Schools and skills of critical thinking for urban design

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**ABSTRACT**

This paper explores possible ways in which urban design can engage with critical thinking and critical theory. After a brief explanation of the terms, with particular attention to the Frankfurt School of thought, it provides various answers to the question as to whether urban design is critical or not. One categorization applied to planning critical theory is then used to explain the potential for employing critical theories in urban design. Critical thinking skills are then argued to be helpful for enriching the literature of urban design in order to achieve better practice. The conclusion is that urban design can benefit from critical creativity, which is an embodiment of critical thinking within the limits imposed onto creativity. In this paper, the ways in which urban design can engage with both critical theory and with critical thinking are explored in order to achieve better critical creativity in the field.

**Introduction**

What does critical thinking mean in urban design? Does urban design enable such thinking? How can designers and academics apply critical theories and critical skills in solving urban problems? What are the key schools of critical theory and how can they help urban design? Despite the fact that critical thinking has been widely identified as a key requirement for professionals, the aforementioned questions have not been discussed adequately within urban design literature. The weak engagement between urban design and critical theory has queried the use of a critical agenda for urban design.

This paper explores the necessity of addressing such questions and provides a basic framework for better use of critical thinking principles in urban design. In so doing, the paper revisits the philosophical arguments around critical theories in order to clarify their potential for urban design. The argument is presented in three parts; after clarifying the theoretical definitions, part one hypothetically explores the relationship between urban design and critical theories; part two investigates the school of critical theory for urban design; and part three offers a set of critical thinking skills for urban design.
What is a critical concept?

The term ‘critical’ is widely used in many fields and in day-to-day conversations, albeit with various meanings. Two meanings of the term given in the Oxford Dictionary are (a) expressing adverse or disapproving comments or judgements; (b) expressing or involving an analysis of the merits and faults of a work of literature, music or art. From these definitions analysis and negative commentary appear to be associated with critical thinking. This reflects the origin of the term that goes back to mid-sixteenth century (in the sense ‘relating to the crisis of a disease’), from later Latin criticus (Oxford Dictionary of English 2010). Critical thinking, however, in many references means systematic and objective evaluation of an issue in order to reach a judgement (see Brink-Budgen 2010; Cottrell 2011; Cohen 2015).

Like many other concepts, the term critique carries certain connotations that have been gradually added to the term. The seminal book of a German philosopher, Immanuel Kant, called Critique of Pure Reason (1781) is in fact the key text that developed the concept of critical thinking. Kant aimed to use critique in order to make a rational philosophy entirely based on reason (Kant 2009). Inspired by this book, A Dictionary of Critical Theory defines critical concepts as sets of concepts “whose reach is always and necessarily greater than their grasp” (Buchanan 2010). This definition explains how critical thinking goes beyond set boundaries. This ability seems to be the nature of critical thinking.

Kant’s philosophy has inspired many successors. In particular, Max Horkheimer, one of the founders of the Frankfurt School, elaborated on Kant’s Critique of Pure Reason in his PhD. He stated that “Kant understood that behind the discrepancy between fact and theory … there lies a deeper unity, namely, the general subjectivity upon which individual knowledge depends” (Horkheimer 1982, 203). He first coined the term critical theory. Adding the word theory was not arbitrary. In fact, critical thinking in the Frankfurt School turned into what we now recognize as critical theory in the sense that it started theoretically to address social issues and systematically to employ critical concepts (Jay 1996). Key characteristics of critical theories among the circle of intellectuals who joined Horkheimer’s school are summarized in the following.

The extent of change suggested by critical theory suggests is often dramatic. Therefore, it is perceived to be radical. In many instances, critical theorists challenged perceived wisdom in the pursuit of revolutionary change.

Another characteristic of critical theory is the fact that the key thinkers of this movement were affected by Karl Marx’s philosophy, in particular, his concepts of alienation and the interpretation of events as social productions (Marx 2011). Despite the fact that not all of the members of the Frankfurt School could be categorized as Marxist, they were highly influenced by his philosophy. This resulted in seeing social identities as being defined by working and living environments. In addition, Marx’s analysis of history (Marx et al. 1970) aided this circle of intellectuals in their conceptualization of social issues, such as wars, poverty and exploitation, as the direct consequences of the class struggle and of the ways in which the production of wealth has formed society. Along with Marxism, Freud’s psychoanalytic approach enabled some members of this school to link a socio-historical dimension to personal feelings (Bottomore 2002; Jeffries 2016).

The boundaries between disciplines were challenged by critical theory stimulating the necessity for interdisciplinarity, which has been encouraged by the nature of critical thinking as it aspires to go beyond any set of thinking frameworks and firm understanding of phenomena (Arato and Gebhardt 1982). For example, many influential works of the members
of the Frankfurt School marry pairs of apparently unrelated areas such as psychology and politics (Fromm 1991, 2001), aesthetics and industrialization (Adorno and Bernstein 2001; Adorno 2007), literature and urbanism (Benjamin 1986, 2016). Critical theory is interdisciplinary and it challenges the set boundaries between various areas of human knowledge. This means that critical thinking, as Adorno stated, inevitably engages with critiquing societies from various perspectives (Benzer 2011).

The various works by the Frankfurt School often raise awareness as to why the topics of their studies are important, or what is at stake in relation to any given topic. Appreciating and understanding why a particular topic is considered attention-worthy is an important characteristic of critical theory in any given circumstance. This approach directly resulted in its theories being sensitive to their local context, time and space. The importance of this approach can be illustrated in opposition to rationalism and positivism, both of which view the subject of their study in abstract. Such abstract theorizing dominated the discourse in many academic circles (in particular the Vienna Circle of philosophy) during the period when the Frankfurt School of critical thinking was formed. “Critical theory would treat facts less as isolated depictions of reality than as crystallized historical products of social action. The aim was to understand a fact within the value laden context wherein it assumes meaning” (Bronner 2011, 25). The actual socio-political context in which the critical works of the Frankfurt School emerged had a profound effect on the content of their theories. On the one hand, in the East, the Bolsheviks were making dramatic changes in society. On the other hand, in Germany, a series of events followed by the First World War resulted in the Great Depression and an authoritarian government coming to power. In this circumstance, many intellectuals were motivated by the desire to effect change. Again, Marx inspired them in his call for social change: “The philosophers were only interested in interpreting the world in various ways. The point, however, is to change it” (Marx et al. 1970, 65). In this respect, the Frankfurt School aimed to couple theory and practice, or as they preferred to express it, in praxis (Jay 1996). Abstract theory, without direct implications for society, did not appear to be of interest for the members of this movement.

In a socio-historical context, the focal point of the majority of their works was in fact critiquing modernism and the modern way of life, asking why the promises of the Enlightenment resulted in such a miserable condition for humanity.

Critical theories and critical thinking since the Frankfurt School have resulted in the development of various circles and have benefited many disciplines. Being interdisciplinary, paying attention to contexts and studying socially-produced identities are all able to inspire urban design thinking. However, first it should be clarified whether or not urban design has the capacity to systematically incorporate such thinking.

Is urban design critical?

Urban design, like almost all other disciplines, has benefited from critical theories directly and indirectly. It is important to highlight here that urban design literature consists of a diversity of texts. Nevertheless, it is possible, and in fact necessary, to comment critically on mainstream urban design as a whole, albeit different theories have different levels of criticality. The question in this section, however, is whether mainstream urban design as a whole is, by its nature, a critical field, and whether engagement with critical thinking is random or systematic. There are different views on the answers to these questions. In what follows, three such options are elaborated upon.
First answer: urban design is not critical

Urban design, as a field, has been condemned for various reasons in many texts (Cuthbert 2005; Gunder 2011; Banerjee 2013; Inam 2013; Madanipour 2014; Dovey 2016). Some authors suggest that urban design is not, and cannot be, critical. One of the leitmotifs of these criticisms is that urban design follows fixed models (Marcus and Francis 2003). Such a criticism indicates that urban design texts and projects advocate a certain urban form without fully understanding the urban problems involved. Urban design of this sort aims to replicate the forms of medieval cities: walkable, mixed-use, having a strong centre (Tibbalds 2000; Cowan 2002). When designing projects for big cities, mainstream urban design is expected uniformly to pedestrianize commercial streets regardless of the context. If following these fixed models were always to be the case, then urban design thinking would be bound to certain shapes which cannot go beyond this solid framework. This would make urban design thinking a non-critical practice, incapable of critical thinking.

Another argument which indicates that urban design is not critical is that urban design, as an independent field, is largely a creation and product of neoliberalism, because it effectively mirrors its values of reification and façade, the superficial, the surface, in the commodification of the built environment (Gunder 2011). This would mean that urban design acts merely as an instrument of global capitalism and neoliberalism. If this were the case, then urban design could not go in any other direction except to serve neoliberal powers. Consequently, urban design would not be capable of being critical. Following on from this argument, when topics such as social justice, emancipatory design and gender are discussed under the titles of urban design, they cannot act otherwise than required by neoliberal forces.

Urban design has also been condemned for its focus on physical design or big-architecture without necessary socio-political understanding (Cuthbert 2007b; Gunder 2011; Inam 2013). This feature can be identified both within the practice and the theory of urban design. The core references of urban design do not reflect critical theories (Foroughmand Araabi 2016). Even 10 years after Cuthbert’s persuasive call for a move towards critical urban design (Cuthbert 2007a), critical thinking is underdeveloped. Arguably, topics such as environmentalism are absorbed only after they have been emptied of their original critical promise and turned into greenwashing (Parr 2009).

The final argument in favour of the first answer is that urban design is ultimately about the creation of new environments, whereas critical thinking is about making rational judgements and evaluating the consequences of existing processes. Creating a new form and critiquing existing processes are seemingly disparate endeavours. Therefore, one can argue that urban design cannot have a critical nature as long as it is merely concerned with design. Perhaps this is why Cuthbert defines urban design as the social formation of urban environments and urban meanings (Cuthbert 2007a, 2016).

Second answer: urban design is necessarily critical

The second possible answer to the question of whether urban is critical or not, is that urban design by its very nature is a critical field. Contradicting the first answer, this answer claims that without critical thinking urban design is meaningless. Some arguments in favour of urban design as a critical field are as follows.
Urban design relies on critical concepts. Therefore it is critical. Earlier, it was explained that concepts ‘whose reach are greater than their grasp’ are critical (Buchanan 2010). This means that such concepts, for example, space and society, cannot be understood through pure experience. Critical concepts can only be described when critical thinking is in operation. Therefore, urban designers, in principle, must be aware of the fact that concepts they are dealing with go beyond any perceptual and set representation. Consequently, when designing a small section of the space for a small section of society, the ability to go beyond those boundaries is necessary in order to be able to evaluate their design. Many professionals are well aware of this point (Carmona et al. 2003; Billingham 2004; Banerjee 2011, 2013). Thus, critical concepts are crucial for locating and making sense of any design that aims to purposefully understand the relevant context and make a change. This argument indicates that meaningful urban design is necessarily critical in its nature, because of its relation to concepts such as space and society.

Another reason supporting the view that urban design is critical follows on from the fact that urban design deals with wicked problems (Lang 2005; Verma 2011; Carmona 2014). Wicked problems have no definite formulation. There is no stopping point for them. There is no well-defined solution for them and they move from one location or section to another (Rittel and Webber 1973; Skaburskis 2008). These are also characteristics of urban problems. This shows the necessity for critical thinking as it enables one to go beyond set frameworks and boundaries in order to make proper evaluations and judgements. Critical thinking endorses constant assessment of the problems in hand necessary for dealing with wicked problems that are dynamic, thus hard to grasp (Foroughmand Araabi 2017). This argument could be followed by the fact that even though many urban design projects were not identified as being critical, the very nature of their thinking resembles the characteristics implicit in critical thinking.

Arguments in favour of the second answer do not seem convincing to many scholars. In addition, its acceptance highly depends on the varying ways in which urban design is understood. Alternatively, some scholars suggest that alteration in mainstream urban design is necessary in order to make it critical (see Chase, Crawford, and Kaliski 2008; Inam 2013; Carmona 2014).

**Third answer: a middle way?**

There may be an intermediate answer, as urban design is critical but not in all situations. One cannot expect urban design to bypass neoliberal regulations, nor can planning or any other field. In addition, fields that are bound to urbanization and economic development are harder to be visualized as highly critical (Lahiji 2016).

Although not many scholars discuss this approach specifically, a group of urban design publications follows this in response to the question. Bentley (1999) states that urban designers inevitably work in a capitalist context, within neoliberal forces. Nevertheless, their designs can be aimed more directly at empowering people. Designers have a capacity, however restricted, to influence the ways in which any given project contributes to the public good or to how the lower classes benefit by the design. This suggests, in line with the idea underlining The Insurgent Architect at Work (Harvey 2006), that urban design can be highly critical in its thinking, however restricted its action. In this condition, urban designers are required to establish critical responses to bigger processes and use their capacity in whatever limited opportunities may arise.
It should be noted that many places that are examples of good urban design were created long before the emergence of neoliberal society. This illustrates the possibility of non-capitalist urban design. However, this possibility relies on assuming that neoliberal forces have not played an entirely dominant role in the world. Urban design also came to particular attention in the Soviet Union (Lang 2005; Hatherley 2015) as another example of the possibility of its usage in a non-neoliberal economy. Even though these examples are the results of processes that are not currently mainstream, they refute the claim that urban design must necessarily be in the hands of neoliberalism.

The answer to whether urban design is critical or not varies depending on definitions of the terms. Nevertheless, the arguments in this section describe the ways in which urban design is perceived to interface with critical thinking.

The next section examines the main schools of critical theory in relation to urban design. It is followed by the introduction of critical thinking skills to urban design.

Schools of critical thinking and urban design

Critical theories are systematic embodiments of critical thinking. When such theories gather round a set of beliefs and principles, they constitute a school of thought, as was the case in the Frankfurt School. To date, there has been no study identifying schools of critical urban design. In planning studies Yiftacjel (1989) proposed three types of theory: rational, communicative and critical. Critical planning theory is defined as being concerned with what constitutes ‘good planning’ (Yiftacjel 1989). This is in line with identifying critical propositions as a necessary ingredient of rational judgement (Kant 2009). More recently, Gunder suggested four categories of critical planning theory: Structuralist Political Economy Interrogation; Liberal Pragmatic Interrogation; Post-structural Interrogation; and Contemporary Neoliberal Interrogation (Gunder 2015). Considering the fact that urban design literature has engaged less with critical arguments compared to planning, this categorization, whilst requiring adjustments, is applicable to urban design.

Such categorization can only be applied to urban design when urban design is considered to be critical. The three answers in the previous section are therefore offered as a prerequisite for the following argument. To a considerable extent, the second and third answers enable better engagement between urban design and schools of critical theory.

The categories offered here are borrowed and adjusted from planning (Gunder 2015). Nevertheless, the critical literature of urban design can be reflected on this categorization, which would highlight what critical theories have to offer to urban design.

Some scholars consider only one category to be valid. This is specifically the case for those who consider Marxist political economy as the only valid framework for understanding the socio-political forces behind the formation of urban problems. Nonetheless, this paper aims to identify all dominant schools of thought in which various forms of critical thinking are consolidated.

Structuralist political economy interrogation

Structuralist political economy is a category of critical theory deeply inspired by Marx. In urban studies this became a key school of thought when Marxist thinkers began to study the concept of space, adding a spatial dimension to political economy (Castells 1977; Harvey
Structuralist political economy is attractive to scholars because it provides an apparently rigorous epistemological rationalization whereby explanatory roots of the structured and structuring social relations are identified (Soja 2011). Critical urban theory is one current version of structuralist political economy which Brenner describes as a term referring to 'leftie' urban thinkers:

Rather than affirming the current condition of cities … critical urban theory emphasizes the politically and ideologically mediated, socially contested and therefore malleable character of urban space — that is, its continual (re)construction as a site, medium and outcome of historically specific relations of social power (Brenner 2009, 198).

This particular school of thinking is presented in the journal *City* published by Taylor and Francis². Critical urban theory studies the deep involvement of cities with capitalism. It asks how urbanism without capitalism and how capitalism without urbanism would be possible. This school of critical theory can be related to urban design if urban designers act as ‘associated producers of space’ (Goonewardena 2011).

In urban design literature, Cuthbert is considered to be the dominant voice of structuralist political economy (Cuthbert 2003, 2005, 2007a). However, long before this, King had raised the question as to what urban design and emancipatory design mean in a capitalist society (King 1988, 1996). Unlike many other urban design texts, works from the perspective of structuralist political economy do not directly lead design practice, contrasting Marx’s call for making change. Despite the fact that this approach is helpful in understanding cities, it seems that when it comes to making suggestions, it becomes less distinguishable from mainstream urban design. For example:

There is no reason why urban design should not be vibrant and real, that it can be appropriately theorized, that urban form can create new experiences and spaces, and even on occasion that the collective good will triumph over economic imperatives (Cuthbert 2016, 431).

In terms of the content, texts belonging to this category mainly critique the current condition of cities as privatizing public spaces and assets (Low and Smith 2006). They also criticize mainstream urban design for not being underpinned by substantial theory, capable of acknowledging the socio-political forces behind urban meaning (Cuthbert 2007b).

**Pragmatic criticality**

Pragmatic criticality empowers theories that are focused on delivering intended outcomes and is not particularly concerned with political direction. It examines existing literature, or the direction in which the field is going on the basis of efficiency. In so doing, it requires a model or a theoretical assessment that shows the disadvantages of the existing situation and the possibilities for a better one. In making assessments of the existing situation, it provides a framework for making critical judgements.

Works in this category include a wide range of texts that are reluctant to take any political direction. Marshall’s argument for assessing the changes in cities with reference to Evolution Theory (Marshall 2009), his suggestion for using scientific capacities of urban design theories (Marshall 2012) and his recent article on using cooperative artistic mechanisms for urban design (Marshall 2016) all fall into this category. Despite the fact that they have different subjects, they do not have a clear political direction but do offer new frameworks for better urban design. This also applies to many key theories developed by key urban designers, for example, Lynch (1960) and Alexander, Ishikawa, and Silverstein (1977).
According to this definition, technical and scientific theories fall into this type of critical tradition; texts such as Space Syntax, criticizing changes in urban form as failing to match up to social logic (Hillier and Hanson 1984; Hillier 2008), Fractal Cities, criticizing urbanization without understanding the natural complexity of settlements (Batty and Longley 1994), and the use of Big Data, criticizing the management of the complex system (Batty 2013) all rely on the tradition of empiricism. This category may alternatively be entitled empirical criticism.

**Post-structural interrogation**

Post-structuralism as an intellectual movement flourished in the second half of the twentieth century. The work of many thinkers, amongst them Gilles Deleuze and Felix Guattari, Jean-François Lyotard, Michel Foucault and Jacques Derrida, falls into this category. In addition to falling within the same social context, these philosophers show some common interests and address similar concepts in their philosophy. Their thinking by its nature is critical, in so much as it seeks to provide a better understanding of the complexity of power as being something more than a matter of coercion or repression (Buchanan 2008).

The key figures of post-structuralism also believe that society should not merely be understood as the product, or the expression of, the powerful majority exercising influence over the minority. Instead, power resides in ordinary language and in the way people organize their lives. In this context, capitalism is seen as creating the parlous condition of the world. What the Frankfurt School criticized was the big scale, authoritative and Fordist version of modernism, whereas post-structuralism considers power to be uncertain and complex and addresses a Post-Fordist version of modernization.

Kant’s philosophy, Marx’s history and the Frankfurt School’s reading of capitalism and psychoanalysis are philosophical frameworks in the form of superstructures that supposedly explain every phenomenon. Post-structuralism moves on from such superstructures and takes into account processes that cannot be understood by such frameworks. In this, post-structuralism has similarities with pragmatism.

During the 1960s, at the same time as the emergence of the post-structuralism, urban design seminal thinkers began to criticize top-down modern urbanism for its oversimplified understanding of human beings and cities (Lang 1987). Le Corbusier’s work had come to symbolize this top-down modernist approach embodying massive-scale urbanization (Fordist). Christopher Alexander, among many others, aimed to replace this simplified understanding with a more complex model for appreciating that there are aspects of cities which can never fully be grasped or understood (Alexander 1965, 1999). This reverberates with what is discussed in many post-structuralist philosophies. *A City is Not a Tree* (Alexander 1965) has similarities with the concept of the rhizome (Deleuze and Guattari 2002). Within different scopes, both call for an acknowledgment of the unpredictable connections between seemingly-separate sections of cities or processes in the world. Nowadays, the ideas of autonomy (Aureli 2008), participatory urban design (Sendra 2015) and urban assemblage (Dovey 2010) are examples of such thinking in which instead of top-down structured procedures, bottom-up movements enable people to participate in the creation of good public spaces and cities.
Neoliberal interrogation

Neoliberalism is profit-oriented yet it is claimed to create significantly greater benefits for a greater number of people than any other system. The ability of neoliberal policies to produce high-quality urban developments (Künkel and Mayer 2012) and urban design projects (Chapman 1996, 2014) has been addressed in the literature. Neoliberalist economy has managed to make many high-quality (often) privately owned but publicly accessible spaces (Zukin 2010; Glaeser 2011). Nevertheless, very few scholars acknowledged the potential abilities of this approach to be critical. Jane Jacobs’ works fall into this category (Hirt and Zahm 2012). She was one of the harshest critics of the urbanization of her time. Her criticisms became mainstream in urban design (Alexiou 2006) after a while. Even though she does not directly indicate the politics behind her ideas in The Death and Life of Great American Cities (Jacobs 1992), it is nevertheless concluded that her suggestions work better within a neoliberal discourse (Hirt and Zahm 2012). She trusts the free market and its ability to produce public good when people freely act for their individual interests. Neoliberal interrogation seems to be the main mode of governing place-making in times of austerity (Carmona, de Magalhães, and Natarajan 2017). Therefore, finding critical directions in this discourse is of importance for future research.

Skills of critical thinking for urban design

Schools of critical theory consolidate various trends in the history of critical thinking. However, it is critical thinking skills which enable critical judgements to be made in practice. Through using critical thinking skills, urban design can enrich the critical body of the literature. Gunder, following Cuthbert (Cuthbert 2007a), concludes that urban design sits more comfortably within urban planning because of planning’s critical research agenda and its educationally-focused engagement with a wide range of socio-environmental issues (Gunder 2011). The problem with this suggestion is that merely subsuming urban design under urban planning or social sciences does not per se alter its content. Alternatively, operationalizing critical skills can create critical research, critical knowledge and critical pedagogy.

Having a clearer understanding of the skills implicit in critical thinking is helpful for a wide range of urban design activities. Many references on critical thinking skills describe them as a process with various steps, from understanding the studied phenomenon to making judgements about it. Critical judgements therefore contribute to a better understanding, thus leading to facilitating the decision-making process (Brink-Budgen 2010; Cottrell 2011; Cohen 2015). Urban designers constantly make decisions that may or may not be critical. Returning to the Yiftacjel (1989) definition of critical planning theory, the key element is making judgements about what is a good design. It is important first to make assessments according to the client’s requirements. This judgement is probably not highly critical. If the designers explore beyond a pre-defined framework, this can be seen as a critical action. One example could be the recognition as to who will receive benefits and who will lose opportunities because of a development, in ways that are not considered in the design brief and in the literature. Skills involved in critical thinking can enable such considerations to be taken into account.

Many studies have explored the relationship between certain techniques and critical thinking. Barry Richmond, a system thinking theorist, suggests a set of critical thinking
techniques suitable for a systematic approach (Richmond 1993). He introduces seven key
critical thinking skills. The following descriptions of skills of critical thinking apply Richmond’s
suggestions to urban design and identify examples of where such thinking is currently being
used in the field. This could be a first step to more systematically applying critical skills to
urban design.

- **Dynamic thinking**: “is the ability to see and deduce behaviour patterns rather than focusing
on, and seeking to predict, events” (Richmond 1993, 122). Dynamic thinking in urban
design rejects environmental determinism (Lang 1994). Urban problems emerge as the
result of ongoing processes unfolding certain patterns through time. Therefore, dynamic
thinking necessitates an understanding of the specific characteristics of each problem
and aims to create a flexible outcome through malleable tools.

- **Closed-loop thinking**: requires seeing any phenomenon as being the result of a set of
interdependent processes. Closed-loop thinking relies on circular cause-effect relations.
In urban design, an example is the relation between diversity and density, a very com-
plex relation (Dovey and Pafka 2014) where diversity and density can each create (or
contribute towards the emergence of) the other. Close-loop thinking appreciates the
uniqueness of each case. Yet it does not deny the possibility of studying the reasons
behind any given phenomenon. The first two skills are close to what Schon conceptu-
alized as features of a **reflective practitioner** (Schon 1984).

- **Generic thinking**: Many concepts are understood in relation to specific meanings. For
example, modern architecture in urban design literature has been criticized for not
providing diversity, human-scale environments or sense of place (Lynch 1960; Jacobs
1992; Tibbalds 2000; Lang 2005). Generic thinking requires going beyond such conno-
tations and revisiting the phenomena with a fresh mind. It is argued that urban design
suggests a certain urban form, walkable, pre-modern-looking and mixed-use (Llewellyn
2000; Tibbalds 2000), prior to fully understanding the problem in hand. If this were true,
then generic thinking about concepts such as vitality, sense of place, walkability (just to
mention a few) would be essential for the field. Otherwise, a set of orthodoxies would
dominate the creation of urban design practice.

- **Structural thinking**: is to think in “terms of units and measures, or dimensions” (Richmond
1993, 125). Urban problems can easily be interpreted antithetically. For example, whilst
for Harvey urban life is on the verge of a big crisis (Harvey 1989, 2013, 2014), Gleaser
celebrates the urban condition for its outstanding successes (Glaeser 2011). Thinking in
terms of specific measures would clarify what exactly indicates the goodness/badness
of urban life. Nevertheless, structural thinking should be in balance with dynamic and
closed-loop thinking. In the literature, there are many outstanding examples of system-
atically measuring qualities of urban design (Clifton et al. 2008; Ewing and Handy 2009).

- **Operational thinking**: is finding out how things really work, not how they work in theory.
For example, the literature of urban design suggests that **eyes on streets** (Jacobs 1992)
provides safety. But no study should be blinded from seeing the reality merely because
of what a theory suggests. Operational thinking means theory must aim to remove the
gap between theory and reality.

- **Continuum thinking**: asks what happens after solving problems; what are the by-prod-
ucts caused by problem-solving endeavours? One example is massive housing projects
for fulfilling housing needs. Such projects may successfully achieve the objectives, but they can produce more problems, as the infamous 1960s urban expansion showed.

- **Scientific thinking**: means having a sound theoretical understanding in mind when dealing with a problem. Even though it is argued that urban design is not scientific, the importance of theory has been acknowledged throughout the literature (Lynch 1981; Sternberg 2000; Biddulph 2012; Dovey and Pafka 2016). Without rigorous theory, urban design would be in danger of simply repeating the mistakes of the past, and would not learn from failures or successes. Urban design without sound theory can also be hijacked by existing forces, resulting, for example, in a giant three-dimensional fashion show of capitalist competitiveness. Scientific thinking in this meaning has long been seen as important to the field.

A balance of the seven skills is needed for comprehensive critical work. Nevertheless, applying all seven skills cannot always guarantee a successful outcome. Critical thinking does not lend itself to being rigidly formulated. This is neither a comprehensive list of necessary skills nor does it precisely define the process of critical thinking. It only aims to illustrate the possibility of using critical thinking techniques to encourage critical analyses at the various stages in urban design.

Figure 1 conceptually summarizes the import of this paper. If the answer to the first question (whether or not urban design is critical) offers the possibility of critical thinking,
then the schools and skills of critical thinking are considered to be useful. Otherwise, urban
design's engagement with critical thinking is random. The aforementioned schools of critical
theory have their own relationship with one another. Structuralist political economy interro-
gation conflicts with both neoliberal interrogation and pragmatic criticality. This has occurred
because the structuralist political economy's frameworks are formed by the inflexible idea of
power and political structures, whereas pragmatic criticality and neoliberal interrogation
define their own frameworks differently in each individual case. Post-structural interrogation
overlaps with other schools, insomuch as it employs flexible frameworks that could be com-
patible with the political framework integral to structuralist political economy and the flexible
frameworks of the other two schools.

Moving from schools of critical theory to applying the key skills of critical thinking occurs
when an urban designer applies any given framework to a real case. The opposite movement,
from skills to schools, can happen when critical urban design theory is informed by
practice.

Considering the question whether urban design is critical or not from the perspective of
the schools of critical thinking, replicates what Biddulph (2012) conceptualizes as thinking
about urban design; that is constructing urban design theories from the perspective of social
science. Following on from this perspective, returning to the first question from the perspec-
tive of operational skills replicates thinking for urban design; that is, using methods for
engaging critically with urban problems in practice (Biddulph 2012).

Despite the fact that critical thinking brings attention to previously unexplored issues, it
is also expected that putting skills of critical thinking into operation will highlight certain
subjects of study. As dynamic thinking and generic thinking invite exploration of greater areas,
a more comprehensive conception of space is expected to become an issue. The relationships
between space, society and economy will be a leitmotiv of critical urban design practice.
Continuum thinking draws attention in urban developments to minorities and marginalized
groups such as gender, disablement, race, class and immigrant. Operational thinking enables
urban designers to take into account the complexities of nature and of urban ecology which
cannot be fully dealt with by using standards and frameworks. Scientific and structural think-
ing challenge interdisciplinary, paving the way for making judgements about urban design
projects from different perspectives. Above all, using critical skills in urban design would
enable practitioners to deal with future problems critically. This approach strongly connects
thinking for and thinking about urban design (Biddulph 2012).

Despite the value of these critical skills, they do not obviate the need for a deep under-
standing of their theoretical underpinning. Such skills cannot replace an in-depth under-
standing of the various schools, but they aim to complement them. At the same time, no
school by itself can adequately inform the practice of urban design. Both schools and skills
are needed in order to generate critical content for urban design.

**Conclusion: towards critical creativity**

The application of critical thinking in general and critical theories in particular would be
beneficial for urban designers by putting critical thinking at the heart of design. This may
be considered to be a challenging suggestion insomuch as critical thinking aspires to go
beyond set frameworks and boundaries, and is more interested in analyzing, questioning
and making new judgements rather than in focusing on producing new urban forms. How
this would be coupled with a design process is one of the challenges when a stronger connection between critical thinking and urban design is at stake. It unmasks tensions between ‘criticality’ and ‘creativity’ that are deeply rooted in urban design traditions. Contrasts between descriptive versus prescriptive theories (Lynch 1981; Moudon 1992) and urban versus design (Madanipour 1996) are examples of those tensions.

As creativity without critical thinking can easily be hijacked by non-critical forces and powers, a purely creative approach is inadequate to serve urban design thinking. On the other hand, pure criticality alone is insufficient. Therefore, what urban design needs is critical creativity, with criticality (including assessing, questioning and making judgements) and creativity (including designing and making new forms) interwoven. Thus, there would be a dynamic relationship between criticality and creativity. Creativity would not then merely be making new forms but would also embody new critical thinking. Equally, a critical approach would aim to make judgements that ultimately contribute to better design output and better life experiences rather than focusing on negative aspects.

Critical creativity, which is not to be confused by any previous use of this term, here offers an approach to future research and to those practices concerned with keeping urban design linked to critical thinking. Despite the fact that this approach indicates good design, the test of time remains paramount. In this regard, as with any other theoretical framework, what happens in reality, in this case in cities, is the final validation process.

This paper offers a particular understanding of the schools of critical theories, aiming to invite the application of critical thinking to urban design. However, there are many other ways of understanding critical theory and of applying critical thinking to urban design. In his recent book, Dovey aims “to inspire critical thinking about urban design” through offering an open-thinking conceptual toolbox (Dovey 2016, 1). The contribution of this paper should be seen in relation to a greater argument about how critically to think about urban design and how critically to implement urban design.

Key characteristics of critical thinking and the necessity for its use in urban design have been addressed in this paper. Mainstream modes of urban design currently are not critical, but there is potential for better employing critical skills in urban design. This could only be actualized by professionals who are interested in going beyond existing processes and beyond the design frameworks and manuals. Universities have a pivotal role in teaching critical thinking to the next generation of professionals. This paper aims to make a contribution towards fostering this movement.

Notes
1. This echoes Kant’s (2009) classification of human knowledge.
2. https://www.city-analysis.net
3. The connections that occur between the most disparate and the most similar of objects, places and people; the strange chains of events that link people (Parr 2010).
4. Structural thinking here, as a technique, must not be confused with structuralism.
5. https://criticalcreativity.org/

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