

# MODES OF INTERORGANIZATIONAL IMITATION AND THE TRANSFORMATION OF ORGANIZATIONAL POPULATIONS

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## ABSTRACT

This paper explores the possible implications of population-level learning in the evolution of organizational populations by examining the potential influence of modes of interorganizational imitation on the persistence of organization-level change in organizational populations. We use an institutionalized ecology of learning model to develop propositions about the effect of modes of interorganizational imitation on the survival of firms that change. We focus on variables and processes that can have a significant impact on the survival of firms that change, including the diffusion of new, high-performance organizational types, the rate of exit from niches that are becoming overcrowded, the costs of search and change, and endogenous processes of environmental change. We conclude that the mode of imitation that organizations use can have important effects on the transformation of organizational populations.

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What is the role of organization-level change in the evolution of firms and populations of firms? Mezias and Lant (1994) used simulations to demonstrate that a significant proportion of firms that imitate other firms will survive under a broad set of conditions. They concluded that this called into question claims that organizational level change does not affect characteristics of the population significantly (Hannan & Freeman, 1984). Haunschild and Miner (1997, p. 497) interpreted Mezias and Lant's results to suggest that "organizational learning may be a rather complex process influenced by multiple contingencies." Although they implied that different modes of imitation may be one of the important contingencies, they did not discuss how or why this might unfold. In this paper, we argue that different imitation rules may result in different outcomes over time, with differential impacts on the transformation of populations of organizations.

In distinguishing among types of imitation, we begin with the categories developed by Haunschild and Miner (1997) in a study of the use of investment bankers as advisors on acquisitions. While the categories of imitation they studied were driven by market-based criteria, they suggested that the categories of imitation may be generalizable and gave examples of how different imitation modes might be used by a printing firm. This hypothetical firm might engage in frequency imitation of accounting practices, trait imitation of the ordering practices of a large firm, and outcome imitation of the press operation practices of the fastest firm (Haunschild & Miner, 1997, p. 496). They also speculated about the implications of their study, noting the importance of "the simultaneous existence of multiple modes of imitation whose strength varies with context. The study underscores imitation's nuanced and potentially complex role in organizational and population-level transformation." We interpret this conclusion as suggesting that it would be useful to examine the role of modes of interorganizational imitation as a form of population-level transformation and learning. We do so here by examining the potential influence of modes of interorganizational imitation on the characteristics of an organizational population.

We use and extend the model of an institutionally informed ecology of learning developed by Mezias and Lant (1994), beginning with the variables that they found to have a significant effect on the viability of imitative change. These included environmental carrying capacity, the costs of search and change for imitative firms, the probability of environmental change, and the gain, or magnitude of environmental change. We extend their model by going beyond the single form of interorganizational imitation that they considered, a trait-based algorithm of copying the largest firm, to examine the effect of three modes of interorganizational imitation: frequency-based, trait-based, and outcome-based.

## AN INSTITUTIONALLY INFORMED ECOLOGY OF LEARNING

A combination of organizational ecology, institutional, and organizational learning theories can offer a balanced perspective on the role of organizational-level change in the evolution of organizational populations (Fombrun, 1988; Mezas & Lant, 1994). Combining perspectives offers a more realistic picture of the evolution of organizational populations (Mezas & Lant, 1994; Fombrun, 1988; Singh & Lumsden, 1990). Further, combinations of perspectives have offered valuable insights in previous literature (e.g., Singh, House, & Tucker, 1986; Tucker, Singh, & Meinhard, 1990).

Successful organizational adaptation is more difficult and costly under conditions of ambiguity and environmental uncertainty (March, 1981; Hannan & Freeman, 1984). Organizations may exchange institutional for technical routines in the face of such environmental uncertainty (Meyer, Scott, & Deal, 1983) because institutional mimetic routines may alleviate the possible disadvantage of organizational change. For this reason, we use a model of an institutionally informed ecology of learning. We use the term *ecology* because we are interested in modeling populations of organizations, and *learning*, since each organization is an adaptive learning system (Mezas & Lant, 1994). Further, we assume that several core dimensions characterize an organization and that organizational change represents a change in one or more of the core dimensions of an organization (Hannan & Freeman, 1984; Tushman & Romanelli, 1985).

As an ecology, the economy or environmental system sustaining a population of organizations has some carrying capacity or number of competing firms (e.g., density) that can be sustained by the environment. As the carrying capacity of the environment increases, more firms can be sustained or, in the event of no new entrants, the competition among existing firms decreases. If the population density increases more rapidly than the environmental carrying capacity, then competition becomes more intense among existing firms.

Some level of environmental ambiguity also characterizes environmental systems. Environmental ambiguity in a population may cloud the underlying relationship between individual organizational core features and organizational performance (March & Olsen, 1976). Ambiguity differentially affects organizations in a population in assessing actual performance levels (Lant & Mezas, 1990; March, 1988; Mezas & Lant, 1994). The greater the level of ambiguity, the more likely that organizations may experience errors in organizational processes such as search or change.

Environmental changes may affect populations of organizations as a result of both the frequencies at which those changes take place and the level of gain or magnitude of those changes (Mezas & Lant, 1994). Fine-grained environments entail changes of comparatively small magnitude, while coarse-grained

environments entail changes of relatively large magnitude (Freeman & Hannan, 1983; Hannan & Freeman, 1977). Both the independent effects and the interaction of the frequency and the magnitude of environmental change characterize the dynamics of change in a population's environment.

We view individual firms as organizational learning systems and use an organizational learning perspective to model the changes of individual organizations within a population (Mezias & Eisner, 1997; Mezias & Glynn, 1993; Mezias & Lant, 1994). Elaborating the organizational model allows for a more complete consideration of the role of individual organizational level actions in the evolution of organizational populations.

### Organizations as Adaptive Learning Systems

The organizations in this ecology carry out mimetic processes by learning from experience as "routine-based, history-dependent, and target oriented" systems (Levitt & March, 1988, p. 319). Organizations act as aspiration-level adapters, comparing current performance to an object or aspiration level. Organizations decide on the amount of scanning or search they will execute based on whether their actual performance is above or below their target level, because search is costly (Cyert & March, 1963; Nelson & Winter, 1982; Payne, Laughunn, & Crum, 1980). Organizational performance above or below the target level influences the prospect of organizational change. Changes to the core features of organizations are more likely when organizational performance is below the target level (Cyert & March, 1963; Levitt & March, 1988; March & Simon, 1958). An adaptive organizational learning model suggests a system in which an organization is more likely to change when its performance is below its target level, and the outcome of the search an organization conducts will determine the substance of the change.

While it is not impossible for an adaptive organization with a performance level above its target level to change a core feature of the organization, it is considerably less likely (Cyert & March, 1963; Levinthal & March, 1981). Organizations with performance levels above their targets may engage in opportunistic searches that sporadically result in the discovery of good occasions to contemplate organizational change (Cyert & March, 1963). For an adaptive organization with performance below the target level, the likelihood of organizational change is an increasing function of the difference between actual and target performance levels (Cyert & March, 1963; Mezias, 1988; Mezias & Lant, 1994).

### Search and Change

The organizational search process is the examination of novel or alternative modes of operating an organization. Ecological and institutional perspectives reveal two possible types of search: (1) search at founding of the organization and

(2) search during the operating lifetime of the organization (Mezias & Lant, 1994). Search at the inception of an organization is assumed to have one of two possible main effects on the variety of organizational forms in a population. According to Hannan and Freeman (1987, p. 911), "Some foundings initiate an entirely new form and thus contribute qualitatively to the diversity of organizational forms in society. Most foundings replicate an existing [organizational] form and contribute quantitatively to diversity." Thus, search at founding may either create a new organizational form or replicate an existing form in a population.

The second type of organizational search is conducted after the organization is in operation. The rules of this type of stochastic search are derived from both the ecological and institutional perspectives. First, following the ecological or selection perspective, some organizations that have just undergone their initial foundings experience inertial forces that make them structurally rigid: "These organizations follow a fixed strategy and do not search or change at any time after founding" (Mezias & Lant, 1994). Second, following the institutional perspective, some organizations may follow a strategy of imitation. These organizations scan for information from their environment, acquiring "information about environments with which they then imitate competitors" (Fombrun, 1988, p. 227). Mezias and Lant (1994) suggested a model in which "there is a non-zero probability mimetic firms will change their core features so as to become more similar to [their] industry leader[s]." We extend Mezias and Lant's (1994) model to include three broad categories of mimetic behaviors that correspond with the three modes of interorganizational imitation studied by Haunschild and Miner (1997).

Neither search nor change is without costs in organizations (Hannan & Freeman, 1984). Following a learning perspective, both organizational search and organizational change become less costly over time with experience. Organizations with experience at a particular type of search process may incur lower costs associated with those activities than organizations without experience. As organizations gain more and more experience with a particular type of organizational search or change, their costs may be a stochastically decreasing function of experience.

### *Modes of Imitation*

Copycats come in many varieties and accomplish this most "sincere form of organizational flattery" in a number of different ways. Organizational imitation is also an institutional process by which firms seek legitimization (DiMaggio & Powell, 1983). Haunschild and Miner (1997) put forth three basic modes of organizational imitation: frequency-based imitation, trait-based imitation, and outcome-based imitation. Frequency-based imitation describes organizations carrying out practices used by a large number of firms; trait-based imitation describes organizations borrowing mannerisms of organizations with particular traits, such as large size or centrality in networks; outcome-based imitation describes

imitating the processes that appeared to generate specific successful outcomes in other organizations.

## **MODES OF IMITATION AND THE TRANSFORMATION OF POPULATIONS**

There are many ways that modes of imitation could affect the rates and extent of change in organizational populations (Mezias & Lant, 1994). First, modes of imitation might affect how a population approaches its carrying capacity. This involves both the rate at which new forms diffuse, so as to gain the advantages of legitimacy, and how quickly firms recognize increasing competition and leave niches that are becoming overcrowded. Second, there may be relationships between modes of imitation and the costs of search and change. Finally, different modes of interorganizational imitation are likely to affect whether the distribution of forms is likely to change over time, which is related to the endogenous component of environmental change. Especially important in this regard is whether particular modes of interorganizational imitation are likely to lead to more or less frequent change and change that is more or less extreme.

### *Modes of Imitation and Carrying Capacity*

A major concern in the evolution of new forms of organization has been understanding the process by which new and superior forms of organization diffuse. One way of thinking about this problem from an evolutionary perspective is to consider the role of carrying capacity. The question then becomes, How quickly can the diffusion of a new and superior form of organization approach the carrying capacity of the environment? Ecological accounts of the relationship between the number of firms and the survival of firms suggest that there are systematic relationships between mortality, that is, the failure of firms to obtain resources from the environment to ensure survival, and density, or the number of firms in the population. First, at low levels of density, increases in the number of firms are beneficial to survival (Hannan & Carroll, 1992), because they enhance the ability of firms to obtain resources from the environment necessary for survival. In terms of carrying capacity, this is consistent with the claim that the carrying capacity of the environment is enhanced by increases in the numbers of a particular organizational form when numbers are low. For example, when the numbers of a new organizational form, say, a provider of Internet access services, are low, initial increases in organizations of this form increase their legitimacy (Hannan & Carroll, 1992).

Second, at higher levels of density, continuing increases in the number of organizations of a particular form are detrimental to survival. Regardless of the effect on legitimacy of a form because of a continuing increase in its numbers, higher

numbers eventually lead to competition for resources. Beyond the point at which competition begins, further increases in the number of organizations of a given form increase the probability of organizational death in the population as a whole. In terms of carrying capacity, this is consistent with the claim that the carrying capacity of the environment is exhausted by the competitive effect of high levels of density. Given this framework, we can explore how different modes of interorganizational imitation might affect the carrying capacity of environments at low and high levels of density.

The question of how modes of interorganizational imitation will affect the diffusion of a new, high-performance organizational form can be answered by exploring the assumptions inherent in the framework for distinguishing among different modes. One characteristic of a form with low density is that its frequency in the population will be quite low; thus, it is hardly controversial to observe that frequency-based imitation will result in slow adoption of an emerging organizational form.

We assume that imitated traits change slowly. If so, it is unlikely that trait-based imitation will result in the rapid diffusion of a new organizational form. Thus, like frequency imitation, trait-based imitation will result in slow diffusion of a new high-performance organizational form. For either trait or frequency imitation, the enhancement of the carrying capacity resulting from increases in density at low levels is likely to be achieved very slowly. By contrast, outcome-based imitation has the potential to diffuse new, high-performance organizational forms much more quickly. To the extent that a new form achieves outcomes that are perceived as worthy of imitation, a mode of interorganizational imitation based on observed outcomes can result in rapid diffusion of an emerging organizational form:

**Proposition 1.** Outcome-based imitation will result in the most rapid diffusion of new high-performance organizational forms. Trait-based imitation and frequency-based imitation will result in slower diffusion.

The relationship between perceived outcomes and the worthiness of imitating the firm achieving the outcomes is important to proposition 1. By assuming that organizations operate in ecologies of learning characterized by some level of ambiguity, we have imposed the constraint that the relationship between firm characteristics and performance is characterized by some level of noise. Thus, firms with similar characteristics may achieve different levels of performance. Further, the relationship between performance achieved and the characteristics of the firm is not a one-to-one mapping (Lant & Mezias, 1992; Levinthal & March, 1981; Mezias & Glynn, 1993). As long as the signal exceeds the noise in the relationship between firm characteristics and performance, then the first proposition should hold. As the level of ambiguity increases and the quality of the signal about the worthiness of imitating the characteristics given by a firm's performance deteriorates, however, an outcome-based imitation rule is more likely to

lead to errors and much less likely to converge rapidly on a single high-performance organizational form (Lant & Mezias, 1990, 1992). In this case, diffusion will be slowed and will most likely result only if a trait-based imitation rule can reveal high-performance types despite the ambiguity. For example, the continued growth of a firm or firms of the new form reveals the signal buried beneath the noise. At that point, a trait-based imitation rule based on size will result in rapid diffusion of the new form. Similarly, the expanding exchange relations of a new high-performance firm might eventually lead to its interorganizational ties becoming so dense that it is imitated because of its centrality.

**Proposition 2.** Under conditions of high ambiguity, trait-based imitation is more likely than outcome-based imitation or frequency-based imitation to result in the diffusion of a new high-performance organizational form.

The other part of the story of the relationship between modes of interorganizational imitation and the carrying capacity of the organizational environment concerns the ability of firms to avoid the detrimental effects of competition at high levels of density. Firms do not want to adopt forms that are so numerous that the intense competition associated with high levels of density will decrease their ability to obtain needed resources from the environment. It seems clear that at high levels of density, a frequency mode of imitation is unlikely to diffuse an organizational form. Moreover, as numerous organizations adopt a particular form, organizations may have greater difficulty distinguishing themselves in the marketplace. Similarly, since many traits, such as being the largest organization or the most central, normally change fairly slowly, a trait-based imitation rule is not likely to help organizations avoid an overcrowded niche. As with the discovery of a new organizational form, an outcome-based imitation rule is the mode of interorganizational imitation that is most likely to reveal that a niche is becoming overcrowded:

**Proposition 3.** Outcome-based imitation is more likely than trait-based imitation or frequency-based imitation to result in exit from competitive niches.

Once again, the level of ambiguity will affect the reliability of negative performance as a signal of the need to exit a niche because of increasing competition. At low to moderate levels of ambiguity, we expect the above proposition to hold. As the level of ambiguity increases, the quality of the performance signal deteriorates. At high levels of ambiguity, the ability of an outcome-based imitation rule to signal organizations to exit competitive niches on a timely basis is reduced (Lant & Mezias, 1990, 1992). Under these conditions, an outcome-based imitation rule is more likely to lead to errors. Exit from the niche will be slowed, and exit en masse from a competitive niche may never occur as it does under



conditions of low ambiguity. By contrast, high levels of ambiguity may not have the same effect on trait-based imitation rules. For example, size can be considered the result of multiple performance observations that will be less affected by ambiguity than the single observations of an outcome-imitation rule. Similarly, being the most central firm in a population may be relatively unaffected by ambiguity, because as firms form ties with frequent exchange partners regardless of the level of variation in their performance from period to period.

**Proposition 4.** Under conditions of high ambiguity, trait-based imitation will be more likely than frequency-based imitation or outcome-based imitation to induce exit from competitive niches.

In summary, with respect to the rapid diffusion of a new, high-performance organizational form, frequency-based imitation should always be slow. In general, a frequency-based imitation rule will not result in rapid diffusion of any form until it becomes very frequent in the population. While the precise rate at which frequency-based imitation will take off is not necessarily clear and may vary across populations, it is clear that infrequent forms are not likely to be imitated under such a rule because there are few examples of this organizational form to imitate, so rapid diffusion would not occur. Similarly, with respect to exit from a crowded niche, frequency-based imitation will also be slow because there are too many organizations of the form that is imitated, so timely exit from an overcrowded niche does not occur. For example, the intense competition among manufacturers of personal computers based on the WINTEL operating system is likely to affect those firms that follow a frequency-based imitation rule. With low to moderate levels of ambiguity, the best mode of interorganizational imitation for both the diffusion of new high-performance organizational forms and timely exit from overcrowded niches is by outcome. With very high ambiguity, however, the high level of noise contained in performance signals can lead to many mistakes using an outcome-based mode of interorganizational imitation. At the extreme, the advantages of outcome-based imitation both in quick discovery of high-performance new organizational forms and timely exit from niches that are becoming overcrowded disappear. Diffusion will be slower but, ultimately, is more likely to occur as a result of trait imitation.

### Modes of Imitation and the Costs of Search and Change

Haunschild and Miner (1997) hinted at the relationship between imitation and the costs of search and change in their concluding discussion. Comparing their findings with others' on the question of learning after founding, they observed that "factors that increase the cost of organizational change constrain vicarious learning to the time of founding" (p. 497). In other words, under conditions of costly change, the viability of organizational change driven by imitation is

reduced. A parallel argument can be made about the costs of search: factors that increase the cost of search constrain the viability of organizational change driven by imitation. This is exactly what Mezias and Lant (1994) found: the survival of firms capable of trait-based imitation was reduced by increases in the costs of search and change. Here, we explore some possible mechanisms by which these liabilities of search (Mezias & Lant, 1994) and change (Hannan & Freeman, 1984) occur by developing propositions concerning modes of interorganizational imitation.

We believe that there are systematic differences in the costs of search according to the mode of interorganizational imitation being used. Typically, evolutionary and ecological models of firms have assumed that the characteristics that distinguish organizational forms are observable; for example, it is quite easy to distinguish a producer of short films from a producer of feature-length films (Mezias & Kuperman, 1998). This implies that frequency search, to discover which organizational forms are most frequent in the population, should not be too costly. In fact, the knowledge required to answer the question of whether there are more companies that produce short films or that produce feature-length films may be widely shared social knowledge. Similarly, we assume that large size and centrality in networks are observable. It may be less likely that precise knowledge of which firms are largest or most central is generally known precisely; however, we assume that the costs of the search required to obtain this information in sufficient detail to guide interorganizational imitation will be low. Once again, this implies that trait-based search, to discover large or central organizations, should not be too costly. Thus, other things being equal, we expect that the cost of search associated with frequency-based imitation will be lowest, and the costs of search associated with trait-based imitation will be relatively low as well.

With respect to outcome-based imitation, the institutionalized ecology of learning model would lead to the opposite argument. First, to discover good outcomes to imitate, the outcomes and organizational forms of a large number of firms will need to be observed. Some of this information may become known as part of the development of general social information; for example, the reputations of firms may be associated with the outcomes they have achieved (Fombrun, 1988). But it still may be costly to get a more complete reading of information on outcomes for various organizational forms. More significantly, the model of institutionalized ecologies of learning suggests that the relationship between organizational forms and performance is characterized by ambiguity. Firms may not accurately reveal, or even know, their true performance; as a result, the monitoring of performance that is the basis of outcome-based imitation will be difficult and prone to error:

**Proposition 5.** The cost of search associated with outcome-based imitation will be relatively high compared with that associated with frequency-based imitation and trait-based imitation.

With respect to the costs of change, our arguments concerning modes of interorganizational imitation are based on the assumption that the costs of adopting an organizational form decrease with the frequency of that form. In the extreme, an organizational form can become so widespread and well understood that, in the words of Meyer and Rowan (1977, p. 344), its building blocks “come to be littered around the social landscape.” As a range of coercive, normative, and mimetic pressures to adopt an organizational form increase with its prevalence (DiMaggio & Powell, 1983), responding to these pressures by adopting the form becomes a managerial imperative. Organizations and professionals will work together to come to common solutions and adopt forms that reduce the costs of compliance with these legalistic imperatives (Edelman & Suchman, 1997). An example is the multidivisional form. University professors will do research and teaching that familiarizes their audiences with the form as it becomes more common. Executives serving on boards become increasingly likely to obtain direct experience in dealing with organizations using this form. Personnel professionals are likely to develop solutions to human resource management problems that arise under this form of organization. Legal professionals are likely to develop common solutions for conforming to legislative, executive, and judicial decrees. Other things being equal, all of these efforts will decrease the cost of changing organizations to adopt the traits of a multidivisional form. The clearest implication of this argument is that the costs of change associated with a frequency-based mode of interorganizational imitation are likely to be low. Similarly, to the extent that the form of central or large firms contributes social information that results in similar cognitive processes in a great variety of institutions at various levels of analysis in an ecology of learning, trait-based imitation will also be associated with fairly low costs of change:

**Proposition 6.** The costs of implementing change associated with frequency-based and trait-based modes of interorganizational imitation will be relatively low compared with those associated with outcome-based imitation.

By contrast, the assumption that there is ambiguity in the relationship between the traits of firms and their performance implies that an outcome-based mode of interorganizational imitation is unlikely to lead to widespread, long-term adoption of single organizational forms. Early on in the history of the emergence of a new form, outcome-based imitation is likely to lead to first or early movement to a new type, as we proposed in proposition 1. Later, as a form becomes more common and competition begins to reduce the performance of that form, outcome-based imitation is most likely to lead to exit from that form. In both cases, the reduction in the cost of change associated with more frequently observed organizational forms, discussed above, is not likely to have occurred. As a result, the costs of change associated with an outcome-based mode of interorganizational imitation

are likely to be high. In addition, as the level of ambiguity increases, the likelihood that an outcome-based model of interorganizational imitation will lead to unnecessary and ill-advised change increases. Thus, the costs of change borne by firms following an outcome-based mode of interorganizational imitation are likely to be even greater as the level of ambiguity increases:

**Proposition 7.** The costs of implementing change associated with an outcome-based mode of interorganizational imitation are likely to be high and will increase with the level of ambiguity.

### Modes of Imitation and Environmental Change

According to open systems theories of organizations the struggle to obtain the resources necessary for survival from the external environment is a key function of organizations (Lawrence & Lorsch, 1967; Thompson, 1967). Ecological and evolutionary theories are based on the assumption that the ability of firms of different forms to obtain resources is mediated by the external environment. This assumption is also shared by the institutionalized ecology of learning model developed by Mezias and Lant (1994), which, in the tradition of most ecological and evolutionary models, treated the external environment as largely exogenous. At the same time, there is strong empirical evidence that the ability to obtain resources is affected by density, which is determined, at least in part, by the decisions of firms to adopt different organizational forms. Thus, at least part of the relationship between firm characteristics and performance will be determined endogenously. Using a model of organizations as learning systems, Mezias and Eisner (1997) explicitly incorporated competition that increased with the number of firms of a given form. The underlying assumption is that the environmental mapping from firm characteristics to performance can be affected by the choices that firms make about forms. Thus, the ability of firms of particular forms to obtain necessary resources from the environment can be seen as having both an endogenous and exogenous component. Our discussion of the relationship between interorganizational imitation and environmental change focuses on how the decisions of individual firms to imitate might affect the ability of firms of particular forms to obtain necessary resources from the environment.

In the discussion of carrying capacity, we have already developed some ideas about the relationship between modes of interorganizational imitation and the discoveries of new high-performance organizational forms and emerging competition. Here, we discuss how the collection of the decisions to change organizational form that results from different modes of interorganizational imitation may affect the frequency and magnitude of endogenous environmental change. The logic generalizes the arguments developed in the context of identifying both new high-performance organizational forms and intensifying competition.

As we have argued, organizations using the frequency-based mode of imitation are slow to discover new organizational forms because there are few of this form to be imitated. Generally, given inertia in organizational type, frequency-based imitation will be unlikely to lead to change in the distribution of forms in the environment. Thus, frequency-based imitation is likely to lead to long periods with little or no change in the distribution of organizational forms in the environment. Change will only occur when there is a large shift in the distribution of organizational forms, which the assumption of inertia implies will be a relatively rare event. But frequency-based imitation driven by population change is also likely to be a threshold event, with episodes of change being rapid and widespread when they do occur. For example, Chandler (1977) can be interpreted as suggesting that the long dominance of the hierarchical form for large firms ended with a relatively rapid shift to the multidivisional form. Similarly, as long as the traits being imitated, such as the largest firm or the most central firm, change fairly slowly, we expect the same result. Trait-based imitation will result in long periods of stability punctuated by short periods of rapid shifts in the distribution of organizational forms in the population:

**Proposition 8.** Both frequency and trait-based imitation will result in long periods of stability in the distribution of organizational forms, punctuated by short periods of rapid and large-scale change in the distribution of organizational forms.

In contrast, the outcome-based mode of interorganizational imitation, as we have argued, is more likely to lead to the diffusion of new high-performance organizational forms. It is also more likely to lead to the discovery of intensifying competition and the need to exit from a niche that is becoming more crowded. Further, as the level of ambiguity increases, the probability that a firm following an outcome-based mode of imitation will perceive the opportunity to move to a higher-performance organizational form will increase. Thus, we would expect change in the mix of organizational forms in the population to be more frequent under an outcome-based mode of interorganizational imitation. At the same time, because the propensity to herd into crowded niches is tempered by an outcome-based imitation rule, we would not expect the extreme changes under an outcome-based rule that we would observe under a frequency-based or trait-based imitation mode. As firms crowd to adopt an organizational form that has achieved good outcomes, subsequent outcomes for this form will be diminished by competition. As a result, firms following an outcome-based rule in subsequent periods will be less likely to adopt a form of organization that will move them into a crowded niche.

**Proposition 9.** Outcome-based imitation will result in more frequent change in the mix of organizational forms in the population, but the magnitude of these changes will tend to be more modest than those that occur under frequency-based or trait-based modes of interorganizational imitation.

## DISCUSSION AND IMPLICATIONS

We began with an interest in how population-level learning might affect the evolution of organizational populations. To gain closure on this broad question, we turned our attention to modes of interorganizational imitation as mechanisms of population-level learning. Further, by linking our framework with Mezias and Lant's (1994) institutionalized ecology of learning model, we also cast this study in terms of the rapprochement of institutional and selection perspectives (Singh & Lumsden, 1990). From this perspective, the important work to be done involves deepening our understanding of the implications for the evolution of organizations and populations of organizations of the interactions of various imitation strategies and selection pressures. We believe that our propositions offer some preliminary insights into this question. Haunschild and Miner (1997, p. 497), in their empirical study of the roles of imitation, concluded that they had found evidence for "the simultaneous existence of multiple modes of imitation whose strength varies with context. The study underscores imitation's nuanced and potentially complex role in organizational and population-level transformation."

We concur and believe that our study highlights the complex role of a mix of modes of interorganizational imitation in population-level transformation. The propositions put forth in this chapter specifically address several mechanisms by which modes of imitation can affect populations of organizations. These are summarized in Table 1. The mechanisms we discussed were derived from Mezias and Lant's (1994) results, which suggested that the carrying capacity, the costs of search and change, and environmental change are all important variables in understanding the viability of imitative search and change. A brief review of the effects of modes of interorganizational imitation on these variables, as suggested by the propositions, begins to illustrate how complex the effects of imitation might be.

We began with Mezias and Lant's (1994) finding that higher levels of carrying capacity enhanced the survival of imitating firms. Then we interpreted the existing evidence to suggest that the carrying capacity of the environment is enhanced by additional adoptions of a form when its density is low. Based on this, we suggested that the ability of a given imitation mode to lead to additional adoptions of a form when its density is low could affect the survival of imitative firms. It was our claim that outcome-based imitation would be the most likely mode of imitation to lead to increases in density at low levels; thus, outcome-based imitation would enhance the survival of imitative firms. Further, existing evidence can be interpreted to suggest that as density increases, the carrying capacity of the environment is approached, and competition becomes more intense. Mezias and Lant's (1994) results suggest that this will reduce the viability of imitative firms. Once again, we argued that an outcome-based mode of imitation would be most likely to lead organizations to notice the reduced performance resulting from this emerging competition. This mode would be the most likely to lead an

**Table 1.** Summary of the Effects of Modes of Imitation on Populations of Organizations

	<i>Frequency-based Imitation</i>	<i>Trait-based Imitation</i>	<i>Outcome-based Imitation</i>
Carrying Capacity	Slower diffusion of new organizational forms	Slower diffusion of new organizational forms	Faster diffusion of new organizational forms
Cost of search	Lower cost	Lower cost	Higher cost
Cost of change	Lower cost	Lower cost	Higher cost
Effects of the probability of environmental change	Lower probability of change	Lower probability of change	Higher probability of change
Effects of the magnitude of environmental change	Larger magnitude of change	Larger magnitude of change	Smaller magnitude of change

organization to discover an alternate form and lead it to exit from a crowded niche. Both frequency-based and trait-based imitation would be much less likely to lead to migration to a new form at low levels of density or to exit from a crowded niche as density increases.

These predictions change at high levels of ambiguity. Our claim was that the ability of the outcome-based mode of imitation to reveal high-performing forms, including new ones, is reduced by ambiguity. As a result, the survival advantage of the outcome-based mode in leading to quick increases in density at low levels and quick recognition and exit from a niche as density and competition increase is reduced. The signal of the viability of a form that is embedded in traits like large size or centrality will be more reliable than the signal conveyed by outcomes.

We next turned our attention to the costs of search and change, which Mezias and Lant (1994) found reduced the viability of imitation. With respect to the cost of search, we argued that the information required for frequency-based or trait-based imitation was likely to result in lower search costs than that required for outcome-based imitation. This cost disadvantage for outcome-based imitation is likely to worsen as the level of ambiguity increases. With respect to the cost of change, we argued that the more common an organizational form, the lower would be the costs to a firm that changed to that form. It follows directly from this that the frequency-based mode would have the lowest costs of change. Similarly, since trait-based imitation is likely to lead to convergence on a form of organization with a particular trait, say, the largest or most central organization, it is likely to lead to convergence on a form. As the frequency of this form increases, the cost to firms of changing to that form decreases. Thus, a trait-based imitation mode would also have relatively low costs of change. By contrast, an outcome-based mode of imitation would be less likely to lead to convergence on single forms. Further, as the level of ambiguity increases, the number of mistakes that firms pursuing an outcome-based mode of imitation would make would also increase.

Thus, we argued that an outcome-based mode of imitation would reduce the viability of imitation by resulting in higher costs of search and change.

With respect to both the frequency and magnitude of environmental change, Mezias and Lant's (1994) results are somewhat more complex. The viability of imitation is enhanced by very frequent change and, to a lesser extent, by very infrequent change. In addition, the viability of imitation is enhanced by a very high magnitude of change and, to a lesser extent, by a very low magnitude of change. In our propositions we argued that all three modes of interorganizational imitation could enhance the viability of imitation by affecting endogenous environmental change, but the mechanisms by which they might do this differ. We argued that both frequency-based and trait-based modes of imitation would lead to infrequent change but a high magnitude of change. In contrast, an outcome-based mode of imitation would lead to more frequent but lower-magnitude environmental change.

We conclude that the mode of imitation that organizations use can have important effects on the shape of an organizational population. Whether organizations use frequency-based, trait-based, or outcome-based imitation can have far-reaching effects. The mode of interorganizational imitation used can affect the diffusion of organizational forms, entry into and exit from competitive niches, the cost of organizational search and change, and the stability of the distribution of organizational forms. Haunschild and Miner (1997, p. 497) interpreted their results to suggest that "organizational learning may be a rather complex process influenced by multiple contingencies." We echo their statement in our most confident conclusion: students of organizations need to understand the powerful interplay between competitive forces and the mode and level of imitation in populations of organizations. Further research that explores the effects on organizational populations of various modes of interorganizational imitation should be one route for developing the understanding of these complex organization and population-level dynamics among both researchers and practitioners.

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