

How Wide is the Gap? Evaluating Current Documentation of Women Architects in Modern Architecture History Books (2004–2014)

Four decades ago, Susana Torre addressed the lack of documentation and representation of women's design and built achievements in architectural histories. This article contributes to the current criticism of the lack of documentation of women's contributions to architectural histories. To evaluate the historical visibility of women since Torre's first addressed of the issue, this article provides a quantitative analysis of the documentation of women and their achievements in recent publications. The titles examined were 10 modern architecture history books, accompanied by an index, published or re-printed between 2004-2014 and available in Belgian university libraries. Only those available in at least three institutions were investigated, and those with multiple copies available were prioritised. The outcome of this research is two-fold. Firstly, it demonstrates that modern architecture histories were composed of an averaging ratio of 19 men architects/designers to one woman architect/designer. Secondly, inspired by the three-question Bechdel test that evaluates women's representation in film, an architectural Bechdel test was introduced and put into practice to evaluate the representation of women's lives and achievements. Only four out of the ten books were shown to represent the lives and/or achievements of one woman architect in at least three pages.

Keywords: women, modern architecture documentation, quantitative study, recent publications

Introduction

Low representation of women is a problem in the practice of architecture today. This will only be exacerbated by an inaccurate account of architecture history. Perpetuating an exaggerated gender gap can discourage women from entering and remaining in the profession. In 2014, a survey covering 97% of architects in Europe showed that the collective average of women practicing architecture was 39%.¹ The same European survey stated that women architects earned 67 cents to a man's euro. This suggests that women are not valued equally in the profession. Moreover, architects tend to earn the most when they are above fifty years-old but, according to the 2014 report, only one woman for every six men reaches this higher recognition. One may wonder, are women architects being discouraged from the profession due to a lack of recognition?

In 1977, Susana Torre addressed the lack of documentation and representation of women's design and built achievements in architectural histories. Torre asked, 'Why, although women have designed and built since the beginning of human civilization, have their achievements remained undocumented and unacknowledged in architectural histories?'² Are women's achievements still undocumented and unacknowledged in the modern architecture records? Is this gap between women's achievements and what is written in the canon history books still significant today? If such gap still exists, one may wonder how wide is the gap?

In the last forty years, several architectural historians and theorists have examined the work and lives of modern women architects and designers. They have disseminated and proliferated their findings through exhibitions and exhaustive publications³ thus, providing the tools to revisit the history of

- 1 'Country profiles' in: 'The Architectural Profession in Europe 2014 – ACE Sector Study, 2014,' Architects' Council of Europe, http://www.acecae.eu/fileadmin/New_Upload/7._Publications/Sector_Study/2014/EN/2014_EN_FULL.pdf (accessed June 16, 2017), research done by Mirza & Nacey Research Ltd, January 2015.
- 2 Susana Torre (ed.), *Women in American Architecture: A Historic and Contemporary Perspective: A Publication and Exhibition* (New York: Whitney Library of Design, 1977).
- 3 Diana Agrest, Patricia Conway and Leslie Kanes Weisman (eds.), *The Sex of Architecture* (New York: Harry N. Abrams, 1996); Lori A. Brown, *Feminist Practices: Interdisciplinary Approaches to Women in Architecture* (Farnham: Ashgate, 2011); Ulla Markelin, *Profiles: Pioneering Women Architects from Finland* (Helsinki: Museum of Finnish Architecture, 1983).

modern architecture and to correct inaccuracies about collaborative projects previously thought to have been individually created. These updated, detailed studies have given modern architecture a new face in a history that does not omit the presence of women. They have 'unforgotten' great architects like Charlotte Perriand, Lilly Reich and Marion Mahony Griffin.⁴ It seems thus necessary today to evaluate the impact of their work. If historians have included women architects, to what extent did they?

The outcome of my research is twofold. Firstly, I present the statistics for total individuals recorded, focusing on those appearing on more than one page or illustration. Secondly, these page-citations are supported with an analysis of the representation of women architects' lives and achievements.

Methodology

This article provides a quantitative and qualitative content analysis of the documentation of women's achievements in modern architecture history publications. This research paper is divided in two parts.

The first concerns the quantification of people named in book indexes who were assigned an individual and documented role in the history of architecture. I am interested in the individuals who are attributed a singular role and individual recognition. By examining book indexes and counting the page citations, a female-to-male ratio of represented individuals can be demonstrated. Because this conference focuses on the period of 1918–45, statistics and information about women architects working in this period will be included.

The second part addresses the way in which women modern architects are included in these books. This was done by creating an architectural Bechdel test through which the books were examined. The Bechdel test is a three-question



Fig. 1. Extract of original comic strip by Alison Bechdel titled 'The Rule' in her *Dykes to Watch Out For*, 1985, p. 22. Copyright belongs to Alison Bechdel.

test developed by cartoonist Alison Bechdel in 1985 to analyse the representation of women in film (Fig. 1).⁵ In order for a film to pass the test, it needs to fulfil the three following requisites.⁶ Firstly, the film has to have more than two named female characters that, secondly, talk to each other; and thirdly, talk about something other than men. The goal of this test is to draw attention to the lack of women represented in film and to illustrate how they are represented. The last question points to the way women characters are written only to promote the stories of other men characters.

The architectural Bechdel test is further explained in part two of this article. This test was done with the support of a supplementary quantitative method. By counting the pronouns he, she, his, her and him employed in the English version of the text, it was possible to illustrate how women architects' lives and their achievements are portrayed in these books. This step was accomplished with digital, English versions of the books examined (Google books and ebooks). This quantification enabled an evaluation of the extent to which gender pronouns, in the English translations of the text, refer to women architects; thus, a form of quantification of the representation of women's lives, achievements and ideas described in such publications.

The Ten Titles Analysed

Ten books were analysed for this research. They were selected according to five criteria.

- (1) Only books published in the last decade were studied (from 2004–14).
- (2) All books were available in more than one architecture library at Belgian universities. Books in multiple copies, languages or editions were preferred.
- (3) Titles had to contain the words 'modern architecture' or '20th century architecture'. This was designated in order to examine what is perceived as 'generally noteworthy' or the canon of modern architecture. There was one exception to this guideline in incorporating the title *Negotiating Domesticity* edited by Gülsüm Baydar and Hilde Heynen. This was deliberately done in order to compare the effect of gender-aware architectural theory and history books.
- (4) Books geographically focused were excluded from the research in order to represent the perceived world's canons and the 'general' history of modern architecture.
- (5) Finally, all books had to include an index of the individuals mentioned within the pages of the literary work.

4 Charlotte Benton, *Charlotte Perriand: Modernist Pioneer* (London: Design Museum, 1996); Mary McLeod, *Charlotte Perriand: An Art of Living* (New York: Harry N. Abrams, 2003); Matilda McQuaid, *Lilly Reich, Designer and Architect* (New York: Museum of Modern Art, 1996); Debora Wood, *Marion Mahony Griffin: Drawing the Form of Nature* (Evanston, IL: Mary and Leight Block Museum of Art, 2005).

5 Glyn Davis et al., *Film Studies: A Global Introduction* (London: Routledge, 2015), 462.

6 Alison Bechdel, "The Rule," in *Dykes to Watch Out for* (Ithaca, NY: Firebrand Books, 1986).

The ten titles of the books studied are: *Encyclopedia of 20th Century Architecture* (2004); *Negotiating Domesticity: Spatial Productions of Gender in Modern Architecture* (2005); *L'Architecture du XXe siècle* (2005); *Modern Architecture and Other Essays* (2005) *L'architecture moderne* (2006); *The A-Z of Modern Architecture* (2007); *Modern Architecture: Representation & Reality* (2009); *La arquitectura moderna y sus creadores* (2012); *20th Century World Architecture* (2012); and *Modern Architecture: A Critical History* (2014).

Then ten publications here studied are not all aimed for the same audiences. Some are intended for scientific audiences, some contain subjective essays on modern architecture, and others claim to be encyclopaedic accounts of modern architecture. A strict distinction was not made for two reasons. Firstly, scholars have praised these ten books as being accurate representations of history, also using them as scientific references in their own academic publications. Secondly, these books were found in university libraries, presented with the same treatment and in the same shelves for modern architecture history sources.

Part One: The Statistical Results

All the ten titles add up to 6985 pages recording the history of modern architecture. After analysis, a total of 3490 individual names were extracted from the indices. Of the total number of people mentioned, 342 were female (10%) to 2936 male (90%) (Fig. 2). Of the 3490 people indexed, 1574 (45%) are mentioned on more than one page or illustration. Since more than 50% of the individuals indexed are only used once as literary references that are unique to one title, I propose to study the statistics of those individuals that are mentioned more than once: in the same book or just once but in more than one book. These 1574 individuals would be portrayed as significant contributors to modern architecture.

Of these individuals cited, 144 (9.1%) are women and 1429 are men (90.9%); 1063 are architects and designers (67.5%); 116 artists (7.4%) and 95 historians (6%). Furthermore, of these 1063 architects and designers, appearing on more than one page, 61 are female (5.7%) to 1002 male (94.2%). Subsequently, of the 61 women, 24 are recorded architects or designers who were active in the profession between 1918 and 1945. Finally, we can produce the ratio of female to male architects or designers, documented in two or more pages or illustrations and being active during 1918–1945, to be 24 women (4.6%) to 490 men (95.3%). This is an extremely low ratio, especially given that out of the ten most cited architects, as recorded in this analysis, more than half had significantly collaborated with women architects and designers.

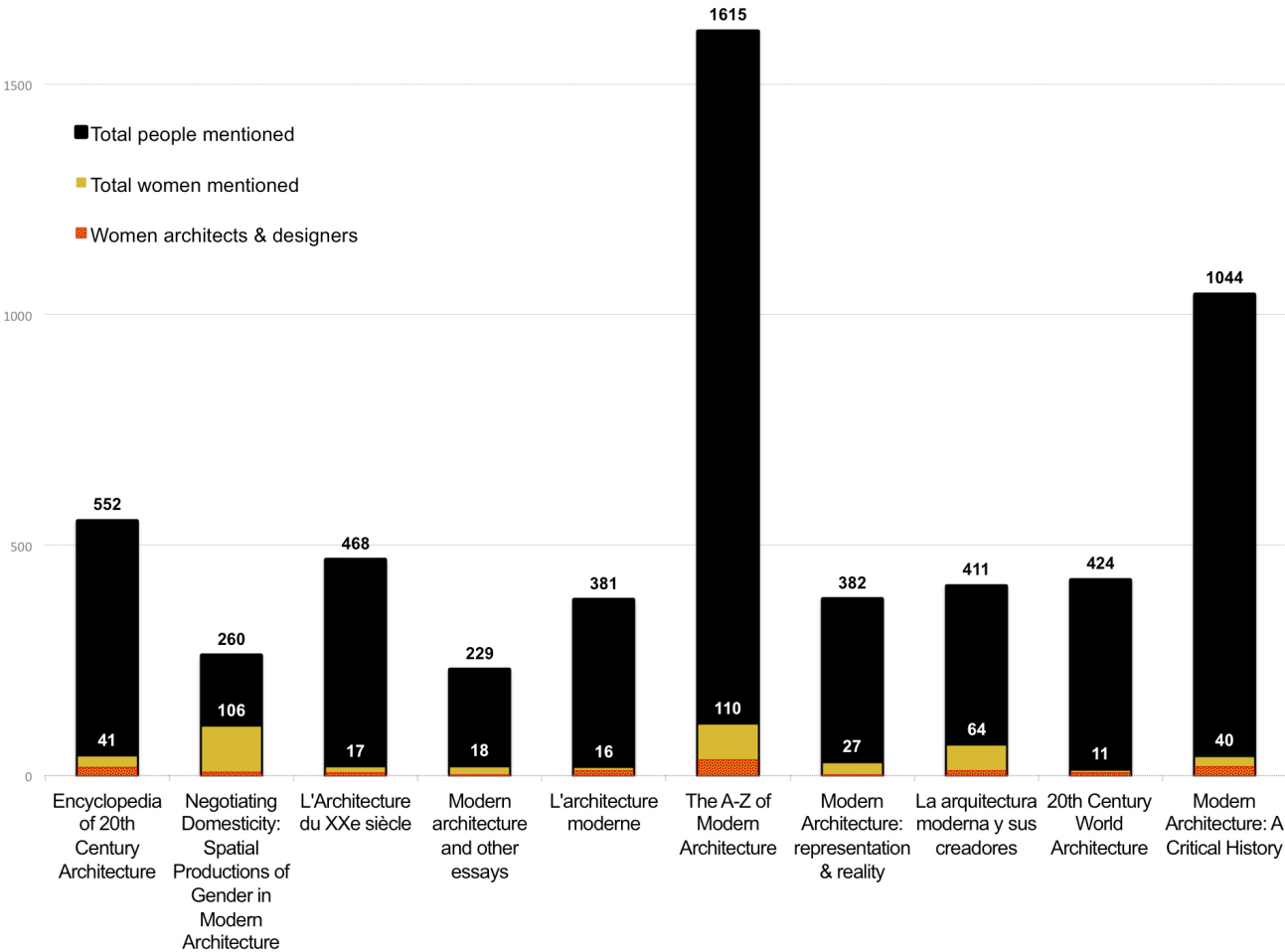


Fig. 2. Chart of all the names mentioned in the indexes of the ten titles

Part Two: The Torre Test

Six out of the ten most cited architects,⁷ in this recently published Euro-American literature, collaborated and some even partnered with fellow female architects and designers for their most celebrated work. However, only two women are present in the top 100 most cited architects (Fig. 3). Furthermore, when women collaborators or partners are described in this historical literature, they are almost never presented as equal architects or designers but rather as drafters, assistants or even just simply as wives. How do we account for this discrepancy? Why are men and women not equally portrayed by historians? It is imperative for architectural history to reflect reality but most of all, it is important that the future of architecture is projected from accurate histories.

⁷ After adding up total counts of page citations, across the ten studied publications a top ten of most cited architects was found. The top ten most cited architectes are, in order of page-mentions: Le Corbusier (Charlotte Perriand), Frank Lloyd Wright (Marion Mahony and Catherine Ostertag), Ludwig Mies van der Rohe (Lily Reich), Louis Kahn (Anne Tyng), Walter Gropius, Robert Venturi (Denise Scott Brown), Louis Henry Sullivan, Philip Johnson, Alvar Aalto (Aino Marsio-Aalto), and Adolf Loos.

SIX OUT OF THE 10 MOST CITED ARCHITECTS COLLABORATED WITH WOMEN

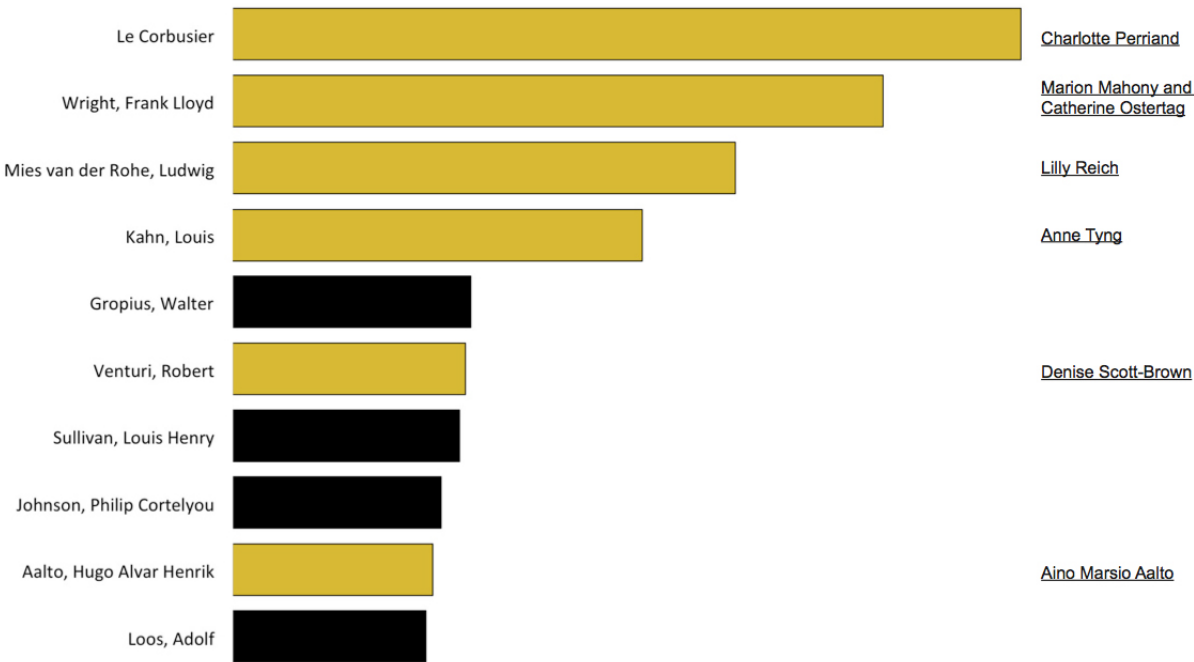


Fig. 3. Chart representing the top ten most cited architects in the ten titles analysed.

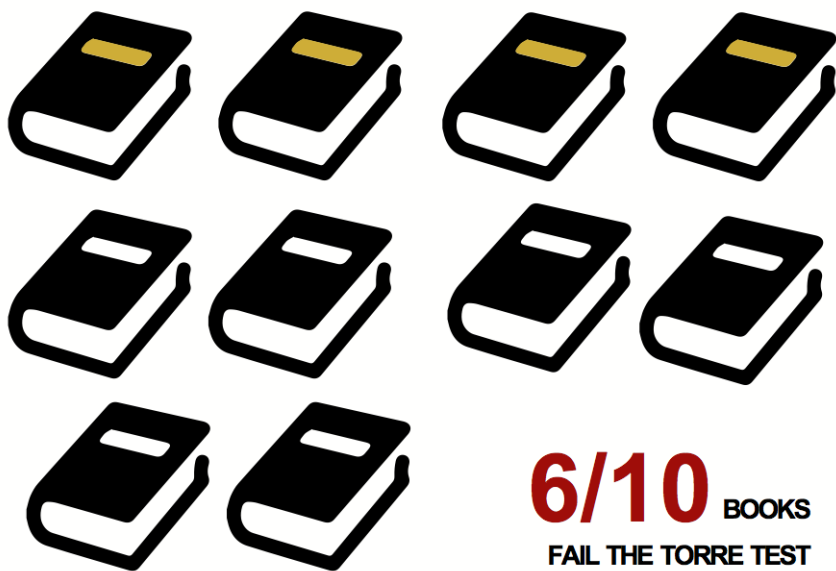


Fig. 4. Results of the “Torre test”.

	TOTAL PAGES	TOTAL WOMEN ARCHITECTS & DESIGNERS	TOTAL WOMEN ARCHITECTS & DESIGNERS, >1 PAGE	1ST TORRE CONDITION	2ND TORRE CONDITION	3RD TORRE CONDITION
1. Encyclopedia of 20th Century Architecture	1525	34	24	✓	✓	✓
2. The A-Z of Modern Architecture	1071	103	9	✓	✓	✓
3. 20th Century World Architecture	831	10	1	✓	✓	✗
4. L'architecture du XXe siècle	604	16	9	✓	✓	✗

Fig. 5. The representation of women architects in Group A.

The architectural equivalent of the Bechdel test that I propose will need to comply with the three following statements. (1) The book contains more than three women architects or designers, named individually in the index. (2) One of the women architect’s projects, productions, ideas or experiences are mentioned (3) in more than two pages of the whole book. I name this adapted architectural Bechdel test the Torre test, in honour of Argentinian scholar Torre and her pioneering contribution to recognising women in architecture with her 1977 publication, in a defining time when history started being written with a conscious perspective of gender biases.⁸ Six out of the ten books fail this simple test (Fig. 4).

For the purposes of clarity, the books will be separated into three groups according to their number of pages. Group A will include the books with over 450 pages. Group B will include books between 300 and 450 pages. Finally, Group C will include the books with less than 300 pages.

Group A

This group is composed of four books that aim at a lengthier narrative of history, replicating the form of encyclopaedias. Figure 5 illustrates the results for their representation of women architects (Fig. 5).

1. Sennott, *Encyclopedia of 20th Century Architecture*, Volume 1–3. New York: Fitzroy.

This title is an extensive historical encyclopaedia composed of three volumes and 1525 pages.⁹ There are 553 individuals mentioned and almost half of them (266) are mentioned multiple times. This suggests an average of 2.7 pages per individual, which allows for a more extensive historical account of the lives and works of the architects and designers. One also observes a higher number of female (26 she and 35 her) and male pronouns (88 he, 89 his and 74 him) used in the text. This is

⁸ Torre, *Women in American Architecture*.

⁹ R. Stephen Sennott, *Encyclopedia of 20th-Century Architecture* (New York: Fitzroy Dearborn, 2004).

also reflected by extensive descriptions of women architects and their contributions, thus passing the Torre test.

Encyclopedia of 20th Century Architecture represents the second highest use of female pronouns. Due to the encyclopaedia format, each entry of a woman architect presents a detailed account of who they were and what they accomplished. This above average representation of women architects may be due to the involvement of the feminist architect and historian Diana Agrest, as she was part of the board of advisors.¹⁰ A particularity of this book, which increases the visibility of the women architects, is that there is an index entry on this topic: titled 'women architects,' which is followed by a reference to the page mentions of nine prominent women architects.

The theme of women in architecture is also treated throughout the three volumes of the encyclopaedia. For example, on the 'Finland' entry there is a two-paragraph description of prominent early 20th century women architects. Along with two other Finnish women architects, Vivi Lönn is presented. She is noteworthy for being the first female architecture graduate in 1896 and the first independently practicing female architect of Finland in 1904.¹¹ In page 460 of this encyclopaedia, she is presented as a 'major force' in the architecture of the first two decades of the country. Her most prominent buildings are also subsequently referenced without elaboration. This book has a 7.43% female name citations in its index. Even with a low percentage, this book is noteworthy in elaborating in higher detail the lives, production and trajectories of 41 women.

2. Gössel and Cohen, *The A-Z of Modern Architecture*. Cologne: Taschen.

This book, consisting of two volumes with illustrated projects, represented the highest number of women mentioned (110), and the highest number of women architects mentioned (103).¹² Some of the wives that collaborated with their partners are given a name and sometimes a face. This reference book is effective in representing the high numbers of women that have contributed to the field of architecture as a whole in the twentieth century. It may be because it is taken more as a detailed encyclopaedia than as a free-flowing writing piece. Even though many women are cited in this book, very few are actually presented or cited on more than one page of the book.

Some of the architect wives of men architects are for the first time present in this book. However, they are not represented equally compared to their husbands. For instance, Herzog and De Meuron both appear in the same number of pages. For example, the Finish modernist architect Aino Marsio Aalto (1894–1949) is here mentioned for the first time on her own in the index, however, she is not given her own entry in the content of the book. Nonetheless, this is the only time in all ten books

researched that she appears in the index individually. Aino Aalto graduated in 1920, a year before Alvar and with the same architecture degree from the Institute of Technology in Helsinki.¹³ She collaborated as an equal partner with her husband, as well as designing on her own.

Surprisingly, the projects that she produced alongside Alvar Aalto are cited in 8 out of the 10 books, with the top 10 highest amounts of page citations in all of the books. The projects and designs Aino Aalto produced with her partner are well recognized and admired but she does not receive any credit for them. On the other hand, Alvar Aalto, who is one of the most described figures of modern architecture, appears in more than 140 pages of all of the books analysed. In this way, it is her husband that is credited as the sole author of the projects that they both collaborated on.

However, Irish architect Eileen Gray's (1878–1976) life and achievements are described on more than one page of the book. It is only thanks to the Peter Gössel and Jean-Louis Cohen mentioning her in three pages that this book passes the Torre test.

3. Terragni and Thomas, *20th Century World Architecture*. London: Phaidon.

This book was edited by two women historians, Emilia Terragni and Helen Thomas, and it has the lowest women representation out of the ten titles.¹⁴ There are only 10 individual women architects cited in the index at least once. Women represent a very low 2.6% of the 424 people cited. The lives or works of women architects are not recorded in this 831-page book. This title was praised upon reception for its accuracy, exhaustiveness and inclusiveness of modern architects from non-Western parts of the world. For example,

The reality, needless to say, was more complicated, and now Phaidon have devoted several kilogrammes of book to putting the record straight. 20th-Century World Architecture is a coffee-table book that weighs more than a table, an epic production that boasts its scale: 3,800 photographs of 757 buildings by 699 architects in 97 countries. It aims to set architecture in wider contexts of colonisation and decolonisation, and of cultural exchanges between countries.¹⁵

Despite this title aspiring to represent 20th century world architecture, it exhibits a case for discrimination. There are female partners that are completely overlooked and whose respective husbands or partners are not (ie. Aino Marsio-Aalto, Nobu Tsuchiura, Charlotte Perriand, Denise Scott-Brown, etc.) There are also several female architects that are overlooked as individuals

¹³ Alvar Aalto, Aino Aalto and Renja Suominen-Kokkonen, *Aino and Alvar Aalto: A Shared Journey: Interpretations of an Everyday Modernism* (Helsinki: Alvar Aalto Foundation, 2007).

¹⁴ Emilia Terragni and Helen Thomas, *20th-Century World Architecture* (London: Phaidon, 2012).

¹⁵ Rowan Moore, "20th-Century World Architecture: The Phaidon Atlas by Phaidon Editors; The Future of Architecture Since 1889 by Jean-Louis Cohen – Review," *The Guardian*, October 28, 2012, <http://www.theguardian.com/books/2012/oct/28/architecture-atlas-phaidon-review> (accessed June 16, 2017).

¹⁰ Ibid.

¹¹ Annie Canel and Ruth Oldenziel, *Crossing Boundaries, Building Bridges* (London: Routledge, 2005), 82.

¹² Peter Gössel and Jean-Louis Cohen, *The A-Z of Modern Architecture* (Köln: Taschen, 2007).

but who are partially mentioned as office names or together with their husbands such as Marion Mahony Griffin, Ray Eames and Helena Syrkus.

A surprising example is the case of Lina Bo Bardi (1914–1992) whose projects are presented in three different pages but the architect is barely mentioned in them.¹⁶ She is firstly introduced as Gio Pionti's student and then the authors proceed to describe her home, the *Glass House* (1951), as an excellent representation of his theories and not hers. Subsequently, when presenting Bo Bardi's project for the *Museum of Art* in São Paulo, the narrators only focus on the husband of the architect, Pietro Maria Bardi. They describe his role in the museum, his networks and his curatorial experience. Her name is only mentioned in the last sentence of the page, to remark her unusual choice in presenting the artwork freely in the space. Finally, only in the project of the *Pompéia Factory Leisure Center* is Bo Bardi's motto 'Architettura povera' cited. However, her unique parti pris for renovating the factory, instead of following through with the planned demolition of the site, is also ignored. This title fails the Torre test because Bo Bardi's life and ideas are not described for more than one page and her projects are presented in such a way that they do not appear to be her own.

4. *L'Architecture du XXe siècle*. Cologne: Taschen.

Multiple copies, editions and language versions of this book were available at all university libraries. The version analysed here is a French translation and second edition of the book published in 2005, a newer version has been published in 2012.¹⁷ However, it is the 2005 edition that was most widely available, in multiple copies, across multiple institutions. This book contains 604 pages of text, with an index presenting a total of 468 people with 17 referenced women. Thus, one can observe a 3.6% representation of women in this notorious reference of modern architecture history. However, this book blatantly fails the Torre test.

When analysing the use of gender pronouns in the English version of the 2005 edition, a great discrepancy stands out. There are a total of 189 male pronouns (83 he, 85 his and 21 him) employed in the text. However, there are absolutely no mentions of she pronouns. This can be translated as: there are zero sentences where women are active subjects in the history of modern architecture. Furthermore, there are only five uses of the pronoun her. Of the five, only two refer to human beings: British-Iraqi architect Zaha Hadid and American-French artist Josephine Baker, as a fantasy client. The other three her pronouns refer to anthropomorphised nature. Zaha Hadid's name appears in text in two sentences of the whole book. Once in the descriptor of a photograph of her *Vitra Fire Station* (1989–1993) and once when describing the profile of architect Daniel Libeskind.¹⁸ In this

16 Terragni and Thomas, *20th-Century World Architecture*, 722, 728, 732.
17 Peter Gössel and Gabriele Leuthäuser, *L'architecture du XXe siècle* (Köln: Taschen, 2005).
18 Gössel and Leuthäuser, *L'architecture*, 524, 585.

	TOTAL PAGES	TOTAL WOMEN ARCHITECTS & DESIGNERS	TOTAL WOMEN ARCHITECTS & DESIGNERS, >1 PAGE	1ST TORRE CONDITION	2ND TORRE CONDITION	3RD TORRE CONDITION
5. La arquitectura moderna y sus creadores	407	17	8	✓	✓	✓
6. Modern Architecture and other essays	400	6	5	✓	✓	✗
7. Modern Architecture: A Critical History	389	25	17	✓	✓	✗
8. Modern Architecture, representation & reality	364	5	3	✓	✗	✗

Fig. 6. The representation of women architects in Group B.

way, her life and work are not included in the body of the book and are not described for at least three pages.

A particularity of this book is that it contains a section detailing twenty architects: as individuals or as duos. Sadly, no women are represented. It insinuates that no women architects were worth being remembered or that their work was not remarkable enough in the history of 20th century architecture. This particular chapter, that appears at the end of the book, also provides a biography of the architects, accompanied by large photographs of the architects mentioned. Because this selection is not explained/motivated in the introduction or the text, one is left wondering, why these twenty? Why only white Western men?

Group B

This group is composed of four books written by one author aiming to portray abridged overviews of modern architecture history, some of them are a compilation of essays. Figure six illustrates the results for their representation of women architects (Fig. 6).

5. Filler, *La arquitectura moderna y sus creadores*. First edition, Spanish translation. Barcelona: Alba.

This book is a composition of articles published online for the 'The New York Review of Books' that was re-edited for the book publication. These articles dating from 1985 to 2007 were edited together in the last 8 years and the author took advantage of the time to include more female architects. Martin Filler narrates history for a wider audience, attempting to include references to popular culture figures (Marilyn Monroe, Judy Garland, Jacqueline Kennedy) as well as political figures (Robert Kennedy, Saddam Hussein and George W. Bush).¹⁹ However, there is no bibliography or footnotes supporting this book, which makes one question its scientific validity.

19 Martin Filler, *La arquitectura moderna y sus creadores* (Barcelona: ALBA Editorial, 2012).

This publication passes the created Torre test, given that women architects are present in the index and a woman architect's life is partially described through multiple pages. However, this doesn't prevent this work from undermining women's contributions to architecture. The author acknowledges that Margaret Macdonald (1864–1933) had been 'forgotten' by many historians and academics, even citing the work of feminist historian Janice Helland. However, he discredits the collaboration of the couple.

Pamela Robertson, an expert on Charles Mackintosh, cited in 2001 one of the letters Mackintosh addressed to Macdonald, his wife, as recognition of her contribution.²⁰ Charles Mackintosh wrote, 'you must remember that in all my architectural efforts you have been half if not three-quarter in them.' However, Filler does not as recognise her efforts. For example on page 44, he questions the fact that both Macdonald's and her husband's initials appear as authors of both of their work. He raises doubts about Macdonald's contributions to the architectural office by adding: 'Scholars debate whether this meant actual collaboration, concept inspiration, or merely, in the case of his series of botanical watercolours (...), her proximity when he painted them.'

Here, Margaret is reduced to the role of an object that appeared to be sharing the same space as the male-genius in the room. On page 207, Marion Mahony is also discredited for her architectural contributions, being only mentioned once, as Frank Lloyd Wright's draftsman and not as the registered architect that she was.

6. Scully, *Modern Architecture and Other Essays*. New York: Princeton Press.

This book contains an introduction by Neil Levine that describes the life of the author, the architectural historian Vincent Scully, and multiple chapters that are essays previously written by Scully and compiled by Levine.²¹ This is not, thus, an encyclopaedia but it does aim to portray a personal overview of modern architecture. There are 18 women out of 381 people cited in the index of this book. However, three of the women indexed are mentioned only once, in the biographical introduction, and only because they were wives or ex-wives of the author. It is surprising that the three indexed women (Nancy Keith Scully, Catherine Lynn Scully and Marian LaFollette Wohl) were, and are, involved in the academic world of art and architecture history but were not included in this book for their accomplishments but as biographical information of Vincent Scully.

There are fewer references to other authors and more focus on a small number of figures. In a way, it almost appears to be too subjective as most of the author's cited architects are rooted in the same country as the author and external scientific referencing is scarce throughout the book.

This is due to the nature of the writing being in essay form. For example, very high page mentions are given to the architect Louis Khan, who is much less referenced in the other books. There is one woman architect, Elizabeth Plater-Zyberk (1950), who is mentioned in more than three pages but always as an accessory to her husband, and her own life and accomplishments are not described for more than one page. Denise Scott-Brown is the other one mentioned in more than three pages but again, as an accessory to her husband and her own life and accomplishments are not described.

There are a total of 30 female gender pronouns employed in this book. There are nine instances where the pronoun she is employed. These are in reference to the following: one for a client of a home (Vanna Venturi), one for a religious story mentioning the Virgin of the Belle, two for an Egyptian mummy story (no name), two for anthropomorphized countries of France and England, one for the dead wife of a king (no name), two for the mother of Frank Lloyd Wright (no name), and finally one for Catherine Bauer who is not included in the index of persons mentioned. This book fails the Torre test.

7. Frampton, *Modern Architecture: A Critical History*, 4th revised edition. London: Thames and Hudson.

This book had a very large index (1044 individuals) considering that it is comparatively small in size, 389 pages.²² This creates a higher density of name citations per page, resulting in less detailed information about one-person, but more individual contributions recorded. This produces a more inclusive history of architecture with large numbers of individuals and not just the too-well-known heroes (cf., Le Corbusier, Frank Lloyd Wright, Mies van der Rohe, etc.).

Although the numbers of people mentioned are higher, the number of women represented is not proportionally higher. Designers, interior architects, and architects that happen to be women are only mentioned once and only in the context of their couple. For example, the designer and artist Noémi Pernessin is mentioned only once (p. 258). Her name appears as a second subject, not the first, and it used as a descriptor of her husband and not as a stand-alone citation. This is her only mention. In contrast, her husband, Antonin Raymond is mentioned as the main subject in multiple pages (257–8, 259). By mentioning only him as a subject, Frampton implies that Pernessin's contributions were negligible. This is in contrast with historians who have examined the biography of the couple and attribute to Noémi Pernessin an equal role of influencing, economically supporting, and directing her husband's work.²³

20 Charles Rennie Mackintosh and Pamela Robertson, *The Chronycle: The Letters of Charles Rennie Mackintosh to Margaret Macdonald Mackintosh, 1927* (Glasgow: Hunterian Art Gallery, University of Glasgow, 2001), 18.

21 Vincent Scully, *Modern Architecture and Other Essays* (Princeton: Princeton University Press, 2005).

22 Kenneth Frampton, *Modern Architecture: A Critical History* (London: Thames and Hudson, 2013).

23 Kurt Helfrich and William Whitaker, *Crafting a Modern World: The Architecture and Design of Antonin and Noémi Raymond* (Princeton: Princeton Architectural Press, 2006), 16–17.

This tendency of mentioning the woman collaborator only as an accessory to a male counterpart is repeated several times throughout the whole text,²⁴ thereby failing the Torre test.

8. Levine, *Modern Architecture: Representation & Reality*. Yale Press.

This book, written by Neil Levine, is a compilation of his lectures given at the University of Cambridge in the academic year of 1994.²⁵ In this way, the content of this book dates back to a time when several other feminist historians were publishing books and organising conferences on women's contribution to modern architecture.²⁶ However, this book does not seem to have been impacted by these contributions. The author, Levine, reviews three centuries of architecture, dating the beginning of modernity to the Italian architect Alberti in the mid-fifteenth century. This would provide for many years of history where women also theorised and took part in the practice of building.²⁷ Nonetheless, there are 27 women cited in this book as opposed to 353 men.

There are a total of 31 female gender pronouns (9 she and 22 her) employed in the text against a total of 225 (87 he, 85 his and 53 him) male gender pronouns. Only five women architects are cited and none of them were working during the period of 1918–45. The only two women architects cited more than twice are Denise Scott Brown (1931) and Cammie McAtee (1966). They are mostly used for literary references and their life and work are not described either.

A review by historian Kenneth Frampton describes the author as an outstanding architectural historian of his generation. It sates,

This is Levine at his critical best and it is this, surely, that puts him in a class apart as far as the architectural historians of his generation are concerned, since his writing not only manifests profound erudition and logical judgment but also exhibits an exceptional capacity to perceive and interpret the spatial and technostatic feeling of a given architecture...²⁸

Even though, *Modern Architecture: Representation & Reality* is a critically acclaimed book, appreciated by fellow historians,²⁹ it fails the Torre test.

24 Lilly Reich (p. 163), Eileen Gray (p. 334), Margaret MacDonald (p. 74), Gertrud Jekyll (p. 50), Gunta Stölzl (p. 128), Catherine Ostertag (p. 62) and more.

25 Neil Levine, *Modern Architecture: Representation and Reality* (New Haven Conn.: Yale University Press, 2010).

26 Agrest, Conway and Weisman, *The Sex*; Beatriz Colomina (ed.), *Sexuality and Space* (Cambridge: MIT Press, 1992); Dolores Hayden, *The Grand Domestic Revolution: A History of Feminist Designs for American Homes, Neighborhoods, and Cities* (Cambridge: MIT Press, 1982); Leslie Kane Weisman, *Discrimination by Design: A Feminist Critique of the Man-Made Environment* (Champaign: University of Illinois Press, 1994).

27 For example Katherine Briçonnet (1495–1526). See: Alberto Gisholt Tayabas, "De la mujer en la arquitectura, una reflexión histórica," *Bitácora arquitectura* 33 (2016), 80–85.

28 Kenneth Frampton, "Modern Architecture: Representation and Reality," *Journal of the Society of Architectural Historians* 4 (2012), 552–55.

29 Jack Quinan, "Modern Architecture: Representation & Reality," *Choice* 3 (2010), 489.

	TOTAL PAGES	TOTAL WOMEN ARCHITECTS & DESIGNERS	TOTAL WOMEN ARCHITECTS & DESIGNERS, >1 PAGE	1ST TORRE CONDITION	2ND TORRE CONDITION	3RD TORRE CONDITION
9. L'architecture moderne	336	10	1	✗	✗	✗
10. Negotiating Domesticity: Spatial Produc...	322	20	5	✓	✓	✓

Fig. 7. The representation of women architects in Group C.

Group C

This group is composed of two books of a shorter length, aimed at a scholarly audience. Figure 7 illustrates the results of their representation of women architects (Fig. 7).

9. Colquhoun, *L'architecture moderne*. Gollion: Infolio.

This book was available across all university libraries with more than one copy, in numerous editions and in more than one language. The version analysed here is a 2006 paperback French translation of the 2002 edition of *Modern Architecture* by Alan Colquhoun.³⁰ Many of the books researched here made reference to this book as a scientific source of merit. There are 366 pages and 16 women that are mentioned in the index. This figure is the second lowest out of the 10 books. This book also fails the Torre test.

The pronoun her appears on two pages out of 366. On page 26, it is used to reference anthropomorphised nature. On the page 275, her is used to reference Catherine Bauer. The only she pronoun also appears on that same page. Both pronouns are used to reference the same housing expert and architectural educator. Bauer is the only woman architect described in the book; although only in less than five sentences. She is first introduced as Lewis Mumford's assistant and later as his 'tour partner.' On page 275, Bauer is also described as a writer, a 'transformed housing reformer', and an expert on social housing. However, Bauer was also a regional planner, part of the US Government Housing Authority and contributor to the United Nations urban development programs. She had been one year away from graduating with an architecture degree at Cornell University but graduated with an English degree from Vassar College instead. Bauer was also a professor and the Dean of the Environmental Design College at the University of California Berkeley.³¹

Household rationalist and designer Christine Frederick is also cited once, accompanied by two women that appear here as literary authors (household designer Erna Meyer and Austrian architect Margarete Schütte-Lihotzky). In two concise sentences, the historian describes the significance of

30 Alan Colquhoun, *L'architecture moderne* (Gollion: INFOLIO, 2006).

31 Barbara Sicherman, *Notable American Women: The Modern Period: A Biographical Dictionary* (Cambridge: Harvard University Press, 1980), 66–68.

the women's movement's influence in promoting new concepts of the domestic management (that greatly inspired celebrated modernist architects). These three household rationalists and designers are mentioned by name, in one page of the whole book. However, no context is given as to why their collective work would be remarkable in the theory of architectural history. Their life, ideas, and architectural works are overlooked.

10. Heynen and Baydar, *Negotiating Domesticity: Spatial Productions of Gender in Modern Architecture*. London: Routledge.

This book represents the most equitable ratio of female to male individuals referenced (41% to 59%), with 106 women out of 260 individuals referenced in the index. It was edited by two feminist architecture scholars and it was a result of a Society of Architectural Historians (SAH) session on Domesticity and Gender in Modern Architecture in 2003.³² In this way, this is a very different book written by multiple scholars, experts in their subjects and not claiming to be a detailed overview of modern architecture history. Furthermore, the topic of gender and women architects is of special interest in this book. *Negotiating Domesticity* is the only title that contains an almost equally high ratio of male and female pronouns 167 she and her and 186 he, him and his. In this way, the women architects mentioned have their life and work described in the more detail compared to the nine other books. This book also passes the Torre test.

Negotiating Domesticity is the only book that mentions the British modernist architecture contributor Elizabeth Denby (1894–1965). Denby was a successful designer and expert in the subject of modern housing. She was involved in several well-known modernist projects of the 1930s.³³ In the chapter titled 'A citizen as well as a housewife', Denby's productions are described as a member of the Utility Furniture Advisory Committee and as a housing consultant (pp. 49–64). The British author, Elizabeth Darling, mentions Denby's collaboration with the architect Max Fry but she also presents direct quotations from Elizabeth Denby herself, thus, giving her a voice and a life as a designer outside her collaboration with a man.

32 Hilde Heynen and Gülsüm Baydar, *Negotiating Domesticity: Spatial Productions of Gender in Modern Architecture* (London: Routledge, 2005).

33 Elizabeth Darling, "The Star in the Profession She Invented for Herself: A Brief Biography of Elizabeth Denby, housing consultant," *Planning Perspectives* 3 (2005), 273.

Conclusion

Four out of the ten books pass the Torre test. The books that were the most frequently available within the Belgian libraries failed. In this way, six titles out of ten did not reach the simple three-page requirement to describe the work, life or ideas of a single woman architect or designer. This test was deliberately made simple and easy to pass in order to draw attention to a great discrepancy that persists today. Forty years after Torre's book and exhibition, there is a persisting lack of acknowledgement of women's contributions to modern architecture.

Recently published works by architectural theorists and historians have responded to some of the criticisms that feminist researchers often receive. One for example is the criticism that 'there are no modern women architects in history books because there were fewer women that had access to an architectural diploma at the beginning of the twentieth century.' However, this thought is misleading. The reality is that modern architecture was never a movement that required obtaining an architecture diploma. Some of the greatest male architects that lead the movement never obtained an architecture degree and sometimes never even received education from a formal college setting. Renowned modern architects such as Adolf Loos and Le Corbusier never acquired any university diplomas,³⁴ even though they commonly engaged in teaching and in writing about modern architecture.

In the same way, there have been many women that also practiced architecture without formal credentials, for example Lady Elizabeth Wilbraham who is attributed the role of architect for leading and designing the construction at least a dozen houses for her wealthy family in the 17th century.³⁵ A Belgian historian, Julie Piront, even discovered that groups of religious women between 16th–17th century in Belgium and France often designed and supervised their own built environments.³⁶

Furthermore, several women actually had already attended architecture studies at the very beginning of the twentieth-century in a few countries. Some of these are the previously cited, Vivi Lönn and Marion Mahony as well as Julia Morgan (1872–1957), the first woman architect to graduate from the Beaux-Arts school in Paris,³⁷ and Margaret Staal-Kropholler (1891–1966), the first woman architect in the Netherlands.³⁸

34 Adolf Loos et al., *The Architecture of Adolf Loos: An Arts Council Exhibition* (London: Arts Council of Great Britain, 1985), 116; Nicholas Fox Weber, *Le Corbusier: A Life* (New York: Alfred A. Knopf, 2008), 456.

35 John Millar, "The First Woman Architect," *The Architects' Journal*, November 11, 2010, <https://www.architectsjournal.co.uk/the-first-woman-architect/8608009.article> (accessed June 16, 2017); Nicole Pohl, *Women, Space and Utopia, 1600–1800* (Farnham: Ashgate Publishing Limited), 2006, 66.

36 Julie Piront, "Empreintes architecturales de femmes sur les routes de l'Europe: Étude des couvents des annonciades célestes fondés avant 1800" (PhD diss., Université catholique de Louvain, 2013).

37 Ginger Wadsworth, *Julia Morgan: Architect of Dreams* (Minneapolis: Twenty-First Century Books, 1990), 25.

38 Dave Wendt, *Academie van Bouwkunst Amsterdam 1908–2008* (Rotterdam: Uitgeverij 010 Publishers, 2008), 19. For more examples of women architects at the beginning of the twentieth century see: Despina Stratigakos, "Architects in Skirts: The Public Image of Women Architects in Wilhelmine Germany," *Journal of Architectural Education* 2 (2001), 90–100.

Finally, some may dismiss this failure by saying that ‘there are less women in the history books because it is a reflection of the reality at the time.’ This conclusion could be drawn if we were to study only one book, with few women citations, for example the 2005 *Architecture in the 20th Century* by Peter Gössel and Gabriele Leuthäuser. However, if one were to pick up another book, such as the *Encyclopaedia of 20th Century Architecture* or *The A-Z of Modern Architecture* then one would see that there are at least 140 women that contributed to the history of modern architecture, and even more outside of these two books. This suggests scientific inaccuracy as historians or a conscious bias against women’s contributions.

In order to shine light on the invisibility of women architects, it is essential to measure the weight of their absence in the records of modern architecture. Numerous female modern architects and designers have been researched and their work proliferated in the last decades. These female histories need to be acknowledged. Historians of modern architecture should move on from the naïve male-hero narrative. Recognizing collaboration between architects will result in a better representation of history. Historians value the story of the ingenious male hero who is admired for his unlimited imagination and building abilities. The problem with this hero story, despite its inaccuracy, is that it has become the only story of modern architecture. As literary author Ngozi Adichie stated in 2009,

The single story creates stereotypes, and the problem with stereotypes is not that they are untrue, but that they are incomplete. They make one story become the only story. (...) The consequence of the single story is this: it robs people of dignity. It makes our recognition of our equal humanity difficult. It emphasizes how we are different rather than how we are similar. Stories matter.³⁹

³⁹ Chimamanda Ngozi Adichie, *The Danger of a Single Story*, screened July, 2009 (Oxford, TED Global, 2009), http://www.ted.com/talks/chimamanda_adichie_the_danger_of_a_single_story/transcript.

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