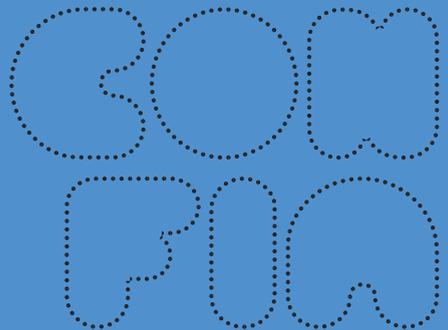


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# Time construction within Koji Yamamura's animation, *Muybridge's Strings*



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## Abstract

The aim of this paper is to consider time construction in Koji's Yamamura animation, *Muybridge's Strings*. Studying time as a subject is important for both animators and theorists in this field. Since time construction defines the meaning of kinetics, the aim is to demonstrate its importance in animation.

## Keywords

Time, motion, kinetics, animation, full animation, orthodox animation, experimental animation.

## 1. Introduction

Animation is considered to be a temporal art, as one of its main traits is that it takes place in time. Nevertheless, time can also be found in other animation elements, like plot structure, subject, the use of cinematic language, and in movement itself. The construction of time in animated movement is the main subject of this article. The film by Koji Yamamura [1] *Muybridge's Strings* (2011) [2] will be used as a case study to demonstrate the importance of time construction in animation.

The basic hypothesis is the following: if the animation artist wants to build a creative approach towards movement, then he or she will understand animated time as an artifice and consider the creative imagination that surrounds it.

*Muybridge's Strings* was chosen as the subject of the case study for two reasons: first, because the author finds his work fascinating; and secondly because in this film time is constructed by very different strategies, so that the film is a perfect visual example of time construction.

The paper is divided into three parts: the first is entitled "How is Time Constructed within Animation?" and contains a proposal on the construction of time in animation. It is based on concepts such as synthesis-based motion, mimesis-based motion [3], orthodox animation and on Paul Ricoeur's book *Time and Narration, Time Configuration Within the Fiction Story* [4]. At this point it is important to explain that, even though I am using concepts from narratology disciplines, my focus will not be on storytelling. The second part, "Time and its Construction within Yamamura's *Muybridge's Strings*" describes Yamamura's short film, its relation with time and an analysis of two of its long shots, considering the construction of time within animation. Part Three contains the conclusions reached.

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## 2. How is Time Constructed within Animation?

And I say to myself: if every artist had used art like most animators, authors and producers have done, then art would only have been used to paint signs and to shape Nativity figures. [5]

Considering that animation creates a link between the moving image and the sense of time experienced by the viewer, animation redirects our attention towards time. This time is discovered, created and invented by animation. We can thus formulate the following question: how is animated time constructed?

In everyday practice this issue is approached by means of different strategies in which stereotyped [6] animation parameters, like rotoscoping and Newton's Motion Laws are the common practice. These animation forms consider the representation of chronological time in such a way that most viewers, without a great deal of effort, understand the message, content and motion. In spite of this, conservative animation has set the animation foundations and has established working procedures, and the results are often perceived as stiff and obsolete. The reason for this resides in the fact that animated motion tends to mimic real life, which helps to conceal the essential question of animation: constructing motion.

Before continuing it is necessary to point out the differences between synthetic-based motion and mimetic-based motion by drawing an imaginary line between them. On the mimetic side we find an intention that represents reality and which is familiar to us. On the other side there is a synthesis where we will find the consciousness of an invention and therefore a willingness to represent the artifice.

The hypothesis of this paper is thus: *if the artist is interested in building a motion-centered proposal he or she will create a consciousness of time as an artifice and as a creative asset.* On the other hand, if the animation artist does not have a personal interest in this matter, then he will copy the motion by means of rotoscoping or by the use of chronographs. If these references are used with a different image, if the motion is traced, but not what is happening within the frame, then an interpretation of the images occurs, but not a kinetic construction. A similar situation happens when the animation artist takes his reference from an animation handbook. The endeavor to fabricate a time representation has been designed by someone else, which results in a non-original style.

From a historical point of view, animation differs from other artistic disciplines. We cannot talk about a rupture between synthesis-based motion and mimesis-based motion, as they have coexisted as well defined branches. [7] On one side there is stereotyped animation, which can be based on photographed moving images, on pre-established animation parameters and on cinematographic language similar to live action films. On the other side is the animation that searches for its own language.

Even though animation is split into two branches that may be considered as opposites, the entertainment industry has relied on animation based on mimetic features, character design and backgrounds. As is well

known, the reasons for using an orthodox style are mainly financial. Luckily, throughout the history of animation, and in spite of the strong promotion of mainstream production, there have also been artists concerned with studying, questioning and getting away from the mainstream tendencies.

How is time constructed within animation? It is important to distinguish between two distinct approaches to time: animation time and animated time. The former is the result of screening duration and its capacity for being measured. It is the duration of a film in hours, minutes, seconds, and frames. It is not about the time used in making a film, but is given in terms of conventional time, which can be measured accurately. The latter is equal to chronological time and forms the foundation on which a distinct time structure is built, which we call *animated time*.

The next question is: is animated time related to our normal experience of time? If the answer is yes, then to what extent is animated time capable of being autonomous? Is it possible to represent a completely abstract time from real experience? These questions involve a double dilemma, firstly about the relation between animation and animated time [8] and secondly about the relationship between these two categories of time and another that belongs to life. [9]

Animated time, as detached from experience, comes from experience and returns to it. It shows us the unreal as a given, not only because it interrupts the audience's commitment towards its real surroundings, but also as it holds back the time experience and shifts it into the realm of fiction. We are able to perceive the links between animated time and real time in the "after animation", which happens when animated time unfolds to the audience in the form of a content generator. In this way a bond is created between animation and the audience's time experience.

Animated time gives meaning to this construction, regardless of any figurative, abstract or symbolic animation strategies used, because it shapes an artificial time experience. This construction may be built from internal [10], intellectual or psychological processes. However, some movements will be more noticeable than others [11]. Fictional time is built upon statism, speed, deceleration, condensation, slowness, repetition, and the use of cycles as tools. The qualities of the frames and the differences between them are matched and tinged in order to create linear and discontinuous structures and broken chronologies, which generate diverse time experiences. [12]

Within this assembly of motion, animated transitions constitute the passage between parts. Many of these are linked to cinematic language, through cross fade, fade to black, fade from black, direct cut, and other types of transitions. Nevertheless, there are other transitions specific to animation, such as metamorphosis or transfigurations. The use of transitions can be homogeneous or heterogeneous. When transitions are used in a homogeneous manner the message is closer to consistency to stability and to analogies. On the other hand, when the features are heterogeneous then the informative abundance, progression and the use of differences prevails. [13] The manner in which these attributes are built generates the spheres of understanding.

### 3. Time and its Construction within Koji Yamamura's *Muybridge's Strings*

This section contains a study of Koji Yamamura's short film *Muybridge's Strings*, chosen for the case study to answer the question: how is time built within animation? This includes a brief description of the film's subject, plot and symbolism.

#### 3.1. *Muybridge's Strings*

*Muybridge's Strings* is an animated hand-drawn piece made with dry media techniques such as pastel and charcoal on paper and wet media such as ink, watercolor, and acrylic paints. The main subject is time. [14] Yamamura solves a universal question from his own point of view. The author interweaves universal symbolism with his own and Muybridge's story. The short film tells two parallel stories that happen in two different periods. One takes place in contemporary Tokyo, and the other, centered on Eadward Muybridge's biography, in the 19th century. In the sequences related to Muybridge, Yamamura uses black and white drawings and for the Tokyo sequences he renders full color images.

As Yamamura witnessed his daughter growing up, he came to realize that the baby he knew was disappearing and this drove him to create *Muybridge's Strings*. [15] In parallel to his personal experience, Yamamura employs Muybridge's biography and oeuvre, accompanied by a piece of music by Johann Sebastian Bach. [16]

The title *Muybridge's Strings* is a reference to the strings that Muybridge used to activate the cameras' shutters set in a line with which he photographed moving horses. He also refers to the piano strings that appear in the film, and to the bonds that join his daughter to his wife. These strings allowed him to manipulate time, [17] both in animated movement and in the narrated story. In the case of chronophotography, the strings allow the frame to be frozen for an instant; inside the piano they vibrate to create music and in the family they establish bonds between the generations. The artist spoke about this topic in a conference at Mexico City's Chopo Museum: "In this time we always find a cycle, for example the mother-daughter cycle. The mother has a daughter, which turns into a mother by having a daughter and so on, this is an always repeating cycle." [18] It is thus also possible to speak about the string of life as a metaphor.

Yamamura also confronts and skillfully resolves the essential problem of time in animation. He contrasts full with limited animation [19]. He uses both methods with equally expressive quality as regards the movement's intention in every shot. He also establishes a dialogue between synthesis-based motion and mimesis-based motion, the former being the most important. I consider that synthesis-based animation is more important in this case, not only because most of the animation time is solved with it but also because it is used to narrate the most important scenes.

Yamamura thus contrasts still shots with moving ones and also uses chronophotography as a straightforward reference to animation, not as an immediate process, but as a way to weave the film's meaning. This

reference is founded on mimesis and skillfully confronted with purely artificial motion.

The following section deals with a study of two long takes from *Muybridge's Strings*. The first is part of a sequence, related to Eadweard's biography; which I have named "Eadweard Muybridge Suspects He Is Not the Father of the Baby". I have designated the second, related to Yamamura's personal experience, "Mother and Daughter are Related to Each Other within String Time".

### **3.2. Eadweard Muybridge Suspects He is not the Father of the Baby**

The sequence "Muybridge Suspects He is not the Father of the Baby" lasts about 39 seconds from 05:49 to 06:28 in chronological time (The long take from 06:14 to 06:28 will be explored subsequently).

The first shot goes through an aperture of two horizontal rectangles that simulate a shutter, painted with a dry brush. This drawing is barely visible since it lasts only three frames, but is reinforced by an incidental "shutter" sound effect, perhaps not for the audience's sense of sight but hearing. Behind this "shutter" we see an insert of a locket with the picture of a woman carrying a baby in her arms; we may assume that she is Flora, Muybridge's wife [20]. This image is an illustration that sets internal and external borders for the figure. It is animated with several stained layers with different tone values, of which the image with borders is only one. The hand that holds the locket is animated frame-by-frame and with different layers of diverse tone values that add even more vibration. In this shot, which lasts more than three seconds, the woman's outline gives us a static feel.

Then there is a zoom out; the hand closes into a fist over the locket. Whilst the camera zooms out, we have a close-up of Eadweard Muybridge's profile and the moon is behind his face. But the zoom out continues to a point when we see a full shot of Muybridge still with the white moon behind his face like a halo. He puts the locket in his pocket. The zoom out continues, and now Muybridge is a very small figure standing on an enormous hand. He is hardly the size of one of the hand's nails. The hand turns, and the white circle that seemed like a halo is not there any more. This marks the end of the zoom out. Now the big hand, with the small man over it, approaches the figure's face. After a left-to-right panning, we find out that it is an enormous human character with fine features. It is not easy to tell if it is a man or a woman. The camera zooms in to an extreme close-up of the lips. The small man, Muybridge, leans forward with extended arms over the lower lip of the colossal face and lightly presses down, then he turns his head back to the right.

With this same intention of stillness, described in the first part of this long shot, Muybridge, who by now is hanging his arms over the gigantic lips and turning his head, holds this pose for almost a second, all in the same style as the outlined-based drawing. There is also a slight vibration generated by the layers of different tone stains, but not because of the difference between the outlines

Next, Muybridge turns his head to look directly towards the camera and then turns his body as well, and while he rotates this man transforms into a baby. The baby's face is in close-up at the center of the frame. A quick zoom out begins. The baby, smiling until now, becomes frightened. Two masculine hands try to hold him, but the baby moves into the background; the arms stretch out whilst the image fades to black at the end of this long take.

The two static shots contrast with the smoothness of the rest of the shot sequence. These create two distinct moments: in the beginning when we see Flora's image, and at the end when the man holds his arms over the giant's lips, before he transforms into a baby. It is evident that Yamamura emphasizes movement by manipulating the speed; in this case we can see the contrast between swiftness versus stillness. These two static moments are done with limited animation. The rest of the shot is accomplished with full animation.

I find this long take particularly interesting, as it proves my aforesaid affirmation, especially by the way Yamamura uses different strategies to construct animated time; through its manipulation, the drawn camera movements and the use of morphs. The contrast between static and movement allows us to appreciate how tension is generated within visual storytelling, and this defines the meaning of the sequence.

Time construction in the long take and in most of this short film can be related to internal processes, which may be intellectual or psychological. In this long take Koji Yamamura refers to Muybridge when he suspects that the baby his wife is carrying is not his own. We appreciate a double internal process: Muybridge's internal process and at the same time Yamamura's.

**Fig. 1.** Koji Yamamura, stills from Muybridge's strings.



### 3.3. Mother and Daughter Relate to Each Other Within the String-Time

This black and white long take goes from 10:18 to 11:22, which means the animation time lasts about one minute. As mentioned before, the *Muybridge's Strings* scenes relating to the 19th century photographer are in black and white, with the exception of a long take that will be examined in the following paragraphs.

This sequence begins with an extreme close-up of an extended arm. A zoom out begins until we see the arm belongs to a naked woman. She has a round head made from numbers and small lines. She is floating on a neutral environment made from different gray-shaded stains. On the left side of the frame a baby appears whose head is drawn the same way as the woman's. The woman extends her arms towards the baby and embraces her. The camera movement continues until it stops at a full shot that encompasses both. Suddenly, some warm toned sparks appear between them, a visual element that we only see at this moment in the whole film. This probably means that an affective bond links mother and daughter. When the baby separates she becomes a child, but she is still connected to her mother by a DNA-shaped-structure that comes out of their heads. They drift apart and the mother breaks this link. Woman and child embrace until the broken link is restored. Completely embraced and in the fetal position, and as they spin floating from background to foreground, the tense ropes break. Since there is no floor line, they fall into neutral space and the baby grows back up again. Both walk in diagonally opposing directions and break the ropes again. Even though separated, we see the two grown-up women getting closer to each other; finally they stand united in the middle of the screen with their legs in a semi-flexed position and arms extended upwards. They unite for an instant only to separate to the sides whilst making a string warp that fills up the frame. The image is scaled with a zoom and rotates until it almost reaches a vertical position; at this moment from the right side of the frame, galloping horse's legs appear breaking the ropes. Next, there is a zoom in which reveals a creature made up of two headless horses' bodies, whose legs gallop in opposite directions, four upwards and four downwards. The gallop keeps on going, while the character spins and separates into two bodies, which remain united by a line. There is another zoom in over the lower horse's body, which continues to gallop, but is now moving backwards and the broken lines are united once more until a string warp is made again. The two naked female characters appear at each side of the frame. They become united by their backs; both women stand up and walk backwards, as one of them turns into a baby again. We see them in a fetal position spinning backwards. After this, every action is repeated again backwards, until we arrive at the extreme close-up of an extended arm that goes off screen from the right side of the frame. The background fades to black.

If we play this long shot backwards, we find that it is an animated palindrome, i.e. an animation that can be played forwards or backwards without almost any change in the action.

It is no accident that the soundtrack is based on *The Crab Canon*

(1747), composed by J.S. Bach. This work can be played either forwards or backwards and will sound exactly the same. So we may call it a musical palindrome: “This can be appreciated in the sheet music: the lower pentagram repeats the upper one but inverted in time.”[21] This musical construction is directly related with the temporal manipulation that Koji Yamamura displays throughout the film: Time is capable of coming and going, as we have already seen described beforehand in the long take. This can be interpreted as a longing for reversing the passing of time.

I consider that this long take condenses the idea of the whole film and renders the most important sequence of the piece. In a certain way, it integrates both stories, linking them by their chromatic characteristics, with the use of black and white images. Until now black and white had been used exclusively in the E. Muybridge’s scenes in the film. Also, the animated horse gallop that is based on Muybridge’s photographs reinforces this link.

The animation of this long take is in full animation, because of the continuous movement, the morphing transitions and the drawing that indicates depth. All the movements are related with previous and following moments, to create meaning. I see the use of a palindrome structure as unexpected, even though it could be imagined, since the sequence is based on a musical canon with similar characteristics.

Yamamura consciously constructs time from artifice and from internal processes as a witness of his daughter’s growth. Time gets closer to psychology and imagination than to chronology, despite the visual references to the clocks and strings. The long take transitions are various: camera movements, the string-made background and characters that are constantly morphing. These transformations relate to time progression;

**Fig. 2.** Koji Yamamura,  
stills from *Muybridge’s  
strings*.



time goes forward and backward. I can state that this is a chronological structure based on a discontinuous, iterative and reversible sense that generates an imaginary time experience. In my view, this sequence is the most important visual reference in this case study.

Due to the scope of this paper, it is not possible to make a complete analysis of the entire Yamamura film, nor is it possible to extend the study to his other works. However, I believe I have selected the sequences that clearly state several strategies that the author used to reflect upon the relation between animated drawing and time at such diverse levels. Koji's *Muybridge's Strings* provides a fertile source to write about time considerations.

#### 4. Conclusions

The main aim of this paper was to consider specific time construction in animation, especially in the animated motion embodied in the case study, Koji Yamamura's *Muybridge's Strings*. The contribution of this academic essay resides in its approximation to a wider understanding of this subject. The intention was not to present a methodology, but instead to highlight some concepts that would be helpful in reflecting on the construction of time in animation. I consider that the hypothesis stated in the Introduction is proved by the study on Yamamura's film: if the animation artist aims to have a creative approach to motion, then he or she will understand animated time as an artifice, considering the creative imagination that surrounds it.

To summarize, the concepts that were taken from Paul Ricoeur's text *Time...* were: animation time and animated time, the relation between them and real time, the internal process that works as the basis for constructing animated time, the highlighted movements to create contrasts and the characteristics of the transitions.

As we have seen, time is the under-layer in which the animated image is generated and played. In the present analysis, we identified both animation time and animated time, i.e. the exact duration in minutes, seconds, and frames, and the construction that might or might not be capable of objective measurement.

In our case study, this animated time is created by the integration of mimesis-based motion and synthesis-based motion. It was evident that Yamamura's interest was neither to copy real time nor to perpetuate a standardized animation style. Even though chronophotography is present in *Muybridge's Stings*, as an element of the story and as an animation strategy, Koji stays apart from the predominant mainstream animation style. There are different internal processes visible in the short, due to his personal experience and to his mastery as an animation artist. This is clearly seen in the characteristics of his drawings and in the movement construction that uses both limited and full animation strategies, as seen in the film analysis. The music also plays an important role in the construction of the movement, particularly in the last long shot, where the animated palindrome corresponds to the musical palindrome. At the same time, these respond to an emotional process in the author, when he

asks himself where his baby has gone. We can interpret the palindrome as a desire to rewind time.

*Muybridge's Strings*, is not only a piece disassociated from stereotyped animation, but also a perfect case of how the consciousness of time is founded. Yamamura confronts motion resources that are completely opposite: he uses the contrast between mimesis and synthesis, he handles the full and limited animation qualities with expressive ends, he uses heterogeneous transitions and he creates highlights all over the film to build a kinetic rhythm. Also, in the animated time, the shape qualities in *Muybridge's Strings* are a demonstration of his inclination towards drawing as a means of expression and as a complex internal interpretation process, whilst at the same time being an investigation into Muybridge's biography and time representation.

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## References

1. Koji Yamamura (Nagoya, Japan. 1964) is a prominent independent animation artist, whose work has been acclaimed not only in Japan, but also worldwide. Among his filmography, *Atama Yama* (2002); *Kafuka: Inaka Isha* (2007); *Kodomo no Keijijōgaku* (2007), among others. His work has won many awards in many countries.
2. Yamamura, Koji: *Muybridge's Strings*, 12min 39sec, animated drawing, Canada (2011).
3. The Spanish animator Carmen Lloret Ferrandiz on her conference *Drawn Motion and Animated: Synthesis - Mimesis. Two Opposing Views*, brings face to face the creative processes involved in animated drawing with the synthetic and mimetic motion representation, in order to set apart the artistic processes from the ones followed by the industry. Lloret considers these styles of motion linked to the way movement was understood in ancient times: mechanistic and dynamist. Carmen Lloret's paper *Drawn Motion and Animated: Synthesis - Mimesis. Two Opposing Views*, was presented at the IV Visual Arts Graduate Studies Symposium, Drawing as a Language, Process and Research on Art, Design and Visual communications, University City, UNAM, Mexico City. November 2010.
4. Ricoeur, P.: *Time and narration II. Time Configuration within Fictional Stories (Tiempo y narración II. Configuración del tiempo en el relato de ficción)*. Mexico: Grupo Editorial Siglo Veintiuno, (2011)
5. Xavier, J.M.: *Poética do Movimento*. Lisbon: Edições da Monstra, p. 21 (2007).
6. Stereotyped animation, also known as orthodox, commercial or traditional, was created by the film industry. Its main function is to entertain and it has a set of rules for its mass production.
7. The Portuguese animation artist Jose Pedro Cavalheiro in his doctoral thesis "The Drawn Animation Resources: Trends and Practices in Author Films", writes about the French Emile Cohl and the American Windsor McCay. According to Cavalheiro, Emile Cohl delimits the animation film using a set of rigs that turned out as essential traits of this media. From this set of rigs, the graphic metamorphosis and the apparent incoheren-

ce in the narration stand out. As stated by Cavalheiro, these inconsistencies are a cohesion and direction factor in Emile Cohl's films. Windsor McCay is presented as the opposite. McCay converts the visual language of his comic strips to animation with minimal modifications. Cavalheiro states that McCay showed an obsession for stability by creating his characters with static traits. Jose Pedro Cavalheiro, "The Drawn Animation Resources: Trends and Practices in Author Films" (Doctoral dissertation, Universidad Politécnica de Valencia, 2009).

8. The difference between animation time and animated time is taken from narration time and narrated time, which was introduced by Günther Müller and adopted by Gerald Genette. Ricoeur, *op.cit.* Pp. 493-496.

9. Günther Müller introduces the concept "time of life". Ricoeur, *op.cit.* Pp. 469-474, 493-496. Paul Ricoeur adopted this concept from the German Philosopher Käte Hamburger. According to this author, fictional criteria consist of the use of several verbs that describe internal processes - intellectual and psychological. Ricoeur, *op.cit.*

11. Harald Weinrich proposes the concept "to highlight", and Ricoeur adopted it with the aim of finding an expression in verb tenses that are not based on lived time experience. Ricoeur, *op.cit.* Pp. 479-485.

12. These qualities are adopted by Paul Ricoeur to talk about a non-continuous narrative structure. Ricoeur, *op.cit.* p. 500.

13. Harald Weinrich presents the idea of heterogeneous and homogeneous transitions in literature. He talks about transitions between verb tenses that will transform the initial situation into the end one. Ricoeur, *op.cit.* 486-487.

14. Interview with Koji Yamamura by the author.

-Tania: "The question is about your movie Muybridge's strings, and its relation with time."

-Koji: "Of course, it is the main subject of my film Muybridge's strings."

Museo Universitario del Chopo. File transcription, from now on will be cited as Interview TL/KY, (2013).

15. -Koji: "Of course, but my motivation to make Muybridge's Strings it comes from my ... I have a son and daughter, both grow now very quickly, and I and my wife always talking where are our daughter, so the baby not exist now, where she is? Of course she's now here. So, it is a very simple question. So I started thinking about time. I think time and space are very connected with, because past time and past space disappear." Interview TL/KY, 2013.

16. Koji, Y.: *Metaphysical Dream. The bill of independent animation*. Conference at Animasi-vo Festival, Chopo Museum, Mexico City, May. Transcription in file, from now on cited as KY Conference, (2013).

17. Khanjani, R.: "Chronos Pulls the Strings: Roaming thoughts On Koji Yamamura's Muybridge's Strings (2011)", *Offscreen*, March, review on February 3rd, 2015, <http://offscreen.com/view/chronos-pulls-the-strings> (2014).

18. KY Conference, 2013.

19. De León, T., et al, "Two ways of classifying animation" (Dos formas de clasificar la animación), in *Animating the Drawing. From Script to Screen. (Animando al dibujo. Del guión a la pantalla)*. México, D.F.: ENAP, pp. 20-21. (2013).

20. I identify this woman as Flora, since E. Muybridge's biography mentions this name to designate the woman who was his wife. Hans Christian Adam (Ed.), *Eadweard Muybridge. The Human and Animal Locomotion Photographs*. Colonia: Taschen, p. 771. (2010).

21. "Canon del Cangrejo (Bach)", *Epsilones*, consulted on March 13, 2015, <http://www.epsilones.com/paginas/musica/musica-018-bach-cangrejo.html>