Cracking the Code: A New Perspective on Architectural Education

JONATHAN BEAN
University of Arizona

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Legitimation Code Theory, or LCT, a framework from education studies, offers the potential for a new perspective on architectural education by distinguishing the different forms knowledge can take and the conditions that determine whether knowledge is considered legitimate within a field of practice such as architecture. At a time when the field is under pressure to respond to climate change and social equity, LCT offers a cogent and tested set of tools for understanding the present state of architectural education and influencing its future. Building on the core LCT dimension of Specialization, three potentials for the field are identified in the interest of moving the field toward a polyvalent definition of architecture.

OVERVIEW

This paper introduces Legitimation Code Theory, or LCT, as an organizing framework for advancing the integrative potential of architectural education. LCT is a fast-growing approach to the study of knowledge that is concerned with two parallel questions.[1] First: what constitutes knowledge? This may seem self-evident, but common-sense notions of terms such as knowledge, skills, and education mask divergence and can lead to duplicated efforts. For example, many agree that problem-solving is an increasingly important skill, but what problem-solving entails is different for a plumber than it is for an energy modeler. This leads to the second question of LCT: what is the relationship between knowledge and the field in which it is used? In LCT, the term "field" has a specialized meaning that comes from a long lineage of sociological theory that can be traced back to the work of Pierre Bourdieu. Fields are arenas where actors compete by drawing on an array of resources including knowledge and status. This perspective is especially useful for understanding the contemporary state of architecture. Considering architecture as a *field*, as opposed to a profession, helps make sense of the cascade of change now underway. Innovations in construction methods and materials, such as 3d printing and robotics and other forms of advanced building construction, changing regulations and expectations, such as the measurement of embodied and operational carbon and the shift to grid-interactive efficient buildings, and shifting professional definitions of excellence, such as the adoption of the AIA COTE Top 10 guidelines as the basis for the Design Excellence award, are fundamentally altering the role of the architect with respect to those in the fields of engineering, construction, operation, materials development, and policy.

For some, these developments represent a welcome broadening of the field of architecture. But for others, they represent an existential threat to its autonomy. This debate, which in the context of architectural education is often manifest in discussions that attempt to differentiate architecture's design and technical aspects, coheres with a core idea of Bourdieuan field theory: that fields are arenas of intense competition.[2] But another idea of field theory is also relevant: that fields are defined in relationship to each other. Whereas the ideal of interdisciplinary, research-driven practice underlies the approach to pedagogy at many schools of architecture, innovation in the profession and built environment fields, such as the integrated design process, is often represented by those external to the field to lag the general pace of innovation. A recent opinion piece in the Guardian lamented the state of the field by leading with the headline "Where are the architects who will put the environment first?". A Bloomberg article answers its own question: "What's Wrong With Modern Buildings? Everything, Starting With How They're Made." Architectural education has a narrowing window of opportunity to lead the response to these changing dynamics by building change capacity within the field and by sharing knowledge about responsible modes of professional practice, but is needed is a robust conceptual framework for realizing change within the field that can, at the same time, help those already in the field—existing architects—or those interested in entering the field—students—gain reflexive awareness of where the field is right now and where it might go in the future. LCT offers a robust framework for understanding questions such as these, which are of of direct relevance to architectural education.[3]

The application of LCT offers an original contribution to the broader field of architecture by articulating an actionable framework to more effectively build connections between built environment fields. The paper concludes by offering three ways that LCT can advance the education of future architects by providing a toolkit that clarifies understand how different

forms of knowledge circulate in professional fields adjacent to architecture, how to bridge between these fields, and and the possibility of accelerating the transformation of the architect's role as an agent of change. LCT foregrounds the potential of the architect's role as a translator and connector in expanding fields of practice.

INTRODUCING LEGITIMATION CODE THEORY

Legitimation Code Theory, or LCT, is rooted in sociological field theory. The overarching aim is to describe the nature of knowledge practices. In LCT and sociological field theory, practice has a specialized meaning that is different from its everyday use in terms such as "medical practice" or "piano practice." Practices are meta-level elements that organize activity by connecting desired results, such as having a dinner party, with the means of achieving those results, such as shopping at the grocery store, cooking a meal, setting the table, serving the food, and maintaining the conversation. LCT offers a wide array of analytical tools that can be used to understand both the big picture questions, such as what makes a nice meal, and the more granular aspects of the practices involved. For example, LCT research has identified *semantic waves*. The kind of writing typically valued in academia follows a distinct pattern, starting with statements with meaning-packed language and context-dependent meanings, then shifting to statements lower in semantic density and less context-dependent. For example, this paragraph started by introducing a new concept, LCT, but then related it to a more familiar experience: having a dinner party. The semantic wave continues by returning to more context-specific and meaning-dense language. Many teachers know this pattern intuitively, because it is highly effective in guiding others through seeing the connections and nuance of a new idea and then scaffolding the idea so that it can be extended to new domains. The form of many architecture curriculums follows this general pattern: studio projects early in the curriculum often are intentionally designed to defamiliarize students; more familiar topics, such as housing, occupy a mid-stream position, which prepares students to push the boundaries of the field in capstone studios. LCT tools such as the semantic wave make it possible to describe and diagram learning phenomena, such as the semantic wave, that characterize knowledge practices.

This paper focuses on the dimension of Specialization, one of the principal tools that LCT offers to understand the nature of knowledge both within and across fields. Three other dimensions have been identified to date: Automony, Temporality, and Semantics, which was discussed in the previous paragraph. Whereas much work in the broad field of the Scholarship of Teaching and Learning is field-dependent, when pedagogical research engages without tools for making comparison across disciplines, an unintended effect can be the siloing of knowledge. This happens in a number of ways. For example, consider the model of studio education. Studies of interdisciplinary architecture and engineering courses relate how engineering students often perceive studio education as messy, undirected, or confusing. Because those entering the studio from outside the field of architecture have not been acculturated to its norms and practices, they often experience what LCT terms a *code clash*, which occurs when members of different practice communities—in this case engineering and architecture—"talk past" one another instead of identifying key differences. The LCT dimension of Specialization provides a framework that can be used to rigorously represent, understand, and analyze the differences between fields. The dimension can be visually represented by the Specialization Plane (figure 1). The horizontal axis maps the relative strength of social relations. This aspect of Specialization maps how important connection and judgement of others is to the legitimacy of participation in a particular field of knowledge. For example, strong social relations (shown in figure 1 as SR+) are very important in the field of architecture, because legitimacy in the field is determined in large part by being part of and showing knowledge of social relations. Value accrues to a work of architecture not only because of spatial and aesthetic qualities, and within the field it is important to know the names of established and emerging architects engaged with the avant garde. While social skills are important aspects of most types of work, in some fields social relations play only a weak role in who is considered a legitimate member of the field. Legitimacy in the field of engineering, for example, is determined not by who you know, but instead by the ability to apply abstract knowledge to solve problems, for example by running structural calculations or computer simulations. An engineer that cannot get the right answer is not a legitimate engineer. Strong epistemic relations (ER+) indicate that the knowledge most valued in a particular field is abstracted, which means that it is not reliant on context. The knowledge that metal can undergo a phase change when it gets hot, for example, is abstract knowledge. Abstract knowledge requires interpretation and distance. In comparison, a field that values epistemic relations less (ER-) would dispense with the abstraction to focus on only the relevant knowledge: bend the pipe by getting it hot. Many architecture programs deliver context-specific through design-build programs and other courses that give students direct experience with materials, assemblies, and structural performance. As suggested in the section headed Potential 3, these programs could also equip students to avoid a code clash by articulating how different forms of knowledge play out in the field of design and construction.

Early work in LCT analyzed several disciplines within the broader field of design including engineering and architecture.[4] This work found that architecture occupies a position governed by strong epistemic relations *and* strong social relations. Put simply, to be a legitimate architect you must have both the right kind of knowledge and be the right kind of knower. Architects see creativity as key to success and legitimacy in the field, and in turn they see creativity as a personal characteristic that is largely cultivated through social relations. This personal creativity, cultivated through social relations, is then what architects use to produce specialized and abstract knowledge. Engineers,

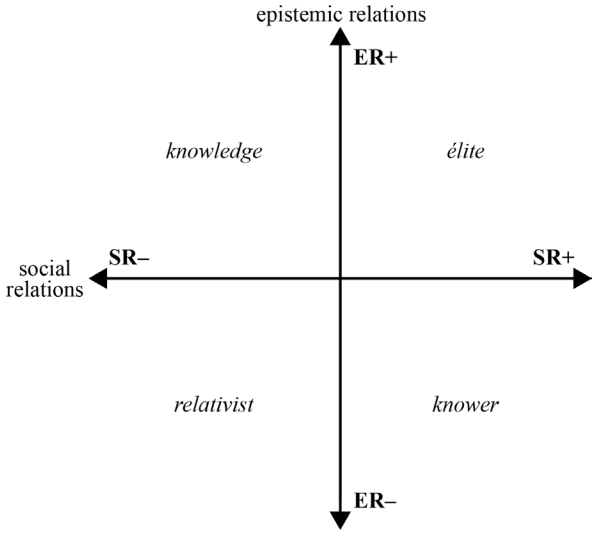

Figure 1: The specialization plane: Maton, K. (2014) Knowledge and Knowers: Towards a realist sociology of education, London: Routledge, page 30.

in contrast, emphasize how knowledge can be generated by following established procedures. The field does not encourage idiosyncratic divergence, but rather coordinated convergence. Two engineers, properly trained and presented with a bounded problem, should land on a functionally equivalent response. If this happened to two architects, it would indicate that one (or both!) lack creativity and, therefore, legitimacy — or, even worse, that one is a copycat, an accusation with the potential for instant delegitimization. This mapping of the fields of engineering and architecture onto the Specialization plane has been extended in earlier work to include adjacent buiding industry fields.[5] Construction is a field governed by strong social relations (in particular, and problematically, to the construct of masculinity) but weak epistemic relations. This does not mean that knowledge is not important on a construction site, but rather that context-specific knowledge is valued more highly than abstract knowledge. For example, someone who cannot swing a hammer is unlikely to exert much influence on a construction site regardless of how well they are able to solve differential equations! As it exists now, real estate is a field where legitimacy is not governed by social or epistemic relations; they are outweighed by other factors, such as access to capital.

CONCEPTUALIZING THE FIELD: ARCHITECTURE'S POTENTIAL TO LEAD

Professional architects regularly engage in a complex and overlapping set of fields and practices. They work with clients, property owners, consultants, government officials, other architects, building inspectors, construction contractors and subcontractors, tradespeople, and a host of others who ultimately share responsibility for the design and construction of a building project. This complexity, however, has not always been part of internal representations of the field — such as that presented in standard approaches to architectural history — or in classes that deal with professional documents, systems and energy, or the aesthetic aspects of design. One reason for this is that architecture, like other professional and academic fields, often prefers to view itself as autonomous — or, at least, possessing a version of itself that exists in a purified form free from the complications of consumption and commerce.

The conceptualization of architecture as a distinct field of practice is not new. Previous analysis has traced its origin, mapped its boundaries, and accounted for its historical rigidity and resistance to change.[6] What LCT brings to the table, however, is a toolkit that can help architecture respond to the plasticity and fluidity of boundaries as the broader field of practice responds to its contemporary situation. Demands for architecture to take an active role in carbon reduction and social justice will require collaboration and more porous borders. The essential question is who will retain control and authority over the built environment. Within the field, the answer is assumed to be architects, but this does not reflect the complexity of contemporary building projects.

For example, a participant in a recent study conducted by the National Renewable Energy Laboratory explained how failing to understand the important role of the builder's experience—stemming from a knower code—can result in the resistance or outright refusal to use new materials such as low-carbon concrete. Architects and others often represent this as stemming from inherent conservatism or resistance to change, but research shows this is not a fair portrayal of builders.[7] The LCT dimension of Specialization provides a clearer explanation: there is a code clash between the builder's knower code, which values context-specific, embodied knowledge (ER-), and the architect's elite code, which values abstract knowledge. Put simply, the architect is likely to advocate for the low-carbon concrete using abstract attributes — points on a certification scheme, its aesthetic qualities — while the builder simply wants to know what the material is like to work with. Lack of awareness of when to engage with different codes reduces the ability of architects to influence change. Furthermore, an architect who has never worked with the material in question is effectively locked out of the legitimacy ascribed to embodied knowledge in a knower code.

The transition away from embodied knowledge gained in shop classes, design-build programs, and the manual construction of physical knowledge is creating further distance between architects and those in adjacent fields. The contractor leaves thinking that the architect, who's never gotten their hands dirty, doesn't know the first thing about construction, while the architect is convinced that the contractor's a simpleton who can't understand basic logic. This may be overstating the case, but increasing trust between degreed professionals and

tradespeople will be essential to any large-scale transformation of the built environment.[8]

POTENTIAL 1. RECOGNIZING SPECIALIZATION CODES

The breadth of architectural education offers an opportunity for educators to make clear to students when they are moving between different codes. For example, a knowledge code underlies many exercises typically done in environmental control systems courses, such as calculations that yield a right or wrong answer. Shop classes are often built on a knowledge code, with projects that require the direct manipulation of tools and materials. And studio courses reflect an elite code, with students expected to draw from their own personal experience and reflection to integrate analysis with an original creative expression. High-performing students are fluent in multiple codes and can read the situation to understand which code or codes they are expected to engage, merge, resolve, or translate between. While accreditation requirements and good teaching practices encourage instructors to communicate learning objectives and outcomes, the dimension of Specialization offers additional potential. Offering students even a preliminary introduction to the context in which knowledge will be used invites them to project themselves into an imagined situation where they will need to use the knowledge and judgement developed through education. Opportunities for mental projection of the students' current self into the future builds off principles of reflective learning[9] and immersive roleplaying.[10]

In addition to honing students' ability to identify different codes, LCT offers tools for identifying where courses and curricula could benefit from a clear focus on code switching. Code switching is a term used in linguistics to describe moments when speakers switch from one language to another, for example to communicate a concept or emotion that does not translate well. Architectural education is rife with opportunities to encourage students to become more facile with switching between Specialization codes. For example, students in a detailing course could be tasked with developing an instruction manual targeted to those with a knower code. A discussion could focus on what other information would be important to present—in addition to the step-by-step procedures shown in the manual—in order to communicate the legitimacy of the information to the prospective user. Studio courses could rework the review process by inviting representatives from fields of built environment practice with divergent legitimation codes to critique student work, or by assigning students to critique each others' work from the standpoint of different legitimation codes. At the level of curricula and accreditation, LCT tools could be used to embed multiple perspectives in existing courses, helping to broaden the perspective of architectural education and help scaffold students in integrating different types of knowledge. This could better prepare students to be agents of change upon entrance to the profession.

POTENTIAL 2. BRIDGING SPECIALIZATION CODES

The way that social class, the value of different kinds of work, and education intertwine in and between built environment fields deserves special attention. While architecture is not a highly paid profession compared to law or medicine, these fields demand similarly lengthy periods of education, apprenticeship, and certification. While compensation is a primary measure of personal value, particularly in American culture, an education in class and taste has long been an implicit component of architectural education. Similarly, a primary value architects provide their clients is similar to that of a marketing or PR professional: to help a client clearly communicate a set of desired meanings in the form of a building, yet this, too, is rarely discussed in architectural education or discourse.[11] Creating distinctions based on distinction is part and parcel of the work of architecture and legacy of architecture's historic and continuing role as an instrument of power. This part of architecture discourse is often camouflaged in highly abstracted field-specific language, for example by using specialized terms to describe a project's materiality and form. Within the field, the continuing failure to acknowledge the role of taste and distinction perpetuates barriers to broader access, posing a significant obstacle to efforts to advance equity and inclusion. It is important to clarify that the problem is not the specialized language itself, for nuance and precision are critical to the evolution and adaptation of ideas. The problem is inadequate efforts to explain the language—to welcome others into an ongoing conversation. This is an even bigger problem when architects address those in adjacent fields, where specialized language can present an impenetrable barrier to comprehension.

What the LCT dimension of Specialization adds to these observations, which have been made before, is the potential to make visible another invisible barrier, which is the basis of knowledge itself. Architects are trained to value an elite code, and especially to value abstract knowledge over context-dependent knowledge. Calls for architecture to recognize the climate crisis, social justice, and equity explicitly demand engagement with context-specific knowledge about place and people. There are two options to responding to the divergence between the dominance of the elite code regulating most aspects of the profession and education and the requirements of the knower code needed to deliver socially- or ecologically-aware architecture. These can be placed in opposition with one another, which is often made apparent in language about aesthetic trade-offs required to make a building less carbon-intensive. The other response would recognize that it is possible to engage multiple codes at once by building stronger connections between the knower code and the elite code. While it does not engage with LCT, the approach to studio work taken by Janet McGaw provides an example of how to do this by building upward from students' lived experience to abstractions of phenomena happening at the global scale.[12]

POTENTIAL 3. TRANSCENDING SPECIALIZATION CODES

Within the organizational studies literature, boundary spanners are defined as "individuals who have a dedicated job role or responsibility to work in collaborative environments."[13] The definition is typically applied to those who work to move knowledge between fields, such as energy modelers,[14] BIM coordinators,[15] and construction managers,[16] though one paper extends the concept to describe the work of a landscape architect.[17] The LCT dimension of Specialization offers the opportunity for a clear, actionable way to help architectural education respond to the growing awareness that challenges such as decarbonizing the built environment will require intense and unprecedented collaboration. The need for this role has been recognized by architecture firms that have created positions with titles such as "performance design lead," "sustainability coordinator," and so on. These are roles where the primary work is moving knowledge from one field to another — and often, at the time, serving as a translator or ambassador. Success in these positions is dependent on a robust ability to make knowledge legitimate to those in building industry fields adjacent to architecture.

One potential for architectural education is to recognize existing programs, such as architectural engineering, that operate at the boundary between one or more Specialization codes. Courses in these programs could then be strengthened by engaging LCT with the aim of preparing students to recognize and bridge specialization codes. New specialty areas could also be developed following the same logic: for example, LCT-informed programs that prepare students to become building envelope consultants would navigate between the knower code of construction, the knowledge code of engineering, and the elite code of architecture. While the work of some in the field will focus on moving knowledge between fields — performing the work of a boundary spanner—we might also consider the degree to which the field itself can work to bridge boundaries. Rather than the continuation of the current trend towards specialization, this would represent a fundamental shift in the nature of practice and education.

CONCLUSION: TOWARD A POLYVALENT FUTURE FOR ARCHITECTURE

Great potential lies in reimagining the boundaries of the field of architecture itself. What would architecture education look like if it aimed to build fluency with and facility in moving knowledge between fields that operate with different Specialization codes? This is an exciting potential because it opens a polyvalent future for the field. Architectural education can start to facilitate these interactions by mapping the current boundaries between built environment fields, creating opportunities for students to meet and learn from those in fields other than architecture, and by equipping students with the skills to traverse, bridge, and reconfigure the boundaries between fields governed by different Specialization codes. The understanding that architecture has the potential to take an active role in moving and transforming different types of knowledge also aligns with a sociotechnical approach to external engagements such as nonprofit and humanitarian organizations, partnerships with industry, and codes and voluntary standards.[18]

Greater awareness of architecture's status as a field — and its adjacencies to other built environment fields — could also help shape external awareness of architecture's potential. While we can look to colleagues in the field of urban planning for examples of how to integrate equity into our practice, or to the field of landscape architecture for deep expertise in ecosystems and water, architecture is the only field that deals with the particularities of the built environment at the scale of the building. The challenge before us is how work at that scale can meaningfully and rapidly alter challenges at the global scale, such as the climate crisis and social justice. LCT may not hold all of the keys, but by making it easier to understand the varied nature of knowledge and the fields through which knowledge flows, it offers a worthwhile start.

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