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Mapping theory: Production of knowledge in theory of architecture in Turkey

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Abstract
The study presents a 'mapping' of the production of knowledge in the field of theory of architecture in Turkey in the last two decades. The study is based on 307 dissertations produced in Turkey between 1995-2015. Through text mining and unstructured data analysis methods, the research suggests a taxonomy of research in the field. Conceptualizing its method as 'cartography of knowledge' the study aims to document the current state of PhD. research in theory of architecture in Turkish context and provide insights about research trajectories in the field.

Keywords
Theory of architecture, Mapping, Discourse analysis, PhD.

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1. Introduction

The issue of theory of architecture being replaced by a practice that is more focused on production methods with the advent of new technologies, or namely "death of theory" is a recurring theme in the last two decades, a discussion beginning with the final issue of Assemblage in April 2000. Theory as-we-know is changing from the post-structuralist perspectives of 1980s and 1990s. Still it is relevant and inseparable part of architecture as a societal system. In addition, there exist local practices and discourses of theory. We started our research on production of knowledge in theory of architecture with these precepts.

This study is an attempt to make an overview of production of knowledge in the field of theory of architecture in Turkey in doctorate level. The study focuses on 307 dissertations produced between the years 1994-2015. The study itself is a third order observation by Niklas Luhmann's terms. By doing so our purpose is first to understand the current state of theory of architecture and second to develop an insight about the possible directions it should take. By nature, our research is a comprehensive review. It is based on works produced in Turkey, so there exists a degree of locality. On the other hand considering the PhD studies as dissertations aiming at the production of universal knowledge, we are also hoping to share insights with the international audience about the state of theory.

Our research is developed through text mining techniques and data visualization. We knowingly refrained from using statistical models, as it would turn an inherently qualitative research into a quantitative one. We used the keywords defined in the theses as a system of references to produce clusters of studies that share common themes and manually revised the outcomes and added a second layer of categorization by interpreting the studies. This allowed us to trace back fundamental discourses and typical aspects of research in the field enhanced with digital tools but still with personal interpretation.

Since the term "theory" is imbued with multiple meanings, we would like to start by contextualizing the term in the first place.

2. Theory debate and the Turkish context

The most agreed upon definition of theory of architecture and its roots goes back to Vitruvius' Ten Books. Followed by many other architectural treaties, until the transformation of the discipline during industrial revolution, the texts of architecture were overarching volumes of knowledge on the discipline that had comments on all aspects of it, from social role and responsibilities of the architect to the tectonic knowledge of architecture.

In 20th century an intellectual environment of multiplicity developed. Coupled with political positions and personal characteristics, the production in the field gained a wide diversity ranging from rationalist techno-centric positions to historicist positions. Charles Jencks' famous article Jencks's Theory of Evolution depicts this vibrant and intellectually rich period (Jencks, 2000).

The last decades of the 20th century are characterized by the rise of politically strong critical discourses heavily influenced by continental philosophy, following thoughts of prominent thinkers like Michel Foucault, Jacques Derrida and Gilles Deleuze. Mainly characterized by a critical-leftist point of view (Türby, 2016), this period defines the image of theory for many. The departure from the political stance and concepts developed in this period is seen by many as the death of theory, however as Christopher Hight suggests what is happening is in the intellectual environment can be read as a natural progression rather than a rupture (Hight, 2009). Hight suggest that the change occurring in the field of theory is actually a natural shift, a diffuse of problems of theory into a more interconnected nature that is 'cybernetics'. The practice, actor-networks involved and the technologies are changing so must architecture. In the end, what happens is not the death of the theory but the progression form an understanding of theory of architecture to another one. The

Turkish context is no different in this progression. It could be claimed that the form of theory and the progression described as above could be observed in Turkish context as well, represented in various mainstream line of inquiries from different universities and academic environments, particularly the ones those have a well-established graduate programs. Mainly thrived through these works, in 1980s and 1990s this inherently critical way of thinking about architecture and space became the mainstream tone for theory in Turkey. We should also briefly describe the academic environment and production of knowledge in universities in Turkish context.

3. A brief introduction to PhD research in theory of architecture in Turkey

The history of institutional research in theory of architecture goes back to 1950ies where there existed two institutions of higher education; Istanbul Technical University and the Academy of Fine Arts (later Mimar Sinan Fine Arts University). First PhD. dissertation in architecture in Turkey has been produced by Turgut Cansever under the supervision of Ernst Diez in Istanbul University Faculty of Literature Department of Art History in 1949. The first PhD. in architecture under the official body of a Department of Architecture is the dissertation by Gazanfer Beken with the supervision of Paul Bonatz in Istanbul Technical University the same year (Dölen, 2007).

It should be mentioned that the academic structure was mainly formed around departments at the time. Based on the German system some professors held positions with specific titles, like a professor of urbanism or professor of art, construction, and like, under the body of department of architecture. The formation separate programs gained pace after 1980s (1). Separate programs within the bodies of departments were established in older institutions with a critical mass of scholars. These programs are mainly focused on graduate level education within a specific field like history of architecture, restoration and conservation, construction and such. After 2000s in Turkey the number of higher education institutions increased at a great pace, new private schools of architecture were established mainly in major cities and many public universities were established in smaller cities.

As of 2019, there are 124 established schools of architecture providing bachelor's degree programs in Architecture accredited by YÖK in Turkey, of which 107 of them were known to be active. As the progress of establishing a graduate program in most cases starts with bachelors, and progresses into advanced studies and specialization, 63 of these schools are known to have masters, and 35 of them PhD programs.

A PhD. program in Turkey typically is a four-year program that can extend to six years, where candidates, take courses in the first two years and go into a qualification exam at the end of second year. Following the qualification exam candidates go into a process of thesis proposal and they undergo interim reviews every 6 months until the final defense. With the theoretical background and local background on the Turkish context, we can now move into the details of the research.

4. The corpus

As noted at the beginning the main source of information for this study is the PhD. studies in theory of architecture in Turkey that have been produced between years 1995-2015. With reference to the specific context of Turkey, we should clarify a couple of points for correct interpretation of the work. The data is mainly collected through Higher Education Council's digital theses collection. The collection has some limitations. Firstly, the authors are allowed to block access to their PhD. studies for up to three years in case they are willing to publish post-defense. For this reason, we determined 2015 as the end of our data collection as the access is restricted for some later studies. Despite the time limit, a small amount of studies was not accessible through the database, but some of these could be found in the university libraries. If the access was granted the studies were included. Otherwise, they

[1] It should also be noted that, until 1984, the founding of Bilkent University, all the universities were public schools, and the first private university to start architecture education is Bilgi University in 2005 with its graduate program in architecture.

were omitted from the study.

Again as noted above the institutional structure differs between universities. In some cases, programs are strictly separated and in some universities, especially those which initiated graduate research recently, the programs are not separated. This creates a problem of demarcation. To be able to distinguish studies in theory of architecture and others for universities with established program structures we automatically eliminated studies in programs other than architecture or architecture theory **(2)**. For schools with general programs with the title "architecture" the studies that were in the domain of other fields such as building sciences were manually eliminated with reference to their relevance to architecture theory **(3)**.As a result we ended up with 307 studies produced in two decades between 1995-2015. (Figure 1,c) The general aspects of the corpus is as follows.

5. General aspects

In terms of language use, 223 of the studies are in Turkish and 84 of them are in English. Middle East Technical University (METU) is the forerunner in production of studies in English. METU, as expected since it is a well-established, oldest doctoral program in English, almost a monopoly before the establishment of other doctoral programs in Izmir Institute of Technology (IYTE), Ihsan Doğramacı Bilkent University (IDBU) are the universities that produce studies only in English. Istanbul Technical University (ITU), Dokuz Eylül University (DEU) are the institutions that accept studies in Turkish or English. (Figure 1, a)

170 distinct advisors have been included in this production and naturally 307 authors. This gives us a sense of the scale of the community in discussion **(4)**. The studies are distributed among 15 schools, ITU, YTU METU having the most numbers of studies, followed by Karadeniz Technical University (KTU), DEU and Mimar Sinan University of Fine Arts (MSGSU). (Figure 1, b) The total number of studies shows an increasing trend starting with four studies in 1995 and with 34 studies in 2014 highest.

6. Mapping knowledge

To map the types of studies we utilized keywords defined by the authors to describe the studies. We utilized a series of manual and automated methods to structure and analyze the data at hand. The process and the results are as follows.

6.1. Keywords as portolans

Our method is in making meaning out of the data is similar to production of portolan charts **(5)**. What we do is look for shared aspects of studies, produce groups that represent these relations and repeat the same thing for the produced group again. Depending on the complexity of the data in some iteration, we use automated tools and in some, we classify the items manually especially when there is a need for critical human participation. AI tools sometimes let us perceive relations that we did not notice earlier, but still needs a human touch especially in a data set like ours, which is highly unstructured.

First stage has been the collection of keywords in the studies, as a common practice authors are required to define keywords related to their studies before submission. The data at hand in the end was an unstructured textual data with, 1792 keywords. As the second stage, the keyword collection at hand was manually structured (lemmatized). For the lemmatization process we grouped keywords that refer to same issue with different wording, such as; education of architect and architecture education, grouped as architecture education. As a second run we grouped keywords referring to associable meanings, like, house patterns, house preferences, housing market, housing problem and mass housing as; house (patterns-preferences)-housing(market-problem)-mass housing. Where brackets represent groupings of second words and hyphens represents or. As a result, we ended up with 657 distinct groups of keywords. This process allowed us to distinguish between use of keywords like, architecture education, education practices, design studios as one group, and architecture practice, office practice, architecture office as another one.

We also grouped the lemmatized

[2] Such as studies in History of Architecture, Conservation, Building Science and so on, some schools have programs with more general titles such as "design and arts", these were examined and some were included as studies in theory.

[3] It should be noted that we tried to be as inclusive as possible in this elimination. If a study had the slightest connection to theory of architecture they were included in the corpus. Only studies directly aiming at building construction or planning/ urbanism with definite quantitative methods were eliminated.

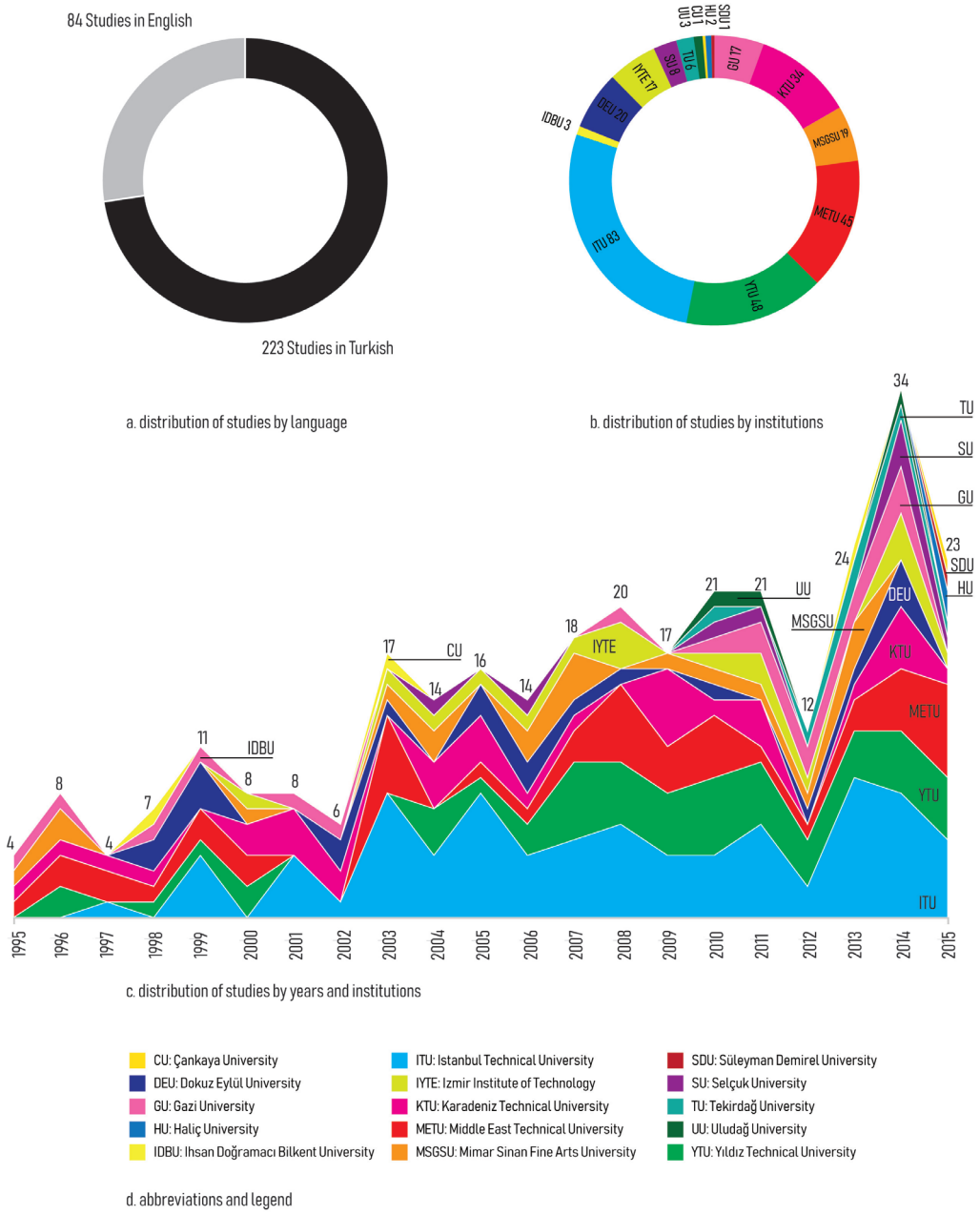

Figure 1. *General aspects.*

keywords with reference to what they signify. Six types of keywords were defined related to; building type, concept, period-style, method, person-group-organization, location-region-specific building. Even though we did not use these categories in the final analysis, we would like to share the contents as it gives a sense about the content of the studies that were examined.

As expected, a majority of the keywords are belonging to the group of concepts. The most commonly repeating five items are; space-place (38), space (consumption, perception, organization, syntax, time, analysis, memory, practice, readability, relations, scenarios) (37), architecture (30), architectural (design-design process) (30), architectural (education, design studio, design education) (22).

Keywords related with building types shows that the housing problem is still one of the most prominent topics in the Turkish context. Distribution of most frequent keywords are as follows; house (patterns, preferences)-housing (market, pattern, ensemble, problem, satisfaction)-mass housing (39), tourism (buildings, facility) (7), campus (5), university (buildings, settlement design) (5), home (5).

Location based keywords mainly refer to Istanbul and locations within Istanbul. The most common five items are Istanbul (15), Izmir (6), Turkey (architecture) (5), western architecture (4), and Ankara (4).

In terms of method based keywords form(analysis, grammar, perception)-formless (23), design (action, activity, approaches, discipline, process, principles psychology)(23), environment (reading, analysis, spatial cognition, awareness, image) (16), design (studies, theory, thought, tools, model, knowledge, language) (13), computational (design, design education, design thought, model, science, thinking)(10) are ones that were repeated more than 10 times.

In terms of keywords referring to a certain period or style modernization (of society, in Turkey) (8), modern architecture (8), modernity (8), global (modernism, architecture)-globalization (8), modernism (7), Early Republican (Turkey, era, period, architecture) (7), post-modern (architecture, housing market)-postmodernism (7) are the most common ones.

The persons or groups as keyword entries are less and more individual. We end up with a list with items that would not come together in a different context; Charles-Edouard Jeanneret-LeCorbusier (3), Sedad Hakkı Eldem (2), TOKI (Turkish Mass Housing Administration) (2), Lefebvre (2).

With keyword information structured, we continued with the mapping process. As the first step of the process, to be able to further analyze and conceptualize the groups of studies we utilized a very simple text mining method. Using software suit Orange **(6)** we produced a hierarchical clustering of the data at hand **(7)**. The process resulted with 32 clusters, and 15 studies not belonging to any cluster. It should be noted that the automated process takes the definitions, looks for similarities in terms of keywords and groups studies accordingly. In a field like theory of architecture, which is very much loaded with nuances and multiple readings, there is also a need to revise the outcomes critically, so we ran a second check of the clusters, assigned names to them, added the un-clustered studies to related clusters **(8)**. We repeated the process three times to produce a taxonomy of studies. As the last step we visualized the clusters in Graph-Commons **(9)** to produce the final network map presented here.

7. Reading the map

With the background information, explanation of our methods, taxonomy of studies and the final network map, we would like to share our own reading of the data at hand. (Figure 2).

7.1. Multiple theories of architecture

The series of clustering operations naturally end in decreasing number of clusters. We have ran three iterations of the process, and marked 32, 7 and 2 clusters in order. The final clustering that resulted in two clusters gives us an insight about the fundamental categories of research in theory of architecture. We named these two final clusters as, history and criticism, as a trace of studies that focuses on the socio-political aspects of architecture and the underlying historical processes, and education and practice as a group of studies that are interested in rather universal aspects of architecture that is form, production of form and education of the architect.

There is a peculiar cluster under history and criticism that is the cluster of object and semantics, although the cluster formed in the second iteration of our clustering process and was included under history and criticism cluster in the third run. This cluster is larger than the cluster of form and the sum of other studies under the cluster of history and criticism. Therefore, we can interpret it as one of the main groups of research together with the other two. So we can examine the

[4] *As a side note: If counted excluding co-advisorship, Arzu Erdem and Semra Aydınlı have the most number of directed studies for the period in discussion with eight directed studies each. Emel Aközer (7), Ferhan Yürekli (7), Ayşe Sağsöz (6) and Uğur Tanyeli (6) are the other professors with more than five directed studies again for the period in discussion.*

[5] *A portolan chart is a chart that is mainly used in 14th and 15th century maritime map making practices, where measurements in open sea are made at a fixed point and distances of distinguishable land features are noted as rhumb lines converging at that point. These measurements produce a system of references through which one can triangulate and define the shape of shores.*

Figure 2. *Map of studies.*

studies in three meta-groups; history and criticism, education and practice, object and semantics.

The cluster for history and criticism has four main branches; discourse-architectural language, human environment, politics and space and object and semantics. Three of these clusters, politics and space, human environment and discourse-architectural language are similar in terms of general tone of studies. These studies are mainly critical studies that use methods of history. They are mainly influenced by continental philosophy. Works of Michel Foucault and Jacques

Derrida are among the main references of these studies.

Studies clustered under the title discourse-architectural language are interested in the discursive practices of Turkish architecture. These studies are interested in the intellectual processes and accumulation of knowledge that turn into the architecture culture. One sub-branch of this family is the study of discursive formations in early republican Turkish architecture. Studies in human environment cluster are similar to discourse-architectural language clusters, and politics and space as well since all three utilize similar research models, and are differentiated by the tone of subject matters of the studies. Studies in this category are formulated in a more universal manner; they are not focusing in context and cultural issues but more in the philosophical aspects of man-environment relations and discourses shaped around these **(10)**.

Object and semantics as a cluster under history and criticism constitute a big portion of studies under history and criticism. These studies focus on issues like semantic-syntactic analysis, space-place time, identity and meaning and spatial analysis. This cluster, when examined in detail, is somewhat an intersection of the final two clusters of history and criticism and form. Studies in this category are mainly influenced by analytical theories of architecture. Bill Hillier's Space is the Machine or Christopher Alexander's Pattern Language are among the seminal references of this trace.

The second main cluster that is education and practice has three branches, architectural program, architecture education, and function. Studies in architectural program cluster have a proximity to history and criticism cluster and function cluster has a proximity to object and syntax cluster, where studies under program cluster discuss architecture and architectural program with a critical perspective, the studies under function cluster are more analytical similar to members of the object and semantics cluster.

The cluster of architecture education is again a relatively big group. The peculiarity of this cluster is that most studies in this category are not only interested in education itself, but they test architectural theories or design methods through the education environment like a laboratory for design. Especially the sub-cluster of architecture education that is interested in design methods is a good example of this type of approach.

It is difficult to make definitive comments by reading the map in terms of institutions. There are no clear distinctions as to which institution produce works under which category. However, we can broadly frame institutional characteristics looking at the map. Middle East Technical University's production mainly focuses in clusters related to history and criticism. Works produced in Istanbul Technical University and Karadeniz Technical University mainly fall under the category of object and semantics. Education and practice cluster is populated by studies from all universities and is like a middle ground for all institutions in this respect.

7.2. Theory in context

In the foreword of the Turkish translation of the proceedings book for the eighth installment of the ANY (Davidson& Aktüre, 1999) conferences that was held in Middle East Technical University, Zeynep Aktüre shares a quotation from Orhan Pamuk. Orhan Pamuk refers to an interview with Jean-Paul Sartre that was published in 1964 Le Monde where Sartre says, "in a third world country where a child is dying of hunger one may consider literature as a luxury". Aktüre uses this quotation to picture a discursive position against the event, specifically Doğan Kuban's critique about the conference (Kuban, 2000). Aktüre, says that, at the aftermath of 1999 earthquake, one may consider Kuban right, but she proceeds with Şevki Vanlı's review where Vanlı expresses his interest in the event and says he is waiting for further publications, Aktüre sees this as a sign of curiosity in the community of Turkish architects. Despite the harsh critiques, the editorial team found the vigor to make a second publication of the volume in Turkish, only to be able

[6] Orange is an open-source machine learning and data visualization package, orange.biolab.si (last Access: 15.08.2018)

[7] We used the lemmatized keyword groups as identifiers of studies, used preprocessing of tool of the text-mining add-on to prepare the data for analysis, used bag of words to distinguish each keyword as a separate data entry, calculated the distances between keywords with the distance transformation tool and finally, used the in-built hierarchical clustering tool to produce clusters of the studies.

to share the discussions with a wider audience.

Architecture theory in Turkey like in all over the world has always been contested by a generation of architects that belong to an era where theory and all other forms of scholarly practices were one. In addition, there has always been a critique of theory coming from the profession and a more practical side of architecture. Still it is an intellectual endeavor with its own audience, and as long as the audience remains, existing theory of architecture will continue to exist.

In Turkish context, with reference to our mapping there exist three functions of theory of architecture. All three in their own ways to try to improve the quality of architecture.

First is a critical review of discursive practices of architecture. This trace mainly examines the transformations of political discourses, societal change, and their repercussions in architecture. History of architecture also has a similar function but the theoretical branch of the same endeavor has more defined critical position as compared to objective history writing. The collective aim here is to raise an awareness of a continuous historical progression and societal change that underlines the values of international values of modernity and human rights.

The second branch of object and semantics tries to improve the architecture production by the quality of the object itself, by improving configurational and compositional qualities of architecture. Some studies within this branch focuses on the quality of the urban fabric by understanding formal relations of unique historical fabrics. Some do the same by criticizing and analytically proving what is wrong with existing production in terms of configuration of spaces and relations.

The third branch focuses on design practices and tries to establish new practices by experimenting with design process and methods. These studies challenge traditional methods of design practices as based on canons and established norms. Studies in this category mainly look for ways of thinking outside the box, both in terms of form and function.

7.3. Whitespaces

Freycinet map of 1811 Australia plots the shorelines of the continent in a very precise way, but they did not have information on the inland at the time so the inside of Australia was left as a "whitespace." Whitespace, was not "blank", since it both gave an idea about the general form, and it implied the content that is yet to be discovered; the information missing on the map that is still open for exploration. That is to say, what is not on the map was also as important as what was on the map.

In the case of theory in Turkish context one trace that is missing as it occurs to us the study of shaping of the world by the human kind. There are traces of this field within human environment cluster as discussed earlier but the impact and shaping of humans on earth, with a perspective wider than city building is a prominent issue for further scholarly work.

Also the change in production methods and new technologies for architecture is an emerging field for further discussion. As our study presents research between years 1994-2015 some recent work in this field are missing in the map. But if we repeat the same study a couple of years later there is surely going to be a trace of research that focuses on new ways of construction like robotics and their implications on architecture.

8. Conclusion

The above account gives a sense of state of theory in Turkey. We are aware of the fact that by nature our research touches the work of a large community of scholars. This fact gives us a responsibility to evaluate and position each work as objectively as possible. We tried to maintain a critical distance, by eliminating our own position by using by our method, but it is not possible to eliminate our own interpretation totally, so the study should be interpreted as not "the mapping" but "a mapping" in the end. The final work is open for further reading.

As a final remark, we would like to return to the "death of theory" debate.

[8] *Some studies ended up un-clustered after the hierarchical clustering as they had either too few or too specific keywords to be clustered with other studies. We controlled these studies and associated them with related clusters manually, these modifications are represented with dotted lines in the related graphs.*

[9] *Graphcommons.org is an opensource network visualization and analytics tool.*

[10] *Some of these studies still have specific projects, locations or periods as subjects but the reading presented is more universal.*

Theory as we know it may be changing with reference to new political environment and technological developments but theory as a societal function will continue to exist with its universal and local aspects.

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