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Design education through toy design. Old and new paradigms in architectural toys design

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Abstract

Since the beginning of the XIXth century the design of toys is a serious cultural and economic issue. In this critical framework, the architectural toys represented a particularly part of a materialistic culture that contains educational, artistic and ideological values. To track this narrative means to track a complex net of relationship that show which part of each culture wants to be preserved and transmitted to the following generation through these educational devices.

KEYWORDS: toys, architecture, education

Introduction

According to the French philosopher Gilles Brougé, the toy is a particular part of the material culture, considered as an artifact that represent the relationship between artifacts and social behaviors, where the representative function stays both before and at the base of its practical function (Brougére & Wajskop, 2008). For a toy the main symbolic value is “the function”. Indeed, the play activity is based on this principle and through it the child can create a three-dimensional image, or scenario, that means an entire cultural framework. As it happens whit a piece of art, the toy means a cultural framework, understood as a generative highly complex system made by objects, technologies and ideologies.

This means that the toys carry semiotic values that are connecting links between the world of adult and the childhood world. As Roland Barthes said when he wrote about French toys (but true also for the toys from every country):
“all the toys one commonly sees are essentially a microcosm of the adult world; they are all reduced copies of human objects, as if in the eyes of the public the child was, all told, nothing but a smaller man, a homunculus to whom must be supplied objects of his own size”. (Barthes, 1957)

Indeed, since the XIXth century, the adults use toys as educational tool to transmit a world that they want to improve or, in some cases, to preserve as it is. So, still with Barthes,

“As for the others, French toys always mean something, and this something is always entirely socialized, constituted by the myths or the techniques of modern adult life: the Army, Broadcasting, the Post Office, Medicine (miniature instrument-cases, operating theaters for dolls), School, Hair-Styling (driers for permanent-waving), the Air Force (Parachutists), Transport (trains, Citroens, Vedettes, Vespas, petrol-stations), Science (Martian toys).” (Barthes, 1957)

Also the psychologist Stephen Kline wrote something very similar in his book Out of the garden: Toys, Tv, and Children’s Culture in the Age of Marketing where he argues that “Middle-class children are given an enormous number of toys (tool sets, mini-kitchens, baseballs, dolls) because they are “models of things” that invoke in play the behaviors or skills required in later life” (Kline. 1993, p. 15). Toys may be considered as a kind of litmus paper to understand which part of each society, or parts of them, want to be kept for the future.

Indeed almost each disciplinary field has its own representation in toys production, creation or consumption. In this context architecture is a quite fruitful discipline because since very long time children play with their relation with space and with the built environment. It is not necessary to use Lego constructions to see a child play with architecture; to create a house with a chair and a sheet, to pile cans or, more for girl, to use a cardboard box as a doll-house, are clearly architectural playing activities. In fact toys are one of the oldest human artifacts; they exist since the play action exists. According to the historicist Johan Huizinga, play is older than culture because he does not imply a human society (Huizinga, 1950) with his structures. For Huizinga, if it is possible to talk about Homo sapiens and Homo faber, it could be possible to talk about Homo ludens because to play is one of the most important manual and intellectual human activities since ever. Animals play as humans do and they do since long time before humans.

But toys as educational device are an almost recent invention. The idea that a kid can learn something playing was very bizarre for the XVIIth or XVIIIth century society where the child was considered as an adult’s miniature. In his famous book Centuries of Childhood (1962) the french historian Philippe Ariès explains that as soon as the child developed his body enough to work he was treated as an adult and started to learn helping the adult’s work activities (Ariès, 1962). Toys were objects very exclusive reserved to the royalty and, in most cases, playing was considered as an useless entertainment (Manson, 2001).

In the nineteenth century some factors have changed the role of toys in the educational field and, also, in the society. New educational philosophies arise with new pedagogical models. Both in Europe and USA the first part of the century is, definitely, the golden era of education with, for example, the creation of kindergarten by Johann Heinrich Pestalozzi (1746-1827) before and,
after, with Friedrich Fröbel (1782–1852). In USA, the *project method* of the pedagogue William Heard Kilpatrick (1871–1965) is, with the famous book *Democracy and Education* (1916) by the philosopher John Dewey (1859-1952) a strong reference in the educational thinking development. The action gains primacy on the knowledge and the play, considered as action, gains its own role in the child activity.

Also in the economical field the production and sale of toys gains relevance (Douglas Brown. 1996). Both in north Europe and United States several companies start producing all kinds of toys, since dolls to construction kits; the growing middle class was asking increasingly for new and better toys in order to improve his educational effort. In some cases, as the F. A. Richter Company in Germany or the A. C. Gilbert Company in USA, the growth was such fast and so spreading that it is possible to talk about a market globalization dynamics (Ganaway, 2009, p.6).

The scale of the phenomena is visible through some toys seller’s catalogs, like the FAO Schwarz one, the oldest store in United States, founded in 1862 and still open. Since 1876 FAO Schwarz used to publish a catalog where it is possible to find each kind of toys, since the most luxury and exclusive to the most common. There are several catalogs published in the beginning of the XIXth century, most of them are not specifically about toys but, nevertheless, have a large toys offering. It is quite interesting browse them and find how toys were presented and described and how each produced was trying to find a way to gain the buyers loyalty like Gilbert, for example, beyond the catalog creates a newsletter with a design competition and the possibility to gain the title of Gilbert Master Engineer. Looking to the Gilbert construction toys it is possible to understand how they were technologically updated; the first Erector set was on sale in 1913, less than 10 years after the first brother Wright flight and only 5 years after the Fort T model production. The Tri-Ang toys catalog from England, for example, show some dolls house that can be considered much more modern that it is possible to purchase today.

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**Figure 1 - Anker advertising ca. 1910**
In addition with the mass production several other design experiences in the toy design field arise, that evidenced not only the importance of the new educational framework but also condensed an entire cultural sector or professional field.

Architectural culture was always strongly related with this dynamics and, since the second half of the nineteenth century, several architectural toys were produced. In some way it is possible to assert that the Froebel Gifts (mainly the wooden blocks) stay at the genesis of almost all the architectural toys; indeed it was a Froebel’s idea that the child can learn geometrical and spatial composition through playing activities. So he improves this principle designing toys (the Gifts) that help the child to develop specific skills.
The importance of this kind of educational devices was considered so strong that at the beginning of the twentieth century several artists were engaged in the design and developing of similar objects (Bordes, 2010).

At the Bauhaus, for example, the *Vorkurs*, started by the swiss painter Johannes Itten (a Froebel trained elementary school teacher), was clearly based on a rediscovering of common and elementary materials and shapes. The idea was to bring the student at a previous intellectual condition in order to reset the cultural conventions, as happen to a child playing. In his book *Design and Form: The Basic Course at the Bauhaus and Later*, Itten explained this process that run from the material to the design: “*It might have been wood, metal, glass, stone, clay, or textile that inspired in [them] the most creative work*” (Itten, 1964).

Still at Bauhaus, Alma Siedhoff-Buscher designed several toys that were an important source of incoming for the school (Weimarer Klassik, 2005). Some of them are still produced today by the swiss company Naef and are one of the clearest examples of the will that existed at the time to educate child to a particular visual culture. The elementary blocks painted with primary colors were extraordinary different from the toys that, at the time, were for sale through the several catalogs. Behind there was an arising and completely new cultural and artistic framework and an effort in order to create a new generation of artists (Bordes, 2007).

![Figure 4 - Dandanah – The Fairy Palace designed by Bruno Taut in 1919 - © MoMA New York](image)

Almost contemporary with the Bauhaus school, is the toy *Dandanah, the fairy palace*. Designed by the german architect Bruno Taut (1880-1938), is a set of building blocks of colored solid glass. With its geometric shape this toy includes itself the entire expressionist ideology of glass architecture that was verbally expressed by the german philosopher Paul Scheerbart in his book "Glasarchitektur" (Scheerbart &Mechthild, 1914). This book inspired Taut when he wrote, in 1919, the essay “*Alpine Architecture*” and when he designed the “*glass house*”, a pavilion built at Cologne for the German Werkbund Exhibition, in 1914.
Other examples exist, from the toys and dolls house designed by the architect and furniture designer Gerrit Thomas Rietveld (1888-1964), through the toys made by the German architect and painter Hermann Finsterlin (1887–1973) or the building block designed by the architect Josef Hoffmann (1870-1956). In all these toys is possible to read the author and his own ideological position that exists beyond his architecture.
Later, still during the twentieth century, other toys were designed by architects to test new technologies and materials. Charles and Ray Eames, one of the most creative couple of the century, designed several objects for kids. Still produced by Vitra, the plywood elephant is one of the iconic objects of XX century industrial design. Also by Eames the fantastic *The Toy*, a building system looking like a kite made by fiberglass sticks and plastic panels that permit to build large scale structure. The LIFE review, in an article of 16th July 1951 wrote that the toy was “one of the most imaginative playthings of the year (...) to intrigue Young men (5-10) who have an engineering or architectural bent and Young ladies (same ages) with a homemaking instinct”. Indeed the Eames’s interest for kites is quite visible also in his own house and studio with his light steel structure and colored panels (Colomina, 2003).

Almost at the same time another architect, Arthur Carrara (1914-1991), designed the Magnet Master, a construction set based on the possibility, already studied by the architect, to use magnetic joints in buildings construction. As he said in writing about *Magnet Masters*, “every idea of man is first emphasized as a toy or in a toy.” Iron sticks and painted iron sheets could be jointed because the attraction of Alnico magnets and form several tree-dimensional structures. It is interesting the fact that Arthur Carrara had been a student of Moholy-Nagy at the New Bauhaus in Chicago and also that Carrara tried, without success, to use the magnetic joint during his own professional life, as other examples it is always possible to track several narrative to build a knowledge structure around some objects.

A remarkable connection between toys and architecture can be found in the Lincoln logs designed by John Lloyd Wright (1892-1972), architect and, more than that, son of the famous American Frank Lloyd Wright (1967-1959). This toy, still produced, gained a place among the North American XXth century culture. Notched miniature logs, used to build miniature forts and buildings, were sold as an image of the typical north-american outdoor living will. Also his father, Frank, has famous story that he wrote in his own biography (Wright, 1941), about the

![Figure 7 - Magnet Master designed by Arthur Carrara in 1949 - © Canadian Centre for Architecture](https://example.com/image.jpg)
importance of the Froebel’s gift and his mother education as teacher. The relation between the gifts and his own architecture fed several texts and pedagogical theories, nevertheless it is more a myth than a scientifically proved reality.

Figure 8 – A design book (instruction) of Lincoln Logs designed by John Lloyd Wright in 1920.

But looking to the Froebel’s gift and, for example, to the Eames’s toys, it is clear that there are two really opposite ways to transmit two deeply different frameworks of architectural thinking. From one side a nostalgic, traditional and “solid” composition rules, from the other a modern, urban and more technocratic way to see architecture and design.

The 70’s and the 80’s deeply changed this scenario introducing the video and computer games. Computer was an indisputable value and was the universal media for all the field of knowledge. So all the educational effort was guided to teach how the use of computer could help each part of life and, more than that, the computer was considered (and it still is) a strong and powerful educational device. There was no child that, at the time, has never played with a computer and all the manual and creative experience gathered with more than a century of toy design and production was put aside in behalf of computers.

The plastic become the main material and this factor implied that several metal toys (a large part of the construction sets that were sold during all the XX century was metallic), for example, could no more be produced with this new material because structural reasons. Also it was unsustainable the producing way because the growing price of the human work and of the raw materials. Oriental countries, like Japan, Indonesia or China, were even at the time, the bigger and cheaper toy producers and plastic was, and still is, the cheaper and faster way to produce large
quantities. Also some hygienic reasons helped to kill old toys; metal, for example, can cut or rust and this was not even thinkable in a new, clean and aseptic plastic world.

The market felt this change and just few companies, like the LEGO or the originally british MECCANO (now produced by the japan toy producer NIKKO), were survived and arise again only in the last years when the new parents’ generation claim for new values and educational models.

At the end of the XX century several factors contributed for rediscovering the interest in the architectural toys not only as play device but also as genuine educational tools. The computer euphoria was a substitute for an integration of this kind of technologies and its role in human life is now much more silent and transparent than before. Although the oriental countries are still the bigger producers, Europa and United States are trying to bring back their own productions, also toy production. This operation is made also through the creation of local brands politics that put in the market products with a clear “made in …” message.

But, more than that, there are two main phenomena that are certainly rediscovering the importance of architectural toys: from one side exists a nostalgic movement that is rediscovering a passion for the “vintage” activities both in the adult and in the child world. It works like a kind of fashion dynamic, broadcasted by reviews or Internet and preach a return to the handwork, to the geometric and chromatic compositions that marked some part of the post-war culture. Wood that look as wood, fabrics, paints and non-electronic toys are returning to the market. The sensorial and kinesthetic learning are preferential over the intellectual learning that computer society was promising and physical manipulation and creation skills are now at the base of an education that bet on an human being complete and artistically autonomous and self-contained. This is an image of what is happening in the entire society where the traditional and academicals values are questioned by the new economic and cultural balances. The handmade work is rediscovered and the modern societies rate the handworker as the scholar, and this is visible in a large number of “dirty toys” where the children can paint, mold, glue or even sew a fabric doll or whatever. Indeed this is the main field for architectural toys; the field of creation, of learning technologies, materials, colors, shapes and proportions.

From other side it is possible to observe the changing of the architectural paradigms that are dragging with them an entire architectural educational culture. The Froebel’s gifts are now in a “koolhaas” version called Zenblock® or Boulder Blocks® in which it is possible to learn balance and imbalance (The reference is made to the Casa da Musica building in Oporto design by the Dutch archtect Rem Koolhaas).
Still on the Froebel theme, the recycling trends are visible in a cork building blocks design by the Japanese designer Tonouchi Tetsuo.

The Bauhaus heritage is clearly present, besides the already cited Naef company, in the toys produced by the Spanish producer Ludus Ludi® where is possible to find the geometrical and concerns both in the building toys and in the tangram game.
The new design and manufacturing technologies are visible in the toy Oliblock®, a building block set that look like a Zaha Hadid building because its organic shapes and with very accurate connections systems. The limitation of Oliblock® is the number of combination because it's very particular shapes; on the other hand it is very inspiring because its almost fluid shapes. It came directly from a CNC design culture and it is visible the new possibility of the customization techniques.

Also Triqo®, a dutch toy, is a quite interesting construction system based on a basic triangular shape that can combine with a square and form several colored three-dimensional objects. The joint system of Triqo®, which is made in flexible polypropylene, is very simple and intuitive and the triangular base shape allows the creation of unexpected shapes. In certain cases it happen a truly formal discovering according to the different ways of combining triangles and squares.

The magnetic construction system designed by Arthur Carrara in '40 deserved a successor in a toy called Geemo®. Geemo® is designed by Cas Holman, a designer from New York, and since 2007 can be found at the NY Moma Store. Geemo® is Y-shaped building-block toys made by a kind of rubbery material that snap together using magnets. The possible figures look like coral and the magnetic proprieties, as was happening with the Carrara toy, allow joining it with other metallic surfaces.
The urban field was also a new design scenario for architects and toy designers that discovered the importance that have for the childhood not only to learn new shapes but also to share the space with the community. The architect David Rockwell designed Imagination Playground® that is a series of different shapes joinable to create a large scale construction system. The material is a kind of hard foam and it is suitable for both interior and exterior use. Children can create large structures and play with and within them.

Figure 14 - © Magis me too

Finally exist the objects made by the Italian company Magis®: the “magis me too”®. Several designers were challenged by Magis® chairman Eugenio Perazza to design an object exclusively destined to the children. Eero Aarnio or Enzo Mari are two of a large list of artists that designed hybrid objects between the furniture and the toy. This is not a really pure architectural toy, but it is obvious that a child that use a duck shape chair will grow up with a quite large and complex idea about what a chair could be. And if the chair can join functional and semiotic rules all the meaning of an entire material culture could be positively infected. This experience is quite similar to the ideological position of Walter Gropius and Siedhoff-Buscher when, in 1923, they designed the Haus am Horn nursery and furniture or, later, when Marcel Breuer designed the Children's Playroom for the House in the Museum Garden at the Museum of Modern Art, NY in 1949.

As it happens with a piece of art and the connection between the subject and his surrounding world, architectural toys need to improve the child’s knowledge about architecture. That means about space, about materials, technologies and, most of all, about the meaning of the relationships among all these elements. This is the main challenge to generate and to preserve an architectural culture that could create a better environment sensibility in the childhood age. Architectural culture is a fundamental part of the human being heritage and, as such, it needs and deserve to be preserved and improved.

The architectural toys design is a quite complex design effort because, as it happen in an artwork, it means to put the universal into the particular in order to transform it in an understandable and transmittable value or concept. This means to know the past in order to organize the present and to improve the future.
It is not enough to copy or to reduce a part of adult’s world; the designer needs to reduce the information and synthesize an image that has to be useful and usable in the child’s logical thinking, a pretty far way of thinking from the adult one.

So for the designer the main target it to create an image taken from a systematic analysis of the symbolic universe that needs to be, at the same time, powerful and consistent in a meaningful structure. Indeed the toy designer is quite close to a comics designer or a fairy tales writer with an advantage: he create the image of the narrative but not the entire narrative.

References


The reference is made to the Casa da Musica building in Oporto design by the Dutch architect Rem Koolhaas.