Reflections on constructivist systemic inquiry traversing territorial scales:
The procedure of reaching authenticity of architectural research design project generated from social dynamics

AR3A160 Lecture Series Research Methods
Transitional Territories Studio
Haozhuo Li
4734912

I INTRODUCTION

Being aware: Know-that, know-how and know-why

Research-methodological awareness is being aware of what, how, and why we use certain approaches during architectural research, thus a combination of ontological (know-that) and epistemological (know-how and know-why) inquiry. Fundamentally, it is a realization of the iterative process of research and design. Such a process helps us to define and sustain the essence of a research-design project,[1] as the project should be coherent in terms of legibility. Research, defined as a systematic inquiry to generate new knowledge,[2] means that knowing what we are doing in a reductionist way to *systemize* and *organize* our steps in practice, and that finally know how and why we have manipulated on certain foci, from which we are able to evaluate. Framing the assumptions during a research process into paradigms help us to communicate our understanding to broader audience, which is also beneficial for academic quality.[3] Therefore, research-methodology includes critical thinking for design practices. It also triggers reflections on architectural profession, which is vital to the future role of architects. Both the study of certain tactics and methods that are culled from a methodology pool and outcomes of analysis can inform us possible *tendency* and *dynamics* of the world, from which we think of what role we are playing and will play in the future, and to what direction we can expand the scope of the discipline. This leads to my further contemplation of the general process of architectural knowledge production: the ever-growing “auxiliary hypotheses” circle and the “Positive heuristic” driven-force, depicted in the diagram of Lakatos’ research programme[4], as an indication that architectural intelligence consistently absorbs fields of knowledge from other liberal arts and sciences[5].

The aforementioned architectural knowledge production process is demonstrated through all the Lecture Series. As a non-native English speaker, my foremost recognition is the proper names given to multiple research methodology. For example, at first sight I related Praxeology to “Environmental Psychology” to build up a connection between a new term and my previous perception, in order to understand the connotation of the former. “Investigating Territorial Scales” given by Fransje Hooimeijer intrigues me most. Through drawing the substrate of the superficial functional surface, we understand a system both from its appearances/phenomena and production process. This echoes with the Casablanca Affordable House case study in the Praxeology lecture. Both an on-site observation and historical inquiry of production of perception are applied to achieve an interstitial position between subjectivity and objectivity. Not only knowing the experienced phenomenon and the perceived relations (the context one is researching), but also be critical about the logic (if there is one) behind to sustain or shift it.

Integrating lecture series’ realization to studio research-design project

Better framed by a paradigm of constructivism[6], systemic inquiry traversing territorial scales joints the technical knowledge of a site with socio-cultural, socio-political, socio-economical and socio-ecological

context. This implies qualitative research combined with influential results from quantitative research, which justifies our phenomenological narration by what might be the truth.

My project within the Transitional Territories Studio(TT) is about architectural reaction to contingencies during the circulation of flows, particularly a contingent state of congestion as an outcome of rupture by other forces, be it severe storm surges or national strikes. The research process is preconditioned by the studio's general approaches of mapping existing North Sea in mainly four aspects using GIS: biotope, climate, flows and geology/geomorphology; mapping projections of limits respectively to the four aspects; drawing four groups of scenarios (ecological, economic, political, spatial) that are based on scenario analysis – a Cartesian orthogonal pair of two axis – under "Crowd", "Steam", "Warm" and "Rest" conditions, where all are situated in unique circumstances of socio-economic and climate assumptions. Besides, an expansive literature reading is required, to help establish the theoretical framework of one's research project. Furthermore, each of us did a case study of an existing "island" or "tide" project before group site visit, to practice forming a narration (writing "places") through working with layers, times and scales.

The collective mapping, writing, reading, and site-visit sessions together form the research context of my personal project. Particularly, the gypsum model making for a symposium of the studio is a thinking-by-doing way to reflect abstractly the essence of my project. Fascinated by flows of materials and circulation (infra-national and supra-national) after the site visit, I define my research questions as follows:
What an architectural reaction would be if a congested situation happens?

How can an architectural reaction, with particular architectural quality, fulfill the transitional process from a congested situation to decongested one, in territory, urban and architectural scales?

Why an architectural reaction is needed to relief a contingent event in logistics flow?

II RESEARCH-METHODOLOGICAL DISCUSSION

The research questions each implies several contents to be focused:
The thing, the "model", the program, historical precedence:
What an architectural reaction would be if a congested situation happens?

The working principle, the logic behind, the "mechanism":
How can an architectural reaction, with particular architectural quality, fulfill the transitional process from a congested situation to decongested one, in territory, urban and architectural scales?

Reflexivity, reasoning and evaluating value:
Why an architectural reaction is needed to relief a contingent event in logistics flow?

The collective research outcomes from the studio will act as an guidance for the personal project, particularly in scenarios evaluation. As introduced in the previous part, the studio contextualized the working basis of the North Sea by research approaches such as *GIS mapping*, *scenarios drawing*, *case-study narrative writing* and *literature review*. Literature readers include discourses of perception of land and sea, landscape, borders, and cross-disciplinary discourses from landscape urbanism and landscape ecology. The outcome of the collective mapping is an atlas of the North Sea, which provides general background information. Maps and projected scenarios are in larger scale. After the group site visit (the Southern North Sea coastal areas basically, the Netherlands – Belgium – France – Dover Strait – England) I narrow my focus down to the extreme South North Sea: Dover Strait and vicinity lands. Therefore, to manipulate under urban and architectural scales, more detailed information need to be known and shown.

My research approaches for the personal project is a continuous practice following approaches used in collective work of the studio, a systemic inquiry of qualitative research[7] although make use of the outcomes and steps of quantitative research. For example, mapping flows of traffic (ships, cruises, ferries, cargos, etc.), flows of travelers, flows of immigrants are based on factual statistics downloaded from credible statistics department such as Eurostat. Data collected from various officials will be furthered checked and interpreted, which means the final outcome of the mapping would be a representation of degrees/continuum. This helps to justify where will be the critical area for research-design intervention. Iteratively, once contextualized in smaller scale, more site-specific details will be researched and the location of the project will be much more accurate, be it on land, proximity to the coast, or in the ocean. Experiential observations from a phenomenological perspective such as filming, drawing and interviewing are more feasible at this stage. Synchronically, literature review and case studies may provide a gap between historical precedence and the proposed project, which may trigger my contemplation of the project itself and self-positioning through reflective notions such as confirmation bias, structure/agency and so on.

The research methodology mainly belongs to qualitative research, which can be framed into the constructivist framework[8] from Groat and Wang's adaptation, where different tactics/approaches are used in search of an authentic value of the project. Furthermore, applying outcomes from quantitative research echoes with my realization from the lecture series about architectural knowledge production process: an intellectual sponge absorbing and synthesizing related fields of knowledge. Particularly, investigating an area with constant flows of materials, crossing sovereignties and other dynamics, it is critical to understand the system as a whole that produce these flows and define the logic of the system:

> For each technology in infrastructure space, to distinguish between what the organization is saying and what it is doing – the pretty landscape versus the fluid dynamics of the river – is to read the difference between a declared intent and an underlying disposition.[9]

What Keller Easterling states here is the process of knowing-how and knowing-why. As a context-led[10] research design project, the starting point is a ubiquitous mechanism of what Michael Foucault already reported (in 1978) as the ultimate problem of the city[11] – circulation – the original study of Jean-Claude Perrot dated back to an 18th century city. Circulation implies a thread of input and output. An increased metabolic flow, as stated in the introduction part of a recent architectural monograph *Learning from Logistics* by Clare Lyster[12], challenges the role of architects and urbanists facing today's urban matters. A more dynamic model for research should be introduced to the architectural and urbanism knowledge pool. Lyster defines a gap from the historical frameworks within the discipline, and avows to "seizing" alternative flow models.

If we agree that conducting research design project in architecture trajectory is generating or formulating design thinking, the constructivist framework of systemic inquiry, within which bears the driven force of achieving trustworthiness, may lead us to build up authenticity of the project.

III RESEARCH-METHODOLOGICAL REFLECTION

First, there is a need to distinguish systemic inquiry from systematic inquiry. Adjectives systemic and systematic, the two both shares the definition of "related to the system", but systematic, first appeared in 1666, pertains additionally to formulating "a coherent body of ideas or principles".[13] It is until 1803 when systemic first appeared.[14] Systematic inquiry thus implies logical, rigorous, and disciplined ways of research conducting, while the other indicates holistic, comprehensive, complicated and complex way.[15]

In *A Guide to Systems Research* published by Springer in 2017, interdisciplinary researcher Debora Hammond outlines the evolution of systemic research. She manipulates the relationship between *research into the nature of systems* (systems science) as fundamental purpose for natural sciences, social and biological sciences, and *a systemic approach in research* (applied systems approach in technology and design, & systems philosophy) as implications of ontological, epistemological and ethical.[16] Related to architectural research-methodology, three "waves" in applied systems approach[17] is presented here. The first wave emerged in the first half of the 20th century, when systemic inquiry joints previously isolated disciplines.[18] These concerns scientific management, human relations, operations research and action research. The historical context can be understood as an awareness for a more integrated approach as a resistance to the previously separated sciences under the reductionist and mechanism assumptions.[19] The second wave emerged in 1970s and shifted "hard" systems methodologies to "soft" ones. The process was characterized by focusing more "on the human experiential dimension, recognizing the significance of meaning and purpose in human activity systems, and emphasizing the importance of including relevant stakeholders in the process of inquiry and decision making". Developments include Russell Ackoff's interpretation on interactive management (1974), soft-systems methodology by Peter Checkland (1981). Parallel to the development, another trajectory, systems science had generated theories on the dynamics of the system in the 1950s and 1960s: cybernetics; developed general systems theory (originally proposed by the father of general systems theory Lugwig von Bertalanffy); system dynamics.[20] These two independent trajectories more or less fertilized each other.[21] Finally, the third wave began in the 1980s, identified as the "critical systems" approach, put the critical systems heuristics, initiated by Werner Ulrich in 1983, into understanding power relationships in organizations.

As described above, systemic inquiry fulfills a transitional process from control to collaboration, from competitive relationships to realization of intersubjective interdependence, from hierarchical to horizontal network (inviting participators) process, from objectivity to self-reflexivity[22], from questioning how we can appropriate the "realness" in the system to questioning how we can narrate "helpful" stories of relationships[23].

The inclusivity aspect and self-reflexivity are what I foreground for the research process. These inclusive and adaptive episteme of systemic inquiry can be learned by architects from landscape urbanism research. In Hooimeijer's lecture about "Engine Room of the City", she opens an angle, looking vertically in sections of the city, to include considering the substrate of the urban environment, which is thinking outside the original knowledge system. The "layer cake" initiated by Ian McHarg is developed from planar to spatial "layers approach" further elaborated in Hooimeijer's another talk "system design with natural conditions". The lecturer took constructing the polder cities as an example. The layers approach defines the elements of a system. Backtracking of the development of polder cities brings about humans' attitude towards living with nature (from defense to coexistence, from nature as nature to nature as culture). A systemic inquiry puts the researcher inside a system, in my case I locate myself inside the context led by flows of materials, biotopes and other dynamics. I start to look not only into architectural objects such as warehouses, terminals, transportation hubs, but also look into infrastructure space and the logic of operation and spatial agencies of architectural objects, which may open a way for research on knowledge system which is outside the existing system.

The systems inquiry is grounded by the meta-theory as a looping process of “plan-act-observe-reflect”[24]. The inclusivity and self-reflexivity include the process of reflecting on findings related to research questions, such as findings of “learning from logistics”, the patterns and operation of flows, and then relate to my purpose of the project: an architectural reaction. It is an awareness and an assessment of both the view and the viewpoint.

As a procedural working method, I feel that systemic inquiry on multiple scales touches upon the distinction between composition and arrangement.[25] One composites through systems, scales, while the other one arranges in a scale, a system. Systemic heuristics underlines a curious attempt without knowing the outcome (as composition of knowledge fields), as well as a systematic realization of a system (as realization of the arrangement of a constructed field of knowledge).

IV POSITIONING

First, I would like to recall some selected issues that I am interested in provided from the Lecture Series:

- When investigating praxeology, the "critical observer" and the "impossible neutrality" of an ethnographer was put forward. A reflective procedure of researching, the case study of Affordable House in Casablanca demonstrates that "the task of a critical observer involves a critical recognition of the historicity of perception (Marieke Berkers' slides)".
- When investigating types and typology, the intention of building up this knowledge system was discussed. Here I quote Susanne Langer's description, "The principle of typology was born as a criterion for arranging and classifying the different objects".
- When investigating territorial scales, the issue of "reductionist trap"[26] was provided. "How to capture the complexity and the breadth of an architectural domain and avoid the reductionist trap" (Royston Landau)? Further understanding of research and design from Groat and Wang provides an angle that the issue is not a matter of problem-solving, but a matter of attitude and position.

Other issues such as the role that spatial narratives plays in architectural research somehow leads to an investigation of historical perception of language metaphors and architecture (I further look up Adrian Forty's review of the process in *Words and Buildings*), which is self-reflective as an architect and language-learner.

Through all these mentioned issues, I sense that there is an end in the research methodology. This is to achieve a certain kind of justified true belief, a convincing argument for practice, a communicative purpose to inspire our audience.

This is the empirical starting point when I put myself, under the constructivist framework, giving a proper name for my position, to indicate that my personal urge to experience this reflective process of research-methodology. To question, whether the authenticity lying under the constructivist's mask, as already stated in the previous part, can be build up through the process. The constructivist way of research is a process of building up credibility through ontological "authenticity"; it is process of reflexivity to try to reach neutrality; it is a process of understanding the "others" (transferability, with an intention to build up a pilot project which will serve as an inquiry example to other similar context).[27] Besides, a more explicitly stated methodology which I've chosen is the systemic inquiry. The two frameworks are comparable in terms of some qualities such as authenticity, transferability and reflexivity. A systemic inquiry is helpful to a project which is preconditioned in several territorial scales. By doing systemic inquiry, one implies intentions to understand interrelationships, commitment to multiple perspectives and an awareness of boundaries (set by the reductionist way of research).[28] It leads to the ethical value finally: an inclusiveness that conditions a broader understanding of actors/stakeholders/spatial agencies inside and outside the system.[29]

The aforementioned status (part II) and literature discourse of our society, with increasing metabolic flows and dynamics additional to a flat networked world that breaks hierarchical establishment among information processors[30]. It is necessary to be aware of the disconnection, the contingencies that might happen. The contingencies may lead us to reflect the problem within a fluid system, and urge us to know in what way we might change our habitat on the earth. By grasping this disconnection moment, to investigate by systemic inquiry in order to understand the process and the object, and to approach an authentic model.

Notes

1 David Wang and Linda Groat, *Architectural Research Methods* (Hoboken: John Wiley & Sons, 2013), 8.
2 Ibid.
3 Ibid, p. 77.
4 Stanford Anderson, 'Rational Reconstructions and Architectural Knowledge', in Kristian Faschingeder, Kari Jormakka, Norbert Korrek, Olaf Pfeifer and Gerd Zimmermann, eds. *Architecture in the Age of Empire / Die Architektur der Neuen Weltordnung.* 11th Internationales Bauhaus-Kolloquium, 2010 (Weimar: Universitätsverlag, 2011), 164.
5 Richard Buchanan, 'Wicked Problems in Design Thinking', *Design Issues*, Vol. 8, No. 2, (Spring) (Boston: the MIT Press, 1992), 6. "Designers, are exploring concrete integrations of knowledge…".
<http://www.jstor.org/stable/1511637> [accessed 11 April 2008]
6 Wang and Groat, p. 76.
7 Ray Lucas. *Research methods for architecture* (London: Laurence King Publishing, 2016), 36-37. <https://ebookcentral-proquest-com.tudelft.idm.oclc.org> [accessed 29 August 2018]
Wang and Groat, p. 71.
8 Wang and Groat, p. 81, 84-86, 95-96. Constructivist replace the previous term "Naturalistic" defined by Egon Cuba, but shares the similar quality of the previous one, in terms of "credibility", "authenticity".
9 Keller Easterling, *Extrastatecraft: The Power of Infrastructure Space* (London: Verso, 2014), 21.
10 Lucas, p. 11-14.
11 Michel Foucault, *Security, Territory, Population: Lectures at the College De France, 1977 – 78* (Burchell, G. , T rans) (UK: Palgrave Macmillan, 2009), 27.
12 Clare Lyster, *Learning from Logistics: How Networks Change our Cities* (Basel: Birkhäuser, 2016). In the introduction part contextualizing the subject of her research, Clare illuminates, "In an era of increasing metabolic flow, we can no longer afford to read the city solely in terms of the architectural object — traditionally the lens through which architects have interrogated the city. Instead, if designers are to stay relevant in urban matters, we must shift to engage the city from the perspective of its operational systems and procedural flows. In the absence of all but a few historical frameworks within the discipline to conceptualize urban space in this way, it behooves us to hijack other flow models as a way to think more critically about the city as a fluid condition and thus revitalize the agency of urbanism and planning in the age of globalization" (page 1).
13 "Systematic." Merriam-Webster.com. Merriam-Webster, n.d. Web. 1 Jan. 2019.
"Systemic." Merriam-Webster.com. Merriam-Webster, n.d. Web. 1 Jan. 2019.
14 Ibid.
15 Louis Klein and Mary Edson, 'Problem Structuring and Research Design in Systemic Inquiry', in Mary Edson, Pamela Buckle Henning, Shankar Sankaran, eds. A Guide to Systems Research, Translational Systems Sciences, vol 10 (Singapore: Springer, 2017), 59.
16 Debora Hammond, 'Philosophical Foundations of Systems Research', in Mary Edson, Pamela Buckle Henning, Shankar Sankaran, eds. A Guide to Systems Research, Translational Systems Sciences, vol 10 (Singapore: Springer, 2017), 1,4,12.
17 Ibid, p. 10.
18 Ibid.
19 Ibid, p. 3.
20 Ibid, p. 10.
21 Ibid, p. 6-7, 9.
22 Ibid, p. 16.
23 Gail Simon. 'Systemic Inquiry as Qualitative Inquiry', in *Systemic Inquiry: Innovations in Reflexive Practice Research*. (Everything is Connected Press, 2014), 7.
<https://www.researchgate.net/publication/313869993_Systemic_Inquiry_as_Qualitative_Inquiry/stats> [accessed 1 January 2019]
24 Hammond, p. 2.
25 Greg Foster-Rice, 'Systems Everywhere: New Topographics, and Art of the 1970s', in Greg Foster-Rice, & John Rohrbach, eds. *Reframing the new topographics* (1st ed.) (Chicago: Center for American Places at Columbia College Chicago, 2010), 66.
(mentioning the procedural working method of photographers Bernd and Hilla Becher) " … the New Topographics photographers shifted their interaction with the subject matter from one of composition to one of arrangement. To paraphrase Bochner, the importance of this distinction is that composition usually meant the adjustment of the parts - their size, shape, color, or placement - within the frame to arrive at the finished work, whose exact nature was unknown beforehand. Composition, therefore, privileged the parts, rather than the whole; arrangement, on the other hand, implied the fixed nature of the parts within the system, and thus it emphasized the creation of a representative of the whole rather than a representation from the parts." Systemic heuristics is performing a curious attempt without knowing the outcome (as composition of knowledge fields), as well as a systematic realization of a system (as realization of the arrangement of a constructed field of knowledge).
26 Royston Landau, 'Notes on the concept of an architectural position', in *AA Files*, No. 1 (WINTER 1981-82) (London: Architectural Association School of Architecture, 1982), 112.
"How to capture the complexity and the breadth of an architectural domain and avoid the reductionist trap"?
27 Groat and Wang, p. 87.
28 Hammond, p. 11.
29 Ibid, p. 12.
30 Manuel Lima, *Visual Complexity: Mapping Patterns of Information* (New York: Princeton Architectural Press, 2011), 69.

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