Identity-constrained Isomorphism:
An Integrated Model of Organizational Mimicry

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Acknowledgements

INTRODUCTION

Organizations do not spring into existence with immutable characteristics and behaviors. Any organization seeking to survive in a competitive and ever-changing environment must adapt. Evolution of organizational forms, strategies, and processes occurs primarily through internal innovation or external imitation, and as Levitt noted fifty years previously, "simple arithmetic tells us that there is lots more imitation than innovation" (1962:69). While mechanisms like social ties or institutional forces exist (Gulati, Nohria, and Zaheer 2000; Meyer and Rowan 1977), when faced with an uncertain environment or competition demanding change an organization must either innovate or look to other organizations to inform decision making (Alchain 1950). Some theorists argue that inertial pressures inhibit radical adaptive change (Hannan and Freeman 1977), yet such a view still must reconcile the inheritance and transmission of beneficial attributes from one organization to another. Whether strictly beneficial or random, whether through the creation of new organizations or by way of adaptation, some processes must underlie the transmission of cultural knowledge interlocking the structures and behaviors of existing organizations.

Exploring these processes, a large body of literature has been developed documenting the role of mimetic behavior in organizational change and the diffusion of technology and strategy across this channel (Meyer and Strang 1993; Mizruchi and Fein 1999; Bikhchandani, Hirshleifer, and Welch 1992; Fiegenbaum and Thomas 1995; Still and Strang 2009). Despite deep exploration of the causes and consequences of engaging in imitative behavior, researchers have spent little time examining who organizations choose to mimic (Barreto and Baden-Fuller 2006). Most of the research examining imitative behavior has focused on the adoption of new technology and practices or market entry, rather than the targets of mimicry itself (Lieberman and Asaba 2006). Despite relatively little scientific inquiry, understanding and predicting

organizational choices of imitation demands scholarly attention because it in large part drives the evolution of organizational forms.

Scholars within the fields of sociology, management, and economics have developed several competing explanations of organizational imitation (Lieberman and Asaba 2006; Ordanini et al. 2008). I argue, however, that these accounts are compatible and introduce an alternative account of imitation based on organizational identity. This model, which I term identity-constrained isomorphism, explains the wide variety of imitative behaviors of organizations documented in strategic group theory, resource-based views, information cascade theory, new institutionalism, and other models. I hypothesize that organizations imitate more legitimate and successful organizations but that this imitation is bounded by perceived similarity across structural resources such as size and finance, status, and key identity characteristics. To test the hypothesis, I examine the comparison groups of four-year public and private not-for-profit colleges submitted to the Department of Education for the purposes of benchmarking strategy. I find that colleges simultaneously emulate similar but more prestigious and resourceful institutions.

LITERATURE REVIEW

Several distinct models for organizational imitation have been proposed by scholars in the disciplines of sociology, management, and economics. These models share an acknowledgement that organizations engage in imitative behavior to reduce risk or achieve efficiency, either in response to information asymmetries or rivalrous competition (Ordanini et al. 2008; Lieberman and Asaba 2006). They differ, however, in the predicted targets of such imitative behavior.

One prominent theory from the economic discipline, information cascades, describes when it is rational for an organization to mimic others under the assumption that the actions of the target

organization reflects some undisclosed private knowledge (Bikhchandani et al. 1992; Banerjee 1992). Bars and clubs build large lines outside the entrances, even when the establishment may be far from maximum capacity, to signal its desirability to potential patrons. An individual passing with no prior knowledge of the club presumes it must be enjoyable because other people are willing to stand in line. More colloquially known as "herd behavior," the theories have excelled in explaining economic bubbles. When pricing certain assets or organizations proves difficult, investors and entrepreneurs mimetically copy others because they presume other actors have accurate evaluations (Avery and Zemsky 1998). Optimistic firm valuations can beget further optimistic evaluations, artificially inflating asset pricings.

While not a central tenet of information cascades, some economists have noticed the power of highly influential actors in igniting herd behavior (Hirshleifer and Teoh 2003). When reports became public indicating that Warren Buffet had purchased additional shares of American Express, their stock price rose by 4.3% (Obrien and Murray 1995). Investors, believing that Buffet had additional information about American Express unbeknownst to them, copied his investment strategies. In many ways this theory bares strong resemblance to mimetic isomorphism in new institutional theory.

First developed by Meyer and Rowan (1977), new institutionalism posits that that rationalized myths about how organizations should be structured are most responsible for the manifestation of organizational structures we witness today. DiMaggio and Powell (1983) captivated organizational scholars precisely because their expansion of neo-institutional theory documented the processes underlying organizational form transmission. They argue that organizations in similar industries are subject to the same social rules and pressures about how they should be formed which causes resemblance among them over time; a process called

isomorphism. Mimetic isomorphism, the mechanism most studied by organizational researchers (Mizruchi and Fein 1999), claims that in instances of uncertainty – times of rapid technological change such as the IT-revolution, uncertain market environments, or opaque and ill-defined goals – organizations look to "similar organizations in their field which they perceive to be more legitimate or successful" (DiMaggio and Powell 1983:152). Whereas information cascades argues decision makers imitate because it is rational to do so, new institutional theory believes organizations imitate to acquire legitimacy in their field, independent of any economic benefits associated with mimicry.

Although DiMaggio and Powell are careful to note that organizations copy simultaneously more legitimate and similar organizations, this distinction has faded as scholars expanded the new institutional body of work. Mezias and Land (1994) argue that in instances of competition and environmental ambiguity or change organizations that emulate largest, most successful organizations have the best survival chances. Likewise Haveman (1993) determined that Californian savings and loan associations mimicked the largest and most profitable members of their field when considering expansion into new markets. She also found that smaller firms did not copy similarly sized peers. This principle of mimetic isomorphism, that in times of uncertainty organizations imitate large and successful players or "those heavily represented in the field," has persisted without similar emphasis on the imitation of similar organizations (Ordanini et al. 2008:381, Haunschild and Miner 1997; Burns and Wholey 1993).

In contrast, strategic groups literature stresses that organizations look to their peers – those of similar size, status, resources, geographical location, etc. – and mimic their strategies (Reger and Huff 1993). Accordingly, they tend to cluster in sets, called strategic groups, which share similar characteristics and behaviors. These groups emerge because "mobility barriers" (i.e. structural

impediments) prevent organizations from imitating those most successful in their field and persist because these same mobility barriers inhibit moving between strategic groups (Caves and Porter 1977; Porter 1979). Once organizations come to share similar resources and market position, a desire to maintain parity amidst rivalrous competition encourages imitation of peers (Fiegenbaum and Thomas 1995).

Emerging from the strategic groups literature is the concept of a strategic reference point, defined as "the targets or benchmarks that managers use to evaluate choices, to make strategic decisions, and to signal to other key personnel their systemwide or organizational priorities" (Bamberger and Fiegenbaum 1996:927). Organizations use their strategic group as a reference point in their decision-making process and behave mimetically towards members of their reference point in response to uncertainty (Panagiotou 2007; Li and Yao 2010; Yang and Highland 2006). Recent research has identified strategic groups in the think tank arena and found that strategic shifts in market position and the type of information produced by some think tanks were mimicked by others in their strategic grouping (Medvetz 2013). Proponents of this theory argue that organizations at the top of their strategic group compare downwards because their reference point anchors their attention to less successful organizations (Fiegenbaum, Hart, and Schendel 1996).

A further extension of the strategic management literature, sharing similarities to the theory of mobility barriers, resource-based view (RBV) frameworks work to explain how an organization can sustain competitive advantage in an industry (Barney 1991). Resources are defined broadly in the field, encompassing any attribute of a firm that could impact its strategy. Organizations can only sustain competitive advantage in an industry if barriers exist preventing rivals from acquiring the necessary resources for mimicry (Peteraf 1993; Dierick and Cool

1987). To RBV proponents, it is the natural propensity of organizations to mimic those most successful in their field but resource constraints prevent them from doing so.

Despite congruencies among these competing theories, no substantive attempt been made towards unification. In their literature review of organizational mimicry, Lieberman and Asaba (2006) find that researchers take a specific theory as given and test against it rather than test a multitude of theories and find the most applicable. The authors organize the theories of business imitation into two overarching categories – information-based theories and rivalry-based theories. They define information-based theories as those which emphasize mimicry occurring due to a perceived information asymmetry against the copying organization and rivalry-based impersonation as when an organization copies a rival to bring parity. The authors attribute the mimetic forces of new institutionalism and information cascades as attempts to overcome information inequalities and suggest larger and more profitable organizations are copied because they are presumed to be the most informative. In contrast, they view the strategic group literature and RBVs as part of rivalry process. They understand competition within strategic groupings of organizations to engender rivalry and that mimicry results from an attempt to reduce the negative consequences of such competition.

Ordanini et al. conducted a similar literature review, noting "the fragmented nature of the literature on imitation" (2008:376). While competing theories differ in the purpose, causes, and targets of imitation, Ordanini et al. believe they share the same over-arching rationales of risk reduction and efficiency. They too try to classify the different theoretical perspectives of imitation, choosing to do so along a macro-micro level scale. The authors see mimetic isomorphism as an environment wide phenomenon, strategic groups as a field occurrence, and resource-based analyses of organizational behaviors as happening at the organizational level.

They suggest that the decision to imitate stems from an intricate interaction of forces which is irreducible to any one theory (Ordanini et al. 2008:391).

Industries as Reference Groups

In identifying targets comparison and imitation researchers have generally assumed a fixed set of comparison institutions. For example, when testing for the importance of a strategic reference point on innovative behaviors, Massini et al. (2005) assume an organization's comparison group is their strategic group and test against that hypothesis. They conclude that organizations mimic their strategic group because such groupings predict imitative behavior, however, it is possible that these organizations also imitate others outside their grouping. An organization could benchmark against six firms in their strategic group and three firms outside their grouping. Testing against the null hypothesis of no correlation between imitation and strategic grouping can lead to the false conclusion that firms *only* imitate members of their own grouping when this may not be the case.

The assumption that organizations imitate other organizations in their industry or sub-industry finds its foothold in both the population ecology tradition and cognitive models of strategy (Porac and Thomas 1990; Hannan and Freeman 1989). Population ecology has traditionally defined an industry as a population of organizations (Carroll 1985; Hannan and Freeman 1977) and suggests that barriers between industries concentrate the attention of organizational decision makers to their own industry. Cognitive models of strategy emphasize the limitations of human mental capacity and its inability to keep track of and compare against all other organizations because doing so would be both illogical and impossible (Porac and Thomas 1990). Scholars citing this tradition contend that decision makers construct cognitive

maps and categories of organizations (i.e. industries) and scope their view to actors within their own grouping to cope with a finite mental capacity (see Haveman 1993; Barreto and Baden-Fuller 2006).

The problem, however grounded this supposition may be in common sense, is that empirical findings in the literature do not always support it. When benchmarking CEO pay, members of the S&P 500 have been found to select organizations beyond industry boundaries (Porac et al. 1999). This inter-industry comparison is not uncommon; Faulkender and Yang (2010) found that over 40 percent of S&P 500 benchmarking targets were outside an organizations own industry.

Theoretically it also creates a dilemma. If imitation is bounded by industry sameness then organizational adaptions and technology could never diffuse across industries via mimetic channels. For any novel industry adoption to occur under this assumption it must either emerge *ex nihilo* through innovation, spread via network ties, or materialize through normative and coercive mechanisms. Suggesting that imitation occurs only within sub-industry categories or strategic groups meets the similar pitfall by artificially restricting the number of potential imitation targets. The salience of cognitive maps and industry categories in increasing the likelihood of comparison and emulation has meet broad support in the literature (Fiegenbaum and Thomas 1995; Porac, Thomas, and Baden-Fuller 1989; Panagiotou 2007), but imitation is a more flexible process dependent on both cause and purpose. Strategic groups literature has focused scholarly attention on the role competition and rivalry play in mimetic processes. New institutional theory and information cascade theory have pointed to the benefits of copying others in the face of uncertainty and doubt, particularly those with legitimacy. These theories, by highlighting the importance of industry categories in shaping organizational thought patterns and behaviors, has brought forth a fruitful avenue of research. The extant problem is that sometimes

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the targets of imitation will closely resemble strategic groups, sometimes they are the large and legitimate organizations in an industry, and sometimes they are beyond industry boundaries. Existing models start by assuming a fixed set of potential imitative targets when organizations have multiple reference groups often including organizations exterior to their own industry or strategic grouping. These models succeed in describing the behavior they witness, but for a comprehensive theory explaining who an organization imitates to succeed it must allow for fluid reference groups.

Industries and Identity

Porac, Thomas, and others, in their numerous works examining the Scottish knitwear manufacturing industry, explain how an industry may emerge and describe organizations within a given field (Porac et al. 1989; Porac and Thomas 1990; 1994). Their research highlights how industries themselves do not exist *a priori*, but are a product of social construction. Organizations look to others with whom they share essential similarities and eliminate others based upon irreconcilable differences. Once these categories become engrained in the cognitive thought processes of the decision makers responsible for comparison, that is to say institutionalized, a bounded industry emerges.

Porac et al. study the Scottish knitwear industry at a time when local manufactures face increasing competition from companies across the globe (1989). One producer bemoans the imitative behavior of Ralph Lauren's Polo who he says "have copied us stitch for stich" (408). Rivalry-based views like strategic groups theory suggest this competition would foster likewise comparison and imitation and the part of the Scottish knitwear manufactures (Lieberman and Asaba 2006), yet the local firms do no such thing. Even though the local manufactures engage in

direct competition with larger, overseas textile producers, neither do they compare against them nor emulate their practices. Porac et al. explain this phenomenon by noting that, for Scottish knitwear companies, the competing firm must specialize in the production of "high quality, full-fashioned, classic knitwear," manufactured in Scotland, before they would be considered part of their industry (408). This in-group identity, centered around the core attributes of local production, classic style, and high quality, defines the boundaries of the Scottish knitwear industry – itself constructed from repetitious thoughts, behaviors, and understandings about the shared attributes and characteristics of organizations in that industry *by* organizations in that industry. Cognitive categories, strategic reference points, and industries themselves are a product of enacted organizational identity. Peteraf and Shanley (1997) suggest that strategic groups emerge when strong shared group identities cognitively bind organizations together and collectively influence their behavior – and purport that in the absence of such an identity a strategic group cannot exist (173).

Despite the centrality of organizational identity in influencing an organization's perception of its environment, its impact on organizational imitation been surprisingly understudied. Scholars citing Peteraf and Shanley's work prefer to emphasize the power of strategic groups in shaping organizational identity (i.e. Short et al. 2007:151). Similarly, attempts to connect it new institutionalism argue that powerful institutional forces drive identity formation (Glynn 2008). Very little scholarly attention has been paid to question of how organizational identity influences who an organization chooses to imitate. Labianca et al. (2001), pulling from earlier work by Gioia and Thomas (1996), discovered that organizational identity, reputation, and image shape who universities choose to emulate, in addition to structural attributes. Anand et al. (2013) recently documented how an organization's identity shapes who it chooses for its strategic

reference group. While commendable in their demonstration of organizational identity's influence on mimetic targets, neither of these scholarly works looked to progress a novel theory. The two recent literature views on the topic of organizational imitation, while comprehensive in scope, have no discussion of organizational identity (Lieberman and Asaba 2006; Ordanini et al. 2008). Despite some research demonstrating the formative power of organizational identity in imitation, its importance has not yet permeated mainstream discussion.

This finding is particularly interesting given the heavy emphasis on categorization, social comparison, and perceived similarity in diffusion studies. Meyer and Strang (1993) noted that an "organization's cognitive map identifies reference groups that bound social comparison processes" and that "rational mimicking requires prior and potential adopters be understood as fundamentally similar" (491). If researchers have long recognized the essentiality of similarities in organizational comparison and imitation, why has no theory enveloping such processes emerged to describe mimetic behaviors?

IDENTITY-CONSTRAINED ISOMORPHISM

In response, I have formulated a new model to answer the question "who does an organization imitate?" which I call identity-constrained isomorphism. The central tenet of identity-constrained isomorphism is that organizations imitate more legitimate and successful organizations in so far as they perceive similarity to them, where similarity is bounded by sameness in certain core and perceptually important identities (Porac et al. 1989; Peteraf and Shanley 1997). The theory argues that organizations rely upon heuristic thought processes, grounded in a perception of self, when determining targets of imitation. Rather than examine all other actors in an industry, organizations rely upon their identity – notions of "who are we as an

organization" – to limit the number of potential comparison targets to a cognitively manageable number of institutions. Resource asymmetries, traditionally understood to make imitative action impossible (Caves and Porter 1977), instead function to bound possible answers to the question of "who can we reasonably imagine ourselves as?" In the model, two juxtaposing forces determine the targets of imitation. A homogenizing force constrains the list of potential comparison targets for an organization to other entities with identities similar to its own, while simultaneously strategic goals, environmental threat and ambiguity, desired future image, and other motivators for change encourage the imitation of more successful organizations.

Defining Identity

Albert and Whetten (1985) first defined organizational identity as members' shared beliefs in response to the question "who are we as an organization?" Although the exact meaning of the term has been subject to much confusion and debate, it is widely understood to refer to core, enduring, and distinctive attributes important to the constituents of an organization (Brunninge 2005; Gioia et al. 1998). I define identity more broadly to mean any attribute of an organization which influences its social comparison towards other organizations and I do so with specific intent. Organizational attributes only matter for comparison if the copying organization recognizes them as important. This process of recognition transforms organizational attributes into perceptions of the organization which are synonymous with identities. Size, a particularly palpable attribute for any organization, provides a clear example of how physical resources become transformed into cognitive identities. For the greatly varying size of an organization to be an important predictor of its imitation choice, as has been demonstrated in previous research (Baum, Li, and Usher 2000; Haunschild and Miner 1997), it must be germane to the

organization's conceptualization of self at the time of comparison. An organization with 150,000 employees, when targeted for comparison, is seen as a large firm. Although an organization's size may not be part of its organizational identity as defined by Albert and Whetten, it is an identity in the sense that the organization identifies with its own size and seeks out other organizations who share or differ from that identity.

Hypotheses

In the following section I categorize four distinct types of identities which may influence organizational imitation: identity characteristics, reputational resources, prestige, and an organization's social network. These four identity categories homogenize the potential list of imitation targets of an organization. Although the distinctions between the different categories may blur at times (i.e. large financial resources confer legitimacy and facilitate access to elite social networks), in some instances an organization may imitate based on structural similarities unrelated to the prestige of the other organization. The classifications serve to generate distinct hypotheses which I outline below.

As shown previously, participant organizations socially create and reproduce the industry in which they are embedded by defining the essential shared similarities and differences with other organizations. It is taken for granted, both by the organization at hand and the scholars studying it, that imitation takes place within this boundary. For this assumption to hold true, the organization first must identify with the core identity of the industry and this identity must be so powerful that it instantaneously excludes all other existing organizations from cognitive thought when determining comparison targets. This process, which I call heuristic exclusion, serves to condense the list of potential comparison organizations to a manageable amount.

To be a religious organization, an association must believe in a religion, maintain a place of worship, and pay salaries to religious leaders. This core identity as a religious organization serves to anchor perceptual comparison to other religious organizations. Other attributes bound an organization's cognitive identification within industry categories or sub-industries. While the organizational leaders of a Christian church responsible for business decisions may elect to compare against an Islamic mosque, a Jewish synagogue, or a Sikh gurdwara, comparison against other Christian churches seems more likely. Although the building size, operating revenue, and the number of followers of a mosque may be identical to a church down the street, neither seems likely to imitate each other's behavior because they differ on an essential attribute – the type of religion they practice. This distinction can be dissected further. Catholic churches may imitate predominately to other Catholic churches while Sunni mosques may not attempt to emulate Shi'ite places of worship. Identity is inseparable from imitation because it answers the question "who is similar to me?", and that answer determines the potential list of comparison targets.

This conception of identity, which I call identity characteristics, is consistent with existing formulations of organizational identity and imitation in scholarly literature (Gioia and Thomas 1996). The industry identity of a religious organization as well as the specific religion it practices are identity characteristics. These attributes can be thought of as categorical or binary variables (you are either a corporation or you are not). Current scholarly literature finds that organizations imitate those who have similar identity characteristics (Porac and Thomas 1990; Labianica et al. 2001; Peteraf and Shanley 1997) and identity-constrained isomorphism echoes this finding.

H1: *An organization will imitate other organizations who have similar identity characteristics to its own*

Identity-constrained isomorphism deviates from existing models by suggesting that structural and reputational attributes should be thought of in terms of identities as well. Whereas resource-based views and strategic group theory suggest resource limitations prevent imitation of the most powerful and prestigious organizations in a field (Caves and Porter 1977), identity-constrained isomorphism argues that sufficient resource differentials prevent cognitive identification with other organizations and this *perceptive* limitation inhibits mimicry. Structural resource asymmetries such as substantial differences in size, revenue, or profitability prevent both imitative behavior and prevent cognitive identification by smaller and financially insecure organizations. Both these processes serve to homogenize the imitation targets of organizations.

H2a: *Imitation will be bounded by similarity in structural characteristics (i.e. size, operating revenue, market share etc.)*

Additionally, reputational resources, those that confer legitimacy and prestige, also have been demonstrated to shape organizational identity and limit imitation targets to organizations of similar status (Gioia and Thomas 1996). More intangible resources of an organization like ranking, reputation, image, and status in society also serve to constrain the reference group an organization generates at any given moment, both upward and downward. Podolny (2005) recounts the predicament faced by high-end jewelers during a boom in the popularity of turquoise, a semi-precious stone perceived to be of low quality. Many jewelers had never sold turquoise and some, such as Tiffany & Co, had always offered some turquoise pieces but in limited quantities. Many high-end jewelers refused to meet the exploding demand on the account

that it might tarnish their image as high-end luxurious jewelers. Their high status constrained their ability to imitate the highly profitable behaviors of lower status stores.

H2b: *Imitation will be bounded by similarity in social legitimacy (i.e. reputation and ranking)*

The targets of imitation are not solely determined by physical and social resources. If organizational theory has learned anything in the past thirty years it is that in order to understand an actor's thoughts and behavior one must understand the social embeddedness of their relations (Granovetter 1983). This can be interpreted as an organization's social network, that is to say their set of relationships and ties with other organizations. Social network analysis has successfully been applied towards organizations (see Tichy, Tushman, and Fombrun 1979; Mizruchi and Galaskiewicz 1994) and has flourished in aiding social science understanding of the diffusion of information, technology, and strategy across these organizational networks (Attewell 1992; Pelps, Heidl, and Wadhwa 2012). When dealing with inter-organizational imitation, theories of social networks emphasize the power of this information sharing in creating similarities among connected organizations (Gulati et al. 2000). Taken together, research on organizational networks suggest an additional hypothesis:

H3: O*rganizations are more likely to mimic actors in their social network.*

Although isomorphic attributes and knowledge may diffuse through an organization's social network, this process is distinct from mimetic imitation of one's social network. Identity-constrained isomorphism emphasizes the centrality of organizational identity in fostering imitation and social network's relevancy in the model is its power to inform identity.

Organizations identify as part of a social network and mimic other organizations that share the same social network identity – independent of any interaction which would facilitate information dissemination. These inter-organizational ties and relationships have been demonstrated to impact social identification and emulation targets (Ashforth and Mael 1989; Geletkanycz, Daliziel, and Jamison 2001; Still and Strang 2009).

These four hypotheses, that organizations imitate other organizations of similar identity, structural characteristics, social standing, and social network, function as the homogenizing force in the identity-constrained isomorphic model. While resource differentials may prevent imitation of an organization who is perceived as too different, it is not the key mechanism underlying the decision to imitate. New institutionalism emphasizes the imitation of superior organizations, particularly in times of environmental uncertainty, to ascertain legitimacy in a field (DiMaggio and Powell 1983). Numerous studies in the field of imitation have shown that organizations copy those who are perceived as successful in the industry (Haveman 1993; Haunschild and Miner 1997; Still and Strang 2009; Asaba And Lieberman 1999). New institutionalism argues mimicking more legitimate organizations is a socially acceptable way to overcome information constraints and doing so can itself confer legitimacy. Organizations believe that following the actions of highly visible organizations will lead to success. Likewise, identity-constrained isomorphism suggests that organizations engage in imitative behavior to better themselves and compare upwards to increase the likelihood of acquiring beneficial behaviors.

H4: *An organization will imitate more prestigious and successful organizations.*

I have predicted that similarities in structural resources, prestige, and identity attributes as well as a shared social network will increase the probability of mimetic behavior. While on the

surface they may appear as four distinct types of variables, they all underlie the same process of identity formation based on salient attributes and cognitive identification with other organizations. Taken together, these hypotheses suggest that an organization would like to imitate the most successful actors in its field but resource limitations lead an organization to imitate those with similar resource levels. Heuristic exclusion processes may prevent the most prestigious organizations in the field from consideration at all. Organizations look to copy the most successful actors in their field so long as they perceive similarity to them. Identity related attributes and an organization's social network determine sameness in addition to structural and reputational resources.

METHODS

In order to test my hypotheses, I will examine the comparison groups of four-year public and private colleges submitted to the Department of Education (DoED) for the purposes of generating a Data Feedback Report (DFR). The DFR provides comparison statistics for the institution based on the list of selected institutions, referred to as a comparison group, that are then used to benchmark performance. These data provide a network of comparison group choices through which I can test my hypotheses on the imitation targets of colleges and universities.

Post-secondary institutions are an excellent population to test my model against competing hypotheses for several reasons. Principally, the strongly institutionalized environment of higher education has a transparent hierarchy and a wide variety of data on the population of organizations. Secondly, universities' struggle to attract students, research funding, and prestige parallel the race for profits and growth in the business world. While the environment, goals, and resources may differ between small businesses, corporations, and higher education, competition

between organizations (and thus inter-organizational comparison) remains constant. Finally, the opaque and multifaceted goals of any given university, particularly when combined with the difficulty in measuring objective outcomes, fosters an environment where institutional reputation and identity demand the attention of top administrators (Gioia and Thomas 1996).

Indeed, all the theories for imitation discussed previously have been applied to universities in the past. The lens of institutional theory and mimetic isomorphism has been employed to explain administrative structure (Tolbert 1985), the targets of retrenchment during budget cuts (Gates 1997), and recycling programs (Lounsbury 2001) to name a few. Furthermore, applications of strategic reference group theory have also proven relevant for explaining university behavior. Brint, Riddle, and Hanneman (2006) demonstrated that reference sets, generated through cluster analysis, closely aligned with the choices of the university for president. Labianca et al. (2001) argue that reference points of higher education administrators are informed by both structural characteristics and more intangible resources such as reputation. The authors find that universities exhibit upward comparisons, that is to say they emulate universities with a stronger reputation than their own, when executing strategic change.

Previous Methodological Hurdles

To generate strategic groups and strategic reference points researchers have traditionally used clustering algorithms. Clustering algorithms partition an industry into subcategories based on similarities and differences in structural attributes and have aided researchers in the previously insurmountable task of comparing large numbers of organizations across many dimensions (Romesburg 2004; Ketchen and Shook 1996). Despite their utility, these algorithms have come under criticism for several reasons. For one, they require that the partitions be set by the

researchers and do not provide any test statistic to inform researchers of the potential fit of such partitions (Wasserman and Faust 1994). Some have argued that these groupings may in fact be artifacts of statistical analysis from random numerical variation rather than real world phenomena (Thomas and Venkatraman 1988) and that clusters may emerge without any intuitive meaning behind them (Barney and Hoskisson 1990). Ketchen and Shook (1996), in a comprehensive review of existing cluster analysis research published in top management journals, find that most studies execute such analysis incorrectly and that the "reliance upon researcher judgment makes the validity of results subject to serious doubts" (453).

Another concern, germane to both strategic groups and new institutional explanations, is a reliance on actual imitative behavior rather than the cognitive process underlying it to test for mimetic targets. By treating adoption of a strategy or program as the outcome behavior, researchers cannot discern between an organizations decision to not imitate and an organizations inability to do such a thing. In the past this has been considered a detriment to isomorphic studies; when studying which investment bankers an organization used as an adviser on acquisitions, Haunschild and Miner (1997) reluctantly admit they assume "that acquiring firms can hire any investment banker they wish" (494). Accounting for resource constraints has proven tricky. As a result, must studies cannot comment on which organizations decision makers would like to imitate.

In response, some researchers have turned instead to using lists of benchmarking peer institutions which are either publically available (Porac, Wade, and Pollock 1999; DiPrete, Eirich, and Pittinsky 2010) or obtained through interviews (Gioia and Thomas 1996; Panagiotou 2007) and surveys (Labianca et al. 2001). All three data sources have associated methodological problems. Public lists may be constructed to appease both internal and external constituents and

consequently may not accurately reflect imitation targets. If an organization is performing poorly it can point to others who are performing even worse to feign success (Elsbach and Kramer 1996). While downward comparisons may be made publically to appease constituents and belie poor performance, the comparisons made by decision makers in the organization to anchor strategy may vary dramatically. Interviews and surveys, on the other hand, are subject to observational biases and in practice have artificially restricted the number of peer selections.

The comparison groups submitted to the DoED provide a uniquely unbiased estimation for the strategic reference group of universities. The groups are used to generate a customized Data Feedback Report (DFR), a report emailed to the chief administrators of the postsecondary institutions which "provides comparison statistics for the institution and a group of similar institutions" for the purpose of benchmarking (National Center for Education Statistics 2016). The comparison groups and the data provided in the DFR are used by institutional research offices and budget and planning offices to see how the college or university is performing against its list of peers and schools can pick up to 100 other institutions. It is not an externally projected list of peers, which can be a group of under-performing institutions to maintain a positive image of the organization for constituents, but rather a list of colleges used for strategic benchmarking by chief administrators in the organization.

Data Preparation

More than 7,500 institutions complete IPEDS surveys each year. This list includes four-year research universities and liberal arts colleges, for-profit institutions, community and vocational schools, and non-degree granting institutions like beauty colleges. To focus my research lens, I chose to examine the population of four-year, degree-granting, not-for-profit institutions. To do

this, I selected the organizations classified as Doctorate-granting Universities, Master's Colleges and Universities, and Baccalaureate Colleges by the 2010 Basic Carnegie Classification of Institutions of Higher Education while excluding for-profit organizations. This query generated a list of 1,546 schools. To further condense the list of four-year colleges and universities I removed an additional 42 schools from the population for one of several reasons.

In one scenario, as was the case with Alliant International University, the school was currently in the process of transforming itself into a for-profit institution. While the school claimed non-profit status at the time of survey submission, it was in the process of becoming a for-profit institution. A second reason a school was omitted from the study was because it is a special focus institution. If a university awards more than 75% of their baccalaureate or higher-level degrees in a particular field the Carnegie Classification considers the school to be a special focus institution. This arbitrary boundary means that a school which awards 74% of their degrees in a single field is included in the data set while a school which awards 75% is excluded. To correct for this imbalance, I removed schools which specialized in a specific field. This included technical colleges like Wentworth Institute of Technology and institutions with a primarily medical focus such as Life University, which serves primarily as a chiropractic institute. The most common reason for exclusion was an overly religious focus. Often these institutions, like Mid-Atlantic Christian University which requires all students to graduate with a Bible major, are accredited by the Association for Biblical Higher Education and function as a Bible college – an institution which prepares students for service in the church. Because these institutions have separate missions and compete for different students than the general population of four-year colleges and universities, I elected to exclude them from the analysis. A school would also have been removed if its peer selection had an overtly international focus. Northern Marianas College,

located in the U.S. territory of the Northern Mariana Islands, is one example. With over 80 percent of their comparison group being located outside the United States, analyzing the rationale behind these selections would be impossible because certain data on international universities are unavailable.

Johnson & Wales University (JWU) is a private four-year college founded in 1914 in Providence, Rhode Island. Currently serving over 16,000 students. In 1992 they opened a campus in North Miami, Florida, a Denver, Colorado campus in 2000, and a campus in Charlotte, North Carolina in 2004. When reporting to the DoED, all four campuses reported the same list of schools, however, only the Providence campus was chosen as a peer by any other school. Unsurprisingly, the institutional research office is located on the Providence campus. To include the peer selections of the other campuses would quadruple count the peer selections of JWU and bias the data. This is the final reason as institutions would be excluded from the data set. Regis College, whilom excluded from the original list, was the one organization added to the population because it was frequently selected in comparison groups.

Of the final list of 1,505 college and universities, 1,104 elected to submit a custom comparison group to the Department of Education. These schools identified 1,733 unique comparison targets and all but 38 of these 1,505 school were selected at least once by an institution as a target of comparison. In total 23,176 comparison targets were identified with a 21 institutions in an average comparison group. While selections of organizations outside the network often complicate social network analysis and can potentially bias the results, only 469 peer selections of the roughly 23,000 choices (2.0%) occurred outside the sampled population network.

Variables

Whether a school was selected as a target of comparison is the behavior to be explained by the different independent variables. This relationship between two schools is dyadic, meaning the object of inquiry is the relationship between two observations (i.e. selection) rather than the characteristics of single observations. Dyadic analysis proves most appropriate when dealing with large quantitative data where the underlying concern is a relation between observations and provides a solid methodological foundation for identifying the underlying organizational attributes driving peer selection (Mizruchi and Marquis 2006) and has been used previously with great success in identifying underlying drivers of mimetic behavior (Guler, Guillen, and Macpherson 2002). Variables used to measure institutional characteristics and resources are divided into four categories: structural resources, prestige, binary identity attributes, and an organization's social network. These four variables code the independent variables driving comparison group selection.

The primary measures for structural resources in this analysis are undergraduate enrollment, the size of the institution's endowment, and the core operating revenue of the organization. All three metrics are measured as full-time equivalent (FTE), which normalizes enrollment between part and full-time students. Because the size of the student body, endowment, and operating revenue vary greatly between organizations, I used a logarithmic transformation to smooth differences. A final structural variable, Basic Carnegie Classification, categorizes the institution into one of 33 groups based primarily upon the type and frequency of degrees awarded (Doctoral, Masters, Baccalaureate, or Associates) while also taking geographical location and size into account. This single measure serves to captures latent structural similarities between institutions without requiring dozens of additional variables in the analysis.

To measure institutional reputation and social status, I used the average ACT score of incoming freshman students, the percent of the undergraduate applicants admitted to an institution, the admissions yield of the undergraduate class, and US News rank. Average ACT score was taken by averaging the 25th percentile and the 75th percentile of the 2013 incoming freshman class because most schools report 1st and 3rd quartiles. If a school did not report an ACT score, but does report an SAT score, then a concordance table was used to convert the SAT score into its ACT equivalent. The percent admitted, also called acceptance rate, indicates both the desirability and competitiveness of an institution. Admissions yield of the undergraduate class refers to the number of individuals who were both admitted and accepted divided by the total number of accepted applicants. These three admissions statistics code for a university's prestige and social standing by operationalizing the desirability and exclusivity of undergraduate admissions.

A final measure of institutional reputation included in the analysis is the 2013 US News and World Report national university and liberal arts rankings. Large amounts of research have been conducted to understand the impact of US News rankings on the behavior of universities. A higher ranking allows schools to accept a lower percentage of its applicants, have a higher admissions yield, and provide substantially less financial aid (Meredith 2004; Monks and Ehrenberg 1999). Previous research has found that a higher US News rank results in higher peer assessment scores for the educational institution, even when controlling for changes in organizational attributes and performance (Bastedo and Bowman 2010). Arizona State University has gone so far as to explicitly tie their president's financial compensation to an improved US News ranking (Jaschik 2007). In addition to the cognitive impact that US News rank may have on a schools choice of emulation targets, the rankings system also captures other

measures of institutional prestige. The rankings are in part determined by a peer assessment survey and high school counselors' ratings, graduation rates and performance, and the class standing of admitted students.

Unfortunately, US News does not rank all four-year colleges and universities on a single list. This analysis only used the "National Liberal Arts" and "National University" rankings – excluding the eight different "Regional" rankings – for two reasons. First, the methodology for determining national rank and regional rank vary across numerous measures. Peer assessment scores have greater weight in the Regional rankings and the institutions providing the scores differs between the National and Regional rankings. For this reason it was impossible to create a composite score to rank all organizations on a single scale. Furthermore, previous research has indicated that for lower tier colleges US News ranking has a substantially smaller impact on admissions outcomes (Bowman and Bastedo 2009). Smaller regional schools recruit a regional student body who face greater financial constraints on average compared to a national top-50 university and their decision to attend a given school is driven primarily by the cost of attendance (Sanoff et al. 2007). As a result, I elected to include two dummy variable indicating whether the college or university was ranked in the National University or National Liberal Arts College rankings.

The third category of variables, identity related attributes, aims to capture important aspects of the college or university independent of financial resources, size, reputation or status. For example, a college may be more likely to select another college if they share the same state. Guam, the Virgin Islands, Puerto Rico, the District of Columbia, and all fifty states are represented in the data set. Additionally, because state may not fully capture the effect of geographical proximity, the analysis also includes the region of a given institution. The schools

were split into 11 regions (New England, Mid East, Great Lakes, Plains, Southeast, Southwest, Rocky Mountain, Far West, Outlying Areas, and US Service Schools) where US Service Schools includes institutions such as the US Military Academy and the US Coast Guard Academy. In addition to geographical location, statistics measuring institutional control (public or private), religious affiliation, whether an institution was founded as a Land Grant university, and whether a college is historically black were also included.

When coding for a university's social network, several options emerged. Past research has examined collegiate consortia, finding that the institution itself forms strong ties between members, fostering increased communication and promoting social learning between them (Kraatz 1998). Network analysis in the past has demonstrated imitative behavior in college consortia with respect towards transitioning from a college to a university (Ozan 2013) and the decision to found professional degree programs (Kraatz 1998). While a university's college consortium does impact its choice of comparison institutions – the University of Michigan submitted the entire 62 school list of the Association of American Universities as its comparison group – these social networks are inappropriate for my analysis. Principally, a university can claim membership in dozens of consortia and its involvement and engagement in any individual consortium is indeterminate. Furthermore, the size, scope, and purpose of different consortia vary by a considerable amount. While library consortia and the IT revolution have overhauled the organizational structure and policies of collegiate libraries (Thornton 2000), their importance in structuring the emulation targets of top administrators is more opaque. A consortium can emerge to address a single issue or can encompass entire campuses and missions (Kaganoff 1998).

In light of these complications, I elected instead to use a school's basketball conference affiliation to account for a school's social network. If a school has a basketball team, they are either a member of the National Association of Intercollegiate Athletics (NAIA) or the National Collegiate Athletic Association (NCAA) and unless independent, are members of a particular conference. 93% of schools report having a basketball team and a typical conference consists of just 7 to 13 other schools. The small list of institutions provides a focused look at the school's social network which should magnify its potential impact on comparison group selection.

While conference affiliation most visibly provides a battleground on which intercollegiate athletic competitions take place, it also creates competition for status, academic standards, and research (Lifschitz, Sauder, and Stevens 2014). Competition taking place on the basketball court may spill over to competition between institutions more broadly. In this way athletics have the power to structure the peer construction schema of university administrators and provide opportunities for interaction between schools strengthening network ties. Not only does athletic conference affiliation create ties between universities, it is often reflective of them by paralleling consortia membership. It is no coincidence that members of the same academic consortium often also claim membership to the same athletic conference. The premier Midwest research university consortium, the Committee on Institutional Cooperation (CIC), counts all BIG10 universities and the University of Chicago as members. When Rutgers University and the University of Maryland joined the athletic conference in 2014 they also joined the academic consortium. In this way conference membership captures the consortium relations without hassle. The principal limitation of such a measure is, given that participating universities exhibit similar academic standing, geographical location, prestige and size with respect to the other members of their

consortia (Sweitzer 2007), determining whether the network itself or common attributes and resources of the member organizations drove comparison group selection becomes muddled.

Table 1. Descriptive Statistics of Independent Variables

	Mean	Std. Dev.	Minimum	Maximum	Unique Values
ACT Score	23.35	3.38	14.5	34	
Percent Admitted	65.27%	18.76%	6%	100%	
Admission Yield	33.16%	15.23%	6%	93%	
Log Revenue	10.03	0.57	8.67	12.85	
Log Endowment	9.46	1.63	2.40	14.24	
Log Enrollment	8.23	1.10	5.42	10.86	
Religious Affiliation					
Religious	61.88%				
Secular	38.12%				
Institutional Control					
Public	38.51%				
Private	61.49%				
Land Grant	5.86%				
Historically Black	3.91%				
USN Ranked University	17.10%				
USN Ranked Liberal Arts	10.78%				
State					53
Region					10
Conference Affiliation					138
Carnegie Classification					10

Using the comparison groups of the remaining colleges and universities, I constructed a 1,023 x 1,023 matrix of peer selections from a random sample of the 1104 schools which report a comparison group. Descriptive statistics for these 1023 schools are reported in Table 1. Whether a school was chosen as a benchmarking target is the dependent variable to be explained in the analysis. The rows in the matrix represent the school performing the selection while each column column is a school which is either being selected as a target of comparison or not. Comparison group selection, Y_{kh}, takes a value of 1 if school K chooses school H as a target of comparison

and a value of 0 otherwise. Both the decision to compare against school H ($Y_{kh} = 1$) and the decision not to compare ($Y_{kh} = 0$) are relevant outcomes so every value in the matrix table is treated as an independent observation. This means the number of observations in the analysis, n, is 1,023 x 1,023 = 1,046,529.

Because the unit of analysis is the dyadic relationship between two schools, I regressed the peer selection matrix on dyadic matrices of structural, social, and identity related attributes. Homophily statistics, X_{kh}, were given 1 if both school K and H shared the same characteristic. Homophily statistics were used to determine whether two universities were in the same region or state, whether both were public or private, whether they were both founded as a land grant university or historically black college, whether they shared the same Carnegie classification, and whether they were both religious or secular. For "National Universities" and "National Liberal Arts Colleges" US News and World Report lists, a school would receive a 1 if it was ranked in either list. The values for US News Rank were not coded as homophily statistics, rather the value of the dummy variable was solely dependent on whether the comparison school was ranked.

When the variable of interest was not demarcated by a binary scale, the non-absolute similarity between the selected school and the selecting school was used, Z_{kh}. This was the case for FTE core operating revenue, FTE endowment, FTE enrollment, percent admitted, admittance yield, and ACT score. If school k had a mean ACT score of 25 and institution h had a mean score of 23, the value of ACT_{kh} would be -2. The difference in ACT scores is a dyadic variable measuring the level of similarity between two schools. I use the non-absolute value because it captures the direction of similarity. According to hypothesis 4, schools should select schools with higher ACT scores higher than their own forgo schools with lower ACT scores.

To test hypotheses 2a and 2b that imitative behavior is bounded by similarity in prestige and structural resources, a measure of similarity alone does not suffice. The linear terms in the regression analysis could be positive, indicating that organizations compare upwards, but cannot say at what point imitation is less likely to occur. In addition to the linear terms, polynomic squared terms were incorporated for all six of the similarity scores to capture the magnitude of change. In the case of ACT_{kh} where the similarity score is -2, the squared term, ACT_{kh}^2, would equal 4. Quadratic terms have been used in the past to detect curvilinear effects in organizational competition, innovation, and imitation models and has succeeded in identifying potential inverted-U-shaped distributions (Haveman 1993; Aghion 2002). If the hypotheses of the model are correct, such that colleges imitate more reputable and resourceful universities but that this mimeticism is at the same time bounded by the level of similarity, there should exist an inverted-U-shaped relationship between the difference in incoming undergraduate ACT scores and the probability of comparison group selection.

Quadratic Assignment

A fundamental problem with regression analysis of social network data is the tendency for interdependence among observations (Krackhardt 1987). Traditional ordinary least squares (OLS) methods for analyzing observations cannot be used to make inferences because the approach relies upon independence among observations. The quadratic assignment procedure (QAP) is one statistical method which enables regression analysis of network data by overcoming traditional hurdles of autocorrelation (Krackhardt 1988). The algorithm used to conduct a QAP multiple regression permutes the matrix of the dependent variables using the same permutation for the rows and columns, maintaining the dependence of attributes in the

same row or column. This process eliminates any correlation between the dependent and independent variables – corresponding to the null hypothesis of independence (Simpson 2001). By repeating the permutation many times (n=1000) and estimating the regression coefficients at each step, QAP generates a distribution of coefficients under the null hypothesis. If the resulting coefficient generated by the standard regression estimation lies at the extremes of the beta distributions generated through QAP then the coefficient is found to be statistically significant. In this manner QAP resolves the dilemma caused be network autocorrelation by providing an unbiased test of regression coefficients (Krackhardt 1988).

When the dependent variable outcome represents a binary distribution of 0 or 1, in this case whether an organization was selected as target of comparison (1) or not (0), standard OLS regressions can be called a linear probability model (LPM). However using OLS estimations of probability distributions has been subject to substantial criticism because any estimations are inevitably heteroscedastic (Horrace and Oaxaco 2005). Furthermore, because the model allows the predicted probability to fall outside the bounds of the dependent variable, it can allow for nonsensical negative probabilities (Liao 1994). To overcome bias in OLS estimates many researchers have turned instead to logistic regression, demonstrating it consistently leads to more accurate estimations of maximum likelihood distributions (Peng, Lee, and Ingersoll 2002; Pohlmann and Leitner 2003). Although until fairly recently QAP analysis was not possible with logistic analysis, subsequent statistical packages and computational resources make executing the permutations possible in logistic analyses (Martin 1999; Simpson 2001), and many researchers have turned to QAP-logit regression analysis to better understand binary network data (see Ingram and Roberts 2000; Brokel and Boschma 2012). Despite these criticisms of LPM as it is generally used, Mizruchi and Stearns (2003) have argued that quadratic assignment

procedure is a non-parametric model and thus linear probability estimations done through QAP may in fact provide unbiased estimations of the probability distribution. Because non-parametric procedures have no requirement that the residuals be normally distributed, the traditional heteroscedasticity concerns of a binary OLS estimation do not apply. Rather than pick one model, I elected to use both a QAP-linear regression and QAP-logit regression to determine the impact of structural and social resources on the likelihood of comparison group selection. The logistic and linear regressions reported nearly identical findings, with the only difference being that the logistic regression reported higher significance levels for two of the variables. Only the logistic model is reported given that it is a more robust method for estimating coefficients.

RESULTS

At first glance, the comparison group selections of four-year public and private not-for-profit college and universities strongly supports the initial hypothesis that organizations compare themselves against legitimate and well-off organizations, but that this comparison is bounded by structural and reputational impediments (Table 2). Of the ten most selected institutions, every school is either ranked within the top 75 of the US News national list or the top 10 of a US News regional list but only one is ranked within the top ten of either national lists (Carleton College: #8 National Liberal Arts Colleges). While schools compare themselves to successful colleges and universities, they estrange selecting the highest status and wealthiest colleges. For comparison, Amherst College and Harvard University are listed below.

Table 2: Most Selected Institutions		
Rank	School	Number of Selections
1.	Carleton College	61
2.	Oberlin College	55
2.	Elon University	55
4.	Davidson College	52
5.	Beloit College	49
6.	Valparaiso University	48
7.	Wheaton College	47
7.	Kenyon College	47
9.	University of Maryland	46
10.	University of Michigan	45
55.	Amherst College	36
230.	Harvard University	25

Schools ranked by the number of times they are selected
as targets of comparison

Results from the QAP-logit regression analysis further credence to the identity-constrained isomorphism model of imitative behavior (Table 3). In the table positive coefficients indicate that a school is more likely to be included in the comparison group and negative coefficients indicate a school is more likely to be included in the reference group. To test hypothesis 1, which posited that an organization will copy actors with similar identity characteristics, I included homophily statistics in the regression controlling for salient identity attributes. All identity characteristics – state, region, religious affiliation, institution control, land-grant, and historically black – had strong, significant, positive coefficients indicating that organizations imitate other organizations who share perceptually important identities. The three strongest predictors of imitative behavior were state homophily, historically black homophily, and institutional control homophily. The religious homophily statistic was surprisingly small (0.547) however this could be attributed to the large number of religious schools and the diversity of religious affiliations. If instead of coding religious affiliation on a binary scale, religion was coded for each individual

religious affiliation (Catholic, Baptist, Methodist, Jewish, etc.) they magnitude of the religious homophily statistic would likely be much larger.

The fourth hypothesis, that organizations imitate more resourceful and prestigious actors in their industry, also met confirmation in the data. With regards to structural characteristics, institutions were more likely to be imitated if they had a larger enrollment, a larger endowment, and greater operating revenue. This is evidenced by positive coefficients for the similarity variables. These results hold when looking at more indicators of prestige and legitimacy. Schools with higher incoming freshman ACT scores were more likely to be imitated as were schools that were ranked on the US News National University and National Liberal Arts College rankings. It is important to note, however, that the findings on US News ranking do not necessarily indicate that placement on the list in and of itself prompted imitation. US News, in this analysis, was also used to index omitted variables from the regression like average class size or professor salary. The only unexpected results were the minimal and counterintuitive impact admissions statistics had on comparison group inclusion.

Table 3: QAP-Logit Regression Results

Dependent Variable: Selection of School H by School K as a Comparison Institution		
Variable	Variable Type	Coefficient
Intercept		-7.1146***
Identity Attributes		
State	Homophily[1]	2.3258***
Region	Homophily	1.1986***
Secular	Homophily	0.6710***
Religious	Homophily	0.5470***
Public	Homophily	2.3096***
Private	Homophily	2.3801***
Land-grant institution	Homophily	0.6886***
Historically black institution	Homophily	1.7667***
Structural Attributes		
Carnegie Classification	Homophily	1.1721***
Enrollment	Similarity[2]	0.2763***
Endowment	Similarity	0.1286***
Revenue	Similarity	0.1831***
Enrollment^2	Squared Similarity[3]	-0.0845***
Endowment^2	Squared Similarity	-0.0265***
Revenue^2	Squared Similarity	-0.0321***
Reputational Attributes		
ACT Scores	Similarity	0.0960***
Percent Admitted	Similarity	-0.0021
Admissions Yield	Similarity	-0.0018*
ACT Scores^2	Squared Similarity	-0.0315***
Percent Admitted^2	Squared Similarity	-0.0002***
Admissions Yield^2	Squared Similarity	-0.0002***
US News National University	Peer Attribute[4]	1.4458***
US News National Liberal Arts	Peer Attribute	0.725***
Social Network		
Conference	Homophily	1.2022***

[1]Homophily takes a value of 1 if both School K and School H share that attribute, otherwise 0

[2]Difference takes $Value_H$ - $Value_K$ for Schools K and H

[3]Squared Difference takes $(Value_H - Value_K)^2$ for Schools K and H

[4]Peer Attribute takes a value of 1 if School H has that attribute, otherwise 0

The percent of undergraduate students admitted was found to be insignificant and similarly the undergraduate admissions yield was found to be very weakly negative. This negative coefficient is particularly surprising because it suggests lower admissions yields, indicating less

desirability and lower prestige, correspond to higher likelihoods of comparison group inclusion. Even with over a million observations the admissions yield coefficient is significant to only the 90th percentile. There are several explanations for these results and I will touch on them briefly.

The principle factor causing these small and insignificant coefficients is the strong regional dependency of the admissions process in determining admissions statistics. With only five four-year colleges in Alaska – one being a Bible College – and the vast geographical distance separating these schools, students have few options when deciding which college to attend. The admissions yield for public colleges in Alaska is around 75%, which normally would indicate a very high level of desirability. On the other hand, because the schools see very few applicants, the percent of applicants admitted is also around 75%. When controlling for state on percent admitted and admissions yield by interacting the terms I found strong statistical significance for both variables. While this narrative explains why the percent of undergraduate students admitted was found to be insignificant, it still does not explain why the dyadic difference in admissions yield has a negative coefficient.

One explanation for why admissions yield might have a weak negative coefficient is that it might not be a good measure of institutional prestige. Not only is the statistic highly regional, it does not correlate well with other predictors of institutional prestige. Table 4 demonstrates that admissions yield has an insignificant correlation with incoming freshman ACT scores and a strong negative correlation with an institution's endowment. If yield was a strong predictor of organizational legitimacy there would be positive correlations between these variables.

Table 4: Correlation Coefficients of Independent Variables

Variable	1.	2.	3.	4.	5.
1. Religious					
2. Private	0.62***				
3. Land Grant	- 0.20***	- 0.30***			
4. Historically Black	- 0.02	- 0.08**	0.21***		
5. Log Enrollment	- 0.46***	- 0.56***	0.32***	- 0.09***	
6. Log Endowment	0.18***	0.51***	0	- 0.10***	- 0.15***
7. Log Revenue	- 0.10***	0.23***	0.15***	- 0.02	0.09***
8. ACT Score	- 0.11***	0.21***	0.028	- 0.35***	0.23***
9. Percent Admitted	0.05*	- 0.18***	0.042	- 0.12***	- 0.02
10. Admittance Yield	- 0.23***	- 0.37***	0.088***	- 0.06*	0.16***
	6.	7.	8.	9.	
7. Log Revenue	0.73***				
8. ACT Score	0.65***	0.70***			
9. Percent Admitted	- 0.38***	- 0.48***	- 0.42***		
10. Admittance Yield	- 0.19***	0.06**	- 0.02	- 0.11***	

Non-binary discrete variable excluded

With the advent of Early Decision applications, a system by which a student applies early and unconditionally attends the college if accepted, college admissions officers had a way to artificially inflate admissions yield (Reingold 2004). By admitting large numbers of students through early decision the college can increase its acceptance yield while simultaneously lowering the percent admitted to the institutions to game college rankings and increase external perception of the desirability of the institution (Machung 1998). Harvard and Stanford University are famously some of the most exclusive colleges in the world and, with admissions yields of 81% and 76% respectively, they are also some of the most desirable. In the admissions yield statistics submitted to the DoED dozens of others institutions reported a higher yield. To name a few, Northwestern Oklahoma State University (82%), University of West Alabama (83%), Touro College (85%), University of Arkansas at Little Rock (88%), Southern University at New Orleans (90%), and the College of the Ozarks (91%) all had higher admissions yields. I do not

mean to disparage any of these colleges and universities when I assert that Harvard and Stanford are both more prestigious and financially secure institutions.

It may be that, while the undergraduate admissions yield and acceptance rate of a given college holds high importance to US News and other external constituents of the organization, they matter substantially less to high level college administrators when choosing emulation targets. With both a high level of manipulation and regional dependency, it appears that the acceptance rate and admissions yield poor measures of institutional prestige and reputation. When looking at comparison choices more broadly it is clear that institutional research officers compare against larger, more desirable, and wealthier universities, as was predicted in hypothesis 4.

Identity-constrained isomorphism also posits that this upward comparison will be bounded by similarity in structural characteristics and social legitimacy (Hypotheses 2a and 2b). To see if the effect is curvilinear, all the dyadic similarity terms of the QAP regression also had a squared term to capture the magnitude of difference. All coefficients for squared terms had significant, negative coefficients. The greater the difference between school K and school H for ACT scores, admissions yield, percent admitted, enrollment, endowment, and revenue, the less likely school K was to select school H as a target of comparison. When combining these results with the positive linear coefficients, it is clear that organizations compare upward, but only to a certain extent.

Finally, sharing the same collegiate athletic basketball conference was also a strong predictor of selection by a given organization. This result supports hypothesis 3 which states that an organization is more likely to imitate actors in its immediate social network. Like other homophily statistics, its positive coefficient demonstrates that sharing an athletic conference

increases the probability of comparison. While not a novel finding, the sheer strength of the coefficient points to importance of interaction and competition when engendering targets of mimicry. Much like the ranking of US News, however, the athletic conference variable carries with it many other independent variables which influence comparison group selection absent from the QAP regression. Not only does the basketball conference homophily statistic capture many of the omitted variables from the analysis, it also captures the omitted interaction terms. The predictive power of network-tie models derive not from any individual variable but from their coalescence. The basketball conference variable merges many of these variables because participating universities exhibit similar academic standing, geographical location, prestige and size with respect to the other members of their conference (Sweitzer 2007). Consequently the analysis cannot say for certain whether an organizations social network fosters imitation, yet given the abundance of literature on the role of network structure and inter-organizational relations on information diffusion and mimetic behavior (Gulati, Nohria, and Zaheer 2000; Greve 1996; Kraatz 1998), it seems likely that the statistical significance of basketball conference affiliation is more than the mirage of omitted variable bias.

Strategic Groups

   Strategic groups theory predicts that organizations imitate other peers of similar size, status, and resources who are concentrated in their strategic grouping in an industry (Reger and Huff 1993). Proponents of this theory argue that an organization's strategic group forms a reference point through which top administrators may compare to inform strategic decision making (Bamberger and Fiegenbaum 1996). The comparison groups submitted to the Department of Education, according to proponents of strategic reference point theory, should reflect the

strategic group in which an organization is embedded. Additionally, the theory predicts that an organization at the top of its strategic group would compare downward and behave conservatively to maintain status in the industry (Fiegenbaum et al. 1996). However, these predictions do not match the empirical findings of this study nor previous research on emulation in academia.

An institutionalized categorization of strategic groups already exists in academia, first published in 1973, called the Carnegie Classification. Based on the level of research activity, geographical location, degree of urbanization, program size and the types and frequency of degrees offered, the schema categorizes colleges and universities into 33 such strategic groupings (The Carnegie Classification of Institutions of Higher Education 2016). Included in the QAP regression analyses, Carnegie Classification homophily was a significant and powerful predictor of comparison group selection, but, it was neither the only significant predictor of emulation targets nor the most predictive. In fact, fewer than half of the comparison group targets were within an organizations own Carnegie Classification. This means that greater than half of the comparison institutions were colleges in different strategic groupings.

Labianica et al. (2001) constructed their own strategic groups of 327 four-year colleges and universities using a clustering algorithm and found that while strategic groups do in some ways predict emulation targets, by focusing solely on structural resources like size and endowment, they neglect the intangible reputational and identity factors which inform comparison. The authors argue that they may understate the important role strong network ties play in fostering imitation.

If an organization strives to change its strategic group, it would make sense for it to imitate organizations outside its current grouping. Indeed, some institutional leaders have made

modifying their Carnegie Classification an explicit objective of the university (McCormick 2000). The argument that an organization compares against their strategic group in some ways precludes this possibility. Fiegenbaum and Thomas (1995), while developing the theory of strategic reference group theory, acknowledge that organizations will look to other organizations beyond their own strategic group if they wish to change their industry position. However the theory itself has difficultly incorporating such behavior into testable hypotheses. These critiques of strategic group theory do not to discredit it entirely. The theory has focused attention scholarly attention to the impact of rivalrous competition on organizational behavior. While applicable in certain instances, the theory does not explain imitative behavior in its multitude of forms and this analysis highlights its deficiencies.

New Institutional Theory

Offering an opposite prescription, several studies grounded in new institutional explanations have argued that actors of larger size, profitability, and status are more likely to be imitated (Haunschild and Miner 1997; Haveman 1993). The new institutionalist account recognizes that an organization's struggles for self-improvement and social legitimacy lead it to copy the behaviors of prestigious and influential organizations in its industry. The findings presented above indicate that organizations imitate more prestigious and financially secure organizations but only to a certain extent. While more prestigious and successful universities are likely to be imitated, *substantially* more prestigious and successful universities are not. These findings are not fundamentally incompatible with new institutionalism, but existing literature does not emphasize how constraining forces can lead to the imitation of small and unsuccessful organizations. Previous research has demonstrated that imitating large and visible organizations

is a good strategy for survival and legitimacy acquisition (Burns and Wholey 1993; Mezias and Land 1994), but this behavior does not always manifest in the data. How could Seattle Pacific University, ranked 15th on the US News and world report Regional University West Rankings, be chosen nearly twice as much as Harvard when their endowment is one 428th Harvard's size and their average incoming freshman ACT score is 8 points lower if schools as a rule imitate the highest status institutions? Much like strategic groups theory, new institutional theory has excelled in documenting and explaining organizational imitation under certain circumstances but alone cannot explain all targets of organizational imitation.

Identity-constrained Isomorphism

Identity-constrained isomorphism argues that organizations imitate more prestigious and successful actors as long as they are recognized as being sufficiently similar in cognitively relevant categories and attributes. Core identities of an industry, in general, serve to constrict the possible list of comparative organizations to those within an industry. In the case of higher education, the essential similarity is the education of post-secondary students; an organization is not considered a college unless it performs this function. This distinction has become institutionalized by the Department of Education. When selecting a comparison group, university administrators can only select other colleges or universities and most likely do not entertain the thought of comparing against other organizations. A college does not compare against laundromats. If asked why it does not do such a thing, the college, perhaps taken aback by the self-evident nature of such a question, might say it is not a laundromat and has nothing to gain from such comparisons. In reality, the thought of benchmarking against the local laundromat never entered the minds of the administrators responsible for generating a comparison list. The

vast majority of organizational forms are excluded from comparison, not because of a conscious, strategic choice of on the role of administrators, but because they are heuristically excluded. This problem solving technique serves to condense the total number of organizations to a cognitively manageable load.

The theory also predicted that other attributes will bind an organization's cognitive identification within sub-industry categories. For my analysis, I elected to exclude two-year primarily associate institutions, vocational programs, special focus colleges, online schools, and for-profit educational organizations. All these characteristics, while not the core attribute which defines whether an organization as a college or university, play a fundamental role in the identity of the organization. Likewise, the identity of a four-year, not-for-profit, non-special focus institution proved salient for the organizations in the analysis – only two percent of comparison selections were schools that did not meet this criterion. Mentally, these attributes may also be taken for granted by university administrators and institutional research officers. When four-year colleges generate their lists of comparison targets they heuristically exclude most community colleges from comparison.

Less dominant identity attributes still were used in the QAP regression analysis to demonstrate the role of identities in comparison group selection. Ownership, geographical location, religious affiliation, and whether a college is historically black or a land-grant institution all successfully explain comparison choices. These attributes further hone the list of schools a college considers comparing itself to. Some of it may be cognitive accessibility; schools compare to other schools with whom they interact. Some of it may be heuristic exclusion. Some of it may be deliberate strategic positioning by top administrators. Regardless, given the shared collective history of black colleges and their shared mission to educate black

youth and propagate black culture, it should come as no surprise that they should be more likely to imitate each other's behavior. Despite its undeniable impact on imitation, existing theories have failed to emphasize how an important organizational identity such as being a historically black college could increase the likelihood of mimicking others who share that identity. Identity-constrained isomorphism, by understanding that perceptions of self and others drive imitative behavior, grounds comparison and mimicry in identity enactment.

Importantly, the results demonstrated that the colleges compare upwards across both structural and social resources, imitating more prestigious and well-off institutions. Previous research has suggested this upward emulation is driven by a desired future image and attempts to execute strategic change (Gioia and Thomas 1996; Labianca et al. 2001). The results also indicate that universities compare upwards only to a certain extent. If a university has substantially more resources, it is not likely to be selected as a target of emulation because its present status exceeds any conceivable future image of the emulating college. Once resource differentials grow too large the college cannot identify with the other organization. This perceptive dissimilarity renders comparison and subsequent imitation impossible.

Resource asymmetries, just like traditional organizational identities, serve to constrain the possible list of comparison organizations to a finite and manageable list of schools. Stanford is one of the preeminent private universities in the nation, yet just the 140th most selected school. The list of institutions selecting Stanford is impressive. The least reputable selecting college according to US News besides Embry-Riddle is Pepperdine University, who still ranks as the 54th best national university in the nation. Stanford has such tremendous financial resources and academic prestige that, unless ranking in the top 50 nationally, other institutions do not attempt to imitate its behavior against it. Perhaps, when a small California university picked its

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benchmarking institutions, the vast gap in resources eliminated Stanford as a target of comparison before any strategic benchmarking occurred. In this way resource asymmetries also facilitate heuristic exclusion just as other identity differences do.

The implications of this point are twofold. One, relative differences determine comparison rather than the absolute values of attributes. Imitation is at its heart a dyadic process of identification and analyses which do not treat the data as such may draw false conclusions. Even when the choices are based on amorphous, immeasurable concepts like social status or image, it is still the relative differences between organizations in these categories which determine mimetic behavior. Second, it reinforces the foundational argument of identity-constrained isomorphism – targets of imitation are bounded by similarity in identities. Concepts of mobility barriers and resource barriers in the management literature emphasize how organizations would like to copy the actions of the largest and most successful organizations in their industry but resource asymmetries prevent successful mimeticism. This analysis of collegiate comparison groups demonstrated that organizations do not compare against those who are substantially more successful irrespective of any potential barriers to imitative behavior. No amount of resource differentials prevent a college from listing Stanford as benchmarking institution or observing their actions. Resource gaps in identity-constrained isomorphism, instead, function to constrain cognitive perceptions of similarity and this process homogenizes potential mimetic targets.

Discussion

The first homogenizing force, driven by heuristic exclusion and social identification, scopes the total possible list of comparable organizations to a tangible list of similar organizations. Heuristic exclusion serves to crop the total number of organizations to a tangible quantity. The

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social identification process occurs with the remaining organizations, whereby the imitator asks if the organization is sufficiently similar to compare against based upon the relevant identities of the organization. If so, then the organization will be a potential imitation target.

The second process works to diversify the total number of potential imitation targets where organizations imitate those whom they wish to be or emulate. The motivation for self-betterment drives the selection of heterogeneous organizations who excel in key attributes. The selection is bounded by the list of organizations generated in the homogenizing process. Actors who are too different will not be considered for comparison. The tension between the two underlying forces of organizational comparison accounts for the large observed differences and predictions in the targets of imitation currently in the field of organizational research. When the pressures for sameness and heuristic exclusion take precedence organizations will compare to others similar to themselves, leading to findings consistent with the strategic groups hypothesis. Yet when these forces are minimized by a desire to execute strategic change or mitigated resource constraints, organizations will look to more successful and legitimate actors in their industry, upholding the predictions of new institutionalism.

The larger and prestigious organizations are most likely to be imitated when there is an opaque hierarchy and when resource differentials are minimized. A common research avenue for imitation within new institutionalism, frequently concluding that larger and more successful organizations are imitated (Haveman 1993; Gentry, Daliziel, and Jamison 2013), is the expansion into new markets. In this scenario the traditional resource differences separating firms are minimized because none of them have an established market presence or a reputation (Fombrun and Shanley 1990). In this situation, traditional neo-institutional explanations of uncertainty and information asymmetries succeed in explaining imitative behavior. Similarities

such as market share, direct competition, and organizational structure, however, still play a key role in determining imitative behaviors in market expansion (Gimeno et al. 2005; Hsieh and Vermeulen 2013).

The conditions under which organizations are most likely to imitate members of their strategic group are in situations in which identity characteristics are strongly engrained or when large resource differences segment the industry. The Scottish Knitwear industry maintained a strong in-group identity which inhibited comparative behavior towards other textile manufactures (Porac et al. 1989). In this situation the identity characteristics became so deeply engrained that the collection of organizations itself came to resemble a sub-industry where the imitative targets of firms closely parallel strategic groups. Likewise differing constituent or environmental forces can narrow imitative targets to similar peers. Medvetz's finding that think tanks mimic the behaviors of other like-minded think tanks exemplifies this behavior (2013). Although identical in structure, conservative and liberal think tanks differ in the audience for their work. An organization identifying as a *conservative* think tank emulates other organizations who share that identity characteristic.

Large resource barriers provide another scenario where organizations are more likely to imitate structurally equivalent peers. Kraatz's analysis of the adoption of professional programs among small liberal arts colleges found that the success of early adopters, rather than their size or prestige, predicted imitation (1998). Rather than demonstrating the irrelevancy of size or prestige in guiding isomorphic behavior, his findings highlight the heavy resource burden in adapting change "more consequential and fundamental than those examined in any previous study of interorganizational network diffusion" (Kraatz 1998:639). Imitation was bound to structurally

similar peers because the resource constraints of adoption were so high and demonstrated success was prerequisite to adoption.

Limitations

While the data used in this analysis overcomes many previous problems with organizational imitation research it still is subject to bias. The institutional research offices responsible for submitting comparison groups for less well-off institutions often are staffed by part-time faculty who lack training in proper benchmarking and comparison group selection (Fuller 2012). As a result, the comparison groups themselves may not accurately represent the emulation targets of high level colleges and university administrators. Secondly, institutional research offices at colleges and universities use multiple types of comparison groups to inform behavior. McLaughlin, Howard, and McLaughlin (2011) note that a small liberal arts college may only need one comparison group but that larger complex institutions require multiple group and identity four such groupings – peer groups, aspirational groups, competitor groups, and predetermined groups. The comparison groups submitted to the Department of Education most likely consist of some amalgamation of all four group types. Third, despite being used primarily for institutional research, the comparison groups are publically available and thus potentially manipulated to anchor constituent opinion of the institution. Although this is a possibility, Randy Swing, the executive director of the Association for Institutional Research, believes that aiming too high will "muddy" data analysis and suggests that most institutional leaders forget that their comparison groups are publically available (Fuller 2012). Finally, inter-organizational comparison serves as a necessary prerequisite to mimicry but the comparison groups themselves do not evidence imitative behavior. Although strategic reference group theory has demonstrated

that reference points anchor imitation targets for organizational strategy and innovation (Fiegenbaum and Thomas 1995) this does not guarantee the colleges selected in the comparison groups are the colleges who would be imitated.

CONCLUSION

Substantial research and scholarly thought has been devoted to the question of organizational imitation. *How* organizations imitate (DiMaggio and Powell 1983; Meyer and Strang 1993; Attewell 1992), *what* they chose to imitate (Havemen 1993; Gimeno et al. 2005), and *why/when* they imitate (Lieberman and Asaba 2006; Banerjee 1992; Gioia and Thomas 1996) have all be subject to extensive theorization and research, yet little attention has been paid to the question of *who* an organization will imitate. This question merits further examination because mimetic behavior in large part drives the evolution of organizational forms and strategies.

Contradictory findings and the fractured nature of scholarly work on the topic have prevented previous attempts at developing a comprehensive theory of imitative behavior (Ordanini et al. 2008). Through the analysis of benchmarking comparison groups of four-year colleges and universities, I demonstrate the central role of identity in determining who organizations choose to imitate. Finding existing theories fundamentally incompatible with the importance of identity, I propose a new model which I term identity-constrained isomorphism. Incorporating existing scholarly research on strategic group theory, resource-based views of the firm, new institutionalism, network theory, information cascade theory, and others into a single predictive model of organizational imitation, it hypothesizes that organizations imitate more legitimate and successful organizations but that this imitation is bounded by perceived similarity. This paper

works to hem a segmented literature base and transition empirical research on the topic away from descriptions of observed behaviors and towards predictive outcomes.

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