Rebels with a Cause: Formation, Contestation, and Expansion of the De Novo Category
“Modern Architecture,” 1870–1975

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Most category studies have focused on established categories with discrete boundaries. These studies not only beg the question of how a de novo category arises, but also upon what institutional material actors draw to create a de novo category. We examine the formation and theorization of the de novo category “modern architecture” between 1870 and 1975. Our study shows that the process of new category formation was driven by groups of architects with distinct clientele associated with institutional logics of commerce, state, religion, and family. These architects enacted different artifact codes for a building based on institutional logics associated with their specific mix of clients. “Modern architects” fought over what logics and artifact codes should guide “modern architecture.” Modern functional architects espoused a logic of commerce enacted through a restricted artifact code of new materials in a building, whereas modern organic architects advocated transforming the profession’s logic enacted through a flexible artifact code of mixing new and traditional materials in buildings. The conflict became a source of creative tension for modern architects that followed, who integrated aspects of both logics and materials in buildings, expanding the category boundary. Plural logics and category expansion resulted in multiple conflicting exemplars within “modern architecture” and enabled its adaptation to changing social forces and architectural interpretations for over 70 years.

Key words: categories; institutional logics; theorization; modern architecture; symbols; materials; network textual analysis; artifact codes

Introduction
When societal institutions undergo profound change, so too do the categories that underpin them and stabilize the “flux of social life” (Douglas 1986, p. 100). Categories are shaped by society’s major institutions, such as the market, state, family, and professions. Each societal sector has a distinct logic: a set of organizing principles that contain the cognitive schema, normative expectations, and material practices (Friedland and Alford 1991, Thornton and Ocasio 2008) that actors employ to enact and assign meaning to categories. Although some scholars identify institutional change as central to category transformation and hint at the role institutional logics play in the process (e.g., Rao et al. 2003), as of yet, they have not examined empirically how logics affect the creation of new categories.

During times of institutional transformation, when dominant social institutions and their logics are questioned and multiple logics become viable alternative organizing principles, categories are likely to be de novo. A de novo category is signaled by the emergence of a new vocabulary, new features in artifacts, and theorization about these new features. However, when multiple, and often conflicting, logics are at play—a condition called institutional pluralism (Kraatz and Block 2008, Greenwood et al. 2011)—contradictory assumptions, values, and criteria for legitimacy are experienced by actors, making it difficult for them to construct, recognize, and learn a new category. A de novo category, in contrast to a new category based on recombined features, cannot draw on existing assumptions and legitimacy associated with established categories. For instance, consumers and producers were able to understand the new vehicle category “minivan” by accessing institutional materials such as the existing “virtues of different minivan designs (car-like versus truck-like),” drawing on and comparing established and legitimate features of “car” and “truck” (Rosa et al. 1999, p. 73). Thus, a de novo category presents a theoretical puzzle to organizational scholars: From which logics do actors draw institutional materials to construct and theorize the de novo category, and how do they generate enough social agreement for the de novo category to guide collective behavior?
Categories are not simply labels that actors use to sort social phenomena into appropriate bins but are instead associated with actors’ status, interests, and identities (Rao et al. 2003, Powell and Colyvas 2008). They exemplify what is socially valued through rewards and penalties (Khaire and Wadhwani 2010, Zuckerman 1999), reveal boundaries that demarcate who and what is included or excluded within a category (Pontikes 2010), and often spark conflict over category definition and content (Bowker and Starr 1999). Categories are more easily constructed, recognized, and learned when artifacts’ features are distinct from those of other categories, and are also similar and visible within a category (Rosch and Mervis 1975). These categories are defined by artifact codes: the implicit rules about what is selected and combined to express a category (Ansell 1997, Atkinson 1985). For instance, films in the Western genre have an artifact code that specifies protagonists (cowboy, rancher, sheriff), antagonists (gunslinger, Indian, farmer), and types of conflict (over material goods such as land, water, or money and over ethics such as vengeance or justice). In contrast to artifact codes, institutional logics provide actors with category content—the assumptions and values that motivate which features are selected—and the criteria for legitimacy for the artifact code (which features can be selected, combined, and ascribed to a category). In essence, logics provide the framework for reasoning and justify why features are important and legitimate, whereas artifact codes focus on which features and patterns of features define an artifact, allowing actors to recognize and group artifacts into categories. By linking logics and artifact codes, internal and external audiences create and interpret an artifact’s meaning and value in a social system (Chandler 2007).

This study deepens our understanding of the relations between institutional logics and new category construction by demonstrating how logics provide the institutional materials by which actors construct, contest, and elaborate de novo categories. In particular, we examine the construction and evolution of “modern architecture” in the context of the architectural profession from 1870 to 1975. In architecture, one of the most important categorization systems is based on architectural styles: “[T]he customary and characteristic system of construction and ornament prevailing in a given time and place” (Hamlin 1891, p. 141). Styles classify buildings much like genres categorize artworks into “sets based on perceived similarities” (DiMaggio 1987, p. 441) and product categories classify automobiles (Rosa et al. 1999, Porac et al. 2001) and mutual funds (Lounsbury and Rao 2004). At the end of the 19th century, the conceptual and categorical moorings by which architects understood and constructed their built environment became unhinged. The architectural profession was experiencing “unsettled times” (Swidler 1986) brought about by rapid economic expansion, industrialization, urbanization, and the production of new materials such as reinforced concrete and steel (Guillén 2006). Architects began creating a new vocabulary, a “wealth of new words,” such as “modern” and “skyscraper,” as noted by modern architect Ragnar Östberg (1934, p. 34). They also experimented with new materials, such as steel and reinforced concrete in buildings, with which they sought to create new forms of architecture. They used a new vocabulary and theorized materials and forms of buildings in their programs, manifestoes, and speeches, which they published prolifically (Conrads 1971). All of this suggests that “modern architecture” was a de novo category that did not build on taken-for-granted assumptions and legitimacy of established categories (Schneiberg and Clemens 2006, Colyvas and Powell 2006). These architects sought a “modern architecture” but struggled to understand and define what it meant to be “modern.” To this day, architects and historians agree only on two general principles that define “modern architecture”: (1) the rejection of historical styles to signal a new building’s function (e.g., the use of Greek columns to signal a courthouse or Gothic arches a church) and (2) the creation of new forms, simplified and lacking ornamentation, that employ new materials (e.g., steel, concrete, glass)—which may or may not be combined with traditional materials—and/or construction processes (e.g., standardization and prefabrication; see Hitchcock and Johnson 1995, Curtis 2005, Wilson 1984).

We construct an analytic narrative of the formation and evolution of the de novo category “modern architecture” from 1870 through 1975 based on primary and secondary historical texts, tracing its evolution from inception to decline. Our narrative is based on structural semiotics’ analyses of (1) institutional logics and (2) artifact codes. Institutional logics are distinct organizing principles revealed through coherent relations among binary contrasts of key vocabulary terms (Friedland 2001). Artifact codes reveal which material features are selected and combined to enact the new category. Material features are also central to logics because symbols and ideals “must be made material in order to signify” (Friedland 2001, p. 141). We link logics and artifact codes to interpret the meaning of “modern architecture” for architects and the profession.

Our study extends category research in two ways. First, by tracing “modern architecture” for over 100 years, we reveal the origins of a de novo category, rather than simply illuminating its evolution and extensions. Second, by using a structural semiotic approach to link logics and artifact codes, we assess both the symbolic and material transformations that occur in a de novo category. We also make three contributions to research on institutional logics. First, we provide one of the few studies that examines a condition of enduring pluralism (Greenwood et al. 2011), when inchoate
and contradictory assumptions, values, and criteria for legitimacy compete as viable models to guide social actors. Second, we assess both the symbolic and the material bases of institutional logics, whereas most scholars tend to privilege the cognitive. Third, we examine the microfoundations of institutional logics through actors’ theorization and material practices, addressing a neglected gap within institutional theory (Powell and Colyvas 2008).

Established and New Categories

Despite evidence of categories’ dynamic nature (Lena and Peterson 2008, Pontikes 2010, Ruef and Patterson 2009), research has paid little attention to their origins and evolution, focusing mainly on established categories with mature and stable classification schemata. For instance, Hsu (2006a) analyzed the schema of film critics but did not explore its origin or how consensus over its defining features was reached. Weber et al. (2008) examined how advocates for grass-fed meat and dairy products mobilized broader cultural codes (e.g., “organic foods”) to motivate producers’ entry into the nascent market category, but not the process through which the meaning of the category was established. Similarly, Ruef and Patterson (2009) identified new business categories in Dun & Bradstreet and how they were evaluated, but not the process by which they arose.

Scholars have examined categories mostly in market settings, such as film (Hsu 2006b, Zuckerman et al. 2003), financial markets (Zuckerman 1999), art auctions (Khaire and Wadwani 2010), automobiles (Rosa et al. 1999), and software (Kennedy 2008, Pontikes 2010). In these settings, commensuration or comparability and valuation of products within a category are paramount. Thus, stability and predictability of products is essential for both consumers and analysts, driving producers’ performance. For instance, Rosa et al. (1999) drew on external audiences’ responses to products in auto enthusiast and consumer rating publications, and Pontikes (2010) analyzed the effects of category leniency on consumers versus venture capitalists in computer software, but neither tracked who theorized the meaning of these new categories. Furthermore, scholars focus primarily on which features an artifact is expected to possess for category membership (Hsu and Hannan 2005, Negro et al. 2011), even though research on artifact categorization shows that both function and form are nearly universal criteria across cultures by which actors categorize artifacts (for a review, see Malt and Sloman 2007). As a result, our understanding of categories is limited to established categories in market settings and focuses on how audiences shape product categories and highlight features as a basis for categorizing artifacts.

When scholars have turned their attention to category formation processes, they have mostly highlighted how new codes arise from recombining and blending features of existing categories. For example, Rosa et al. (1999) and Porac et al. (2001) traced the rise of the minivan, which is a combination of a car and a van. Khaire and Wadwani (2010) examined the rise of “modern Indian art,” which is a hybrid category that combines features defining the categories of “modern Western art” and “traditional Indian art.” Others have focused on how new categories arise through modification of extant categories. Rao et al. (2003) revealed that nouvelle cuisine, as a new category, maintained essential features of the classical cuisine code, such as chef, waiter, dish, ingredients, and restaurant but modified their content, i.e., the role identities of chef and waiter, the archetypal ingredients used in a dish, the rules of cooking, and the organization of the menu. Alternatively, scholars have shown that existing categories can be reinterpreted through the association of an existing label to a new code. For instance, modern and traditional Barolo and Barbaresco winemakers contended over the features (i.e., material and size of their barrels for aging wine), not over the label, associated with their wine (Negro et al. 2011). These scholars assume that category stability is built on collective consensus about a category’s features (e.g., Cattani et al. 2008, Negro et al. 2010).

A de novo category, however, does not yet have an artifact code that defines it, established features that can be combined or contended over, or exemplars to “focus attention on specific features” (Nigam and Ocasio 2010, p. 826). Oftentimes, analogies are used to highlight the similarities between exemplars, helping to define, explain, and legitimate novel ideas and practices (Gavetti et al. 2005, Etzion and Ferraro 2010). Some scholars argue that a category needs to be theorized where abstract principles are identified for it to diffuse (Strang and Meyer 1993). Other scholars have focused on examining how established categories are learned through exemplars that are labeled and grouped, revealing graded (or lenient) rather than dichotomous (or strict) categorical boundaries (Rosch and Mervis 1975, Pontikes 2010). Thus, although we have gained insight into how new categories recombine, modify, or reinterpret existing features, the process through which categories are created and theorized de novo is underexamined and not well understood in the literature.

In this paper, we examine the construction and evolution of the de novo category “modern architecture.” The multistage process entailed the creation of a new artifact code that combined previously unavailable materials and symbols and that drew upon institutional logics to guide theorization and specification of artifacts’ features, forms, and functions. These were, in turn, learned and grouped together into a new category by internal and external audiences.
Methods
Our methods focused on how institutional logics influenced the construction and change of the de novo category “modern architecture.” Because logics are defined as a set of material practices and symbolic constructions (Friedland and Alford 1991), we conducted a structural analysis attending to texts and buildings, ensuring neither “system of meaning nor mode of practice…be privileged in the analysis” (Mohr 2000, p. 64). Furthermore, we examined changes in the architectural profession, triangulating multiple sources of primary and secondary historical data. We present our findings using a narrative interpretation of our structural and historical analyses (Thornton and Ocasio 2008).

Data Sampling
Category research focuses on exemplars and rules as two important means by which actors learn a category (Erickson and Kruschke 1998, Malt and Sloman 2007). Exemplars are particularly important in the creation and theorization of de novo categories because the rules that determine which features define category membership and boundaries have not yet been constructed. Hence, to examine the construction and evolution of “modern architecture,” we relied on exemplars: texts and buildings produced by eminent architects. Their expert authority and institutionalized recognition made them central to discourse and practice in the architectural profession (Larson 1993). We selected all architects who received the two most widely recognized honors in architecture of their time: the American Institute of Architects (AIA) and the Royal Institute of British Architects (RIBA) Gold Medals for lifetime achievement. The AIA (since 1907) and RIBA (since 1848) Gold Medals are the only consistent honoraria awarded on a yearly basis by fellow professionals to architects whose ideas and body of work had a lasting influence on architecture and culture (Wilson 1984).

Architectural historians identify the period from 1890 to 1900 as the beginning of modern architecture (Conrads 1971, Curtis 2005). Our study of eminent architects thus began in 1870, ensuring that we fully captured the category’s formation, and concluded in 1975 for three reasons. First, the AIA and RIBA awards to architects recognized as modernist had a natural break after Louis Kahn, who received the AIA and RIBA in 1971 and 1972, respectively. The next winner of both the AIA and RIBA was high-tech architect Norman Foster in 1983 and 1994, respectively. Second, over 75% of the architects in our sample had died by 1975. Their demise mirrors the decreased dialog about modernism, suggesting that the category had become taken for granted (Colyvas and Powell 2006, Schneiberg and Clemens 2006). Third, many in the architectural profession rejected modernism, adopting postmodernism, which became an alternative approach in the 1970s (Larson 1993). These criteria yielded 18 eminent architects. Because we required both material practices and symbolic constructions, we excluded Sir Patrick Abercrombie, who was a town planner and never constructed a building. Table 1 reports our final sample of 17 architects.

These 17 architects provided a diversity of viewpoints, ranging from those who rejected “modern architecture” to those who were deeply engaged in and advanced its discourse and the practice. Architectural historians and architects themselves noted distinct groups of architects that played an important role in both opposing and theorizing the new category. To describe these groups, we employed labels that the architects used themselves. “Revivalists” were a dominant force in the architectural profession during 1870–1920 (Brain 1989), as shown by the multiple Gold Medals they won during this period (see Table 1). Revivalism gained its name from the revival of historical, primarily classical, architectural styles associated with the École des Beaux-Arts. Mies van der Rohe noted how most architects had “ventured into the dangerous realm of the historical; to some of these men the revival of classic forms seemed reasonable, and in the field of monumental architecture, even imperative” (1946, p. 41). A second group, “modern organic” architects, was centered in the United States and Northern Europe (i.e., Finland). Frank Lloyd Wright, Eliel Saarinen, and Alvar Aalto all referred to their architecture as organic, and Wright theorized an “organic architecture,” culminating in his 1953 treatise “Organic Architecture: Language of Organic Architecture.” A third group of “modern functional” architects was concentrated in Germany and France (many later emigrating to the United States) and focused on the function of architecture, as made explicit by Walter Gropius in 1926: “[A] container, a chair, or a house…must serve its purpose perfectly, that is, it must fulfill its function usefully, be durable, economical and ‘beautiful’” (reprinted in Conrads 1971, p. 95). Finally, as shown on Table 1, the final group, which spanned Italy, Japan, and the United States, represented a new wave of modernists who were considered “pluralists” because they drew from both modern functional and modern organic in creating original work.

Symbolic Elements: Analyzing Language in Architects’ and Audiences’ Texts. Professional journals played a key role in the rise of modern architecture by providing a space for discourse and showcasing practices (Lichtenstein 1990, Stephens 2002), similar to engineering (Shenhav 1995). We captured discourse within the architectural profession through the 17 architects’ writings using archival research methods (Ventresca and Mohr 2002, Colyvas and Powell 2006) and relying on texts listed by the Avery Index to Architectural Periodicals, for a total of 283 articles (see Table 1). To supplement our analysis of architects’ texts, we collected a
Table 1 Total Sample of Architects and Their Texts

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<td>McKim, Charles F.</td>
<td>American</td>
<td>1909</td>
<td>1903</td>
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<td>0</td>
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<tr>
<td>Webb, Sir Aston</td>
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<td>1907</td>
<td>1905</td>
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<td>3</td>
</tr>
<tr>
<td>Laloux, Victor</td>
<td>French</td>
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<td>1929</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Östberg, Ragnar</td>
<td>Swedish</td>
<td>1933</td>
<td>1926</td>
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<td>2</td>
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<tr>
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<td>English</td>
<td>1925</td>
<td>1921</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Wright, Frank Lloyd</td>
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<td>1941</td>
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<td>39</td>
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<tr>
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<td>1955</td>
<td>1935</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Saarinen, Eliel</td>
<td>Finnish/American</td>
<td>1947</td>
<td>1950</td>
<td>0</td>
<td>6</td>
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<td>Aalto, Alvar</td>
<td>Finnish</td>
<td>1963</td>
<td>1957</td>
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<tr>
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<td>1952</td>
<td>1948</td>
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<tr>
<td>Gropius, Walther</td>
<td>German/American</td>
<td>1959</td>
<td>1956</td>
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<tr>
<td>Mies van der Rohe</td>
<td>German/American</td>
<td>1960</td>
<td>1959</td>
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<td>French</td>
<td>1961</td>
<td>1953</td>
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<td>Fuller, R. Buckminster</td>
<td>American</td>
<td>1970</td>
<td>1968</td>
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<td>Italian</td>
<td>1964</td>
<td>1960</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Kahn, Louis</td>
<td>American</td>
<td>1971</td>
<td>1972</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Tange, Kenzo</td>
<td>Japanese</td>
<td>1966</td>
<td>1965</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Total</td>
<td></td>
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<td>128</td>
<td>135</td>
<td>283</td>
</tr>
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</table>

random sampling of 5% of all reviews on the 17 architects by their audiences—architectural historians and professional peers—during the time period of our study. Articles on architects written after their death were excluded. This resulted in 158 critiques and reviews.

To ensure that we were capturing the entire formation process of “modern architecture,” we also analyzed articles written in English in the Avery Index that mentioned the word “modern” published before and right after 1870. We began in 1853 with the publication of the first article mentioning “modern” and ended in 1902, capturing 36 articles. This analysis (available from the authors) revealed that “modern” was used primarily as a temporal modifier such as “modern Gothic” or “modern feudal” to distinguish a contemporary Gothic or feudal building from centuries’ old building. It also was applied to new kinds of buildings such as skyscrapers. The term “modern” co-occurred with art and architecture 300%–400% more than any other terms, signaling a lack of theorization of “modern architecture” as a new category.

**Material Elements: Exemplary Buildings and Construction Materials.** We focused on architects’ materials in exemplary buildings to capture changes in modern architecture over time. GreatBuildings.com (Matthews 2004) is one of the few data sources that identifies and categorizes exemplary buildings by architectural style. In December 2008, this database reported information on 569 buildings that were constructed between 1870 and 1980, including 148 buildings by the 17 architects in our sample. We also engaged in extensive archival searches to identify the materials used in these buildings. We focused on seven materials that were used in more than 10% of the buildings in our sample: stone, brick, wood, concrete, reinforced concrete, glass, and steel.

**Categorization by Architectural Styles.** The categorization (by styles) of the 569 buildings listed on GreatBuildings.com is shown in Figure 1. Revivalist styles dominated from 1870 through 1910. The “modern” style first appeared in 1890, took off in the 1920s, and became the dominant style from 1920 through the 1970s. It is important to note that the categorization by GreatBuildings.com, being retrospective, identifies “modern” exemplars before “modern” as a category was socially recognized by architects and relevant audiences. For example, the first reported instance of a modern building is by Daniel Burnham in 1890 (the Reliance Building in Chicago). However, “modern” was not a label applied to Burnham at the time nor was he recognized with a Gold Medal by the profession as making a major contribution to architecture. His Chicago contemporary, Louis Sullivan, who also practiced from the 1880s through the 1920s, was not recognized as a modern architect until Morrison’s (1935) biography *Louis Sullivan: Prophet of Modern Architecture*, and Sullivan was awarded an AIA Gold Medal only in 1944, 20 years after his death. To better understand this categorization, we triangulated the GreatBuildings data with the retrospective categorization of modern architects in the *Contemporary Architects* books (Emanuel 1980, 1994; Morgan and Naylor 1987), which revealed that modern
architects were not recognized until the mid-1930s and then increasingly so over time. Dudok was the first modern architect to win a Gold Medal in 1935.

Data Analysis: Structural Analysis of Architects’ Symbolic Systems and Material Practices

As noted earlier, we clustered our 17 architects into distinct but internally consistent groups. These groups were guided by architectural historians’ and peers’ assessments and then verified by a prominent architectural historian and critic. A detailed step-by-step description of our analysis is contained in the online appendix (available at http://dx/doi.org/10.1287/orsc.1110.0701).

Institutional Logics: Symbolic Patterns in Binary Contrasts of Language. We analyzed architects’ and critics’ writings because the vocabularies of participants reveal the social construction of reality (Berger and Luckmann 1967) and act as a “window on the mind” and “on culture” (Carley 1994, p. 291). Scholars have employed structural network methods on texts to reveal social actors’ symbolic systems such as categories, classifications, institutional logics, and mental maps, and they are built on the assumption that language can be modeled using networks in which nodes are not people or actors, as in traditional social network analysis, but rather words, where meaning can be inferred from the co-occurrence between concepts (e.g., Carley 1994, 1997; Jones and Livne-Tarandach 2008; Mohr and Duquenne 1997). This technique has been labeled “network text analysis” (Popping 2000) and requires researchers to filter, or select which concepts to map (Carley 1997).

We employed a semiotic qualitative structural approach to filter the subset of relevant symbols using paired contrasts (de Saussure 2008), which are the “basis of classificatory systems” (Chander 2007, p. 102), to reveal cultural meaning and appropriate for understanding aesthetic movements (Chandler 2007, pp. 102–103, 142), because they underlie the development of style categorizations in art (Wölfflin 1950). Similar to Weber et al. (2008), we read the texts and agreed upon the most critical paired comparisons (six contrasts for 12 concepts)—modern–traditional, economic–artistic, engineer–architect, machine–nature, industry–human, and technical–organic—producing association matrices that represent the dyadic co-occurrence of the most relevant symbols used. We displayed the co-occurrence matrices to reveal how different architects (a) used distinct sets of symbols, (b) related symbols to one another, and (c) changed their symbolic associations over time, allowing us to represent “changes in the meaning structure” (Mohr 1998, p. 359). Symbols that are central in
these networks are shared either through agreement or disagreement; this is particularly important for our analysis because we focused on how logics (i.e., shared and deeply held assumptions) influenced the category formation process. We extracted quotes from texts to support our network data and reveal how actors drew on logics during the formation and evolution of the category.

Artifact Codes: Relations Among Material Features. We also examined the material elements that architects used in their exemplary buildings. Thus, similar to Rao et al. (2003, 2005) and Cerulo (1993), we attended to the deployment of material elements in cultural products. We used a structural network analysis to visualize the effects of logics on artifact codes: how different groups of architects selected and combined materials that enacted “modern architecture.” We traced the usage and co-occurrence of the seven most frequently utilized building materials (wood, brick, stone, concrete, reinforced concrete, steel, and glass) in the 148 buildings by our 17 architects. When features are visible aspects of a category (such as materials) and frequently co-occur, they render a category easier to recognize and learn (Rosch and Mervis 1975). A de novo category with a clear set of materials/features associated to it should enhance its recognition as a distinct category by internal and external audiences.

Macro Environment of Plural Institutions: Client Sectors and Evolution of the Profession

Scholars assume that individuals reside within multiple institutional logics that coexist in states of negotiation and conflict; they also assume that at the field level, logics are historically contingent (Friedland and Alford 1991, Thornton and Ocasio 2008). Because logics provide the institutional material through socially shared frameworks by which actors define categories, we empirically assess the sources for different logics in architecture, which are clients who provided resources and opportunities for building and whose expectations and needs shaped what was built.

Client Sectors and Multiple Institutions. Architects experience institutional pluralism because their clients come from different societal sectors. For example, commercial buildings are designed for corporate and private business clients, churches for religious organizations, and residences for families, whereas town halls, civic centers, museums, and state offices serve the political and cultural aims of and are most often supported worldwide by the state. Within the profession, a shift in the dominance of clients triggers a corresponding shift in institutional logics that guide the profession.

To capture the dominance of client sectors, we analyzed the clients of a sample of 660 architects for 32,632 buildings from 1870 to 1980. We used two sources: (1) Contemporary Architects, a reference compiled by architectural historians Emanuel (1980, 1994) and Morgan and Naylor (1987), and (2) collected building data on 43 RIBA and AIA Gold Medal winners who were not recognized as “modern architects” in Contemporary Architects. As shown in Figure 2, religious and state clients were the dominant clientele during the formative stage of modern architecture—the 1870s through the 1890s. These two client sectors are the most conservative social institutions, and the dominant styles of

![Figure 2: Evolution of Architects' Clientele by Societal Sector, 1870–1980](image)
these buildings correspond to the profession’s focus on historical revivalism—an honoring of and anchoring in the traditions of the past. The largest client growth was in residential (family) clients from the 1880s through the 1930s, fueled by the increased urbanization of cities and the rise of a middle class. During the 1880s, commercial clients grew dramatically, then fell off, and then grew again from 1900 through the 1930s, the time retrospectively identified by architectural historians as the “birth of modern architecture” (e.g., Conrads 1971, Curtis 2005). Commercial and family/residential buildings have the fastest rates of change (Brand 1995), facilitating experimentation with a new category. We expect that distinct client sectors will influence which logics are seen as relevant by architects and guide their theorization of and material enactment of artifact codes when building for their clients.

Evolution of the Architectural Profession. A fully fledged profession is signaled by professional schools that codify and credential specialized knowledge, journals that transmit it, exemplars who personify expertise, and licensing that excludes rivals from executing its professional knowledge (Abbott 1988). By 1900, the United States had erected the foundations of the profession: a professional association, the AIA, founded in 1857 (Woods 1999), which started awarding the prestigious Gold Medals for lifetime achievement in 1907; preeminent architectural schools (e.g., the Massachusetts Institute of Technology, the University of Illinois, Syracuse, Columbia, the University of Pennsylvania, Harvard), founded between 1867 and 1900 (Noffsinger 1955); state licensure by 1897 (Boyle 1977); and professional journals (available by the 1890s).

Professionalization followed a much different path in Europe. England was the first to establish a professional association—the British Institute of Architects in 1834 (to become the Royal Institute of British Architects in 1866)—with competency exams and exemplars identified through the awarding of the Gold Medal starting in 1848; however, it had few architectural schools, relying instead on informal apprenticeship (Wilton-Ely 1977). Similarly, Germany relied heavily on trade schools and apprenticeship until the 1920s, when Gropius sought to transform architectural education with the Bauhaus (Whitford 1984). In Italy, architectural schools and professional journals arose in the 1920s and were associated with fascism, whereas France had the École des Beaux-Arts, founded in 1797, but no state licensure, professional journals, or unified professional association until the 1920s (Scrivano 2004).

A profession’s logics and practices are influenced by the rise of alternative professional schools (Dunn and Jones 2010) and the development of professional knowledge (Lounsbury 2007). For these reasons, we tracked the rise of professional schools and number of self-declared professionals, focusing on the United States for two reasons. First, as noted above, the United States was the only country that had institutionalized the key pieces of a profession. Second, by the 1930s, the preeminent modernists who headed architectural schools resided in the United States (i.e., Wright, Saarinen, Mies van der Rohe, and Gropius). Figure 3 shows the growth patterns over time of self-declared architects using U.S. census data, controlling for the overall population, and of professional schools. The architectural profession was stagnant in terms of growth during the First World War, the
Depression, and the Second World War, likely because of restricted materials and restricted building activity, although the number of professional schools continued to grow. The cumulative number of Gold Medals awarded to modern architects, as categorized by Emanuel (1980, 1994) and Morgan and Naylor (1987), was nonexistent until the mid-1930s and grew exponentially from the 1940s onward. These data reveal that professional schools grew irrespective of world events, whereas the number of professionals was constrained by forces that affected the economy such as world wars and depression, and modernists were not socially recognized as exemplars until the 1930s and grew exponentially thereafter.

Period Effects: Identifying Key Events. Our qualitative assessment of periods corresponds to the use of period effects in quantitative studies of institutional logics (e.g., Thornton 2002, Kim et al. 2007). We attended to relevant events that refer to “any occurrence that is remarkable in some way—one that is widely noted and commented on by contemporaries” (Sewell 1996, pp. 841–842). We identified three periods punctuated by wars: 1870–1915, 1919–1945, and 1946–1975. The world wars disrupted the communication among architects by limiting exposure to and cross-pollination of ideas through journal circulation and architects’ travel for education, inhibiting one professional logic from being widely shared. The end of the world wars brought building opportunities, and after World War II, resources were made available to countries by the Marshall Plan. We verified these periods by examining the evolution of the 17 architects’ productivity in writing and building (results are available from the authors) as well as the growth and categorization of styles as shown in Figure 1.

De Novo Category Formation, Contestation, and Expansion

We use historical narrative and event sequences to describe the formation, contestation, and expansion of the de novo category “modern architecture.” In Period 1, the emerging modernists rejected revivalist architects’ use of historical styles to signal a building’s function, whereas revivalists insisted on basing architecture on historical referents and ignored nascent “modern architects.” In Period 2, the conflict shifted into a discursive struggle not only between revivalists and modernists but also among modernists. Modernists argued over whether to transpose a logic from commerce based on efficiency and functionality into the profession or transform the profession’s aesthetic logic based on classical (i.e., Greek and Roman) historical referents to one based on nature from Gothic architecture. These distinct logics defined different artifact codes for modern: commercial with a restricted code to new building materials only or professional with a flexible code to include new with traditional materials. In Period 3, the category “modern architecture” expanded when advocates of the commercial logic and restricted artifact code acknowledged the transformed professional logic with a flexible artifact code as modern, and a third wave of modernists was pluralistic, integrating aspects of both logics and artifact codes into their theorizing and buildings.

Period 1—Category Formation: Rejecting Revivalist Traditions and Constructing Modern, 1870–1915

A key question at the turn of the 19th century was whether architects should imitate and extend historical styles or cast aside traditions in their entirety. Quotations from Architectural Record in 1892 illustrate both sides of this argument: “We have at this moment no style, no traditions; we must imitate something” (Freeman 1892, p. 398), and “Modern architecture ... has used the dead languages of extinct styles, copying incessantly where it should have invented .... [not] ... developing any truly modern and characteristic system of constructive and decorative forms” (Hamlin 1892, p. 265). The extent of the dispute is highlighted in Figure 4, which displays how three groups of architects—revivalists, modern organicists, and modern functionalists—employed different institutional logics and deployed different combinations of building materials. Each group took a different stance on whether tradition should be maintained, changed, or rejected.

Each group relied on clients from distinct societal sectors to finance their buildings, a factor that influenced their logics and the side each took in the debate. Revivalist architects garnered almost half of their commissions from religious and state clients (45%), a higher share than those who advocated a “modern architecture” (modern organic, 26%; modern functional, 17%), and controlled the vast majority of the overall demand of these two sectors (72%). It is noteworthy that religious and state clients tend to be conservative, encoding historical referents into their buildings to connote enduring qualities of culture and state (Viollet-le-Duc 2009, Brand 1995). In contrast, modern architects, who rejected historical styles, had more commercial clientele (30% of commissions for modern functional and 18% for modern organic, for a combined 71% of the overall demand). Commercial buildings changed frequently (Brand 1995), were designed to suit contemporary needs, and “involved problems of construction fully as serious and difficult as were ever encountered in the most stupendous of medieval cathedrals ...” (Hamlin 1891, p. 145). Consequently, the understanding of compression loads and statics, the introduction of new skeleton structures, and new technological innovations such as the elevator (which made tall buildings habitable) demanded de novo theorization. Thus, it is not surprising that a new category of architecture is associated with the growth of a new client sector.
The differences between the architects’ clientele and related logics yielded starkly dissimilar symbolic structures. Revivalists emphasized the general concepts of \textit{art}, \textit{architect}, \textit{modern}, and \textit{technical}, shown in the center of Figure 4 (top graph, solid lines). They used \textit{modern} as a modifier to signal a contemporary rather than ancient building. Although Charles McKim, as president of the AIA, acknowledged in his 1902 presidential address to the AIA that “technical instruction shall be added” to fine arts training for the architect, he reiterated that “the architect who would build for the ages to come must have the training of the ages that are past” (McKim 1902, p. 91). Between 1870 and 1920, revivalists trained primarily in the French École des Beaux-Arts, had alumni who designed three of the four Universal Expositions, were a significant force as faculty and deans at European and American architectural schools, and were also prominent architectural practitioners (Noffsinger 1955, Brain 1989); they dominated the profession. The profession valorized architects who built in classical revivalist style; they received both Gold Medals (AIA and RIBA) from 1903 through 1933 (see Table 1). Revivalists enacted specific historically forms that signaled a building’s function. This artifact code was still so prevalent in 1939 that Wright (1939, p. 856) openly advocated for a “modern architecture” with “no preconceived form fixing either its present or its future…that a bank will not look like a Greek temple, a university will not look like a cathedral, a fire-engine house will not resemble a French chateau.” Revivalists employed traditional materials of stone, wood, and brick, and when they used steel, they covered it with such materials.

In contrast to revivalists, modern architects linked different concepts to the general concepts of \textit{art} and \textit{modern}, revealing two distinct approaches to the emerging
“modern architecture”: modern organic (Figure 4, dotted lines) and modern functional (dashed lines). Modern organic, as espoused by Wright, transformed the profession’s focus on art by incorporating both machine and nature, revealed in the frequent associations of the terms organic, nature, machine, and modern with art. Wright’s approach drew on Gothic traditions used by the arts and crafts movement and by his mentor, Louis Sullivan (Morrison 1935, Scully 1974), both of which focused on nature. He advocated nature as analogy for and purpose of modern architecture: “[Use] an ideal of organic nature as a guide, so to unite these qualities to serve [your] purpose . . . regardless of preconceived notions of style . . . . Grasp the nature of building a beautiful building beautifully, as organically true in itself, to itself and to its purpose, as any tree or flower (Wright 1914, p. 413, italics in original). Wright’s association of machine to art might seem at odds with his emphasis on nature, which the arts and crafts movement characterized as opposites (Cumming and Kaplan 1991). Wright instead saw them as complementary: the machine provided the means through which the modern architect could produce art and address human needs. Describing how he “deliberately chose to break with traditions in order to be more true to Tradition than current conventions and ideals in architecture would permit” (Wright 1914, p. 407), Wright sought to transform the profession’s logic based on aesthetics by marrying it with the machine and new materials. He moved across and combined both traditional and new materials such as concrete and steel with wood, stone, or brick (Figure 4, bottom graph, dotted lines).

Modern functionalists rejected the revivalists’ logic of art based on tradition, contrasting the two terms. Instead, they transposed the commercial logic of the market into the profession, as seen in the constellation of concepts economic, industry, and technical with modern and architect in Figure 4 (top graph). These ideals, espoused by Gropius and Le Corbusier, were first championed by the Deutscher Werkbund movement, whose founder, Peter Behrens, mentored Gropius, Le Corbusier, and Mies van der Rohe early in their careers. The Werkbund was less an artistic movement than an effort to focus on consumerism and commoditization by reinventing traditional crafts using mass production techniques (Schwartz 1996). Gropius argued that “methods based on craftmanship are antiquated and must be replaced by the acceptance of a modern concept of industry” (1910/1961, p. 50). Gropius and Le Corbusier proposed the analogy of machine industrialization to understand what modern meant: “[C]ombine by means of industrialization the aesthetic activity of the architect and the economic activity of the entrepreneur” (Gropius 1910/1961, p. 50). Modern functionalists focused on new materials—reinforced concrete, glass, and steel—to maximize industrial productivity. For instance, Gropius’s Fagus Works (1913) was built on a projected steel skeleton and used broad glass windows as a façade (known as a curtain wall) to increase lighting, improve working conditions, and enhance productivity in the factory, highlighting his industrial approach to architecture. Already, we see modern functional and modern organic architects enacting distinct artifact codes for “modern architecture” in their building materials.

Surprisingly, the architects’ audience, comprising professional peers and historians, did not play a central role in the theorization of “modern.” Their symbolic structures were more limited and less clear, denoted by fewer concepts used such as art, architecture, and modern (results are available from the authors). They mostly referred to Wright, who focused on human environments, and used the term engineer to describe Gropius and Le Corbusier’s approach. Furthermore, audiences focused on contrasting modern with tradition rather than elaborating modern. They reacted negatively to early modern buildings that did not conform to the historical styles advocated by the École des Beaux-Arts. For instance, Russell Sturgis, a revivalist architect and critic trained at the École, strongly criticized Wright’s Larkin Building: “The lover of architecture who looks, perhaps for the first time, at a building so entirely removed as this one from the traditional styles and schools feels a shock of surprise, and this a surprise which is the reverse of pleasant . . . . [It is] . . . an extremely ugly building. It is, in fact, a monster of awkwardness” (Sturgis 1908, p. 312).

To summarize, between 1870 and 1915, revivalist architects served religious and state clients and dominated the profession and its aesthetic logic based on historical styles, where forms such as a Gothic arch or Greek column signaled a building’s function; they ignored the nascent “modern architects.” In contrast, the nascent “modern architects” served primarily commercial and residential clients, rejected the profession’s reliance on historical styles to signal a building’s function, and experimented with new building materials and aesthetics, which were not well received by their audiences. Although modern architects rejected classical revivalism, they formed distinct artifact codes that drew from different logics. Modern organic sought to transform the profession’s logic by drawing on architecture’s history of Gothic tradition, which focused on nature and marrying traditional with new materials, whereas modern functional transposed a commercial logic of industrialization into the profession and focused on new materials. Table 2 provides an overview of these three distinct artifact codes and the logics underpinning them.

The distinctiveness of these initial forays into theorizing “modern architecture”—one primarily American (i.e., Wright and Saarinen emigrated to the United States in 1914) and the other European (i.e., Gropius and Le Corbusier)—was reinforced by World War I, which
disrupted professionals’ communication and travel and hindered the development of a shared set of assumptions required if a dominant logic with a unified artifact code were to guide “modern architecture.”

**Period 2—Category Contestation: Theorization and Institutionalization of Artifact Codes, 1919–1945**

Architects in the profession erupted into open contestation. Importantly, only the terms nature, art, and technical were used by all architects (Figure 5, top graph). Revivalists were the most vocal opponents of modern functional architecture, and their opposition is reflected in their constellation of concepts: modern, tradition, architect, and engineer. The revivalists advocated that architects uphold traditions from art and nation rather than pursue the technical and industrial solutions of modern functionalists, who instead valorized the engineering profession, which had aligned itself with commerce (Shenhav 1995). Lutyens (1932, p. 164) argued that “[the architect] has capitulated to the engineer…the architect alone…should watch and safeguard the traditions of the country he builds in, and the locality with its personality.” Östberg (1934, p. 34) agreed: “[T]he purely technical is never art…Types such as Corbusier, the Swiss…lose themselves in all possible, unrelied, mechanical functionalism and are prone to technical repetition.”

Although revivalists acknowledged that new materials spawned new forms—based on intersecting planes rather than the counterforce of stone blocks—they held fast to traditional materials and building techniques. Östberg (1934, p. 36) noted, “We no longer build in the true meaning of the word, by laying stone upon stone….” Lutyens (1931, p. 775) articulated eloquently the value of traditional materials and the intensity of the conflict among architects: “Traditional ways of handling material (tiles, bricks, timber, and stone) are the basis of style in architecture, besides one of its chief joys….” The modern impersonal architecture of so-called functionalism does not…show as yet a genuine sense of style….” One cannot make friends, through it, with the men who built it.”

Revivalists, whose primary clientele were anchored in the conservative logics of religion and state, continued to value and build in historical styles with traditional materials, such as stone and brick (Figure 5, bottom graph, solid lines), that are associated with monumental buildings: churches, parliaments, town halls, and elite colleges. Modern organic architects sought to transform the architectural profession from one based on classical historical styles to one based on Gothic architecture’s focus on nature and one that subjugated technical innovation to the human needs of the new century. They relied more on institutional and religious clients than did modern functional (45% versus 32% and 8% versus 4%, respectively) and less on commercial clients (21% versus 29%); thus, their client base reinforced an emphasis on human needs rather than commercial ends. Their constellation of terms (Figure 5, top graph) unites organic, human, and nature with art and technical, indicating that they subordinated the technical to serve human needs rather than reject it as did revivalists or prioritize it as did modern functionalists. Wright declared, “Architecture expresses human life, machines do not, nor does

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**Table 2  A Comparison of Architects During Formation of Category “Modern Architecture,” 1870–1915**

<table>
<thead>
<tr>
<th>Revivalists</th>
<th>Modern organic</th>
<th>Modern functional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actors</td>
<td>Wright and Saarinen (joined by Dudok and Aalto in following period)</td>
<td>Gropius, Le Corbusier, and Perret (joined by Mies van der Rohe and Fuller in following period)</td>
</tr>
<tr>
<td>Clientele</td>
<td>Pluralistic mix of adaptive and tradition (52% residential, 29% institutional)</td>
<td>Adaptive and functional (51% residential, 30% commercial)</td>
</tr>
<tr>
<td>Guiding logic</td>
<td>Professional: Transform aesthetic traditions from classical to Gothic and incorporate industrial production to enhance artistic expression</td>
<td>Commercial: Reject aesthetic traditions and transpose market into profession for universal, efficient, and economical solutions of industrial production</td>
</tr>
<tr>
<td>Symbolic system</td>
<td>Modern as new category: Art based on nature and the organic that serves human needs</td>
<td>Modern as new category: Reject tradition and base art on technical, industrial, and economic needs and processes</td>
</tr>
<tr>
<td>Artifact code</td>
<td>Flexible: Combines traditional (wood, stone, brick) and new (concrete, steel, glass)</td>
<td>Restricted: Focus on new materials—concrete, steel, and glass</td>
</tr>
</tbody>
</table>

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any appliance whatsoever. Appliances only serve life” (Wright 1931, p. 49). Aalto argued that the technical serves human needs, a point made more pressing by the war: “[T]he technique of the present war destroys…we need a more organic social awareness, giving priority to the needs of human beings…relegating the technical resources…to their proper subsidiary role” (Aalto 1941, p. 78). Modern organic architects vilified the commercial logic of modern functional architects (“commerce…has no soul”; Wright 1928, p. 334) and referred to the skyscraper as “a stupendous adventure in the business of space-making for rent—a monstrosity” (Wright 1931, p. 48). They provided an alternative vision of “modern architecture” based on nature: “Organic buildings are the strength and lightness of the spider’s spinning, buildings qualified by light, bred by native character to environment” (Wright 1931, p. 49). Saarinen highlighted nature as an analogy: “Nature is our teacher in the principles of architecture” (Saarinen 1932, p. 237). These architects combined traditional and new materials together in a flexible artifact code, responding to the conditions of institutional pluralism reflected by their heterogeneous clientele (Figure 5, bottom graph). Wright and Saarinen institutionalized their approach by founding or leading schools in the United States: the Frank Lloyd Wright School of Architecture at Taliesin (1932) and the Cranbrook Academy of Art (1925), respectively.

The commercial logic underlying modern functional architecture (Figure 5, top graph) is captured by the constellation of economic, industry, technical, modern, and machine. Modern functional architects institutionalized their logic through schools and associations. The Bauhaus, founded by Gropius in 1919 in Germany and later headed by Mies van der Rohe, trained architects to follow a commercial logic. At the Bauhaus, “practical designs for present-day goods were conscientiously worked out as models for mass production” (Gropius 1934, p. 680). Le Corbusier cofounded the Congrès
Internationaux d’Architecture Moderne (CIAM) in 1928, and in their charter they “refuse categorically” any past work methods and embrace “rationalization and standardization” (Conrads 1971, pp. 109–110). Le Corbusier dismissed the criticisms of both revivalists and modern organic architects: “A new architecture has been born, breaking with tradition. . . . [It] is efficient and economical; it is rational and functional; it responds to the profound aspirations of the modern conscience and expresses a new era of civilization” (1935, p. 18). As the period drew to a close, Le Corbusier recognized the conflict as disrupting: “[S]plit into two totally opposed camps . . . entailing different states of conscience” (1944, p. 49, translated by authors). Modern functional architects emphasized new materials to create new forms. In 1923, Mies van der Rohe declared, “The materials are concrete, iron, glass. Ferroconcrete buildings are essentially skeleton structures . . . That means skin and bone construction” (Mies van der Rohe 1923, p. 3). Gropius argued that “new industrially improved building materials are competing with those provided by Nature and are about to get the better of them. These new building materials—steel, concrete, glass—have rendered it possible to erect wide-spanned, amply lighted rooms and buildings at a great saving of structural material” (1931, p. 273). Hence, Mies van der Rohe, Le Corbusier, Perret, and Gropius developed an artifact code based on this restricted set of materials, casting aside traditional materials and techniques (Figure 5, bottom graph). Gropius and Mies van der Rohe moved the modern functionalist approach to the United States when they fled Nazism in 1937; Gropius to Harvard and Mies van der Rohe to Illinois Institute of Technology (formerly the Armour Institute of Technology).

Audiences responded to the contestation among revivalist, modern organic, and modern functional architects in different ways. The professional associations awarded their prestigious Gold Medals first to revivalists (Östberg and Lutyens) and then to modern organic architects (Dudok and Wright; see Table 1). In contrast, key critics Henry-Russell Hitchcock, Philip Johnson, and Sigfried Giedion (cofounder with Le Corbusier of the CIAM) heralded modern functional as the exemplars for the prototype of “modern architecture” and identified Gropius, Mies van der Rohe, and Le Corbusier as the leaders of the “modern movement.” Hitchcock and Johnson (1995) labeled Wright, Saarinen, and Dudok as “half-modern,” but later in 1951, Hitchcock recanted this position. Modern functionalists’ restricted set of materials, which were visible and provided high category contrast with revivalists, made it easier for audiences to recognize and label them as “modern.” In contrast, “modern organic” architects mixed new with traditional materials, reducing their contrast with revivalists, who used traditional materials and thus delayed their recognition as “modern architects.” Indeed, in 1942, a full decade after his initial categorization of 1932, Hitchcock identified Wright’s Fallingwater (1935) as “epitomiz[ing] the aspirations not of Wright alone, but of all modern architects. . . . a new cycle of world architecture had opened. . . . for premature end in Europe with the coming of war” (Hitchcock 1942, pp. 91–92). Dudok’s 1935 RIBA Gold Medal ceremony revealed a confused audience. An honorary speaker reflected the unresolved and opaque struggle over the labeling of “modern architecture”: “[I] have never yet discovered whether Mr. Dudok is a Modernist or a Traditionalist” (Anonymous 1935, p. 690). Ironically, the next speaker called Dudok “our only anchor against the Modernists!” (Anonymous 1935, p. 690). Not only were audiences confused, but they also were aware of the conflict within the profession. Even the president of RIBA, Sir Giles Gilbert Scott, noted the intensity of the schism: “Modernists and traditionalists can see nothing in contemporary efforts that are not expressed in the particular form that they themselves favour” (Anonymous 1935, p. 685). Audiences conceptualized modern based on art, architecture, and tradition, which architects voiced in Period 1, while simply recognizing architects’ distinct analogies—nature and technical—but not elaborating them (results are available from the authors).

In sum, this period revealed a battle over “modern architecture” within the profession and between modern organic and modern functional architects driven by their distinct logics that guided different artifact codes. Modern organic architects relied more on institutional and religious clients (52% of their total commissions), who valued human needs, whereas modern functional architects relied more on residential and commercial clients (63% of their total commissions), who valued functionality and adaptability of buildings. The discursive struggle took an unpredictably sharp turn in 1932, when Hitchcock and Johnson defined modern functional as “modern” while labeling the modern organic only as “half-modern,” creating a disrupting event that was recognized by architects and audiences. These divergent logics and artifact codes caused confusion among audiences, and the intense contestation promised to either divide the modern movement or prompt reconciliation in the next period.

Period 3—Category Expansion: Pluralism and Integration, 1946–1975

After the intense conflict of Period 2, this period witnessed the acceptance of pluralism and expansion of the category “modern architecture.” The two modernist factions remained wedded to and guided by their distinct logics (Figure 6, top graph). Modern organic architects still conceived of modern architecture as being based on nature, organic, human, and art (and re incorporated machine, which Wright introduced in Period 1
and functionalists highlighted in Period 2). Wright continued to reject the commercial logic underlying modern functional architecture as “too easy to commercialize or teach” (1952, p. 152). He rejected the claims of science as a basis for architecture and advocated instead the traditional sources of art and humanities: “Now science can give us the toolbox and the tools in it—and leave us there…. Let us forget science except as a mere technique to achieve the ends of the spirit; only the prophet, the poet, the philosopher can help us now” (Wright 1950, p. 232). In his acceptance address for the AIA Gold Medal in 1955, Dudok concurred, describing modern functional architecture as “spatial engineering” defined by “boxes…architecture with very much glass” and wondering “if human life finds sufficient expression in these essentially hard, razor-sharp buildings” (p. 52).

Modern functionalists remained anchored in their conceptions of modern, shown by the concepts economic, technical, art, and architect (Figure 6, top graph, dashed lines), and nature is linked to modern, but it became increasingly divergent. Gropius described “nature” in ways remarkably similar to modern organic: “A new set of standards in architecture has been born which draws its life from the climate, from the soil, and from the habits of the people” (1946, p. 26). At other times, Gropius (1967, p. 104) reasserted a commercial logic guiding modern architecture: “The architect has to recognise the impact of industrialisation and to understand its technical and economic implications. Then structure and mechanical parts can become forceful and eloquent vehicles of artistic expression.” Le Corbusier, in contrast, reasserted his earlier theme, espousing the inevitable march of engineers and science: “Science knows no limit or frontier, nor do mathematical formulae, axioms, or machines…. The engineers dispersed throughout the world, spreading their science and enterprise” (1947, p. 67). Only Le Corbusier remained intransigent, whereas Mies van der Rohe and Gropius, now colocated in the United States, publicly paid homage primarily to Wright—Mies van der Rohe (1946) in “A Tribute to Frank Lloyd Wright” and Gropius, who acknowledged Wright, Aalto,
and Le Corbusier, expressing reconciliation of modernists (1946):

We all agree that architecture is an art, that its scope reaches beyond the realms of science and technique…. (p. 10)

Tradition does not mean imitation of the past…. [It is] rather the preservation of essentials in the creative process of the fluctuating life which lies at the back of all materials and every technique…. (p. 11)

Yet, what a variety of architectural expression has resulted from it in the different countries! As great a variety as we shall find when we compare buildings of a Frank Lloyd Wright in the United States, a Le Corbusier in France, and an Alvar Aalto in Finland. They vary ever so much in their form-expression, according to the various regional conditions which their architects have studied and they vary also with regard to the personal peculiarities of their creators. (pp. 23, 26)

Modern functionalists were now also engaging in more work for institutional clients (49% in Period 3 versus 30% in Period 2), which may have sensitized them to the more conservative clients and the role of architectural traditions in expressing monumental rather than strictly functional architecture.

A new wave of modernists, which included Nervi, Tange, and Kahn, became active in this period but did not participate in the discursive struggles that characterized Period 2 and continued between Wright and Le Corbusier. Instead, they united concepts that had anchored distinct logics such as nature, art, and human with technical and economic, as shown in Figure 6 (top graph, dashed lines with dots). Tange suggested that modern architecture will “bring harmony between the individual and the whole and between technology and humanity” (1961, p. 34) and observed that destruction from the war made reconciliation possible: “[C]ontemporary architecture in Japan in the true sense started with the reconstruction after the devastation caused by World War II” (1956, p. 30). Similarly, Nervi synthesized “architect” with “engineer,” arguing that “the architect must have an understanding of structural concepts so deep and well integrated as to transform these concepts . . . into a unique synthesis and into an intuitive and spontaneous sensibility” (1956, p. 8). Kahn married diverse approaches. He was trained in the Beaux-Art tradition, influenced by Le Corbusier, and was similar to Wright in placing technology at the service of human needs: “[N]ew materials, new technologies are servants to the pulse of human rapport” (1971, p. 34). This more human modern architecture flowered in the late 1940s and 1950s because of reconstruction from the devastation of World War II and resources made available by the Marshall Plan.

The presence of pluralism and integration is seen in which materials were utilized in buildings (Figure 6, bottom graph). All groups (modern functionalists, modern organicists, and third-wave modernists) relied heavily on new materials (concrete, glass, and reinforced concrete), which were closely associated with commercial buildings. Modern organic architects (Figure 6, bottom graph and dotted lines) continued to mix traditional materials (stone, wood, brick) with new materials, and third-wave modernists deployed unique combinations (i.e., steel with concrete or concrete with wood) from the two distinct artifact codes. By embracing both artifact codes of modern, Kahn, Nervi, and Tange used the tension between them as inspiration for creating highly original yet very diverse buildings—all within the category of modern.

Audiences retained their focus on the general triad modern–art–architecture, without uniting the binary contrast that underlay the two logics of commerce and profession, as done by the third-wave modernists. During this period, the profession valorized pluralism by awarding Gold Medals (see Table 1) first to modern organic architects such as Aalto, Saarinen, and Wright, and then to modern functionalist architects such as Gropius, Mies van der Rohe, and Le Corbusier, and then finally to third-wave modernists who integrated both logics and enacted a flexible artifact code for modern architecture. External audiences, following Mies van der Rohe and Gropius, advocated pluralism within modern architecture. In 1949, Philip Johnson, who initially declared Wright, Dudok, and Saarinen as “half-moderns,” proclaimed Wright “the founder of modern architecture as we know it in the West…. All younger moderns—except, perhaps Le Corbusier—acknowledge Wright’s influence, though some may forget the debt in their later years” (p. 105). In 1951, Henry-Russell Hitchcock publicly apologized in Architectural Record for the “con-descending” term “half-modern.” In 1954, leading critic Vincent Scully highlighted how Wright paved the way for Mies van der Rohe and Le Corbusier, who in turn reinvigorated Wright’s work during the 1920s. Thus, the tension between the two factions of “modern architects,” guided by distinct logics and expressed in different artifact codes, became acknowledged as a source of creative inspiration.

Audiences also recognized the third-wave modernists as an integrative force in modernism. In his 1966 tribute to Tange, Boyd declared, “[Tange] has become an architect of the world largely because his work is so intensely Japanese. For he has demonstrated to the world’s great satisfaction that a unique regionalism may develop genuinely within the international modern idiom” (p. 82). Similarly, in his RIBA award ceremony in 1960, Ove Arup described Nervi as “a man who has refused to submit to the schism which has befallen the art of building…. [as one who]… did not seek to lead any movement” (Anonymous 1960, p. 229). Scully (1962, p. 43) described Kahn’s buildings as
“passionately uniting the rational preoccupations of science with the nonrational assertions of art.” Thus, in Period 3, following the devastation of the Second World War, architects within the modern movement focused on an architecture that met human needs and sought to heal wounds inflicted by open conflict in the previous period. Moreover, audiences that had categorized modern functionals as “modern” and modern organics as “half-modern” recanted their positions, acknowledging Wright and others as contributors to “modern architecture.” Finally, a third wave of modernists drew from both camps of modernism to inspire their original work. Together, these factors ensured the acceptance and integration of plural logics and artifact codes, expanding the category “modern architecture.”

Discussion and Conclusion

Our study traced the formation, contestation, and expansion of the de novo category “modern architecture.” We drew on institutional logics to show that modern architecture was shaped, from its inception, by fights over logics based on distinct client sectors and serviced by different groups of architects who enacted “modern architecture” through both symbols and materials (Friedland and Alford 1991, Friedland 2001). Our fine-grained analysis of logics—both the binary contrasts of symbols and the materials of artifact codes—revealed that, as the profession’s aesthetic logic advanced by revivalists, who disproportionately relied on commissions from religious and state clients, was displaced, two competing approaches to modern architecture guided by distinct logics emerged. Differences between these logics led to contestation in the modern movement’s formative period (1921–1945). Modern organic architects served a greater percentage of more conservative clients (i.e., religious and state), transformed the profession’s aesthetic logic from classical to Gothic ideals based on nature, and integrated new materials and methods into the profession’s artifact code. In contrast, modern functional architects served a greater percentage of business clients, eschewed the profession’s aesthetic logic and traditional materials, transposed a commercial logic into the profession, and deployed a restricted artifact code of new materials.

The category literature has tended to treat categories as static rather than dynamic (Lena and Peterson 2008, Ruef and Patterson 2009) and has often relied on methods that trace the evolution of the label but not the content and meaning of that category. Our longitudinal analysis and results showed that “modern architecture” changed dramatically over time, buffeted by social forces and contestation among members, who fought over the meaning and direction of modern so it could express their interests and identities and reflect their status in the profession. By tracking categories over short periods of time and only among audiences, researchers may be overemphasizing static and consensual dynamics of categories. Furthermore, simply tracking the evolution of the usage of a categorical label is not sufficient, because the meanings of and categorical boundaries evolve as a category is adopted. In fact, contrary to previous studies, we found that a shared interpretive framework came through a process of boundary expansion rather than contraction (Colyvas and Powell 2006) or collective consensus (Hsu and Hannan 2005, Cattani et al. 2008). As we noted in our introduction, modern architecture has no clear definition (Wilson 1984), likely because modern architecture never contracted through either consensus or the dominance of one logic with a restricted artifact code. Our findings suggest that a new category may house multiple, distinct, and sometimes conflicting exemplars, expanding rather than contracting boundaries around a clearly defined prototype for the category. These multiple exemplars, driven by enduring pluralism from clients and their respective logics within the modern architecture movement, infused the category with a robust and multivocal identity that enhanced its capacity to adapt and become a dominant style for decades.

Our study also showed that the process of de novo category formation versus the formation of a new category entails particular challenges. Actors who attempt to create a de novo category may be faced with a double-edged sword: a greater contrast with existing categories’ artifact codes allows actors and audiences to recognize and classify it as new (Rosch and Mervis 1975), yet it simultaneously makes it harder for audiences to understand and accept the new category. In contrast, a new category that is a hybrid allows actors to draw upon existing categories, such as car and truck, to interpret and make sense of a new category as they did with the minivan (Rosa et al. 1999). In our study, modern functionals had greater contrast in their commercial logic and artifact code with revivalists, which made it easier for audiences to recognize and label a new style of architecture. Yet their ideas sparked intense conflict with revivalists and other modernists, and it took decades to resolve the dispute over the category and its boundaries—who and what was or was not included as “modern.” In contrast, modern organic architects had greater overlap with revivalists both in their professional logic based on aesthetics and their artifact code of incorporating traditional materials, making it harder for audiences and peers to see them as distinct, but also enabling them to gain earlier acceptance within the profession. Modern organic architects received the Gold Medals years before the modern functionals did. Thus, logics within a profession evolve, and categories that seek to alter radically a profession’s logic are likely to encounter stiff resistance, because the new category also alters identities, interests, and statuses for both producers and audiences.
Unlike most category studies that focus on market contexts in which products are comparable through either standardization or commensuration processes, such as cars (Porac et al. 2001), businesses (Ruef and Patterson 2009), software (Pontikes 2010) and art markets (Khaire and Wadwani 2010), this study details an instance of category formation within the context of a profession. In markets, the presence of a dominant logic may strengthen a category by enlarging and stabilizing a customer base because that base demands predictability and likely enhances audiences’ power over producers by controlling, evaluating, or directing consumption and production opportunities. In such contexts, audiences may be the primary theorists of new categories. However, when products or services demand customization, the presence of multiple logics may facilitate originality by offering actors a broad variety of frameworks to exploit. The range of clientele and expectations of professional providers may provide variation in category content. As the architects in our study noted, architecture is an art where originality in terms of novel building materials, designs, and new forms of buildings is critical. These conditions militated against standardized materials and forms, which were criticized as “repetitive” and “monotonous,” but which are critical for the comparison of features that enable commensuration processes in markets. Under these conditions, the availability of multiple logics may result in category expansion and revitalization and be driven by producers, not audiences. Drawing on Thornton et al. (2005), we speculate that the coexistence of plural logics may influence category boundaries through facilitating multiple, conflicting exemplars or logics, such as in medicine (Dunn and Jones 2010) or charter schools (King et al. 2011). A comparative study of markets based on commensuration and professions based on customization can help to unpack whether plural logics can coexist and the range of exemplars in a category, shaping the leniency of category boundaries and identify scope conditions of categories.

Our findings also show that producers (architects in our case) were the primary theorists, which differs from most research that credits external audiences as the tastemakers of cultural products (Shrum 1991, Hsu 2006a, Porac et al. 2001, Zuckerman 1999). Audiences that evaluate and provide status are professional peers and architectural historians; thus, producers and audiences comingle with no clear interface between them (Abbott 1988, Greenwood et al. 2002). Scholars of categorization, however, rarely assess the role that professionals play in theorizing and representing a new category, and they tend to focus on consumers, even in studies that claim to examine the actions of both producers and consumers. In addition, the architects’ clientele supported distinct approaches to modern architecture; thus, the diversity of client demands may be an important variable in who theorizes and the content of theories. It may also be that only certain audience members influence a professional or cultural field as a result of, for example, status differentials, a factor that is not captured by the limited analysis of external audiences presented in this study. High-status audience members may play a pivotal role in identifying who is worthy of being remembered and placed into collective memory (Jones 2010) and what logics or combination of logics should guide artifact codes. Who theorizes a new category and the role of a theorists’ status may provide important insights into category formation and evolution.

Our results also contribute to institutional theory by revealing the microfoundations of institutional logics and change and by examining a process that leads to a stable condition of pluralism that allows for enduring differences to coexist. We examined how institutional logics were enacted through language (Friedland and Mohr 2004, Powell and Colyvas 2008, Sudhaby and Greenwood 2005). By analyzing the key binary contrasts used by architects, we reveal linguistic patterns and how they theorized a de novo category, drawing on institutional logics available and salient to them to elaborate the meaning of modern. Their distinct views were reflected in different key words, which were contrasted with modern, such as tradition, and also used as complements to elaborate modern, such as technical, art, machine, and industry for modern functional architects versus art, human, architect, organic, and nature for modern organic architects. The pattern of these co-occurring words revealed not only the logic upon which these architects drew to fashion the new category of modern but also how they infused the same term “modern architecture” with distinct meanings and practices.

Within institutional theory, few studies have examined enduring plural logics (Greenwood et al. 2011), focusing instead on how conflict between logics is usually resolved in a shift toward a dominant logic within a profession in which divergent meanings settle in common practices (e.g., Thornton 2002, Suddaby and Greenwood 2005). Our findings indicate that both pluralism and difference were inherent in and influenced the dynamics of the architectural profession. Architects simultaneously served multiple clients from distinct social sectors—commercial, state, family, and religion. Yet architects also tended to serve one or two client sectors more strongly than others, driving their desire and ability to embrace a new logic or revise an existing logic, utilize new materials that enacted a restricted or flexible artifact code, and develop a new category such as modern architecture. Research that compares the degree of plurality in logics might tease out whether dominant, hybrid, or plural logics are associated consistently with category processes of contraction, consensus, or expansion. Because many professions such as nursing, law, academia, accounting, and medicine are undergoing
profound change, our findings provide fruitful directions into how logics drive shifts in artifact codes, altering the meaning of a profession for professionals and audiences. In addition, by examining artifact codes, scholars may aid research on institutional logics. Currently, there is little theorizing that helps adjudicate between societal-level logics and those used in practice, spawning a plethora of “logics” (e.g., expertise, performance, trustee, fiduciary, aesthetic, efficiency) often within the same societal sector such as profession. Rather than “hybrid logics,” which suggest new societal-level understandings, these combinations are likely the translation of societal-level understandings into actors’ practices of them (Lounsbury and Crumley 2007). Artifact codes reveal how actors select and combine elements of logics as interpretive acts to address the challenges they face and give meaning to the societies in which they live.

Our study also has some limitations that might be overcome by future studies. First, we did not examine the entire field of architecture but focused on the elite architects that were the opinion makers of modern architecture and potentially ignored the influence of contractors, engineers, and related professionals who are critical to the construction of a building (Blau 1984, Larson 1993). Thus, we did not assess the full ecology of the profession (Abbott 1988). Second, although our study hinted at architects’ distinct logics being instilled through different apprenticeship experiences and institutionalized into the profession through new schools, journals, exhibitions, and associations, we did not examine these relations and patterns within the modern movement. Social movement and social network research may provide important insights into how the relational and movement dynamics shaped “modern architecture.” Social movement research has focused on what drives membership and how common experiences and organizations facilitate collective action (Davis et al. 2005) that can improve understanding of how professions change (Zald 2008), whereas social network theory may help to understand when and where schisms occur because of the presence of cross-cutting ties or brokers that are key to maintaining integrated social systems (Simmel 1950).

In conclusion, the formation of the de novo category “modern architecture” was a long and arduous process. Modern architects engaged in fierce contestation, fueled by conflicting logics and championing different artifact codes. When the conflict threatened to rupture the modern movement, key architects initiated reconciliation and expansion of category boundaries. Audiences followed, embracing two logics with distinct artifact codes of “modern” and a variety of exemplars that epitomized “modern.” These tensions became the creative material for third-wave modernists who integrated the former oppositions into their original approach. Because the profession emphasizes customization for clients and originality as the basis for status rather than standardization and market commensuration, diverse exemplars that were based on or married distinct logics and artifact codes were not only possible but rewarded by Gold Medal awards within the profession. Thus, the tent poles of the modern movement were stretched taut, almost to the point of snapping, but they instead expanded to include plural voices and approaches to “modern architecture,” reinvigorating the category and stimulating creative solutions.

Electronic Companion
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Endnotes
1 Semiotics scholars identify three kinds of codes: social, artifact, and interpretive (Chandler 2007). Social codes capture socially shared knowledge, values, and assumptions; thus, they are similar to logics. Artifact codes, or textual codes in semiotic terms, refer to a variety of artifacts, not just written documents. Interpretive codes link social and artifact codes to interpret and create meaning about the artifact in its social context. We use the term artifact code because it more clearly identifies that the code refers to an artifact’s content and form.
2 The Avery Index contains over 440,000 entries for over 700 American and international journals. In our data, English dominated (61% of texts), followed by French (13%) and German (10%). We hired a professional to translate non-English
articles. We used a Students’ Z-test to compare translated and untranslated texts and found no significant differences on architects’ 30 most frequently used nouns and verbs. 1During World War I (1916–1918), architects produced no writings or buildings, so we began Period 2 in 1919.

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