

Extending Skin: Architecture theory and conceptual metaphors

Philip D. Plowright

¹Lawrence Technological University, Southfield, Michigan

ABSTRACT: Architects use metaphor constantly in their writing, speech and project development. It is engaged for its ability to transfer meaning and as an aid in orientating design positions (Collins 1971; Seligmann and Seligmann 1977; Alberti 1988; Forty 2000; Hearn 2003; Muller 2009; Libeskind 2012). While architects have acknowledged the general presence of metaphor as part of design theory, there is little understanding of metaphor's deeper role in architectural cognition and its effect on architectural values (Lakoff and Johnson 1980; Caballero 2006). This paper examines a small aspect of metaphor use in architecture in order to follow a thread from historically grounded applications of metaphorical terms to contemporary and highly conventionalized conceptualization of spatial design. The focus is on the HUMAN BODY as a source domain and, in particular, the concept of *skin*. Through the discussion, skin (and thus the human body) is shown to be present in architectural discussions not only knowingly used metaphorical expressions but also in highly conventionalized and normalized occurrences. These unrecognized examples of conceptual metaphors allow skin move well beyond simply being an analogue for a building enclosure. Rather, concepts related to skin are extended into interpretations of actions as a projection of human capacity into deep disciplinary examples of architectural concepts and abstractions.

KEYWORDS: conceptual metaphor theory, architectural theory, cognitive linguistics, building as body, conventionalization, cognitive semantics

INTRODUCTION

Architects use metaphor constantly in their writing, speech and project development. It is engaged for its ability to transfer meaning and as an aid in orientating design positions through the recognized, and historical, source domains of the HUMAN BODY, LINGUISTICS, GEOLOGY, ORGANISMS, BIOLOGY, and MECHANICS (Collins 1971; Seligmann and Seligmann 1977; Alberti 1988; Forty 2000; Hearn 2003; Muller 2009; Libeskind 2012). While architects have acknowledged the general presence of metaphor as part of design theory, there is little understanding of metaphor's deeper role in architectural cognition and its effect on architectural values (Lakoff and Johnson 1980; Caballero 2006).

Architecture, as a member of a larger group of design disciplines, stresses a value on tacit information transfer and outcomes over clear process, suppressing cause and effect relationships of design outcomes as communication vectors (Logan 2007). In the application of explicit non-disciplinary information based in either visual or textual form, metaphor is valued as a generator or an orientation tool for a design starting point which will 'inspire' a reaction (Goldschmidt and Sever 2011). Some theorists have made the claim that it "is a none-too-commonly-known fact that in Western culture the understanding of architecture is metaphoric in that it is rarely known for itself" (Johnson 1994, 429), raising the importance of understanding metaphorical operations in architecture. Yet, this is combined with ambiguity to how metaphorical statements and expressions are considered in architecture, with the possibility of metaphorical concepts interpreted as literal by the designer but analogical by the audience; or symbolic rather than metaphorical. What is clear, however, is that metaphor has been connected with issues of method and meaning in architecture for many centuries, whether acknowledged or latent in the texts of architectural theory. Clearly, metaphor matters to architecture.

This paper examines a small aspect of metaphor use in architecture in order to follow a thread from historically grounded applications of metaphorical terms to contemporary and highly conventionalized conceptualization of spatial design. The topic considers the application of the metaphor BUILDING IS A BODY (Forty 2000). This major metaphor involves highly conventionalized terms in architectural jargon such as *ribs* as an expression of structure, *bowels* to refer to deeply situated interior spaces, or *spine* to address a linear type of circulation that connects many spaces (Caballero 2006). While some of these topics are covered, the more detailed discussion is focused on *skin* to mean the surface of a building.

1.0 THE NORMALIZATION OF THE HUMAN BODY AS AN ARCHITECTURAL METAPHOR

The mapping between the human body and buildings is a metaphor found in historical texts of architecture as well as current discussions. The metaphor has been present in architectural theory since the earliest recorded text, Vitruvius' *de Architectura* (first century, AD), and codified by the Renaissance writing of Alberti's *On the Art of Building in Ten Books* ([1452] 1988). The body terms used in these metaphorical expressions have been normalized and become polysemic within the discipline, causing no incongruence to the reader, speaker or listener.

Vitruvius established symmetry as a principle of good architecture as part of a mapping that transferred the quality from the human body onto buildings (Vitruvius 1914). He also considered the building *to be literally* a body, addressing the same issues of health and protection (from heat, sun, wind, temperature) as any biological entity would need (1914, 19). The body metaphor applied a value system to buildings that included wholeness and coherence, which made architecture analogous with closed system based on homogeneity, centrality and symmetry (Till 2007).

Alberti extended aspects of the human body as a source of meaning, directly connecting body references to building elements. He considered features of roofs to be "bones, muscles, infill panelling, skin, and crust" (Alberti 1988, 79) and used the same biological terms for vaults, stating that "with every type of vault, we should imitate Nature throughout, that is, bind together the bones and interweave flesh with nerves running along every possible section" (1988, 86). Beyond the human body, there are other organic references including those to shells, flesh, carcass, spine, bowels and so on (Caballero 2006, 18). In fact, the body and its containing category, the organic, is considered to be the most prevalent metaphors in the history of architecture, connecting building design to nature and, thus, giving buildings both meaning and authority (Hvattum 2006).

The body was a dominant reference into the Enlightenment combining with the concept of BIOLOGY by the Industrial Revolution (Moloney 2011). The use of anatomical terminology before the Industrial Revolution tended towards equating buildings to body elements and body schemas (*arms, legs, head, heart, feet on ground, heart as central* etc.) and this included a parallel view of CITY AS BODY. The metaphor could go so far, as McClung (1981, 283) illustrates through a literary reference, that a building's "medieval arrangement of apartments (hall with kitchens to one end and private quarters to the other) is imposed upon a point-by-point correspondence of the castle to the human body." However, once the pursuit of scientific knowledge became rooted in Western society through the Enlightenment, understanding of the body shifted from "a sole description of bodily organs in terms of their physical appearance and position in the body, to focus on the functions performed by those organs within the whole." (Caballero 2006: 18).

The growth in biological knowledge, especially knowledge of evolution and cellular growth, also changed the type of information expressed through the metaphor. The dominant understanding shifted from the body as an anthropomorphic mapping between the environment and human physicality to instead focus on the body as a biological organism which stressed systems and natural laws (De Palma 2006). The organic metaphor was used in this way as part of early architectural Modernism, which projected completeness and solidity through biological principles in order to present a building as a final expression of natural, dynamic forces with a form that emerges from its context, and therefore cannot be questioned for its meaning (McClung 1981: 281; Hvattum 2006: 497). It also stressed issues of health and illness found in formal representation that ranged from early Modernist concepts of purity, hygiene, cleanliness (Till 2007; Muller 2009) to late 20th-century fixations on scars, scabs and parasites (Caballero 2006; Kanekar 2010), using these to associate redemptive qualities with design when applied to the environment.

2.0 RESEARCH METHODS AND KNOWLEDGE BOUNDARIES

This paper reports from a research project based in Cognitive Linguistics (CL) using Conceptual Metaphor Theory (CMT) but studying architecture as a discourse community and a discipline of knowledge. The purpose of the overall project was to examine central texts representing deep disciplinary discussions in architecture to address what patterns of metaphors are present and how they support the construction of meaning in the built environment. Understanding metaphorical language as an expression of ways of thinking and, therefore, systematic to human cognition rather than simply as a stylistic flourish positions CMT as an important tool in

understanding the world. CMT is a contribution to Cognitive Linguistics that understands the organization of language as a direct reflection of how thoughts are organized. As such, it and allows access to thinking structures of the human mind by understanding conceptual metaphor as a central operation in human thinking rather than simply a linguistic embellishment.

A conceptual metaphor is the “understanding one conceptual domain in terms of another conceptual domain” (Kövecses 2010: 4). While some scholars might take issue with the term “understanding”, it is an important concept that places the conceptual metaphor as a major operation in meaning and human value structures. Lakoff and Johnson (1980) theorize that there is a pattern of concrete-to-abstract mapping that is fundamental to conceptual metaphor, considering that we use metaphors to map physical knowledge as a way of understanding abstract concepts. The generation of a conceptual metaphor is considered to operate through similarity (whether real or created by the metaphor itself), which creates a dependence between source and target domains (Lakoff and Johnson 1980, 147), is a systematic correspondence (Kövecses 2010, 7) and includes inferential structure (Grady 1997, 7). The similarity theory of metaphor comes from an Aristotelian position that metaphor connects two dissimilar concepts by some key shared feature and has been challenged recently as not being empirically consistent. If we follow the theory of embodied cognition, then it is more probable that the association between domains and concepts is predicated on physical human experience structured through the engagement of the body in the world (Grady 1997, 5).

Conceptual metaphors are recognized in this study through the presence of a term in a sentence or sentence fragment which produces incongruence between the literal meaning of that term and the context in which it is used. The overall focus remains on the expression rather than breaking a sentence into lexical units and testing each unit for its basic meaning as isolated elements (Pragglejaz Group 2007). As such, it is the intention of the sentence or sentence fragment in a discourse context which drives the identification of metaphor through the presence of incongruence. (Cameron and Maslen 2010). as the identified metaphors are understood to be discourse examples of metaphorical expressions which are the basis of analysing the presence of conceptual metaphors through decomposition.

3.0 DISCUSSION

The metaphors using the human body can be coherently organized under the megametaphor OBJECTS/BUILDINGS ARE HUMAN BODIES. The underlying correlation between objects in the environment and humans supports the coherence of several conceptual metaphors as well as the extension of basic mappings into associated concepts. Metaphors referencing the human body are common when discussing the physical understanding of architecture (i.e. as building) but the corpus also contains examples of when the same body concepts using the same salient features are used in abstract discussions as well. For example, *spines* and *backbones* refer to the physical space of a linear, organizing corridor, an abstract concept about the organization of circulation and also an idea that gives structure and is built upon by other ideas.

Not all aspects of the human body are used as part of metaphors even though the body is an important source reference for understanding parts of our world and experience. The most common metaphorical source terms and concepts are *skin*, *face*, *heart*, *spine (backbone)*, *ribs* and *arms*. Common references use relational information - *arms* are physical extensions of a main building, the *body* of a building is the central massing of that structure, and a *face* is a reference to the front of an object. Less common in architecture is attribute or shape references using the human body. One that does occur is *ribs*, a concept used to refer to visible and repeated structural elements which usually involves a curved form.

3.1. Building enclosure as skin or clothing

The most common mapping between the human body and architecture is *skin* as a term used to understand the outer surface of an enclosure (physical) or container (conceptual). In this regard, historical instances of metaphor in architecture as architectural terminology, such as Alberti's reference to *bones*, *muscles*, and *skin* to refer to structure and cladding in *De re aedificatoria* (1443-52), is consistent with terms found in a corpus dedicated to late 20th and early 21st century architectural theory. The mapping of *skin* uses relational information as the outer surface of a building is considered to operate through similarity as the outer surface of a human body. As a normalized term in architecture, *skin* as a source domain does not include any operational complexity such as mappings between pores, temperature and pressure sensing, nor notions of elasticity. The conventionalized use of the metaphor enclosure is skin can be found in example below:

- (1) “The *skin* is defined in places by concrete, and in places by glass” (Allen 2000, 1)

In (1), the mapping between skin and building enclosure is an analogy that uses knowledge of the skin as a thin outer layer acting as an interface coherence with the image schema CONTAINER or as boundary between interior complexity and the exterior environment. There is the inherent understanding that buildings are human bodies as internal systematicity suggests that *skin* is part of a coherent system that also links the building to *organs, limbs, faces* and *backbones*. The larger mapping relates buildings to being human and having a human body as the outer surface does not generally have *fur, scales* or *chitin* in the normalized version. While (1) is an example of the basic use of the conceptual metaphor, other concepts can be involved in the mapping. The next example (2) uses the same conceptual metaphor of enclosure is skin but the context involves more complex social engagement.

- (2) “we witnessed during the 1990s an attempt to use the *skin* of the residential building to represent diversity and multiculturalism” (Zaera Polo 2008, 93)

In this example, the metaphor involves the outer surface of the buildings as presenting socio-cultural information rather than skin as the physical outer surface of a container and aligned with the normalized understanding of BUILDINGS ARE (HUMAN) BODIES. The skin is representing a set of values and beliefs as part of cultural expression and does this because it is the surface which is visible to the public. The visible surface maintains social interactions and is connected to primary metaphors such as visibility is attention and perceptible is out but also, and more importantly, surface is identity. In (2), skin is a vehicle for a much more complex social situation than is considered in the previous example while using the same conceptual metaphor ENCLOSURE IS SKIN.

The outer enclosure of the building could be considered as clothing at the same time it is normalized as skin because cognition through domain association allows for multiple inferences without invalidation. The mapping of ENCLOSURE IS SKIN and ENCLOSURE IS CLOTHING co-exist in the same way that MORE IS UP does not contradict GOOD IS UP in discussions of cultural coherence (Lakoff and Johnson 1980: 23). While UP can be both MORE and GOOD, the building surface can be both skin and clothing without conflict but depending on context. One of the differences between skin and clothing is how knowledge of them is acquired and how they are classified. Skin is a biological term which is highly embodied as part of human body schema while clothing is a cultural reference that infers social content such as fashion, social norms (nudity) and social standing.

In the corpus, metaphoric expressions portraying building surfaces as clothing differ from those of skin. While both refer to the terminal surface between an object/organism and the environment, skin is understood as integral to the human body while clothes are an additional element to be overlaid on that body. As seen in the examples above, metaphors mapping skin to buildings and abstractions consider that outer layer as an integral surface. As a metaphor in architecture, the source domain of clothes is used when the enclosure of the building and the rest of the building to be considered as conceptually separate from each other. This attitude can be exemplified by the following example:

- (3) “The ‘*clothes*’ have become so removed from the *body* that they require structural support independent of it.” (Colomina 1992, 93)

In this example, there are two metaphorical expressions. The first uses the metaphor is ENCLOSURE IS CLOTHING (“*clothes*’ have become so removed”) and the second uses CORE IS TORSO (“from the *body* [of the building]”). Both metaphors are coherent with the underlying megametaphor BUILDINGS ARE HUMAN BODIES. The source domain is clothing because the purpose of the sentence is a conceptual separation between the enclosure of the building and what is considered the essence of the building (often equated to structure and enclosed program). Referring to the enclosure as skin would not easily allow for understanding the enclosure and building as separate and independent elements as one is part of the other. However, the source domain of clothing replaces the source domain of skin if the speaker wishes to stress a conceptual isolation between the outer surface of the building and the idea of the building itself. As such, a building can be considered finished and functional in terms of its physical construction yet “undressed” (Cadwell 2007: 23) or even “nude” (Lavin 2011: 72). Clothes are a modification on the conceptualization of building enclosure as skin, coherent with understanding it as a terminal layer between a body and the environment.

As noted above, skin is used in a second way as well – as a representational surface that manages social interactions and expressions of identity. When ENCLOSURE IS CLOTHING replaces ENCLOSURE IS SKIN as a metaphor for the outer surface of an object, the purpose of the metaphor shifts from conceptual separation of object and surface to the role of clothing in socio-cultural systems, especially as part of a system of fashion. In the next example, the Disney Concert Hall in Los Angeles designed by Frank Gehry is considered as a body with clothing rather than simply a body.

- (4) “The Concert Hall project is *fashionably dressed up* to designate a volumetric mass that denies any coherent and hierarchical order” (Hartoonian 2006, 123)

The concert hall in the example above expresses a clear separation between the façade and the building. The architect is known for curving building enclosures that are physically and conceptually isolated from the environmental and programmatic aspects of the project (i.e. the core of the building). However, the metaphor ENCLOSURE IS CLOTHING activates cultural values of being fashionable which requires social structures that pertain to status, rank, and timeliness. The discourse context of the expression discusses the building in how it is viewed from the surrounding streets, stressing its elegance and appropriateness to the urban context. The enclosure is operating as a surface that projects cultural identity as part of human social interpretation. This use of clothing is coherent with the second way that enclosure is skin is interpreted – as the visible surface that engages in relationships with other people. The difference between metaphors based on skin and clothing is that clothing can be changed, used to mask identity or be a disguise as the object and the surface is considered as non-integrated.

3.2. Extending body metaphors through external systematicity

As an underlying source domain for discussions of architectural concepts, the mapping to the human body allows for more innovative expressions which are still coherent through external systematicity. In these examples, the metaphor is BUILDINGS ARE HUMAN BODIES rather than BUILDINGS HAVE HUMAN BODIES. The latter expression involves considering ideas and objects as using the body in situations that extend human capacities to non-human, non-animate and non-physical constructs.

Once a building is understood as being a human body, the metaphor can be extended into many different expressions. The extension of metaphorical mappings in architectural discourse can be illustrated using the discussion of skin as a metaphor for both enclosure and social engagement above. The conventionalization and normalization of a metaphor allows for the possibility of elaborating on the basic metaphor to create richer and more subtle inferences. For example, once the surface of an object (or objectified abstraction) is normalized as skin, that surface can then be acted upon or modified in the same way as skin with the assumption that the underlying mapping is just accepted. This includes ornamentation such as piercings and tattoos, physical disfigurement such as when the discipline of architecture “has gained a *scar*” (Lavin 2011: 75) or when the conceptualization of urban and natural ecologies “are *sutured* together,” (Lerup 2001: 52). Biological and physical actions can also extend from the understanding of enclosure as skin. One author states it through considering the air above a city as being “*like our skin*, an immense enveloping organ, to be constantly attended to, chilled, channeled, and cleaned.” (Larup 2001: 58). Other actions present in the corpus make actions using skin including *flaying, piecing, cutting, slicing* and *exfoliation*. The next examples expand on these points.

The ENCLOSURE IS SKIN metaphor can be extended into novel expressions using non-normalized concepts while still being coherent with the BUILDINGS ARE HUMAN BODIES metaphor. In the example below, (5), the skin is considered to be marked through the cultural practice of tattooing, what seems to be a metaphor using similarity based on image.

- (5) “It is a *tattooed surface* which does not refer to the interior, it neither conceals nor reveals it” (Colomina 1992, 98)

The “tattooed surface” in the example above refers to a physical interpretation of a building enclosure, a façade of alternating black and white horizontal stripes with very few windows. While the outer surface of a building is normalized as skin in architecture, this expression maps the human cultural artefact of tattooing ink into flesh to create images to that surface. Tattoos are used as part of social identity in human societies and change the role of human skin from biological enclosure to a surface on which other actions occur. In the expression, the stress on the surface of the enclosure changes the relationship between the enclosure of the building and the spaces it contains. While this novel expression builds on the underlying conceptual metaphor of ENCLOSURE IS SKIN and the megametaphor is BUILDINGS ARE HUMAN BODIES, there is no direct reference to either of these concepts.

The tattoo metaphor is being used to bring attention to the outer surface of the building but not as a way to explain an image or shape. When skin is tattooed, it fulfils a double role on the human body – it is the surface that mediates with the environment but it is also a drawing surface that changes the hierarchy and content of that interaction. Rather than being sensory surface of an organism, a tattooed surface uses the metaphor SKIN IS CANVAS to turn the body into a background for artwork or graphics. As a canvas, the skin’s primary role is not to contain the complexity of the body as a surface of a container but to mask the presence and operation of the body through focusing attention solely on the surface. In this example, the building enclosure is being

claimed to work in the same way through the metaphor. The architectural critic is using the metaphor to claim that this particular enclosure exists in and for itself rather than its traditional role of protection from the elements, creation of privacy and allowing views from inside to outside and vice versa. As such, the novel expression both uses and modifies the underlying metaphors as the intention is that the building is all skin and no body as while the house has a *physical* interior, it does not have a *conceptual* interior. This is obviously not literal as the house has rooms, a roof, doors and windows but the conceptual understanding of space is overlying and overpowering the physical experience of space.

Metaphors building in novel ways on SKIN IS ENCLOSURE are more conceptually focused, addressing abstract concepts that are theoretically subtle and use deep disciplinary knowledge. While the tattooed surface in (5) could be understood as a basic attribute mapping creating an image metaphor, the purpose of the metaphor is to consider the conceptual understanding of the building rather than its physical presence. The next example also uses ENCLOSURE IS SKIN as part of BUILDINGS ARE HUMAN BODIES.

- (6) “This *flayed* modulation of interior and exterior produces the effect of loose and sometimes surprising correlations between program and space or room.” (Somol 1999, 69)

In this example, enclosure is skin is being used not as an object but as the basis of an action performed on the surface. The action is *flaying*, referring to the stripping away the outer layer of skin to expose the flesh below. As a physical action mapped to a building, one might expect to find the metaphor present to describe how layers of a building façade are removed to allow views of interior space. The example (6) above, the “*flayed* modulation” is not directly addressing physical aspects of the building but instead brings attention to the conceptual relationship between building typology, conceptual occupation through the use of spaces (program), and the physical space of the building. These are complex ideas that are understood implicitly by members of the architecture discipline. In the expression, the metaphorical expression “flayed” is used to bring to the attention that the building under discussion (a community centre) purposefully reverses the traditional understanding of inside and outside as well as public and private as a critical aspect of the design proposal. The resulting physical building is conceived to deny the traditional edge/centre hierarchy (public is edge, private is centre) and presents the building as a body without skin . . . or more exactly, a building with skin on the inside and exposed flesh on the outside. There are, however, no physical clues to this interpretation in the building enclosure. In the extension of ENCLOSURE IS SKIN and BUILDINGS ARE HUMAN BODIES, skin is being equated to publicness and flesh (interior tissue) to privateness. The mapping includes correlational mapping of visible aspects of the environment as public elements, supported by the second normalized interpretation of skin as a social element. In this case, the ability to understand skin as a public expression is possible through the metaphors visibility is attention and visible is accessible. To consider flayed to be simply a condition of peeling back outer layers of the wall would be to completely misinterpret the expression as no physical comparison is possible.

The next example, (7), does not involve a physical object such as a building but is still uses the metaphor ENCLOSURE IS SKIN. In the same way as shown in the last example, architects consistently map their conceptual understanding of disciplinary knowledge into physical situations. The human body is often used as the basis of these mappings.

- (7) “Was the *exfoliation* of the private/public threshold to the inside of the unit a politically advanced decision,” (Zaera Polo 2008, 94)

In the example, “exfoliation” is applied to the abstract idea of “the private/public threshold” rather than the outer surface of a building. The threshold found in (7) is where the space between the conceptual ideas of public and private is considered a threshold. For this to be possible, the qualities of publicness and privateness need to be understood as physical analogues through the metaphor (bounded) abstractions are containers, a corollary of (bounded) abstractions are objects. The surface of the container is then considered to be skin through understanding the surface of a container as an enclosure and enclosure is skin. The final association is conceiving of the skin as a type of threshold rather than just a surface between outside and inside.

The surfaces in the expression considered to be part of a threshold are the conceptual relationship between the abstract ideas of publicness and privateness. In this example, the normative public-to-private relationship expected by architectural and urban designers is the domestic residence relationship to urban context. However, the author is discussing a second more innovative public-to-private relationship which is found within the domestic residence through the use of screened rooms. The normative understanding of urban public-to-private relationships is considered be transferred to explain the non-normative understanding of domestic residence public-to-private relationships. Exfoliation then refers to the action of transferring an urban idea to

an architectural situation even though they exist at very different scales. As a conceptual and experiential idea, the flaking of part of the conceptual urban environment to embed itself within the domestic interior then affects the physical organization of the building and the former is used through similarity to understand the latter. The metaphor is needed because the way that space is being conceived is non-normative and does not match a standardized typological pattern. The importance of the public-to-private relationship is not immediately understandable through the form of the building and the metaphor brings attention and focus to this abstract content.

CONCLUSION

The human body has a clear importance for the discourse of architecture. Conventionalized terms are used for their resemblance values to aspects of buildings mapping relational aspects of the human body to their counterparts in the built environment. The stress is on structure, enclosure, thresholds, circulation and centrality (i.e. importance). The body is also activated through correlational mapping of perceived actions into nonhuman things.

The application of actions to the object of the human body can be seen to be structurally and conceptually more complex than expressions than using the body as an object, like *spine*, *heart* or *face*. The other aspect to note about the examples above is that for while the immediate subject is a physical building, the sense of action places the focus not on the building itself but the content found in conceptual act of design that formed the physical building. These actions cannot be interpreted from the immediate physical context without knowledge of the architectural intentions. The actions are not interpretations of the environment through spatial motion or force dynamic image schema found in *FORM IS MOTION*. The other point to consider is that while many of the expressions exploring the use of skin to architectural discourse build on complex content such as social identity and deep disciplinary abstract concepts. This creates a complex structure that spans embodied concepts and disciplinary conceptual constructions (i.e. how architects understand space, occupation and use) while implicitly maintaining, or building upon, the conceptual metaphors *BUILDING IS A BODY* and *ENCLOSURE IS SKIN*.

REFERENCES

- Alberti, Leon Battista. *On the Art of Building in Ten Books*. Cambridge, Mass: MIT Press, 1988.
- Allen, Stan. "Le Corbusier and Modernist Movement: The Carpenter Center for Visual Arts." In *Practice: Architecture, Technique and Representation*, 102-121. Amsterdam: G+B Arts, 2000.
- Architecture is a Language: Daniel Libeskind*. TEDxDublin. Dublin: 2012.
- Caballero, Rosario. *Cognition and Shared Cultural Models: The Role of Metaphor in the Discourse of Architects*. Berlin: Mouton de Gruyter, 2006.
- Cadwell, Michael. "Swimming at the Querini Stampalia Foundation." In *Strange Details*, 3-46. Cambridge: The MIT Press, 2007.
- Cameron, Lynne and Robert Maslen. "Identifying Metaphors in Discourse Data." In *Metaphor Analysis: Research Practice in Applied Linguistics, Social Sciences and the Humanities*, edited by Cameron, Lynne and Robert Maslen, 87-115. London: Equinox, 2010.
- Collins, Peter. *Changing Ideals in Modern Architecture 1750-1950*. 2nd ed. Montreal; Kingston; London; Ithaca: McGill-Queen's University Press, [1965] 2003.
- Colomina, Beatriz. "The Split Wall: Domestic Voyeurism." In *Sexuality & Space*, edited by Colomina, Beatriz, 73-128. New York: Princeton Architectural Press, 1992.
- Forty, Adrian. *Words and Buildings, A Vocabulary of Modern Architecture*. London: Thames & Hudson, 2000.
- Goldschmidt, Gabriela and Anat Litan Sever. "Inspiring Design Ideas with Texts." *Design Studies* 32, no. 2 (2011): 139-155. doi:10.1016/j.destud.2010.09.006. <http://dx.doi.org/10.1016/j.destud.2010.09.006>.
- Grady, Joseph E. "Foundations of Meaning: Primary Metaphors and Primary Stress." Department of Linguistics, UC Berkeley, 1997.

Hartoonian, Gevork. "Frank Gehry: roofing, Wrapping and Wrapping the Roof." In *Crisis of the Object: The Architecture of Theatricality*, 104-132. Oxon, New York: Routledge, 2006.

Hearn, M. F. *Ideas that Shaped Buildings*. Cambridge, Mass.: The MIT Press, 2003.

Hvattum, Mari. "'Unfolding from within': Modern Architecture and the Dream of Organic Totality." *The Journal of Architecture* 11, no. 4 (2006): 497-509.

Johnson, Paul-Alan. *The Theory of Architecture: Concepts, Themes & Practices*. New York: Van Nostrand Reinhold, 1994.

Kanekar, Aarati. "Between Drawing and Building." *The Journal of Architecture* 15, no. 6 (2010): 771-794. doi:10.1080/13602365.2011.533543.

Kövecses, Zoltan. *Metaphor: A Practical Introduction*. New York: Oxford University Press, 2010.

Lakoff, George and Mark Johnson. *Metaphors we Live by*. Chicago: University of Chicago Press, 1980.

Lavin, Sylvia. "Current Kisses." In *Kissing Architecture*, 65-113. Princeton: Princeton University Press, 2011.

Lerup, Lars. "Stim and Dross: Rethinking the Metropolis." In *After the City*, 47-63. Cambridge: The MIT Press, 2001.

Logan, Cheri. "Metaphor and Pedagogy in the Design Practicum." *International Journal of Technology and Design Education* 18, no. 1 (2007): 1-17. doi:10.1007/s10798-006-9009-x.

McClung, William Alexander. "The Matter of Metaphor: Literary Myths of Construction." *Journal of the Society of Architectural Historians* 40, no. 4 (1981): 279. <http://www.jstor.org/stable/989645>.

Muller, Brook. "Metaphor, Environmental Receptivity, and Architectural Design." In *Symbolic Landscapes*, edited by Backhaus, Gary and John Murungi, 185-199. New York: Springer, 2009.

Pragglejaz Group, Peter Crisp, Raymond Gibbs, Alice Deignan, Graham Low, Gerard Steen, Lynne Cameron, et al. "MIP: A Method for Identifying Metaphorically used Words in Discourse." *Metaphor and Symbol* 22, no. 1 (2007): 1-39. doi:10.1207/s15327868ms2201_1. <http://oro.open.ac.uk/15225/>.

Seligmann, Klaus and Claus Seligmann. "Architecture and Language: Notes on a Metaphor." *Journal of Architectural Education* 30, no. 4 (1977): 23-27.

Somol, R. E. "IntraCenter: The Seduction of the Similar." *Assemblage* 40, (Dec, 1999, 1999): 68-79.

Till, Jeremy. "The Selfless Plan." In *Pattern, Purpose, Place: The Work of Proctor and Matthews*, 209-217. London: Black Dog Publishing, 2009.

Vitruvius Pollio, Marcus. *Vitruvius, the Ten Books on Architecture*, edited by Morgan, M. H., Herbert Langford Warren. Cambridge: Harvard University Press, 1914.

Zaera Polo, Alejandro. "The Politics of the Envelope: A Political Critique of Materialism." *Volume* 17, (2008): 76-105.