

POSTWAR EUROPEAN CHAIR DESIGN. A COMEBACK OF THE STYLE CONNECTION

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Abstract

The paper presents the results of studies and research aimed at identifying significant concepts of the design process dynamics of two European designers, Gió Ponti (Italy) and Hans Wegner (Denmark). Two of their major chair designs, the Wishbone Chair (Wegner, 1944-49) and the Superleggera Chair (Ponti, 1951-57) were chosen as study cases. Their historical concept sources were carefully investigated and documented, since in the postwar years a tendency towards disregarding the dogmatic functionality of the interwar avant-garde furniture design occurred, making place for a different kind of innovation that did not contradict the natural evolution of form and function, but introduced an inherent elegance of form, as well as exceptional craftsmanship seen as adding value to the industrial production.

Formal, compositional, structural and ergonomic elements were analysed, measurements of dimensions and angles were made and compared, sitting positions were visualised, in an attempt to unveil crucial aspects of specific design insights. The good understanding of the style connections, of the significant construction details that confirm the innovative, functional and well-balanced appearance of these chairs, of the careful selection of materials that characterised postwar austerity, contributed to an already confirmed investigative approach, which may be seen as a useful instrument of knowledge not only for design education, but also for design historians, furniture designers, manufacturers and artisans.

Key words: chair design, style, form, Hans Wegner, Gió Ponti

INTRODUCTION

Mies van der Rohe once said "The chair is a very difficult object...A chair has to be light, it has to be strong, it has to be comfortable. It is almost easier to build a skyscraper than a chair" (quoted in Olesen 2014). A chair is indeed a statement of a particular lifestyle and at the same time it is a "highly expressive cultural object, interweaving technology, the history of style, social history, and the history of ideas." (Olesen 2014). No other piece of furniture is able to claim so effectively its dynamic part in history, neither is it able to be simultaneously a highly social and fiercely individual object. Having close contact with the human body the chair lends personality and authority, involving the sitter in style awareness and/or status affirmation.

The chairs that were investigated were created in 1944 and 1951. Both chairs were designed at the request of manufacturing companies, the *Wishbone* by Carl Hansen & Søn, (Denmark) and the *Superleggera* by Cassina (Italy), which are still manufacturing them, since 1949 and respectively 1957. Both are made of wood, a traditional material. The two designers, Gió Ponti (1891-1979) and Hans Wegner (1914 - 2007) are best known for their postwar activity. Yet their education bears the imprint of the design ideology of the interwar avant-garde.



Fig.1.
Chronological background of Hans Wegner and Gio Ponti

In the twenties, the radical European Modernists rejected tradition and historic styles and created something entirely new that aimed to be an exclusive expression of function¹. However, both Ponti and Wegner endeavored to produce a fusion of functionality and sobriety with visually pleasing designs that were far from giving up the historical sources of style, yet were dedicated to contemporary needs. It is useful to look at Ponti and Wegner within their biographical co-ordinates and compare their success in integrating valuable historic roots, modern functionality and high quality craftsmanship in their design. The synoptic analysis method highlights their design process from concept to form, composition and emotional values, from functionality and ergonomics, to materials, construction and industry-oriented technological assets.

OBJECTIVES AND METHOD

The research aimed at deepening the knowledge and understanding of at least a part of the chair design process dynamics of Giò Ponti and Hans Wegner, by using the synoptic comparative analysis method². Subsequently it attempted to document and describe a significant sequence of 20th century chair design history. The research work started with theoretical investigations required by the historic-biographic guide-marks in order to set up the historical background of the design process. These were followed by the identification of the chair designs typology, and their temporal distribution.

The chairs that were chosen as study cases belong to a modern classics chair collection (Cionca 2014). The analysis was carried on through direct collection of data, measurements and visual investigations regarding dimensions, angles, sitting positions, followed by detailed technical sketching and drawing. Functionality and ergonomics, components and construction details, materials, style and composition were also analysed and compared.

Unfolding the illustrated synoptic features of the design and construction stages is expected to be beneficial for the good understanding of innovative craftsmanship and industrial design.

ANALYSIS OF THE CHAIRS

Concept sources

A few biographical highlights of the careers of the two designers are synoptically presented in Fig. 1, where several moments of their life and works were selected in order to configure a necessary chronological background for their furniture designs and artistic approach.

Christian Holmsted Olesen, director of *Designmuseum Danmark*, said that “Wegner was inspired by older types of furniture, managed to create totally new concepts of form and function, and so he became a key figure in the creation of an entirely new type of Modernism, creating contemporary masterpieces, based on all the experience history could provide” (Olesen 2014). Wegner, though trained in the spirit of progressive functionalism, proved that it was possible to redesign “old-fashioned” furniture types from other eras and foreign cultures, remodeling them into modernity with a visionary timelessness (Fig. 1). Wegner’s historical concept sources were diverse: British Windsor chairs, American Shaker chairs, classic Chinese chairs, the ancient Greek *klismos* and the ancient Roman *cathedra*.



Fig. 2.

Concept sources of the Wishbone chair

(photos: Handler 2005, Harding-Hill 2003, Olesen 2014, Cionca 2014)

The *Wishbone* concept derives from the round-backed “horseshoe” Chinese Ming chairs with an S-shaped back-splat (Fig. 2). Wegner did not ignore either the British tradition and styles - Windsor, Queen Anne, Chippendale back-splat chairs. The *Wishbone* was intended by its manufacturer, not by Wegner himself, to challenge the popular bentwood Thonet *K14 Café* chair. Wegner’s *China* chair family pays a tribute to the classic Ming round-backed chairs, which were brought to Europe starting with the 16th century. They showed the functionalist requirement of honesty: their appearance reflected their construction. They were both geometric and organic. Some of the Chinese details were copied directly from Chinese models, others filtered through British furniture design.

Wegner developed designs inspired from both Chinese chair designs, the yoke- and round-backed Ming chair types. He worked simultaneously on four versions of the Chinese chair type, concentrating on the organic curve in the light back slat. Due to Wegner’s strive for user-friendliness the backrest of the *Wishbone* chair, possibly inspired also by the classic Ming folding chair (Raycheva 2014), shows two major improvements compared to that of the China chairs: the rear legs bend forward to support the back rail so it became safer to get into and up, and the front ends of the bentwood backrest were shortened, in order to improve the interaction of the sitter with the table

(Table 1). The *Wishbone* hence confirms its role as a true side chair, offering also good lumbar support.

Table 1

Wishbone chair: concept sources and description of components

COMPONENTS of chair shown in Fig. 3	DESCRIPTION OF COMPONENTS				
	CONCEPT SOURCES				WISHBONE (4)
	Chinese Ming chair (1.1)	Chinese Ming folding chair (1.2)	Sack-back Windsor chair (2)	H. Wegner, China chair (3)	
Top back rail	Round-backed "horse-shoe" shape extended into armrests, supported by 6 vertical turned elements joined to the seat frame	Round-backed "horse-shoe" shape extended into armrests	Round-backed bent top-rail, horizontal circular bent rail at mid-height extended into armrests	Round-backed "horse-shoe" shape, extended into armrests, supported by 6 vertical turned elements - 2 back legs and 4 joined to the seat frame	Bent circular rail, no armrests
Backrest	S-shaped splat	S-shaped splat	2 rows of spindles	S-shaped splat	S-shaped splat, Y-cut
Armrests	4 turned armrests, 2 S-shaped and 2 vertical, joined to the seat frame	Armrests are formed by the S-curved legs that are joined to the back rail	2 spindles	2 S-shaped armrests joined to the seat frame	—
Seat	Solid wood	Fabric	Solid wood	Woven paper cord	Woven paper cord
Seat frame	Angled joints	No seat frame, 2 stretchers joined to the front and back legs for fastening of the seat fabric	No seat frame	Side frame rails joined lower to the legs than front and back frame rails	Side frame rails joined lower to the legs than front and back frame rails
Legs	Rectangular cross section	Turned, X-crossed	4 turned legs joined to the bottom of the seat	Tapered back legs joined to top back rail, cylindrical front legs, protruding above the seat	Tapered front legs, with rounded upper ends protruding above the seat, back legs tapered ending in strong S-curve when joined to top back rail
Leg stretchers	4 rectangular cross-sectioned stretchers	Front and back end-stretchers and a raised foot rest	3 spindles forming an H	4 leg stretchers, 2 additional side stretchers underneath the seat frame joining the armrests	2 turned stretchers (front and back) and 2 flat slightly trapezoidal side stretchers

In his earlier professional life Gió Ponti was an adept of the *Novecento*, a counter-movement to the interwar European Rationalism. He liked to revive and promote the Italian classical styles, being unwilling to reject this cultural heritage for the sake of bare modernity. Later on some of his projects helped integrate crafts with industrial productions. While substantially function-oriented, yet constantly refining his unique blend of elegant and slender proportion with a delicate and skilful use of materials, Ponti disregarded conventional boundaries and explored and used various fields of art and design. During the 1950's, he devoted more time to industrial design (Fig. 1). His *Superleggera* (Super-lightweight), designed in 1951, was apparently a strictly functional chair, but a closer analysis revealed its stylishness and structural complexity. Its stylistic roots are located in Chiavari (Liguria), where the cabinetmaker Giuseppe Gaetano Descalzi (1767-1855) created the Chiavari chairs, known as *Chiavarine* (Fig.3, Table 2). Descalzi redesigned some French Empire chairs by simplifying the decorative elements and lightening the structural elements. The special lightness of the chair is achieved by structural sections: each component is designed according to the specific stresses it will carry. The seat was made with thin strips of purple willow, hand woven and attached directly to the chair frame (Casoni and Casoni 2011). The *Chiavarina* is still abundantly present in banqueting halls and ballrooms, all over the world.

Lightweight chairs conceptually similar are to met all over the 19th century: from the graceful designs of the British Thomas Sheraton to the elegant Napoleon III *chaises volantes* that are indeed flying chairs³. Towards the end of the 19th century, the architect Philip Webb, friend of William Morris and close to the Arts & Crafts movement, designed for Morris & Co his Sussex chairs with rush seats,

that show a certain likeness to the *Chiavarina*. One can only guess that the family of chairs presented in Figure 3 was not unknown to Giò Ponti.



Fig. 3.
Concept source of the Superleggera chair. Related chairs
(photos: Casoni 2011, Hinckley 1990, Badea-Paun 2009, Kirk 2005, Ponti 1990)

Table 2

Superleggera chair: concept sources and description of components

COMPONENTS of chair shown in Fig. 3	DESCRIPTION OF COMPONENTS				
	CONCEPT SOURCES	RELATED CHAIRS, 19 th c.			SUPERLEGGERA (5)
	Chiavarina (1.1, 1.2)	Sheraton (2)	Napoleon III (3.1, 3.2)	Sussex (4)	
Backrest	Chiavari 1.1: 3 curved back rails, the upper rail decorated, the two lower rails are thinner and narrower	4 curved horizontal rails, 4 vertical spindles reinforcing the upper backrest area	Chaise volante 3.1: 3 curved back rails, the upper rail slightly wider than the lower rails	4 curved horizontal rails, 4 vertical spindles reinforcing the upper backrest area	2 curved horizontal rails
Seat frame and legs	Chiavari 1.2: horizontal frame rails joined to the front and back legs; the rounded front leg ends protrude upwards beyond	Horizontal frame rails joined to the front and back legs; the rounded front leg ends protrude upwards beyond the seat level	Chaise volante 2.2: horizontal frame rails (but joined vertically to the front legs)	Horizontal frame rails (but joined vertically to the front legs)	Horizontal seat frame rails joined to the front and back legs; the rounded front leg ends protrude upwards beyond the seat level
Seat	Chiavari 1.2: caned	Rush woven	Chaise volante 2.2: caned	Rush woven	Caned
Legs	Turned	Turned	Turned	Turned	Convex triangular cross- section, back legs tapering upwards and downwards, front legs tapering downwards
Leg stretchers	6 spindles	7 spindles	6 spindles	7 spindles	6 flat stretchers

Form and composition

Wegner's entire life was one long idealistic design process, his method for approaching a design task was unique, one that designers are still trying to learn from and understand. He was able to combine loose, sweeping and organic forms with deeply rational and visible construction techniques that became part of the chair's expressiveness, its ornament. Although Wegner worked in sculptural and elegant forms, he perceived his work as an ongoing process of cleansing and clarification. Figure 4 shows a form typology where his relentless wish to improve the form and the sitting quality, impossible to separate, becomes visible - the creative process unfolds. The *China* chair, the *Wishbone*, the *Round* chair and the *Cow Horn* chair are branches of a genealogical tree, parts of a common form/ composition concept which was organically developing. One of Wegner's sketches is in fact a draft where the *China*, the *Wishbone* and the *Round* chair are merging in a single design (Olesen 2014), and this shows his special gift of experimenting with forms. Indeed he is an organic modernist, but remains within the reasonable boundaries of a soft functionalism. The *Wishbone* has a beautiful, decorative and sensuous design, with impeccable craftsmanship shown in joinery and providing several good sitting positions. The *Round* chair, another successful Wegner design, seems to lack the sophistication of the *Wishbone*, but a closer look reveals not only an increase in sitting comfort, but an overlapping of two style roots visible in the back rail form: the Chinese and the ancient Greek *klismos*. It has the back support surrounding the person seated and the armrests have been integrated into the backrest. The *Round* chair is harmonious and balanced, and it also expressive and exclusive. Wegner is the undisputed master of top-rail design and dynamic sitting opportunities. Since the *Round* chair couldn't be placed properly at a table and Wegner issued the *Cow Horn* chair, with short armrests, providing even better lumbar support and some elbow support. The back has two center joined bentwood parts, designed to increase the strength of the chair. The central joint is discreetly decorative, with a touch of artisanal intervention enhancing the visual value of the entire composition.

Ponti's typology of forms shown in Figure 4 unveils the fact that while developing rather whimsical designs in the 1930's, his slim *940* chair from 1933 seems at first glance to surrender to bare functionalism, even to minimalism, but the first glance proves to be deceiving.

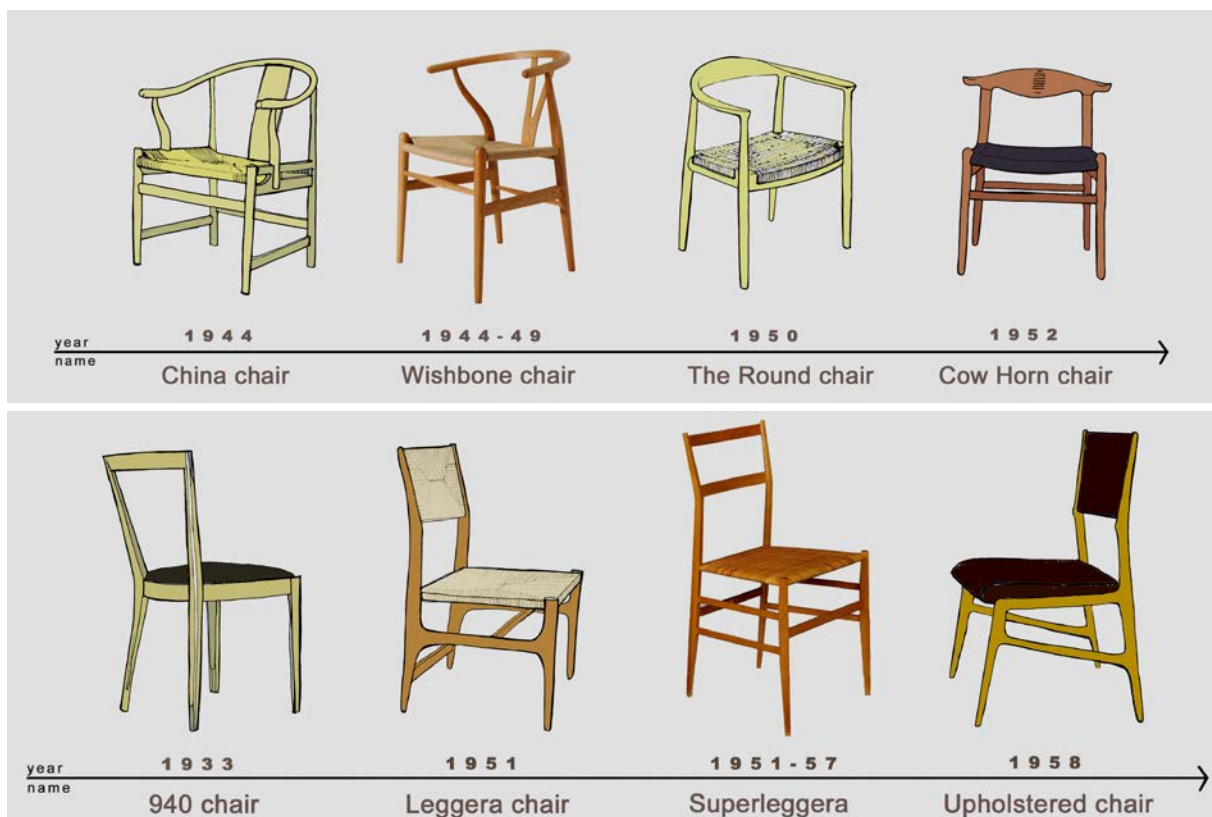


Fig. 4.
Wegner and Ponti: Form Typologies
(drawings after Holmsted Olesen 2014, Ponti 1990)

The chair's austerity is contradicted by the unusual spiky hourglass shape and by the partly hollow back legs, requiring top craftsmanship. The will to reduce the weight of the chair is obvious, but this is a beech wood chair, hence not too light. His *Livia* chair from 1937 is also a slim and simple chair, but in 1949 Ponti started to work at altering and optimizing the traditional low-price and popular *Chiavari* chair. One of the results was the *Leggera* (Light) chair that he designed for Cassina in 1951 which was another attempt to reduce the structure of the *Chiavarina* to a bare minimum. The *Leggera* had stylish joints between the side stretchers and the legs and was already made of ash. The cross-section of the legs did not yet attain the *Superleggera* minimum and we may look at the *Leggera* as an intermediary design process phase. The *Leggera* met with great success among consumers, but Ponti strove for even greater perfection and started to design in the same year the *Superleggera* - it entered production at Cassina in 1957. The *Superleggera* was made of light, stable ash wood and had a caned seat, or, to keep the price low, made of woven colored cellophane. It was yet another result of the *Chiavarina* optimization, but this time Ponti designed an ergonomic bend in the backrest area and tapered the front and back legs. The legs have an unusual cut and the stretchers became thinner. The classic design line remains tangible, the chair's weight reaches a minimum never to be surpassed by a wooden chair. The composition is well-balanced, well-proportioned and pleasing, the chair is light and remains timeless functional.

Both the *Wishbone* and the *Superleggera* may be considered remarkable links between past and present in terms of joining the artisanal tradition to the modern world of design.

Construction details and materials

To make the *Wishbone* of oak wood was a premiere for Wegner, who until then preferred dark, exotic woods like mahogany and teak, which were customary on the Danish furniture market in the first decades of the 20th century. But in the forties, after WWII, a reorientation toward indigenous wood occurred and Wegner decided to use oak or maple with simple finishing. The *Wishbone* was the first of Wegner's designs to enter serial production. The chairs were washed in soapy water, to preserve their beautiful texture and the natural feeling of the surface.



Fig. 5.
Construction details, Wishbone chair

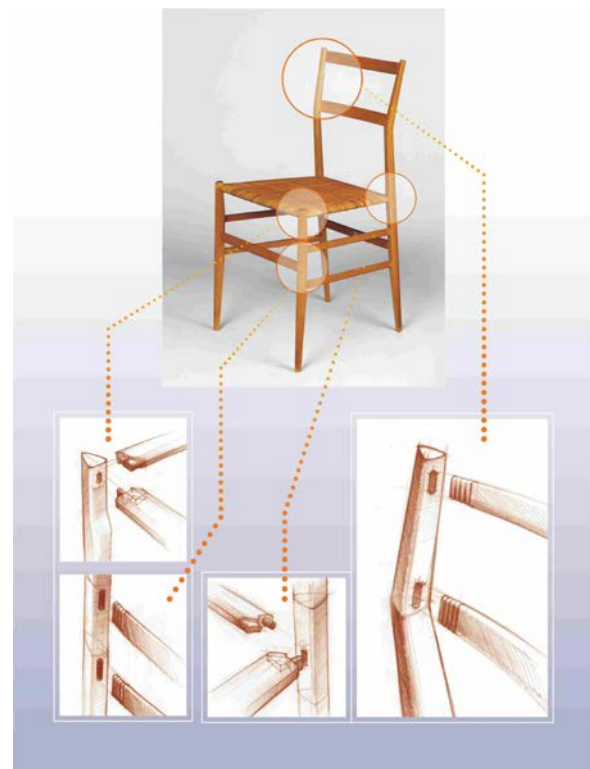


Fig. 6.
Construction details, Superleggera chair

The chair's construction details can be seen in Figure 5. The construction is simple, but several details reveal careful, ingenious design: **A.** the frame rails are placed horizontally in order to facilitate the cord weaving and add comfort to the seat, but their tenons, which are inserted in the legs'

mortises are vertical, hence giving good strength to these joints which are crucial for the chair's resistance; **B.** the side frame rails are placed above the front and back frame rails, hence the leg in its double mortise area is secured; **C.** the longer mortise of the back frame rail is meant to facilitate the paper cord weaving in the back-slat area; **D.** the back-slat is made of S-shaped molded plywood, with two cut up struts forming the Y or "wishbone" and three tenons which are assembled to the bentwood back-rail and the back frame rail; **E.** the ends of the back-rail as well as the upper ends of the front legs are carefully rounded.

Ponti's *Superleggera* had the benefit of the success of Descalzi's chairs, which were made of ash and beech, later on also of cherry and maple. Deciding to use ash wood for the entire structure, except the frame, Ponti reduced the round cuts of wood, typical to the turned legs of the *Chiavarina*, to a triangular cross-section with edges only 18mm long, and devised an unusual system of double tenons to achieve the weight-bearing frame joints. The result is a stable chair weighing 1.7 kilo. To put it to the test, Ponti threw the chair from the fourth story of an apartment building into the street, where it bounced like a ball without breaking (Salsi 2012). The weight-bearing joints frame joints are those between the side frame rails and the front and back frame rails, and between the side frame rails and the front and back legs as well (Fig. 6). These two pairs of exceptional double joints not only secure the frame-and-legs structure, but show unique wood craftsmanship qualities, e.g. in the rounded tenon shoulders that meet the curious shape of the triangular legs when the striated tenons are inserted into the mortises of the legs. These double joints using the side rails' tenons seems to be unique in wooden chair design. It explains also why the chair frame was made of beech wood, which is known to be strong and dense, with superior mechanical properties. Knowing the aim of each of the two designers' concept, adequate wood species were chosen, according to their physical and mechanical properties: oak (*Quercus robur*) for the Wishbone – strong, hard, very stable, with a beautiful texture and good finishing qualities; ash (*Fraxinus excelsior*) for the *Superleggera*'s legs and stretchers – dense, tough, relatively light but very strong, elastic and resilient, with a beautiful texture and good finishing qualities, and beech (*Fagus sylvatica*) for its frame rails – tough, widely used for furniture framing but dimensionally unstable, which does not affect its role in the chair structure.

Sitting positions and dimensions

The analysis of the two chairs' ergonomics is shown in Figure 7 and Table 3. The Wishbone and the *Superleggera* are both side chairs, usually seen in dining rooms. Their ergonomic qualities are expected to be similar. They are very much alike indeed: their seat angle is 2°, the angle between the seat and the back is 107° for the *Superleggera* and 108° for the *Wishbone*, and their backrest angles are also similar, 19° and 20°.

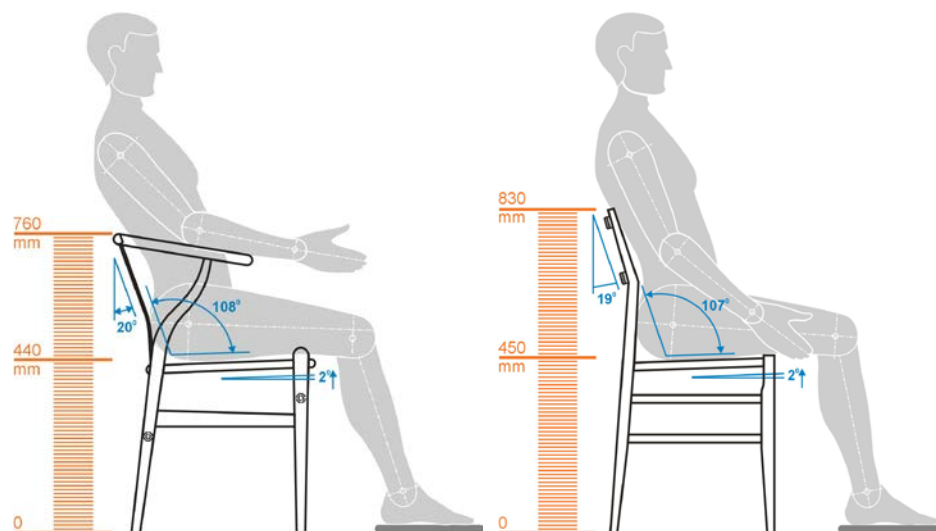


Fig. 7.
Sitting positions, dimensions and angles

Their seat angles are below the recommended angle values, their backrest angles are substantially above the recommended values (Table 3). Table 3 also shows comparative data for two other side chairs previously analysed, Charles Eames' *Wire* and Eero Saarinen's *Tulip* chairs². The

four chairs were industrially produced between 1944 and 1955. All of them became “primadonnas” of 20th century history of design. Some of their dimensional and angular characteristics do not situate within the recommended limits, but this does not affect the comfort they offer to the sitter. The *Wishbone* offers good lumbar support to the sitter’s spine due to the Y back-splat, and so does the *Superleggera* due to its well-positioned backrest rails.

CONCLUSIONS AND DISCUSSIONS

For the carrying out of the main objective of the paper, which consisted of documenting and describing the postwar comeback of inherent style connections in wood chair design (a less investigated sequence of 20th century design history), several stages of a synoptic analysis of the design process were instrumental to its knowledge and understanding:

- Chronological background (Fig.1) regarding the professional evolution of two designers, Hans Wegner and Giò Ponti
- Analysis of their concept sources (Fig. 2, 3), an investigation that allowed the understanding of the style imprint existent in the two chairs and visualize similar designs
- Analysis of form typology and composition development (Fig.4) within their design process
- Investigation of the structure, components and significant constructive details (Fig. 5, 6)
- Comparative analysis of the chairs’ ergonomics (Fig.7): dimensions, angles, sitting positions
- Comparison between the results of the measurements and the recommended dimensions and angles (Table 3)
- Comparison between the two European side chairs and two American chairs also designed in the 1950’s, where other materials than wood were used, the *Wire* and *Tulip* chairs of Charles Eames and Eero Saarinen (Table 3)
- The synoptic presentation of the sitting positions shown in Figure 7 allows a good understanding of the anatomical interaction and is able to help designers have an overview of the chairs’ proportions and interactions with the human body. The measurements results compared with the recommended parameters in Table 3 resulted in accepting that it is possible to “trespass” the recommended limits without affecting function and comfort parameters.

Table 3

Dimensions and angles of designers’ side chairs 1949-1955
(Neufert and Neufert 2012, Grandjean 1997, EN 1335-1:2000 Cionca et al 2013)

	Hans Wegner <i>Wishbone</i> 1949 (Europe)	Giò Ponti <i>Superleggera</i> 1957 (Europe)	Charles Eames <i>Wire chair</i> 1951 (US)	Eero Saarinen <i>Tulip chair</i> 1955 (US)	Recommended for side chairs
Seat height (frontal measurement mm)	440	450	440	470	400-450
Seat depth (real sitting depth mm)	405	390	400	400	380-450
Seat depth (total) mm	425	395	420	455	-
Total height of the chair mm	760	830	810	820	-
Seat angle	2°	2°	4°	0°	5-8°
Seat-backrest angle	108°	107°	97°	97°	105°-115°
Backrest angles	20°	19°	11/15°	7/17°	13-15°

The most important outcomes of the analysis and research regarding the two chairs are: a) the structure and dynamics of the style connections comeback were first encouraged and appreciated in Europe and soon adopted and praised in the US (the *Wishbone* case – organic modernism); b) the radical transformation of the classical line into “functional elegance” (the *Superleggera* case – stylish postwar austerity); c) the innovative construction details of both chairs highlighted also their major contribution at remodeling modern design in wood and showing the assets of this traditional material; d) the two chairs are parts of the same design approach available in early postwar Europe. They deserve their presence among the best designs of the 20th century due to their progressive vision and to their timelessness. The *Wishbone* contributes with the enhanced simplicity meant for industrial production, while the *Superleggera* resolves the practical problem of the relationship between

structure, material and weight in an era when people were searching for simple, handy household products, expressing a common longing for a normal life.

Subsequently, this design approach of the late 1940's and 1950's demonstrates that the revival of sensuous and graceful forms and of subtle handcrafted details expressed in wood, far beyond avant-garde functionalism and purely industrial performance, was a latent desire whose effectiveness is now available to all of us.

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NOTES

¹ Bauhaus called for a design revolution in countless areas of daily life. It asked for new industrial methods of production. Tubular steel became an icon of technical and industrial modern times, the emblem of a new sense of esthetics and its functionality of a "morality of objects". These Bauhaus objects had to be liberated from the ominous weight of bourgeois representation. They were in fact initially exclusive ideals of a modern, enlightened and reformist middle-class. (Andrea Gleininger, Neues Bauen, New Forms of Living, New Man. Furniture from the Bauhaus Workshops, in Fremdkörper 2012).

² The method was configured, applied and presented in 2013 (Cionca et al. 2013).

³ Due to its lightness and stackability.

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