.no/?p=25) (accessed 4 January 2019). This project led to an audio CD of the same name (Simax PSC1299).
- 20 Nicholas Cook, e-mail to the author, 22 March 2018.

españolas on his return to Barcelona.<sup>21</sup> Because Granados died during the journey home, no new version was ever published. So her recordings of Granados's music reveal changes to the score that were unknown to the next generations of pianists. For example, Attenelle remarked that Granados's *Allegro de concierto* was very popular among the students at the Marshall Academy, but he had never previously heard the deviations from the score as performed by Madriguera on her recording (Duo-Art roll No. 5830). Perhaps Granados's sudden death prevented him from telling Marshall of the modifications he had made to the work, which meant that he did not pass on this knowledge to his students except for Madriguera.

**Issues with analysing historical recordings** In recent years, musicological studies have pointed out the complexity of extracting musical parameters by just listening to a recording. In his book *Beyond the Score*, Nicholas Cook considers visual representations and tempo graphs as ways of supporting unaided listening in the same manner that a score functions as guidance, "making it easier to talk about music with precision".<sup>22</sup> The concept of augmented listening also appears in the writings of Jordi Roquer, who refers to the use of a 'visual zoom' for examining particular interpretative values in performances by Granados. For example, in his investigation of Granados's performance of his arrangement of *Pièce de Scarlatti* in B-flat major, κ. 190, Roquer observed subtle deviations in the repetition of a musical section when visualising graphic representations of the sound with the sonogram. The slight fluctuations between repetitions could easily escape our attention if we only used traditional listening methods.<sup>23</sup> When analysing performances, musicologists would thus do well to complement listening to the music with methods similar to those employed by pianists when practising – repeating passages, playing slowly, and investigating physical gestures and fingerings in almost microscopic detail.

One factor that could compromise any analysis of sound recordings on piano rolls is the fact that the production process was different for each recording label, being subject to their individual policies and their sound engineers' personal approach. So listening to different editions of the same roll might be highly disorientating when analysing the performance parameters of a particular pianist. For example, the listener might have great difficulty discerning specific notes and chords in the bass line of recordings if there is an excessive use of a reverberation effect. The tempo, dynamics, articulation and clarity of

21 See below and Madriguera: *Visto y oído*, pp. 31f.

22 Nicholas Cook: *Beyond the Score. Music as Performance*, Oxford 2013, p. 143.

23 Jordi Roquer González: *Els sons del paper perforat. Aproximacions multidisciplinàries al fenomen de la pianola*, PhD thesis, Barcelona 2017, pp. 271f., see [www.tdx.cat/handle/10803/405411](http://www.tdx.cat/handle/10803/405411) (accessed 7 January 2019).

sound might also be greatly compromised from one label to another. Most sound engineers probably determine the musical parameters of their work according to their own individual tastes, without employing historically appropriate methods. This naturally has an impact on the sound, tempo, phrasing and other nuances of the performance. Piano rolls also need to be played on the appropriate reproducing piano, which ought to be kept in prime condition. For all these reasons, piano roll recordings might not always be a reliable documentary source for historical performances, and listening to them can be a confusing, frustrating experience.

**Piano rolls as historical sources** “Musicologists tend to be on the one hand insufficiently critical of sound recordings, not appreciating the limitations in what can be deduced from them about past performance culture, but on the other hand over-critical of piano rolls, dismissing them as intrinsically unreliable. In both cases the basic problem is ignorance.”<sup>24</sup>

In the last decades of the 20<sup>th</sup> century, catalogues of piano roll recordings were compiled for the Ampico, Duo-Art, Welte-Mignon, Duca and Hupfeld systems.<sup>25</sup> At present, academics are showing a greater interest in piano rolls as a source for gaining insights into performance, as they potentially offer a greater degree of accuracy than acoustic recordings. The first graphic representation of digitalised images of Spanish music from a piano-roll scanner is found in Anatole Leikin’s study of Granados’s Duo-Art piano-roll performance of his *Danza española* No. 5. As Leikin writes, “direct transcriptions of piano-roll perforations may be more reliable than some latter-day piano-roll disc releases.”<sup>26</sup>

Over recent decades, interest in piano rolls has increased, and scholars have published numerous articles about their significance in analysing historical performances and in investigating the stylistic evolution of interpretation over time.<sup>27</sup> This field of

<sup>24</sup> Cook: *Beyond the Score*, p. 58.

<sup>25</sup> See Charles Davis Smith/Richard James Howe: *The Welte-Mignon. Its Music and Musicians. Complete Catalogue of Welte-Mignon Reproducing Piano Recordings 1905–1932. Historical Overview of Companies and Individuals. Biographical Essays on the Recording Artists and Composers*, Vestal, NY 1994; Richard James Howe: *The Ampico Reproducing Piano*, Saint Paul, MN 1987; Elaine Obenchain: *The Complete Catalog of Ampico Reproducing Piano Rolls*, New York 1977; Larry Sitsky: *The Classical Reproducing Piano Roll. A Catalogue-Index*, New York 1990; Charles Davis Smith: *Duo-Art Piano Music. A Complete Classified Catalog of Music Recorded for the Duo-Art Reproducing Piano*, Monrovia, CA 1987.

<sup>26</sup> Anatole Leikin: *Piano-Roll Recordings of Enrique Granados. A Study of a Transcription of the Composer’s Performance*, in: *Journal of Musicological Research* 21 (2002), Nos. 1/2, pp. 3–19, here p. 6.

<sup>27</sup> See Peter Phillips: *Piano Rolls and Contemporary Player Pianos. The Catalogues, Technologies, Archiving and Accessibility*, PhD thesis, University of Sydney 2016, <https://ses.library.usyd.edu.au/bitstream/2123/16939/1/Piano%20Rolls.pdf> (accessed 3 January 2019); Carolina Estrada Bascuñana: *Granados’ Secrets*

research has also triggered scholarly interest at universities, prompting sound engineers and enthusiasts all over the world to develop new means of conserving piano rolls and making them accessible to other researchers and musicians through digitalising the data in them. Stanford University, for example, has built an imaging system based on a design by British software engineer Anthony Robinson.<sup>28</sup> In Europe, only three universities have optical scanners for this: the University of Pavia, the Autonomous University of Barcelona and the Bern University of the Arts in partnership with the Department of Engineering and Information Technology of the Bern University of Applied Sciences. In Australia, Peter Phillips has developed the first pneumatic roll reader that reads roll data as it is read by a reproducing piano. Phillips's doctoral dissertation offers the first-ever discussion of optical and pneumatic technologies and methods for archiving piano rolls.<sup>29</sup>

**Granados the recording artist** New technological developments in the recording industry also attracted the attention of Granados at the time. He was a very active recording artist, recording 17 of his works with various companies and reproducing systems between 1912 and 1916, including 78 rpm discs and piano rolls.

These seventeen works are captured on 38 piano rolls and four acoustic recordings (Odeon 78 rpm discs). Ten recordings are on Hupfeld rolls (transferred to Phonola, DEA, Animatic and Triphonola), nine are on Pleyela rolls and nine on Welte-Mignon. These recordings were made in circa 1912. Granados's final recordings, made in 1915 and 1916, are found on ten Duo-Art rolls (see Table 1).

This paper will examine Granados's Welte-Mignon, Duo-Art and Hupfeld piano-roll recordings as well as his four Odeon acoustic recordings. Authoritative texts such as the Boileau edition have claimed that Granados's Welte-Mignon and Duo-Art rolls are his only authentic piano roll recordings, whereas Pleyela and Hupfeld "might have been

Revealed by His Piano Rolls, in: *Enrique Granados in Context. The Spanish Piano School and Pre-War Artistic Movements*, ed. by Luisa Morales, Michael Christoforidis and Walter Clark (Spanish Keyboard Music Series, Vol. 6) (in press); Carolina Estrada Bascañana: *New Approaches to Enrique Granados Pedagogical Methods and Pianistic Tradition. A Case of Study of Valses Poéticos op. 43*, in: *Diagonal 2* (2017), No. 1, pp. 120–135; Manuel Bärtsch: *Musik. "Handwerkslehren", Allegorie, wirkungsintentionales Design*, in: *Handbuch der Medienrhetorik*, ed. by Arne Scheuermann and Francesca Vidal, Berlin/Boston 2017, pp. 109–130; Peres Da Costa: *Off the Record*; Christoph E. Hänggi: *Wie von Geisterhand. Aus Seewen in die Welt. 100 Jahre Welte-Philharmonie-Orgel*, Seewen 2011; Gustavo Colmenares/René Escalante/Juan F. Sans/Rina Surós: *Computational Modeling of Reproducing-Piano Rolls*, in: *Computer Music Journal 35* (2011), No. 1, pp. 58–75; Cook: *Beyond the Score*.

28 <http://library.stanford.edu/blogs/stanford-libraries-blog/2017/04/piano-roll-scanner-update> (updated 10 April 2017, accessed 8 January 2019).

29 Phillips: *Piano Rolls and Contemporary Player Pianos*.



TABLE 1 Catalogue numbers of all piano roll and acoustic recordings made by Granados between 1912 and 1916

Title	Acoustic Recordings	Piano Roll Recordings					Pleyela c. 1912	Aeolian Duo-Art 1916
		Welte-Mig- non c. 1912	Phonola	Hupfeld c. 1912				
	Odeon 78 rpm c. 1912			DEA	Animatic	Triphonola		
Valses Poéticos		2781	14804	28419	51125a 51125b	T51125a (11) T51125b (13)		
Pièce en si b Scarlati-Granados:	68671 matrix xs 1509	2782	14802	28422	55611			
Goyescas:								
Los requiebros		2783	14795	28420	51118		5357	
El coloquio en la reja		2784	14796	28415	51119			
El fandango de candil		2785	14797	28423	51120	T51120 (24)		
Quejas, o La maja y el ruiseñor		2786	14798	28418	51121		6542	5763
El pelele	68651 matrix xs 1511						8245	5762
Allegro de concierto							5325	
Danza española No. 2							5514	5757
Danza española No. 5		2780	14799	28412	51122		5513	5758
Danza española No. 7	68649 matrix xs 1508	2779	14800	28416	51123		5505	5760
Danza española No. 10	68650 matrix xs 1510	2778	14801	28417	51124			5759
Prelude sur une Copla Murciana			14803	28421	55981			6429*
Rêverie (Improvisation)								5756
Danza op. 37, No. 1							5931	6133
Improvisation (Theme of Valenciana Jota, with an influence of southern Arab music)								6295
Sardana Clarga [larga]							8246	

\* Published as "Prelude from the Opera María del Carmen".

produced from a printed score rather than from actual performances."<sup>30</sup> A large number of recordings by Granados were therefore discarded when making the Boileau edition. However, one of the ground-breaking aspects of the present investigation is that we have established that Granados's Hupfeld piano rolls are genuine renditions of his playing,

30 See Granados: *Integral para piano*, Vol. 18, pp. 64 f.

of equal significance to his Welte and Duo-Art rolls. When studying the piano rolls of *Valses poéticos*, I found much evidence

“to conclude that the Hupfeld piano rolls [...] are original recordings performed by Granados. First of all a great number of musical elements in those recordings are not found in any original manuscript or printed score, making it unlikely that the rolls were taken from a printed source. Secondly, the many differences between the Welte and Hupfeld rolls make it unlikely that the Hupfeld rolls are remastered from the Welte rolls. Finally, *Valses poéticos* only appear in the catalogues of Welte and Hupfeld, leading one to conclude that they could not have been remastered by any other system.”<sup>31</sup>

There is also evidence that Granados presented his *Goyescas* in Leipzig, as was reported by various Spanish newspapers including *El Globo*, *El Liberal*, *La Época* in Madrid, *La Veu de Catalunya* in Barcelona and *La Región* in Palma de Mallorca, published on 10–12 August 1912. These newspapers refer to an article published by the *Leipziger Tageblatt* in which Granados is described as a musician of excellent taste.<sup>32</sup> The Hupfeld studios were located in Leipzig, one of the main commercial and musical centres of early 20<sup>th</sup>-century Germany, and it is possible that Granados would have made his Hupfeld recordings there. Furthermore, a text signed by Granados ostensibly on 12 July 1912 in Leipzig proves that he was in contact with the Hupfeld company there. In it, Granados praises the Hupfeld Phonola as “superior to all instruments of personal interpretation that I have heard.”<sup>33</sup> It is in fact surprising that Granados praised the Phonola system, since it was less advanced than the Hupfeld Animatic system in use in 1912, so we must consider the possibility that Granados was actually paid to do so.

- 31 Carolina Estrada Bascuñana: *Echoes of the Master. A Multi-Dimensional Mapping of Enrique Granados' Pedagogical Method and Pianistic Tradition*, PhD thesis, University of Sydney 2016, pp. 31 f., <https://ses.library.usyd.edu.au/handle/2123/14399> (accessed 23 March 2018).
- 32 According to the translation in *El Globo*: “En la música de carácter español, como en la de carácter portugués, pierden algo su expresión sentimental aquellas partes donde no impera el ritmo y el color, resistiéndose en esos momentos la meticulosidad de su trabajo. Pero [...] debemos hacer constar su timbre dulce y melódico; su riqueza de color, su envoltura brillantísima [...]. El maestro Granados es [...] un músico de exquisito gusto, sin blanduras ni elasticidades, sin la violencia de temperamento que creíamos natural en un español.” *Correspondencia epistolar (1892–1916) de Enrique Granados*, ed. by Miriam Perandones, Barcelona 2016, p. 383.
- 33 Handwritten text from Enrique Granados. It reads: “I consider ‘Phonola’ as a wonder and I find it superior to all the instruments of personal interpretation that I have heard. The great advantage consists in the use of impressed rolls by the artists. E. Granados (Barcelona) Leipzig 12 July 1912” – “Considero la ‘Phonola’ como una maravilla y la encuentro superior a todos los instrumentos de interpretación personal que he oído. La gran ventaja consiste en el empleo de los rollos impresionados por los artistas. E. Granados (Barcelona) Leipzig 12 Julio 1912”. Translation into English by the present writer, and with special thanks to Marc Widuch, who provided the author with a scanned image of this letter from the Staatsarchiv Leipzig.

Robert Frömsdorf invented the Phonola in 1902. This was a 72-note piano driven by a foot pedal, in which the melodic line had a better defined singing quality thanks to the separation of the bass and treble between *f* and *f*<sup>#</sup> above middle *c*. The Phonoliszt, DEA and Animatic systems were introduced in 1905, 1907 and 1912 respectively.

“The Phonola was foot-pedalled, and so there was no automatic dynamic coding on Phonola rolls, but the Phonoliszt had three levels of loudness, and it was theoretically possible to capture at least something of a pianist’s dynamic shading. When the Dea was introduced in late 1907, its six dynamic levels neatly doubled those of the Phonoliszt, and its mechanism provided variable crescendos and decrescendos in addition.”<sup>34</sup>

Hupfeld introduced the Animatic system in 1912, enlarging the scale to 88 notes and generally conforming to the standards established in the US in 1908. These rolls also include perforations for the sustaining pedal. The first Phonola roll catalogues were published in 1912. Since Granados does not appear there, this could suggest that he did not record for Hupfeld before that year. In later years, Granados is listed on Hupfeld’s various music rolls, in the Phonola, DEA and Animatic catalogues. He also appears in the Triphonola catalogues, a system in use from 1920, four years after Granados’s death. According to Rex Lawson, Hupfeld would record pianists on master rolls that were used for various types of player pianos that they manufactured. Thus Granados did not record for Phonola, DEA or Animatic, but simply for Hupfeld, and the recordings in question were then adapted to the different systems.<sup>35</sup> The Hupfeld studios were located close to the Popper Salon, where the Welte rolls were produced, and this could suggest that Granados made his Welte and Hupfeld recordings during one and the same visit to Leipzig, since he recorded the same works for both firms in around the same year. However, according to Lawson, it is unlikely that Granados would have made his Welte recordings there, since Welte only recorded in Leipzig between January 1905 and April 1906.<sup>36</sup> Until 1909, Welte made its recordings in Freiburg im Breisgau, after which the recording system was taken to London, then to Russia in 1910 and in 1912 to Paris. Several letters exist, suggesting that Granados not only visited Paris that same year, but also was in contact with the Welte-Mignon company.<sup>37</sup>

Most of the works that Granados recorded on Hupfeld and Welte rolls were performed in his programme at the Barcelona Palau de la Música on 11 March 1911, including

34 [www.pianola.org/reproducing/reproducing\\_dea.cfm](http://www.pianola.org/reproducing/reproducing_dea.cfm) (accessed 31 March 2018).

35 Rex Lawson, personal communication with the author, March 2018.

36 Rex Lawson, personal communication with the author, March 2018.

37 “Paris, le 18 Juillet 1912 / Mon cher ami, / Je vous envoie sous ce pli quelques lettres arrivées [sic] pour vous depuis votre départ ainsi qu’un chèque de Sept. cent trente sept pesetas, pour le complément de votre cachet.” Letter from Édouard Moullé – Steinway & Sons and Welte-Mignon agent in Paris – to Granados; see *Correspondencia epistolar*, p. 375.

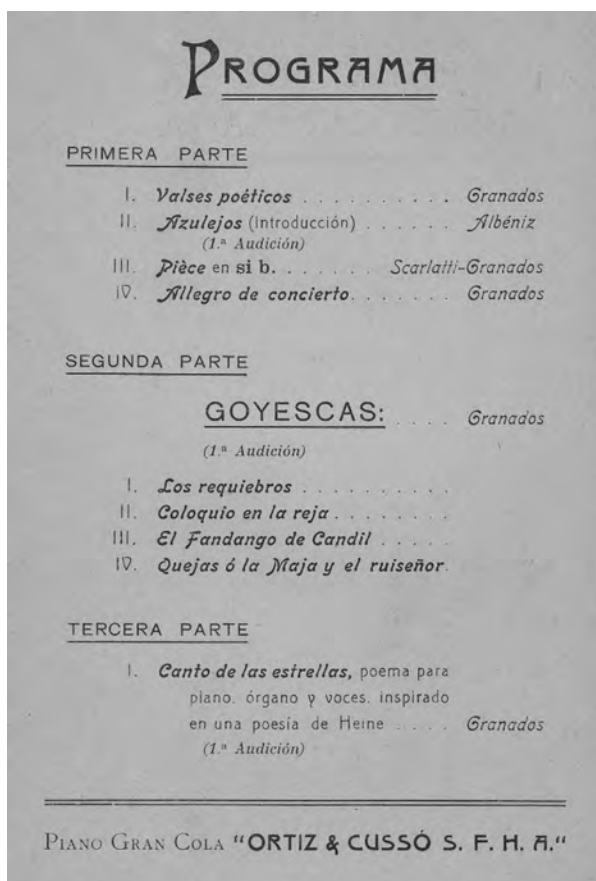


FIGURE 1 Programme for the concert held at Palau de la Música Catalana in Barcelona on 11 March 1911

the first book of *Goyescas*, *Valses poéticos*, the transcription of the Scarlatti Sonata in B-flat major K.190 and the *Danza española* No.7, which Granados played as an encore (see Figure 1). For both recording sessions he added the *Danzas españolas* No. 5 and No. 10; in the Hupfeld session alone, he also recorded the *Prelude sur une Copla Murciana*.

**Visualising Granados's pianism. A Performance Radiography** Following the personal recommendation of Nicholas Cook, I used graphic visualisations to create an environment of augmented listening to explore Granados's published recordings. The computer software Sonic Visualiser assisted us in this analysis, providing visual representations of the audio data. For my analysis of piano roll recordings, I refrained from using commercial sound recordings of the piano rolls for the reasons already given above. Instead, I chose an empirical approach based on an analysis of data transferred from the rolls to MIDI files with optical and pneumatic technologies. This analysis of Granados's performances was possible thanks to privileged access to high-quality reproducing systems that enabled me to listen to the piano rolls, and also to the assistance of two engineers and specialists in piano roll systems in extracting and analysing the data from the rolls, Jordi

Roquer and Peter Phillips. In Sydney, thanks to my collaboration with Phillips, I was also able to read the data from the MIDI files, produce graphs and transcribe the information into a legible score for pianists. Transcribing piano rolls makes original recordings visually accessible to piano students who are committed to historically informed performances. These transcriptions offer a way for performers and scholars to explore interpretative trends in performance.<sup>38</sup> The sources used for this investigation were MIDI files made by Phillips of all of Granados's Welte and Duo-Art recordings from the Denis Condon Collection of reproducing rolls, acquired by Stanford University in 2014. These performance files were produced with the pneumatic prototype roll reader developed by Phillips, and are an excellent resource for researchers. They can be visualised with computer software as well as played on any standard MIDI piano. Furthermore, roll scans of Hupfeld artist's rolls No. 51125ab<sup>39</sup> were made with the pianola roll digitiser owned by the Autonomous University of Barcelona at Museu de la Música de Barcelona. These Hupfeld rolls are held at the Biblioteca de Catalunya.<sup>40</sup> This collection holds five recordings by Granados, including rolls Nos. 22119, 55121, 51125ab and 55981. Although they are all Animatic versions, only rolls 51125a and 55981 have "Animatic" stamped on the roll.

The possibility of comparing performances of the same work played by the same pianist for different roll brands can help answer questions about technical aspects of the different roll recording systems.<sup>41</sup> This can also shed light on consistencies between different interpretations within Granados's recordings that have not previously been commented on in this field of research. There are not many musicologists exploring performance practice through analyses of piano rolls, though they tend to agree on the lack of information on the rolls regarding musical elements such as dynamic nuances,

38 Estrada Bascuñana: *Granados' Secrets Revealed by His Piano Rolls*.

39 The Hupfeld Animatic version of this work is cut into two rolls (51125a and 51125b) and can be found at Biblioteca de Catalunya.

40 Daniel Blanxart Pedrals (1884–1965) donated to Biblioteca de Catalunya (BC) a collection of more than 4000 recordings including 78 rpm discs and piano rolls. In his collection there were 43 Hupfeld artist's rolls recorded by composers and pianists from the beginning of the 20<sup>th</sup> century such as Granados, Vilalta, Fauré, Backhaus, D'Albert, Landowska, R. Strauss, Busoni and Planté. In 2015, the BC payed tribute to Blanxart and presented an exposition about his generous donation; see [www.bnc.cat/Exposicions/Daniel-Blanxart-la-passio-per-la-musica](http://www.bnc.cat/Exposicions/Daniel-Blanxart-la-passio-per-la-musica) (accessed 8 January 2019).

41 During my doctoral studies at the Sydney Conservatorium of Music I examined Granados's recording of *Valses poéticos* on Hupfeld and Welte-Mignon rolls. The opportunity to analyse both rolls offered a rare means of comparison, and to my surprise I noticed a considerable number of consistencies between both recordings. Granados's Hupfeld piano roll recordings were analysed for the first time, proving the reliability of this source that had long remained unrecognised by musicologists. My thesis included much research within this area of expertise, revealing previously undocumented sources; see Bascuñana: *Echoes of the Master*.

tone colours, chord voicings, touch and pedalling. Anatole Leikin laments that the “most painful loss during the music-roll recording concerned a critical feature of piano performance – the pianist’s touch”, id est the parameter that demonstrates the artistic sensitivity of every pianist.<sup>42</sup> As previously mentioned, musicologists have often been over-critical about piano roll recordings. This attitude is starting to change, and their positive impact on the study of performance practice is now being discussed in the works of contemporary scholars. Peres Da Costa explores expressive practices such as dislocation, non-notated chordal arpeggios, rhythmic alteration and tempo modification. He claims that acoustic piano recordings and reproducing piano rolls “provide an all-important window into the last hundred years or so.”<sup>43</sup> Likewise, the criticism expressed by Charles Rosen<sup>44</sup> is seen by Cook as the wrong attitude to take when examining historical performance practices captured on piano rolls. Cook recommends that piano rolls should not be listened to in the manner of listening to a CD, but rather should be examined analytically, extracting what is reliable, and discarding what is not.<sup>45</sup>

It has often been assumed that the recordings made by Granados were rather frivolous and spontaneous. This is why most professional pianists are sceptical about accepting his interpretations as valid models; often, they do not even bother to listen to them. The excessive freedom of Granados’s performances was a topic of discussion during our numerous sessions with the last inheritors of his legacy. At first, the three pianists were reluctant to recommend Granados’s recordings as an example for new generations of pianists to follow. They all believed that many musical gestures in his playing were the spontaneous creations of an extraordinary artist. In this sense, they believed that the improvisatory style of his recordings should be taken as a testimony of his genius, not as a model for imitation. However, the results of a comparison between the two different versions of the same piece recorded on Hupfeld and Welte-Mignon rolls revealed surprising consistencies in his playing, even though some of these consistencies between recordings were not present in his manuscripts or published editions. Since these recordings were made after the scores had been published, they can be seen as part of Granados’s creative process and thus integral to his legacy. These piano rolls could be considered as Granados’s last testament – a kind of recorded “manuscript”. The three pianists I interviewed supported this idea, and were certain that the roll recordings had to be taken very seriously. Some of the elements explored in this study relate to issues of tempo, the starting and ending times of notes, dynamics and pedalling.

42 Anatole Leikin: *The Performing Style of Alexander Scriabin*, Farnham 2011, p. 15.

43 Peres Da Costa: *Off the Record*, p. 40.

44 Charles Rosen: *Piano Notes. The Hidden World of the Pianist*, London 2003, p. 147.

45 Cook: *Beyond the Score*, p. 60.

Issues related to tempo Investigating the tempo of Granados's recordings on reproducing piano rolls is far more complex due to mechanical issues and certain unanswered questions. Welte-Mignon rolls generally indicate a roll tempo with a tempo scale of 'Slow', 'Normal' and 'Fast', with no numerical values. While the normal paper speed – according to Phillips's calculations – is about three metres per minute, which means that the roll drive motor rotates at 120 rpm,<sup>46</sup> Denis Hall believes that the slower tempo rotates at two and a half metres per minute.<sup>47</sup> The rolls produced for the Duo-Art, Ampico, Welte Licensee<sup>48</sup> and Hupfeld instruments have differing paper speeds as marked on the roll.<sup>49</sup> Paper speed is not related to the tempo played by the pianist, but is instead set by engineers before making a roll recording, and it takes into account the rapidity of the playing while minimising the amount of paper needed. Rapid playing generally requires a higher paper speed than slow playing. In terms of paper and motor speed, the constant rotation of a take-up spool is similar in the Duo-Art, Ampico and Welte systems. According to Phillips, if the playback geometry in the reproducing piano matches that of the recording system, there will be no increase in musical tempo even though the paper speed will increase as the roll plays.<sup>50</sup>

Some recordings have a range of tempo possibilities for the playback stamped in the roll, leaving the choice of musical tempo to the user. This implies a significant diversion from the original speed of the roll in every playback. In this case, comparing other recordings with a different recording system could help us to define the tempo. For example, the Animatic version of *Valses poéticos* cut into two separated rolls (51125a<sup>51</sup> and 51125b<sup>52</sup>) has different speed markings stamped on each roll, suggesting a value of 50 for

46 Phillips: *Piano Rolls and Contemporary Player Pianos*, p. 113.

47 Denis Hall: *Piano Roll Speeds*, in: *The Pianola Journal*, No. 22 (2012), pp. 3–9, here p. 3.

48 The Welte Licensee Instrument was developed at the Auto Pneumatic Action Company in Poughkeepsie factory in the US during 1916. The actions produced in the US played standard size rolls, while those produced in Germany played original size rolls. In Europe, the Green Welte instrument was introduced in 1920. This instrument could play standard size rolls; see Phillips: *Piano Rolls and Contemporary Player Pianos*, pp. 20 f.

49 "A typical Welte-Mignon Licensee roll is 11¼ inches in width and holes spaced 9 per inch across, consisting of 98 channels of punched holes". Zhengshan Shi/Kumaran Arul/Julius O. Smith: *Modeling and Digitizing Reproducing Piano Rolls*, in: *Proceedings of the 18th ISMIR Conference*, Suzhou, China, October 23–27, 2017, ed. by Sally Jo Conningham, Zhiyao Duan, Xiao Hu and Douglas Turnbull, [s.l.] 2017, pp. 197–203, here p. 198.

50 Phillips: *Piano Rolls and Contemporary Player Pianos*, pp. 60–63.

51 "Valses poétiques: No. 1–3 E. Granados S.G.INT. DE L'EDITION PHONOGRAPHIQUE 80 Rue Taitbout, Paris Animatic = Tempo 50".

52 "Valses poétiques: No. 4–7 e coda E. Granados". Although it does not say it is an artist roll, inside the roll can be read "Diese Rolle enthält mein persönliches Spiel" with the signature of Granados below. The Tempo given is 50–60.

roll No. 51125a and a value between 50 and 60 for roll No. 51125b.<sup>53</sup> When setting this value on the 88-note Apollo player piano from 1913<sup>54</sup> located at Sala Llevant in the Biblioteca de Catalunya, the tempo of the performance turns out to be exaggeratedly slow, suggesting that this value does not correspond to the standard measure in beats per minute, but to the motor driving the take-up spool in Hupfeld reproducing pianos. According to Lawson, the Hupfeld Meisterspiel DEA manual says: “Bei Einstellung des Tempohebels auf die Zahl 50 soll die Aufnahmewalze in der Minute 2 m Papier aufnehmen” (“when the tempo lever is set to the number 50, the pickup roller should take up two metres of paper per minute”). This measurement could match Phonola and Phonoliszt speeds, since the perforation sizes are the same. But this speed cannot be used for 88-note rolls such as Animatic or Triphonola rolls. In Lawson’s own experience, when trying to explore Hupfeld’s 88-note speeds he found that although there are rolls with identical perforation patterns, the sizes of the perforations are smaller on the 88-note rolls, suggesting that the paper speed has to be proportionally slower.<sup>55</sup>

Granados’s acoustic recordings can be used as a reference to determine the tempo of his piano rolls. I have used Sonic Visualiser to check that there was no pitch modification of the commercial transfer of the Odeon 78 rpm disc recording.<sup>56</sup> In some cases, pitch can alter the playing time of a recording; even half a semitone can dramatically affect the playing time. The acoustic recordings were made with a mechanism involving the use of a horn or trumpet to capture sound vibrations through a stylus. These are unedited recordings, and therefore present a ‘genuine’ performance by Granados. Time limitations imposed by Odeon might have had an impact on the tempo chosen by Granados during recording; in other words, he might have played more quickly so as to not exceed the recording time limitation of around three minutes of music. Of his four acoustic recordings, *Danza española* No. 10 is the longest, with a duration of 3’02”. Since *Danza española* Nos. 7 and 10 are also recorded on Welte and Duo-Art rolls, these might assist us in determining the tempo of the Hupfeld versions. The discrepancies are noticeable when we compare the piano rolls to the different acoustic recordings.

When we talk about exact durations for the Welte rolls, we have to come to terms with the above-mentioned uncertainty about the rolling speed. Nevertheless, the different

53 *Valses poéticos* appears as one roll in the Phonola (No. 14804), 1912 DEA (No. 28419), 1914 Animatic (No. 51125) and 1924 Hupfeld (No. 28419) catalogues. It appears as two separate rolls, No. 51125ab in the 1927 Animatic and Triphonola catalogues.

54 Model built by Melville Clark Co., Chicago, in 1913. In 2010, it was restored by Taller Parts Piano, Barcelona; see [www.bnc.cat/El-Blog-de-la-BC/La-pianola-de-la-Biblioteca-de-Catalunya](http://www.bnc.cat/El-Blog-de-la-BC/La-pianola-de-la-Biblioteca-de-Catalunya) (accessed 8 January 2019).

55 Rex Lawson, March 16, 2018, e-mail to the author.

56 *The Catalan Piano Tradition* [CD, with early 20<sup>th</sup> century recordings by Granados and others], 1992, VAI.



TABLE 2 Timing differences of five piano works performed by Granados on three different recording systems (one acoustic and two piano roll versions). The bpm indicate the tempo for the quarter note. Beware that while the tempo of the piano rolls might be adjusted slightly, the differences between the various recorded works in the two roll versions still seem remarkable.

Title	Acoustic Recordings	Piano roll recordings	
	Odeon	Welte-Mignon	Duo-Art
Quejas, o La maja y el ruiseñor	–	6'44"	6'22"
Danza española No. 5	–	3'49"	4'20"
Danza española No. 7	2'59"* (138 bpm)	4'28" (135 bpm)	5'01" (118 bpm)
Danza española No. 10	3'02"	3'42"	3'19"
Transcription of Scarlatti Sonata in B-flat major K.190	2'08" (80 bpm)	2'10" (70 bpm)	–

\* Bars 115–170 omitted.

roll types and the pieces recorded seem to show differences considerable enough to warrant further investigation here.

Although the time limitations of the recording process could have been why Granados performed this piece at a higher speed on the acoustic recording, his phrasing and tempi seem far more organised and logical than on the Duo-Art and Licensee versions. So it would perhaps be naive to assume that he played quicker, just to fit in the whole piece. It could be that the tempo markings on the Licensee and Duo-Art rolls are not accurate, or that the differences in notation between the three versions might have caused different timings. In *Danza española* No. 7, Granados solves the time limitation by omitting sections that are repeated (bars 115–170), resulting in a recording that lasts 2'59". Both the Duo-Art and Welte versions are performed without omissions. However, the Aeolian performance is significantly slower, by 33 seconds (Table 2). In all three versions there is a slight acceleration towards bar 11. The metronomic measurement of bars 1 to 11 shows a value of 118 bpm, 135 bpm and 138 bpm for a quarter note in the Duo-Art, Welte and Odeon recordings respectively. This means that the Welte and Odeon recordings have a similar tempo, and in turn suggests either that the tempo marking on the Duo-Art roll is incorrect, or that Granados changed his tempo there as a result of a compositional decision.

In order to determine the tempo of Granados's *Valses poéticos* on the Hupfeld rolls, I took as my reference the tempo of Welte roll No. 2781 from Phillips' MIDI file collection. This MIDI file is of a Licensee version of a Green Welte roll made by Richard Tonnesen (1940–2014) in the US, and is held in the Condon Collection at Stanford University.<sup>57</sup>

57 I am grateful to Peter Phillips for recording and sending me the sound files of the Welte-Mignon rolls of *Valses poéticos* (roll No. 2781) played by his Mark 4 Disklavier Pro on a c5 Yamaha piano.

Tonnesen designed a piano roll reader and a piano roll perforator that were well regarded among piano roll collectors and produced a large number of recut rolls until 1998, when he was diagnosed with Parkinson's disease. This recut Welte Licensee roll has a tempo marking of 80. Phillips is fairly certain that this tempo is correct, as it was derived from an original Green Welte roll, all of which have a tempo marking of 70. Nor had he found that any of Tonneson's recut rolls had a tempo different from the original rolls. The roll tempo of 80 gives a musical tempo of 115 bpm in the first eight bars of the Phillip's MIDI file as played on his Disklavier piano. This value was taken as a reference when setting the playing tempo for both Hupfeld rolls. At a value of 78 for both rolls, there are substantial divergences in the musical tempo between the rolls. The first four bars are played at a tempo of 130 bpm, thus 13% faster than in the Welte version, but the second Hupfeld roll plays much more slowly than the Welte recording. The coda is a partial repetition of "Vals melódico", so this could be taken as a reference point for us to compare musical tempi between the rolls.

According to Phillips, tempo in Welte recordings might assist in determining discrepancies with Duo-Art recordings, when there is no other available version.<sup>58</sup> In the case of *Quejas, o La maja y el ruiseñor*, although the tempo is similar in both recordings, the final timing in the Aeolian version is faster by 22 seconds. In *Danza española No. 5*, the Licensee roll plays a version that is faster by 29 seconds. However, the tempo is more regular and steadier than in the Duo-Art version. The accelerations and decelerations in the Duo-Art performance are greater than in the Licensee version, giving the impression that Granados played faster on the Aeolian recording. These tempo fluctuations can be visualised in Leikin's piano roll transcriptions of Duo-Art roll No. 5758 for bars 1–19 and 48–65.<sup>59</sup> Another example is found in the recording of Granados's transcription of the Scarlatti Sonata in B-flat major K. 190. Although Welte and Odeon recordings coincide in the overall time duration, the impression gained is that the Odeon recording is slightly faster.

MIDI files extracted from a roll scan do not give the accuracy needed to compare tempos.

"A scan of a roll requires the paper to move past the scanning element at a constant speed, and is generally much slower than the playing speed of the roll. There is really no way to determine the playing time of a MIDI file derived this way [...]. MIDI files derived from scans are mainly used to operate a perforator to produce copies of the roll."<sup>60</sup>

Listening to a high-quality instrument avoids the interference of mechanical issues when playing reproducing pianos.

58 Peter Phillips, personal communication with the author, March 2018.

59 Leikin: *Piano-Roll Recordings of Enrique Granados*, pp. 8–13.

60 Peter Phillips, e-mail to the author, 1 March 2018.

Phillip's MIDI performance files of Granados's Duo-Art and Welte-Mignon recordings are therefore the most reliable source for this type of analysis. Researchers at Stanford are starting to develop computer software in order to process roll scans and get results similar to the MIDI performance files created by Phillips.

Therefore, although the roll speed might not be reliable in most of the cases, the tempo fluctuations within the performance are relative to the roll speed, meaning that the time distances between the notes and the expressive gestures will be proportional to the speed of the roll. Nevertheless, not being able to define the correct musical tempo does not interfere in the performance analysis.

**Issues related to dynamics** One of the critical issues when exploring piano roll dynamics is related to external elements that influence the sound during a pianist's performance, namely the acoustic conditions of the instrument and the space it is in. This particularly influences rolls by pianists such as Granados who have a unique attitude towards sonority, and a distinctive artistic profile. Pianists react to the different morphologies of an instrument such that these dictate their performing gestures during the recording session. For example, a pianist might react differently depending on different mechanical aspects such as the speed and length of key depression, or the touch and feel of the piano action. Likewise, the surrounding space influences the reflections of sound that affect most performance decisions made while playing. In this sense, exploring the dynamic range on piano rolls could help us to approximate to the original performance, since it will never be possible to recreate the specific acoustic conditions in which the roll was recorded. Furthermore, the sonority will vary, depending on the tonal qualities of the instrument used for the playback, and on the space surrounding the instrument. The irregularities in reproducing systems due to poor maintenance or an incorrect choice of instrument could be avoided by playing MIDI files on the best available instrument, such as the Yamaha Disklavier. The dynamic values for every note can also be extracted using computer software, and the resultant visualisations can assist our listening during the playback.

Another issue is related to the degree of editing to which a roll recording might be subjected, with regard to coding and dynamics. Roll recording companies generally had musical editors who added this information manually, both during and after the recording. Welte had a means of recording the playing dynamics, and technicians converted the recorded dynamics into perforation coding. The people who worked on Welte roll recordings were not usually trained musicians, so one might justifiably argue that matters related to dynamics might be disassociated from the original musical gestures of the pianist. But according to Phillips, a new recording could be tested for accuracy by playing it through a *vorsetzer* at the recording piano and comparing the dynamic data recorded

on the new roll to that recorded by the pianist. In the case of Duo-Art, the dynamics were added by a producer sitting at a desk and turning two dials in accordance with the playing dynamics as the pianist was performing. Later, the pianist was invited to participate in the editing process (and in some cases was contractually obliged to do so). Furthermore, the Aeolian Company (the makers of Duo-Art) held special 'comparison' concerts where roll recordings were compared with the pianist's live playing.<sup>61</sup> Phillips points out that

"[r]egardless of the hyperbole surrounding these concerts, there is little doubt the piano rolls and the Duo-Art reproducing pianos acquitted themselves admirably, to the point where reviewers, whether sponsored or otherwise, spoke glowingly and sometimes with a sense of hushed awe."<sup>62</sup>

Welte is regarded as having had the means to record a pianist's dynamics, and pianists were not generally required to participate in the process of producing their own roll recordings. Although there are many theories about it, the actual Welte recording process remains unknown.

Statements from authors such as König,<sup>63</sup> claiming that dynamics in Welte recordings are not accurate, do not concur with the opinions of other musicologists such as Denis Hall or Peter Phillips. Phillips states that "[w]hen comparing sound recordings and Welte-Mignon roll recordings of the same work played by the same pianist, the similarities of the dynamics in both recordings are obvious."<sup>64</sup> Following on from this statement, when we compare the dynamics in Granados's *Danza española* No. 10 in the Welte-Mignon and Odeon acoustic versions, there is a similar dynamic pattern in both versions in bars 74–78. Granados also recorded this dance for Duo-Art, but the dynamics of the thematic notes are higher than those on the other recordings. This could be due to Duo-Art editors having increased the original dynamics manually, or there may be inaccuracies in the emulations of the MIDI files, or perhaps Granados simply played it that way on the day. The dynamics in Granados's Duo-Art recordings thus require cautious analysis. The visualisations of dynamic MIDI values, indicated as velocity levels (i.e. note dynamics) in the Cakewalk Pro Audio 8.00 computer software, show repeated patterns with the same dynamic range. In bars 74–78 of *Danza española* No. 10, most of the notes in the accompaniment show a velocity MIDI value of 49 (Figure 2c).

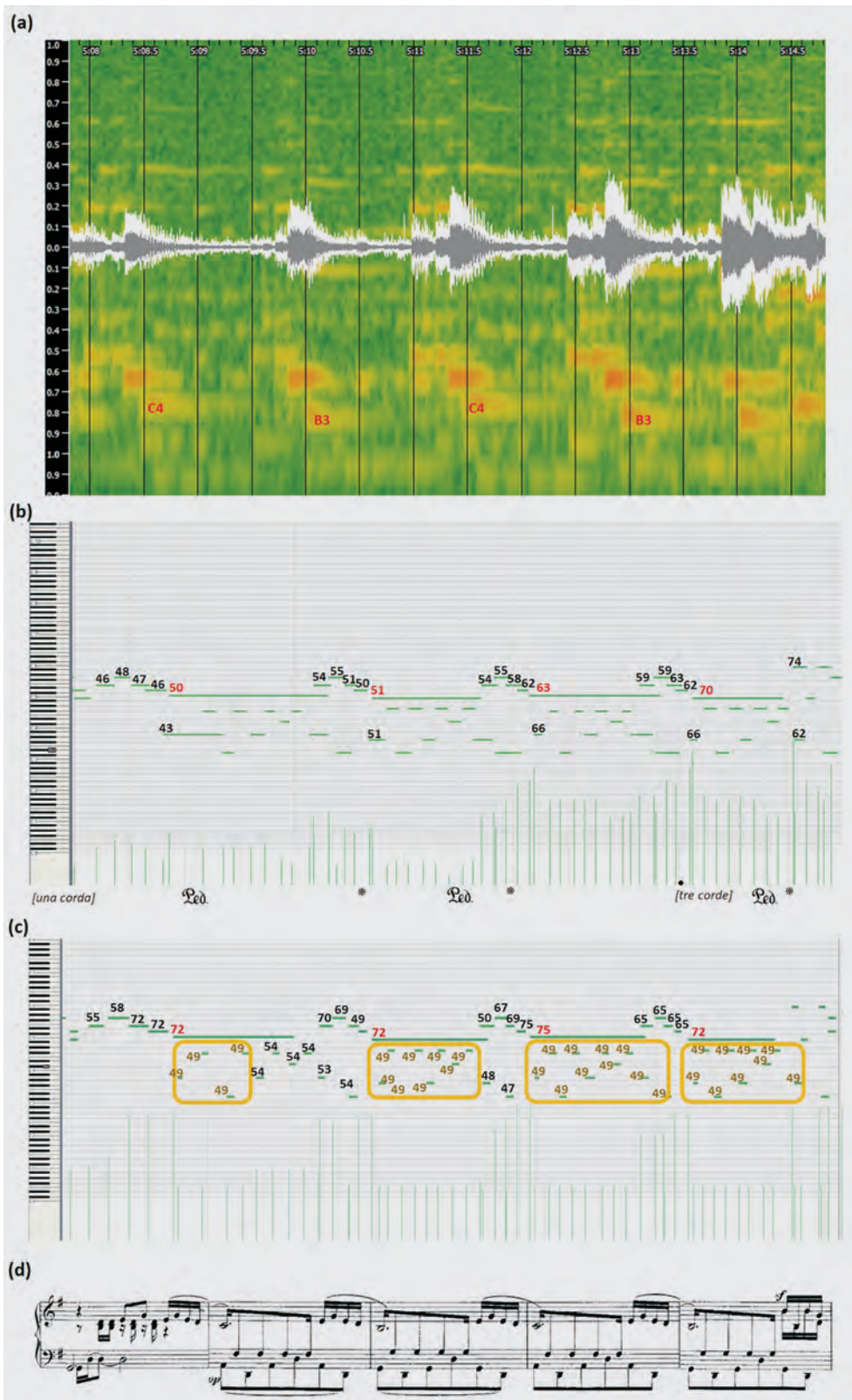
The dynamic values in the Welte-Mignon emulation seem reliable even when there is a different dynamic pattern, like in bars 12 and 13 of the *Danza española* No. 7 (see Figure 3). In the acoustic version, the spectrogram visualisations on Sonic Visualiser show

61 Peter Phillips, personal communications with the author between February and March 2018.

62 Phillips: *Piano Rolls and Contemporary Player Pianos*, pp. 158 f.

63 Werner König: *The Welte-Mignon Reproducing Piano and Its Place in the History of Music*, in: *The Pianola Journal* 18 (2007), pp. 52–62, especially pp. 52 f.

64 Phillips: *Piano Rolls and Contemporary Player Pianos*, p. 117.



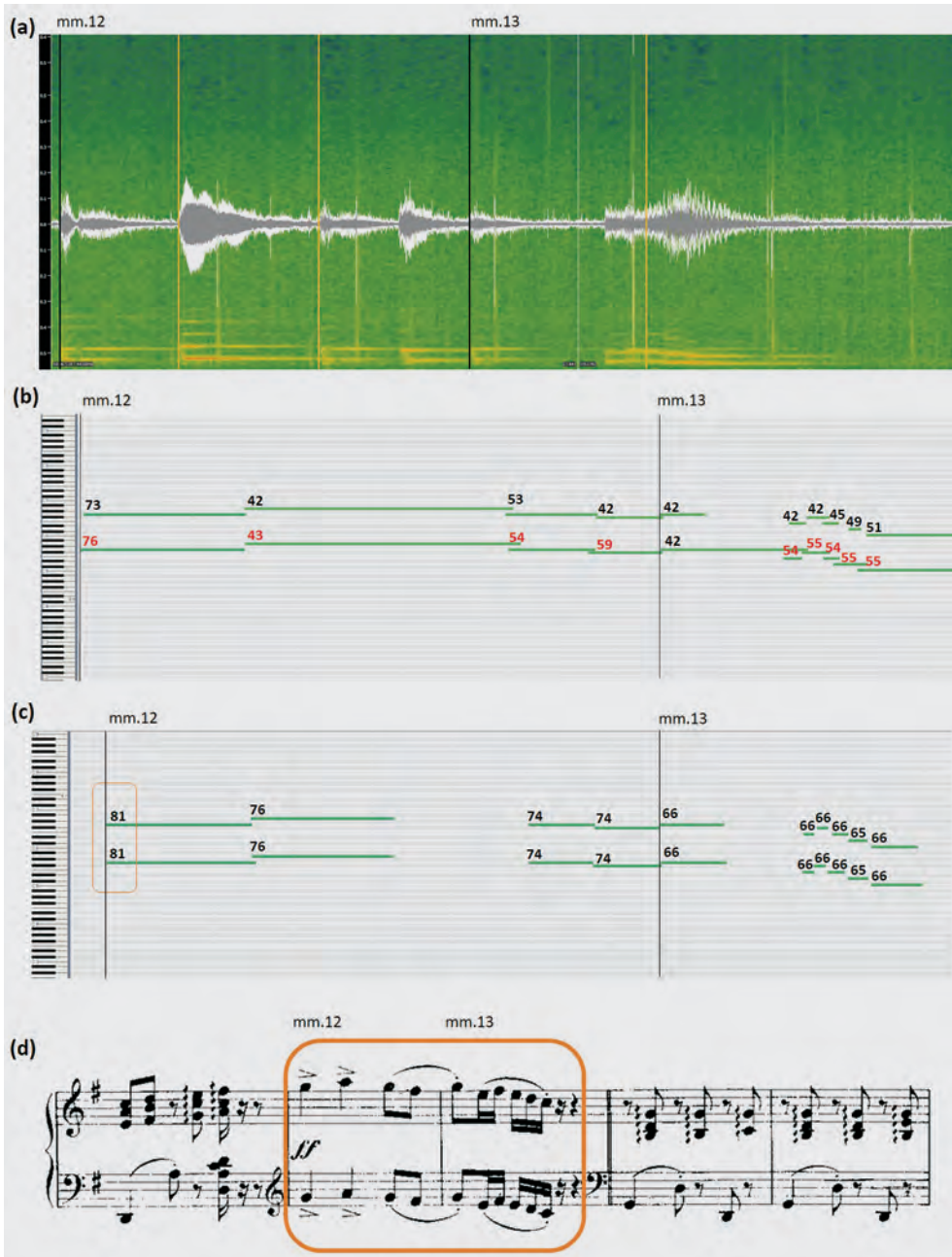


FIGURE 2 (left page) Enrique Granados: *Danza española No. 10*, bars 74–78, performed by Enrique Granados. Melodic range spectrogram (window 4096, scale dBV, green), waveform and ruler layers of the recording on *The Catalan Piano Tradition* [CD], commercial transfer of the 1912 acoustic Odeon recording No. 68650 matrix xs 1510 (a), the dynamic values (velocity levels) of the 1912 Welte-Mignon roll No. 2778 (b), the 1916 Duo-Art roll No. 5759 (c), and Dover Publications, 1987 (d). Software: Cakewalk Pro Audio 8.00 and Sonic Visualiser

FIGURE 3 (above) Enrique Granados: *Danza española No. 7*, bars 12–13, performed by Enrique Granados. Spectrogram visualisations of the recording on *The Catalan Piano Tradition* [CD], commercial transfer of the 1912 acoustic Odeon recording No. 68649 matrix xs 1508 (a), the dynamic values (velocity levels) of the 1912 Welte-Mignon roll No. 2779 (b), the 1916 Duo-Art roll No. 5760 (c), and Dover Publications, 1987 (d). Software: Cakewalk Pro Audio 8.00 and Sonic Visualiser

how Granados brings out the melodic line in the bass for the first two notes as well as a melodic displacement in which accents fall on the second beat *a* and on the last quaver *f* (a), instead of falling on the downbeat and the third beat as in the Welte recording (b). The melody doubled on the bass presents different phrasing in every recording. However, the Duo-Art dynamic range has exactly the same values for the left and the right hand, which seems as if those values would not correspond to a very natural and realistic playing (c). In terms of notation, we observe breaks between beat 2 and 3 in measure 12 and beat 1 in measure 13, which could be thought as editorial corrections. However, at these particular spots, Granados connects the melody with the pedal, lifting his hands in a natural physical gesture. This interesting example demonstrates interpretative phrasing through hand choreography.

The dynamics in piano rolls have often been regarded as unreliable by musicologists. According to Phillips, the fact that dynamics were edited (and not recorded first-hand) is no reason to label those rolls as musically incorrect.<sup>65</sup> Likewise, Peres Da Costa points out that the editing was done by highly skilled professionals with pianistic knowledge. Peres Da Costa also points out that the post-editing was minimal when compared to the methods used in today's recording studios. The information contained in early roll recordings can thus confidently be used for research into performance. Peres Da Costa also discusses dynamics in early acoustic recordings and piano rolls elsewhere.<sup>66</sup> Studying the dynamics could shed light on some of the finer aspects of a pianist's technical approach to sound production, such as voicing, expressive melodic inflexions, agogics and other elements that are often highly intricate, such as the touch of the pianist.

**Note start and end times** The perforations in a piano roll provide information about the notes that were played during the recording. Although they might have been edited, their notation is usually reliable.<sup>67</sup> It is thus possible to extract from it performance gestures such as asynchronisation or contrametric rubato, arpeggiated chords, and alterations to the rhythms and notes as printed. Examining how notes are struck makes it even possible to detect fingerings and the distribution of the hands. Some studies explore hand gestures in the piano roll recordings of Granados<sup>68</sup> and Claude Debussy.<sup>69</sup> Al-

65 Ibid., p. 109.

66 Peres Da Costa: *Off the Record*, pp. 11–40.

67 Welte piano rolls made in 1905 preserve the performances without any editorial changes.

68 Estrada Bascuñana: *Echoes of the Master*, p. 70.

69 I should like to thank Kai Köpp for providing a draft copy of his paper 'Interpretationsanalyse an Welte-Künstlerrollen'. Ein quellenkritischer Versuch am Beispiel von Debussys Einspielungen', in: *Claude Debussys Aufnahmen eigener Klavierwerke*, ed. by Tihomir Popovic and Olivier Senn, Stuttgart (in press).

though the pianist's touch is not captured vividly on piano rolls, a study of the loudness and length of the notes might, to a certain extent, reveal certain tonal qualities in Granados's piano technique and the variety of his touch. If MIDI files capture values such as velocity levels (note dynamics) and onset timings, it might be possible to extract this information and to calculate the average time for different types of articulation. Since there is no commercial software for extracting and converting this information from MIDI files, I will avoid making conclusions on this topic until such a time when these issues have hopefully been resolved.

There are some subtle gestures that could escape our attention with traditional listening techniques. When visualising and augmenting the data, there are details that can be easily detected visually when closely examining piano rolls. In the first bar of Scarlatti's *Sonata in B-flat major K.190*<sup>70</sup> arranged and performed by Granados, Roquer immediately detects an interpretative deviation from the written score. Granados performs the acciaccatura as if it were a mordent. When 'zooming' into the digitised roll to analyse this particular ornament, Roquer finds a subtle interpretative gesture in Granados's performance. There is a striking similarity between the way he performs the ornament in both versions. The MIDI file shows the attacks of each of the three notes in a scale of 25 units. The almost identical execution of the acciaccatura on the first bar and in the repetition in bar 27 epitomises a particular musical intention that is linked to a physical gesture. This visual observation assists our listening when exploring what it is that makes Granados's performances so unique, and distinct from other pianists.<sup>71</sup>

There are some opportunities for further analysis in the following examples:

Example (a). In *Valses poéticos*, the first eight bars of "Vals mariposa" are stated three times throughout the piece, offering an excellent opportunity to examine the amount of editing involved. The data in the rolls shows different chord alienations and lengths in the start times and end times for almost all notes in every repetition, both in the Hupfeld and Welte rolls. Furthermore, comparing different Hupfeld versions of the same work could give an opportunity to determine modifications made between the Phonola, DEA, Animatec and Triphonola systems.

Example (b). In *Vals 7*, there are some essential notes missing in the Welte recording, *a*8 and *g*#8 in bar 1 and *a*2 in bar 5 and in every repetition. This could lead us to believe that Granados deliberately omitted those notes, but in fact these notes were not available on the Welte reproducing piano and were therefore not recorded. This is a limitation com-

70 Welte roll No. 2782 found at the Museu de la Música de Barcelona and digitised using the Giles Darling system in 2012.

71 Roquer González: *Els sons del paper perforat*, pp. 295–300.



mon to all reproducing pianos, as none had a full 88-note compass except the Green Welte instrument. Even so, rolls for the instrument were made from existing Mignon masters, which has an 80-note compass (c2 to g8).

Example (c). There are numerous consistencies between different versions that diverge from currently published editions, such as in *Danza española* No. 10 or *Valses poéticos*, for example. Granados adds musical passages to connect waltzes in his *Valses poéticos*. He also plays the coda in *Vals* 8 very differently from what is published. In both piano roll recordings, he does not perform bars 35 to 82, and only performs the eight first bars and eight last bars of the coda (bars 27–34 and 83–91), which is a reminiscence of “*Vals melódico*”. If there had only been one recorded version of those works, the common assumption might have been that Granados simply improvised these passages.

Example (d). There is one existing, rare copy of a Phonola roll of Granados’s *Danza española* No. 5, recorded in circa 1912. This Solodant roll No. 14799 is held by Marc Widuch in Munich.<sup>72</sup> In the Phonola catalogue 1912/1913 this roll appears as “*Danzas españolas* No. 5 e-mi-e. (Valenciana)”, which is a mistake because this dance is known as “*Andaluza*”, while “*Valenciana*” corresponds to *Danza española* No. 7. The question as to whether this roll corresponds to *Danza española* No. 5 or “*Valenciana*” has been answered by Widuch, who kindly played back the roll to confirm that No. 14799 despite its label (see figure 4) is a recording of *Danza española* No. 5 (*Andaluza*).



FIGURE 4 Enrique Granados’s piano roll of *Danza española* No. 5 (Phonola). Provided by Marc Widuch’s piano roll archive

Exploring added notes not found in the published scores can lead us to identify significant consistencies between different recording versions. In any case, these historical (roll) recordings ought to have a much greater impact on the art of performing Granados than has hitherto been the case.

72 [www.faszinationpianola.de](http://www.faszinationpianola.de) (accessed 8 January 2019).

The sustaining pedal This refers to the mechanism activated by the right foot of the pianist to raise the dampers off the strings, thereby greatly affecting the piano's sonority during performance. The way a pianist depresses and raises this pedal during a piece can completely change its performance. There are multiple possible combinations regarding the extent and timing of the use of the pedal. Every pianist has a personal approach to pedalling, and some pianists are particularly praised for their sophisticated use of it. The exquisite pedalling by Alexander Scriabin is one clear example. He combined highly expressive nuances in his playing with different positions of the pedal, using half-pedalling, quarter-pedalling and even a vibrating pedal. There is a well-known anecdote about Vasily Safonov who invited Scriabin to play for his students, and afterwards scolded them by saying: "What are you looking at his hands for? Look at his feet!"<sup>73</sup> Granados was especially obsessed with sonority, and he often demanded great attention from his students in their use of pedal. Although such an emphasis is generally attributed to his teacher in Paris, Charles de Bériot, there is also evidence in Pujol's piano methods of this interest in piano pedalling.<sup>74</sup> Granados was the only student of Pujol who continued to produce instructive writings about the pedal. Although he makes no mention of his thoughts on the different degrees by which one might depress and release the pedal, he was particularly interested in matters of timing regarding pedal changes.

Pedalling has been examined in the Welte rolls thanks to the digitisations made with Phillips's pneumatic roll reader. The Hupfeld rolls were extracted using the Pianola Roll Digitiser developed by engineers at the Autonomous University of Barcelona, though this system does not extract dynamics and pedalling. This is a time-consuming task that has to be done manually. Due to timing constraints, an analysis of these elements has not been carried out for the present examination of Granados's Hupfeld rolls. However, simply by listening to the Apollo Player Piano at the Biblioteca de Catalunya we can hear that little pedal is used on the Hupfeld rolls of *Valses poéticos*. The pedalling presents considerable discrepancies when compared to the Welte version. According to Lawson, when Hupfeld introduced the Triphonola,

"they patented a system of creating dynamics by pedalling rolls at a player piano, and connecting electrical contacts to the side of the equaliser (the pneumatic reserve that joins together the supply from both foot pedal exhausters). The fact that they developed such a mechanism suggests to me that at least some of their original master rolls were made without any form of automatic dynamic recording".<sup>75</sup>

73 Heinrich Neuhaus: *The Art of Piano Playing*, trans. by K. A. Leibovitch, London 1973, p. 166.

74 Joan Baptista Pujol: *De los pedales, mecanismo, sonoridades y empleo*, in: *Nuevo mecanismo del piano basado en principios naturales, seguido de dos apéndices*, Barcelona 1895.

75 Rex Lawson, e-mail to the author, 16 March 2018.

The pedal markings might therefore not be genuine. Also, pedalling is difficult to determine in early acoustic recordings. Since we do not possess the necessary knowledge about the morphology of the instrument and the sound characteristics of the space in which Granados made his acoustic recordings, we can never really experience the true nature of his playing. Some pianists, such as Ferruccio Busoni (1866–1924) and Alfred Grünfeld (1852–1924), were told to use less pedal during recordings due to limitations in the acoustics of the recording studio and the recording equipment used.<sup>76</sup> Since Granados's four acoustic recordings sound rather dry, it might be possible that he was asked to use less pedal during his 1912 recordings in Barcelona for similar acoustic reasons.

Although it is possible to detect the moment at which Granados depresses and releases the pedal in his piano roll recordings, the mechanism itself does not recognise half-pedalling, quarter-pedalling or vibrato pedalling. This is because piano rolls only provide an on/off function for the pedal. Sophisticated pedalling techniques are thus absent from the rolls, and this potentially affects the sonority of them. For example, in bars 56–60 of *Danza española* No. 7, Granados might well have used quarter pedalling, similar to the vibrating technique of Scriabin. This allows the pianist to retain certain harmonics in order to enrich the melodic line, while cleaning the excessive sound as the texture becomes thicker in the bass. In the acoustic version, this particular passage is played using very subtle pedalling, whereas in the Welte-Mignon and Duo-Art recordings, the pedal is held almost for the whole bar, as shown in the Sonar visualisations (see Figure 5).

Since there are almost no pedal indications in most of his original manuscripts, my analysis of his roll recordings offers a possibility to document Granados's pedalling. An attentive use of the pedal for purposes of expression and sonority was one of the most important aspects of the Catalan piano school and was part of Granados's pianistic legacy. Although some musicological studies have made new discoveries in relation to Granados's pedalling methods,<sup>77</sup> none of them have revealed Granados's true use of the sustained pedal.

**Conclusion** Roll accelerations and mechanical imbalances caused by the limitations of the reproducing piano systems might compromise the performance. The roll might also have been altered through editing, while even playing it back on the best available instrument might not be the best solution. This raises questions about mechanical issues, and even about the actual performance ability of the artist making the recording. For example,

<sup>76</sup> Peres Da Costa: *Off the Record*, pp. 17f.

<sup>77</sup> Óliver Curbelo González: *Innovaciones pedagógicas en los métodos para el uso del pedal de Enrique Granados*, in: *Diagonal* 2 (2017), No. 1, pp. 144–154.

Figure 5 consists of three parts: (a), (b), and (c).  
 Part (a) shows a piano roll for the Welte-Mignon roll 2779. It features a vertical keyboard diagram on the left and a series of horizontal lines representing notes. Vertical long lines indicate damper pedal operation, and small dots below the keyboard indicate pedal release. The markings are: (Peda), \*, (Peda), \*, (Peda), \*, (Peda), \*, and \*.  
 Part (b) shows a piano roll for the Duo-Art roll 5760, with similar notation and markings: (Peda), \*, (Peda), \*, (Peda), \*, (Peda), \*, and \*.  
 Part (c) is a musical score for the same passage. The treble and bass staves are shown. The bass staff has circled notes. Below the score, the damper pedal markings are: Welte ( Peda \* Peda \* Peda \* Peda \* ) and Duo-Art (Peda \* Peda \* Peda \* Peda \* ).

FIGURE 5 Enrique Granados: *Danza española* No. 7, bars 56–60, performed by Enrique Granados. Performance files produced by Phillips with his pneumatic prototype of Granados's Welte-Mignon roll 2779 (a) and Duo-Art roll 5760 (b). Dover Publications, 1987 (c). Damper pedal operation is indicated with a vertical long line, the release of the pedal is indicated by the small dot below.

Granados's performances of *Valses poéticos* on both his Welte and Hupfeld rolls demonstrate numerous uneven notes and incongruent musical gestures, including sudden, robotic stops and other phrasing that seems incomprehensible to us. The works that Granados recorded on both acoustic and piano roll systems are especially interesting, such as *Danza española* No. 7 and No. 10, his transcription of Scarlatti's *Sonata* in B-flat major K. 190, and *El pelele*. Comparing them can even result in scepticism on our part regarding the reliability of piano rolls. But any notion that Granados might have played 'sloppily' on piano rolls disappears when we listen to his acoustic recordings. When I explored the rolls, I occasionally had the impression that his playing was careless, sometimes even amateurish; but the Odeon recordings demonstrated the opposite. In this sense, Lawson refers to piano roll recordings as "portraits" of the pianists rather than "photographs".<sup>78</sup> Despite the limitations of the reproducing systems, their enormous value for research is undeniable. According to Phillips, sometimes their limitations are not so substantial as to invalidate the sources in question for purposes of analysis.<sup>79</sup>

The key to understanding a music tradition is not only to read about it but also to listen to its performers. It also requires practical experimentation by emulating specific musical gestures on original instruments, such as asynchronisation and contrametric rubato, chordal arpeggiation, tempo fluctuations, the dramatisation of agogics, textual changes and especial attention to pedalling. Furthermore, the guidance provided by the inheritors of that tradition can reveal insights into how its exponents performed music. All the same, we must be cautious about simply accepting their opinions, because discrepancies in their performances and methodologies might have resulted from the expression of their own artistic personalities. This is a cyclical, practice-led research process involving experimentation and theoretical research, and it demands the continuous re-examination of musical gestures and original sources.

Historical recordings hold invaluable information for research on performance practice. For many years, piano roll recordings were poorly regarded and were even mistrusted by some commentators. In order to determine whether or not the technical limitations of reproducing systems might invalidate the original sources, it is important to engage in an analysis of the piano rolls, away from the reproducing instruments. Today, for example, there is little scholarly interest in Hupfeld piano rolls. But one of the great advantages of investigating them using computer technologies is the possibility of documenting Granados's performances that were captured by several recording systems of his time, including both piano rolls and acoustic recordings. Granados also

78 Rex Lawson, e-mail to the author, 16 March 2018.

79 Phillips: *Piano Rolls and Contemporary Player Pianos*, p. 103.

recorded the same work for different recording companies, which offers us excellent material for comparison.

Granados's recordings reveal certain consistencies in the same works recorded for different systems. Sometimes these do not correspond to either current published editions or the original manuscripts. They therefore raise many questions about the validity usually ascribed to original recordings by both musicologists and musicians. Since Granados has often been regarded as a Romantic, spontaneous artist, there is a tendency to believe that deviations from the written text must be simply improvisations by a man who was an extraordinarily creative artist, not the result of actual intentions on the part of the composer. But should not the original musical idea, as conveyed by the written text, be considered to be superseded by the audible evidence? Would it not be naïve to disregard consistencies found between different versions of the same work as recorded by Granados in his last four years? Surely we should rather consider those recordings as an 'audible manuscript' of Granados himself.

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RUND UM BEETHOVEN

Interpretationsforschung heute •

Herausgegeben von Thomas

Gartmann und Daniel Allenbach

MUSIKFORSCHUNG DER  
HOCHSCHULE DER KÜNSTE BERN

Herausgegeben von Martin Skamletz  
und Thomas Gartmann

Band 14



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