ORGANIZATIONAL PROCESSES OF RESOURCE PARTITIONING

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ABSTRACT

By the logic of many theories of organization, the dominance of large firms in an industry should hinder the emergence and operation of small specialist firms. Yet, in modern economies, a variety of industries display simultaneous trends of increased concentration and specialist proliferation. Within the perspective of organizational ecology, the theory fragment known as resource partitioning views these two trends as interdependent. The theory holds that under certain environmental and organizational conditions, the increased dominance of large firms in an industry will enhance the life chances of specialist organizations. Here, we examine this theory and the evidence that has been offered in its support. We discuss four different mechanisms that produce resource partitioning: location, customization, anti-mass-production cultural sentiment, and conspicuous status consumption. We also explore empirical issues involved in investigating these mechanisms. Finally, we describe some interesting and little investigated problems of the theory.

INTRODUCTION

In a variety of markets and industry segments, the end of the last century witnessed a resurgence of small, specialist producer organizations. For instance:

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1

- The number of American beer breweries rose from 43 in 1983 to over 1,400 by mid-2000.¹ Nearly every one of the breweries founded in the intervening period associated itself in some way with the self-labeled "microbrewery" movement, a group of brewers and consumers concerned with craftsmanship and taste in brewing beer. Individual breweries tend to be small and specialized in their product offerings and target markets (see Carroll & Swaminathan, 1992, 2000).
- The number of Dutch auditing firms increased from well under 300 firms in the mid-1970s to over 470 firms by 1990. The vast majority of the new firms were small, reflecting a trend also seen in Australia, Canada, the United Kingdom and the United States (see Boone & van Witteloostuijn, 1995; Boone et al., 2000).
- In U.S. winemaking, the number of wineries grew from 330 in 1967 to 1,327 in 1990. This growth came primarily from the entry and success of farm wineries, firms that typically manufacture premium varietal wines, often from a designated vineyard operated on a relatively small scale (sometimes referred to as "boutique," "chateau," and "small" wineries see Swaminathan, 1995, 2001).

Hand in hand with these developments, many industries experienced an increased scale and dominance of large organizations in the market. In the American beer industry, for instance, the combined market share held by the four largest firms rose from under 10% in 1910 to over 80% in the 1990s. Similar trends of increasing concentration and large-firm dominance occurred in Dutch auditing and in the American wine industry.

The economist Jovanovic (2001) calls the pattern of specialist product emergence in these markets "variety proliferation." He surmises that it may constitute a new fourth fact or stage to the well-known stylized industrylife-cycle of Gort and Klepper (1982) depicting a three-stage sequence of discovery, mass entry, and then shakeout.² Jovanovic notes that explanations based on rising wealth or affluence of consumers are not adequate because they do not account for the inability of the large established producers to capture this new market segment. This inability is at odds with much social science theory about organizations, which assumes that organizations are highly adaptive.

Indeed, many analysts regard these two trends as contradictory. To them, it seems paradoxical that small specialist organizations can proliferate at the same time that concentration increases within the same general market. This apparent paradox likely originates in theories of business strategy and organizational structure, many of which usually assume adaptability and imply a unidirectional trend of organizational size (Piore & Sabel, 1984; Galbraith, 1985). By contrast, organizational ecology's theory of resource partitioning explains why the two trends sometimes occur simultaneously within the same industry (Carroll, 1985). As reviewed below, it does so by assuming that organizations are not highly adaptive and by invoking processes about optimal positioning with a defined resource space. The theory views the two trends as fundamentally interrelated; it predicts that under certain conditions the resource space becomes partitioned into generalist and specialist segments.

How do small specialist organizations proliferate in industries dominated by large-scale competitors? Increasing returns to scale imply that in the long run, very small organizations cannot win head-to-head competition with larger ones. In markets or industries defined narrowly, such as commercial jet airliner production, this may be all there is to the story, since all participating firms compete primarily on the basis of scale. Within a broader market, however, resource-partitioning theory and research shows that smaller organizations sometimes find ways to avoid the severe pressures of direct scale competition. One general way, emphasized in the core of the theory, is by identifying and exploiting market segments or product-space locations that are too obscure and small to be exploited profitably by very large organizations (Carroll, 1985; Dobrev, 2000). Another way, emphasized in recent extensions of the theory, comes from focusing on a particular customer segment with changing needs and tailoring products to it, including customized production (Boone et al., 2000). A third general way, also developed recently, comes from specializing so as to produce goods and services whose appeal derives from socially constructed images such as perceived producer status or authenticity - see Carroll and Swaminathan (2000). The viability of any of these strategies depends on the structure of the market, as we discuss below.

In this article, we review and discuss various aspects of resource-partitioning theory and the empirical studies examining it. We start by summarizing the two conceptualizations of niche width used in organizational ecology, pointing out how usage in resource-partitioning theory differs from the original theory of niche width. We then review the core ideas of the theory, focusing on predictions about the two signature trends noted above, increased concentration and specialist proliferation. The core theory uses spatial imagery and pays primary attention to locational mechanisms. Following that, we discuss several recent theoretical extensions. Here we focus on three alternative mechanisms that might produce partitioning: customization, anti-mass-production cultural sentiment, and the social status of producers. We then turn to operationalization of the niche width concept, explaining how different mechanisms imply different measurement schemes. In the concluding discussion, we point to a number of issues where we think contributions might be made. Our goals are to stimulate interest in the questions addressed by the theory, to explain the theory and its associated research program, and to provide sufficient background for social scientists to undertake relevant research. Toward this end, we think opportunities abound. In addition to the examples provided above, industries that have been casually observed or documented as following the signature trends of resource-partitioning theory include: newspaper publishing, banks, book publishing, music recording, stock brokerage, banking, airline passenger service, film production, and software production.³

Resource-partitioning theory highlights the role of small specialist organizations in industry and society. Although individual small organizations do not often carry the social, economic, or political significance of large organizations, there are important scientific and policy reasons to study them collectively.

Consider again the American beer brewing industry - its market was virtually stagnant before the microbrewery movement. Specialty brewers tapped new beer business, bringing in new customers for as much as half of their markets (Backus, 1999). The rise of small specialty breweries has also coincided with dramatically enhanced consumer choice in the marketplace, significant new product innovation, and an expansion of employment opportunities. According to some data, specialty brewers have profit rates higher than the industry average (see Institute for Brewing Studies, 1996; Beer Institute, 1997). The sustained viability of these breweries and their many diverse manifestations has changed significantly the competitive environment faced by the mass production breweries. Whereas these large companies used to confront only a few like-minded large competitors, they now also face hundreds of specialist competitors, many of whom have high status and great appeal among the more affluent consumers in the market. The mass production brewers have already seen much of the market for their high-end products, the so-called superpremium beer category, erode because of competition from the microbreweries (Van Munching, 1997). Given the fickle nature of beer tastes, there is also the very real possibility (fear for some) that the market will turn even more in the direction of microbrewed products.

Small organizational size often does not mean trivial impact, especially for consumers. This point is illustrated well by comparing the contemporary American and German brewing industries. While the two industries have become very similar in terms of the number of breweries (the United States now has a slight advantage), they still differ a lot in their size distributions. Many small and tiny firms populate the American industry while the German industry has a bigger set of intermediate size firms. The beer markets of both countries are characterized by a healthy amount of product diversity but we would venture with confidence that the American market vastly outdoes Germany on this dimension. Collectively, American breweries now produce most of the German styles of beer and they also make all sorts of other malt beverages that are hard to find in Germany, including those of British, Belgian, and indigenous origins as well as a multitude of hybrids. These products mainly come (at least initially) from small and tiny American breweries.

NICHE WIDTH IN ORGANIZATIONAL ECOLOGY

The niche width of an organization refers to the variance in its pattern of resource utilization (Hannan & Freeman, 1977). In terms of this concept, organizations pursuing strategies based on performance over a wide range of environmental resources possess a wide niche and would be classified as generalists. Organizations following strategies based on performance within a tight band of resources are considered specialists – their niches are narrow.

Organizational ecology contains two major theory fragments based on niche width, the original theory of Hannan and Freeman (1977) and the theory of resource partitioning (Carroll, 1985). It is confusing that the two theories use the generalist-specialist concept in somewhat different but related ways. Each reflects an appropriate intuition about resource utilization but makes different (sometimes implicit) assumptions about how resources are distributed and related. To explain resource-partitioning theory, we first clarify this distinction.

Environments and Viability

The original theory of organizational niche width addresses what Freeman and Hannan (1983) call the "Jack-of-all-trades" problem; namely, how does an organization cope with the demands of many different (or changing) environmental conditions when only one is confronted at any particular point in time. According to Freeman and Hannan (1983, p. 1119), niche width reflects "tradeoffs between tolerance of widely varying conditions and capacity for high performance in any particular situation ... Specialist populations follow the strategy of betting all their fitness chips on specific outcomes; generalists hedge their bets."

The original theory (Freeman & Hannan, 1983; Péli, 1997) builds on the observation that a specialist designed well for a particular environmental state will always outperform a generalist in that same state. This is so because the

generalist organization must carry extra capacity – appearing as slack at any point – that allows it to perform adequately in other environmental states. By this theory, the specialist "maximizes its exploitation of the environment and accepts the risk of having that environment change" while the generalist "accepts a lower level of exploitation in return for greater security" (Hannan & Freeman, 1977, p. 948).

This theory of niche width predicts that specialists do better in environments that are stable or certain and in environments where change is fine-grained (short durations in environmental states). However, when environmental variation is high and coarse (long durations in states), specialists have trouble outlasting the long unfavorable periods and the generalist strategy conveys advantage (see Péli, 1997).

Another Type of Environment, Another Type of Generalist

The original niche width theory assumes that environmental resources and conditions are disjointed or highly dissimilar (Péli, 1997). Because of this assumed dissimilarity, generalist organizations that straddle two different resource pockets or conditions pay a price in terms of overhead or excess capacity.

Resource-partitioning theory uses a different assumption about environmental resources. It holds that the different pockets or conditions are not so dissimilar, a situation that modern organizations often face.⁴ This shift is important because when environments are not so dissimilar, generalists may not be burdened by the straddle (as they are in original niche width theory). In fact, they may actually benefit from it because participation in more than one environmental state may entail advantageous economies - activities common to participation in both states can be conducted on a larger scale. Scale differences may also arise because some environmental states are blessed with higher resource levels (original niche width theory implicitly assumes a balanced distribution across states), again yielding economies to the larger firms. Moreover, these economies of scale and scope might be so strong that they outweigh any overhead costs or the like, thus giving the overall advantage to the generalist organization. This seems especially likely when the different environmental states do not alternate across time, as in original niche theory, but instead can be experienced simultaneously. Resource-partitioning theory uses insights about economies of scale to make different predictions about niche width based on this second type of generalism.⁵

THE CORE IDEAS OF RESOURCE-PARTITIONING THEORY

At a general level, the core theoretical imagery of resource partitioning relies on notions of crowding among organizations in a market characterized as a finite set of heterogeneous resources. Organizations initially attempt to find a viable position within this market by targeting their products to various resource segments. Specialist organizations choose narrow homogenous targets, while generalist organizations choose targets composed of heterogeneous segments. It is essential to the theory that environmental resources are distributed in a particular way. It is also essential that some aspect of product delivery in the market possesses a scale advantage; this is typically envisioned as a strong economy of scale in production, marketing, or distribution.

The core theory can be usefully viewed as consisting of three major components. The first component consists of assumptions and statements about the environment, the shape of the resource distribution. The second concerns how generalist organizations behave and evolve over time, given the environmental resource distribution. The third focuses on specialist organizations and their evolution; it takes as given both the resource distribution and the generalist segment. Although much previous research concerns mainly the specialist organizations, we discuss each component in turn in order to give a full exposition of the theory.⁶

Resource Distributions

Resource-partitioning theory assumes that environmental resources are distributed across multiple dimensions. Each dimension consists of states or a smooth gradient of states, a combination of which are experienced simultaneously by organizations. That is, every firm is located within a particular region of multidimensional environmental space.

In a typical rendering of the theory, resources represent potential consumers in a market and the dimensions might represent consumers' socio-economic or demographic characteristics. So, for instance, in a newspaper market the human population would obviously constitute a major resource base as potential readers and subscribers.⁷ Potential newspaper readers can be arrayed on dimensions such as age, education, political affiliation and geographic location of residence, each of which can form the basis for newspaper differentiation. Along each dimension, readers are more or less abundant at various points; a distribution of their relative abundance across each dimension can be calculated for each observed market or environment. For reader age in a newspaper market, for example, this distribution would simply reflect the age distribution of the human population.⁸ The location of every firm in the market can be identified within a dimension, by either its range (niche width) or the center of its range. For instance, a newspaper such as the *New York Times* would be situated higher on the education dimension of its market than would its local competitor the *Daily News*.

The theory of resource partitioning assumes that environmental resources are unevenly distributed within each dimension, with a unimodal peak. The distribution of resources along each dimension is assumed to be roughly symmetric around that peak. In the joint distribution of all relevant dimensions, there is also assumed to be a unimodal peak; it represents what is called "the market center" (Carroll, 1985; Boone et al., 2002).⁹ This distribution means that some environmental areas are much more bountiful or lucrative than others, providing potential scale advantages to those located there. For instance, in a newspaper market, this market center would represent the most abundant group of potential readers – in a "normal" American local market, it might represent potential readers who are middle-aged, possess a high school level of education (and possibly some college), hold centrist or moderate political views and live in the major city of the market.

Resource Distribution Assumption: Environmental resources are distributed unevenly within and across relevant dimensions. The joint distribution of environmental resources possesses a unimodal peak.

Figure 1 shows a hypothetical resource environment of this character. The top of the cone depicted in the figure represents the place where the peaks of relevant environmental dimensions intersect. With detailed data on environmental resources, this pattern can be investigated and measured directly. For example, in their study of Dutch provincial newspaper markets, Boone et al. (2002) use aggregate data across time to examine directly the distributions of potential readers across dimensions of age, education, political party preference and religious preference. Each dimension shows the expected unimodal shape.

A more rigorous examination of the assumption requires data on the joint distribution, which means detailed data either on individual consumers or on the cross-tabulated aggregate data. For example, Figs 2 and 3 present some exploratory analysis of survey data on beer consumption among a representative sample of 22,051 individual consumers in the U.S. These data were collected by Simmons Market Research Bureau (1994), a large marketing research company that surveys thousands of individuals about a plethora of their buying habits. The plots graph the (estimated) probability of picking a beer drinker (any types, any brand) at random from the U.S. human population

(vertical axes) as functions of age (Fig. 2), political outlook (Fig. 3) and the cross-classification of the two variables (Fig. 4).¹⁰ For age, Fig. 2 shows that the highest proportion of beer consumers is found in the 30 to 34 age group. For politics, Fig. 3 shows that most beer drinkers are middle of the road in their political outlook. Furthermore, the joint distribution of beer consumers by age and political outlook, shown in Fig. 4, also has a unimodal peak, a pattern that is consistent with the assumptions of the resource-partitioning model.

The Evolution of Generalists

We start our discussion of generalist organizations by considering the market center, the region around the peak in the resource distribution (see Fig. 1). Suppose there are two organizations here with equal niche widths exactly overlapping one another. Yet despite the identical scope of operations and market position, the two firms differ in size. The larger of the two will possess a distinct advantage if scale economies operate. Now consider two firms with the same position and similar niche widths but with one slightly broader. If the



Fig. 1. Unimodal Joint Distribution of Environmental Resources.











Fig. 4. Beer Drinkers by Age and Political Outlook.

additionally spanned resource space is not highly dissimilar from the other parts, then the firm with the broader niche width will also often possess a scale advantage because of its larger resource base. Stretching this logic further, we can see that when scale economies (and other scale-based advantages) are strong and resource pockets are not highly dissimilar, size relative to competitors can matter more than location or niche width – the competition becomes predominantly scale-based. So, a very large firm positioned adjacent to the center of the market would outcompete a smaller firm positioned exactly at the center. But to become larger, this firm would need a broader niche.

By our reasoning, when scale advantages are strong and the resource distribution is unimodal, the center of the market will be populated mainly with generalists. In the competition among these generalists, relative size becomes increasingly important and – given a certain range in locational parameters – at some point it likely outweighs niche width or location in importance. That is, competition among generalist organizations consists of an escalating war for resources based on scale, with larger generalists eventually out-competing smaller ones. When the smaller generalists fail, their target markets become free resources. Generalists occupying adjacent regions hold the best positions for securing these newly available areas and they typically do so. The surviving generalist thus becomes larger and more general, occupying the market center.

The consequences of a unimodal environmental resource distribution for generalists thus appear to be three-fold. First, generalist viability depends not only on niche width but also on position or location within environmental space, especially around the market center. Second, scale differences likely drive competition among generalist competitors with roughly comparable market positions. Third, because the resource distribution is unimodal, it follows that the extent of market concentration should track the extent of resource concentration. That is, the steeper the resource peak, the higher the concentration level. We discuss each issue in turn.

Market Center Competition

Because of their narrow niches, specialists have great freedom in choice of location; they can locate in the market center or toward either periphery (above and below the center). Generalists face more constraint in choice of location because a wide niche covers much of the market; yet, they can still choose whether to locate the mid-point of their range near the center of the market or toward one of the peripheries.¹¹ Because of their broader product scope, generalists are also more likely to possess niches that spread over the market center. A position in this lucrative sector of the market (where resources abound) allows generalists to reap scale advantages – to grow and expand further, which in turn makes them more likely than other firms to be centrally located. So, the choice of market position appears to be inextricably related to scale and mutually reinforcing: the benefits of generalism go hand in hand with scale advantage from location in the part of the market where the peaks in the dimensions of environmental resources intersect. This leads to the prediction:

Market-Center Location Hypothesis: An organization's hazard of mortality increases as a function of its position distance away from the market center.

Dobrev and colleagues found empirical support for this hypothesis in studies of mortality among European automobile producers (Dobrev et al., 2001) and American automobile producers (Dobrev et al., 2002). These studies examine

the technological niche of automobile producers, defined in terms of the range of engine capacity across a firm's models and conceived of the market center as the area (in technological space) covered by the niches of the four largest firms in each national market. The findings reveal that the survival chances of automobile firms decrease proportionately to the distance by which the firm was positioned away from the market center.

Scale Competition

As noted above, in many organizational contexts, larger relative size ought to dominate competition among those (large) firms presumed to have broad niches and aiming for the market center, what might be called "scale-based competitors." Large size relative to other producer firms likely conveys political and economic advantage in intrapopulation competition. The political effect might occur because states compete over larger employers and offer them favorable terms (taxes, location, utilities, etc.) unavailable to smaller firms; large firms in trouble are also often assisted if not actually bailed out. Economic advantage might stem from scale economies in production and marketing, which allow larger firms to enjoy lower average costs. Or it might come from disproportionate influence over suppliers and distributors.

To assess scale-based competitive pressure on generalist firms, it makes sense to examine the size structure of the competitive environment faced by each generalist firm at any time. A promising model of this kind posits that the selection pressure faced by a firm of this kind depends on two factors:

- (1) the number of larger competitors it faces (who each hold a scale advantage over the smaller focal firm); as well as
- (2) the sum of the distances between the focal firm and each of its larger competitors on the scale dimension (with distance reflecting the extent of the advantage).

Combining these considerations into a single organization-specific environmental measure yields the prediction:

Scale-Competition Hypothesis: Among scale-based (generalist) competitors within an organizational population, the greater the sum of distances of a firm from each of its larger (generalist) competitors, the higher its mortality hazard.

In this hypothesis, the distance measures could be calculated according to any number of principles and they represent the scale-based disadvantages faced by firms that are smaller than their competitors.

Because economies of scale drive much competition among generalists, analyses often use a measure of distance based on the approximate shape of a

typical long run average cost curve. Estimates of the model operationalized in this way show that scale competition can exert a powerful effect. Carroll and Swaminathan (2000) find that it adds significantly to a model of organizational mortality among mass production breweries in the United States. Likewise, Dobrev and Carroll (2000) find that it contributes significantly to a fully specified evolutionary model of organizational mortality in four major automobile producer populations. Results from the analyses of evolutionary competitive dynamics in the automobile and the beer-brewing industries demonstrate that the mortality hazard of a scale competitor is an increasing function of its cumulative distance from the larger rivals it faces on the market at any given time.

Occupied Resource Space

Consider what happens to various generalist organizations as the market concentrates. By the process of scale competition described above, it is clear that individual generalists often benefit by expanding their ranges within resource space. Yet, only the largest of these organizations will survive in the long run, whatever their ranges. With a unimodal and roughly symmetric environmental resource distribution (see Fig. 1), niche width and scale run hand in hand, reinforcing each other. Under these conditions, we expect:

Surviving-Generalist Expansion Hypothesis: As market concentration rises, the mean amount of resource space covered by surviving individual generalists will expand.

Despite the wide range of a generalist's target area, it is difficult to secure all the free area in resource space – doing so might prove more costly than it is worth or entail loss of some of the firm's existing target area (Péli & Noteboom, 1999). This is especially the case in mature markets where generalists are very large and possess extremely broad target areas. The difficulty in securing all the free resources arises because the small gains to scale potentially obtained by moving further out on any dimension (into the "thin" parts of the resource space) are more than offset by the high costs of covering these extreme highly differentiated regions.¹²

By contrast, in markets with many generalists, the major competitors aim for the market center but they also attempt to differentiate themselves and to cover some uncrowded or unoccupied region. So, as the competitive struggle among generalists proceeds to its eventual monopoly equilibrium, the size and target breadth of the survivors increase. But simultaneously the combined resources held by all generalist organizations declines, provided the total space does not decrease (Carroll, 1985; Carroll & Hannan, 1995). *Generalist Occupied-Space Hypothesis:* As market concentration rises, the amount of unique resource space covered by the combination of all generalist organizations contracts.

Anecdotal evidence about the range and size of generalists in relevant markets following consolidation events of merger or failure often supports this hypothesis (see, for example, Carroll, 1985). The acquiring firm in a merger, for instance, often broadens its target range to encompass the space previously covered exclusively by the acquired firm but is unable to hold all customers in that space, especially those furthest from its own original target range. A systematic analysis of this hypothesis has yet to be advanced, although it would seem straightforward to do.

Market Concentration

Now consider the entire organizational population in a market at any given time. To determine concentration, we need only consider the larger organizations, which will be generalists given the unimodal resource distribution. It follows from the competitive scenarios outlined above that market concentration should run hand in hand with resource concentration. That is, the steeper the resource peak, the higher concentration level. This is because concentrated resource distributions leave little room for differentiation among generalists – they force generalists into more direct competition at an earlier stage.

Market-Concentration Hypothesis: The more concentrated the environmental resource distribution, the more concentrated the scale-based organizations serving the market.

Boone et al.'s (2002) comparative longitudinal study of provincial newspaper markets in the Netherlands bears out this claim. These investigators collected and analyzed data on potential readers in each of the Netherlands' provinces over time. They found information on the distributions of potential readers by age, education, political party, and religion. The more concentrated a province on each resource dimension, the more concentrated the newspaper market in the province. Additional studies of this kind, in which the resource distribution is measured directly, would seem to have great potential for studies of organizational populations.

The Evolution of Specialists

Now we turn to specialist organizations and their evolution. The main device for explaining the rise of specialist firms in resource-partitioning theory involves the resource space that lies outside the generalist target areas. It is here, away from the intense competitive pressure of the dominant large generalists, that specialist organizations can find viable locations (Carroll, 1985). And because resources tend to be thin in these regions, the specialists located here also tend to be small. Small highly specialized locations are also less likely to be invaded by the ever-encroaching generalists than are broader locations; they also tend to be more defensible if they are. When these resources are sufficient to sustain a specialist segment, the market is "partitioned" in that it appears that generalist and specialist organizations do not compete; they depend on different parts of the resource base.

The original insight of resource-partitioning theory comes from comparing the amount of resource space available for specialists when overall market concentration rises. Because market concentration derives from generalist consolidation, this comparison can be made by measuring the total area outside generalist targets under different stages of the generalist competition scenario. As implied by the Generalist Occupied-Space Hypothesis, when the total space does not decline, this area (space outside generalist targets) is larger when concentration is higher (fewer and larger generalists). So, assuming that some kinds of specialists can operate in the open regions leads to the following hypothesis:

Specialist Space Hypothesis: As market concentration rises, the total amount of resource space open to specialist organizations expands.

Péli and Nooteboom (1999) apply mathematical results from analysis of what is known as the sphere-packing problem to examine central questions related to resource partitioning. Their analysis uses some different assumptions than outlined here. In particular, they assume an even (uniform) distribution of environmental resources and a set of generalists with fixed shape and size (represented by hyperspheres). They also assume that resource space is finite.

Péli and Nooteboom (1999) ask how much resource space is available outside the area covered by all generalist organizations when the generalists are packed as tightly as possible in the resource space with no overlap.¹³ Their results show that as the number of dimensions in resource space increases, the percentage of total resource space outside the most tightly-packed generalist arrangement grows nonlinearly. Péli and Nooteboom suggest that the taste dimensions of consumers might change exogenously, thus reordering the resource space and generating resource partitioning. But the main finding holds even if tastes are created by the specialist organizations themselves (that is, they are endogenous), a common occurrence in partitioned markets. *Resource Dimensionality Hypothesis:* As the number of dimensions in resource space increases, the total amount of space open to specialist organizations expands.

Ecological theory holds that as available resource space increases, the potential viability of specialist organizations suited for these locations is enhanced. The organizational population may not adjust immediately to this condition: it takes time and information for entrepreneurs and resource providers to recognize the new opportunities, especially because these markets have been nasty battlegrounds for long periods. But the available space means that pressures do exist favoring the emergence and proliferation of specialists. The stronger these pressures exist and the stronger they operate, the more likely a response will occur.

Enhanced viability implies that the specialist segment should expand. This can come about through either an increase in founding rates or a decline in mortality rates or both. Indeed, the prediction of enhanced viability has been interpreted with respect to both founding rates or mortality rates.¹⁴

Specialist Founding Hypothesis: As the resource space open to specialists expands, the founding rates of specialist organizations will rise.

Specialist Mortality Hypothesis: As the resource space open to specialists expands, the mortality rates of specialist organizations will fall.

Empirical research on resource partitioning has been guided primarily by the logical implications of combining the Specialist Space Hypothesis with either the Specialist Founding Hypothesis or the Specialist Mortality Hypothesis. In both cases, the empirical implication is an interaction effect between organizational form (specialist-generalist status) and concentration on a vital rate. Systematic tests of this kind have been conducted on the full organizational population or, more typically, focused on the specialist organizations because of their counterintuitive nature. These tests span a wide range of organizational and industrial settings including:

- newspaper publishers (Carroll, 1985; Dobrev, 1997, 2000)
- telephone companies (Barnett & Carroll, 1987)
- beer breweries (Carroll & Swaminathan, 1992, 1993, 2000)
- banking cooperatives (Freeman & Lomi, 1994; Lomi, 1995)
- commercial banks (Li, 2001)
- manufacturers of medical diagnostic imaging equipment (Mitchell, 1995)
- wineries (Swaminathan, 1995, 2001)
- automobile manufacturers (Torres, 1995; Dobrev et al., 2002)
- microprocessor manufacturers (Wade, 1996)

- airline passenger service (Seidel, 1997)
- investment banks (Park & Podolny, 2000)
- law firms (Jaffee, 2000)
- film production companies (Mezias & Mezias, 2000)
- film distributors (Mezias & Mezias, 2000)
- auditing firms (Boone et al., 2000).

BEYOND LOCATION – EXTENSIONS OF THE THEORY

What we have called the core of resource partitioning theory places primary emphasis on an organization's location in resource space, especially relative to other types of organizations. This logic forms the basis for the hypotheses explained above, which together serve as the primary predictions for the specialist phenomenon. We also believe that it accounts almost entirely for the partitioning of certain industries such as airline passenger service, where physical geography plays a central role.

In some other industries, however, other factors often take on greater importance than sheer location of products in resource space.¹⁵ Drawing on recent studies and thinking about this issue, we discuss in turn three alternative mechanisms to location:

- (1) customization;
- (2) anti-mass-production cultural sentiment; and
- (3) conspicuous status consumption.

The first of these features the role of dynamic organizational capabilities, while the second two highlight identity. Because these mechanisms and their implications are not yet fully understood, they are much less developed theoretically. So, we do not specify formal hypotheses as we did for the core theory.

Customization

Boone et al.'s (2000) study of Dutch auditing firms first highlighted the role of customization in resource partitioning processes.¹⁶ In looking at the history of this population, Boone et al. found that in the Netherlands small specialist auditing firms proliferated in the late twentieth century, just as the whole market concentrated with the entry and growth of the large international accounting firms. The two signature trends of resource partitioning led them to consider the theory in the context of professional service organizations. They asked how could small specialist auditors – often one or two person operations

- compete effectively against the powerful generalists. Boone et al.'s analysis offers three possible advantages that specialists might possess relative to their larger generalist counterparts in certain parts of this market. Each concerns how the services of small specialist auditors might be more attractive for small client firms.¹⁷

The first possible advantage of small auditors identified by Boone et al. (2000) involves fee structures. Specifically, the fees of large audit firms are higher that those of small auditors; in competitive situations, the large firms are usually either unwilling or unable to match those of the smaller auditors (Palmrose, 1986). Among client firms, the smaller firms typically are much less willing to pay the premium demanded by a large generalist auditor. Small client firms are less willing to do so than large clients because:

- (1) the relative cost (to total firm revenues) of these fees is higher for them than for large client firms;
- (2) the large auditors are likely to deploy their less experienced junior auditors to service small clients than they are for large client firms; and
- (3) the need for high (perceived) audit quality is lower among small client firms than larger ones.

Small companies also depend less on external stakeholders, such as dispersed shareholders and third-party financiers, so the reputation of the auditor matters less. The lower fees of small auditors thus serve the specific needs of the small client firm segment more precisely.

A second possible advantage arises because the services of small audit firms are likely to be much more personalized than those of large auditors. In fact, the small firm auditor frequently becomes the confidant of the small business manager, providing personal advice and information on many issues including tax preparation, bookkeeping, and regulations. Thus, the client can consult the same person on many problems at a relatively low cost. Such personalized services cannot easily be delivered by large audit firms where labor is divided along separate functions, such as auditing and consulting. In addition, large audit firms have high labor turnover rates at low hierarchical positions because of the 'up-or-out' partner selection system (Maijoor & Meuwissen, 1993).¹⁸ This high turnover makes it difficult to establish personal relationships between (junior) auditors and small firm clients.

A third possible advantage arises because the "structured audit" approach of large audit firms often gives small auditors a competitive advantage in the small-client market (Yardley et al., 1992). This is because such standardized approaches do not take into account the specific and perhaps idiosyncratic needs of small client firms. In addition, standardization tends to reduce

flexibility, leaving the advantage of providing customized services to small firms.

So, although large audit firms possess a number of strong scale advantages enabling them to grow and diversify, small audit firms still seem to possess special advantages in the small-client niche of the audit market. The basic reason underlying all three possible advantages is that small specialist firms may be more flexible and adaptable than large generalists to certain clients with unusual or changing needs. Small specialists can get closer to the client and appeal directly to its needs – and alter fees and services as the needs change. Because of their higher overhead and more developed organizational structures, large generalists have less interest in small isolated markets and less flexibility in addressing them or changing with them.

The mechanism of customization seems insightful and appealing, especially in the context of stock brokerages, banks, and other service providers. Its theoretical and empirical implications still need to be explored in greater depth. The need for customized services in industries such as banking and auditing may also partially reflect a "second-order" effect of resource partitioning in some client industries. For instance, the proliferation of boutique wineries in the United States has been accompanied by the entry of firms that seek to provide them with customized marketing, accounting, legal, personnel, and other services. At this juncture, we are unaware of the extent to which the emergence of firms that offer customized services is influenced by changes in the structure of client industries.

Anti-Mass-Production Cultural Sentiment

The role of anti-mass-production cultural sentiment in resource partitioning first arose in Carroll and Swaminathan's (2000) study of American beer brewing.¹⁹ Their study finds that small specialist breweries and their products remained viable even after the mass production breweries (large generalists in terms of market appeal) learned to produce comparable products of high(er) quality. In other words, the resource space of the specialist microbrewers based on tangible product characteristics was not inviolable yet they remained successful as a group. Why?

Carroll and Swaminathan (2000) claim that their identity as large mass producers proves problematic for major breweries in this market.²⁰ In their view, the identity problems of mass production breweries emanate from their organizational form and revolve around questions of tradition and authenticity.²¹ Consumers buying specialty beers seek simply a malt beverage brewed in a small craft-like firm according to traditional methods and using natural

ingredients.²² This causes many of them to balk at beverages brewed by large corporations using modern methods of mass production and to reject outright those beverages sold deceptively by a business corporation.²³ It explains why both mass producers and contract brewers (marketing firms that outsource their beer production) conceal their true organizational identities. It also explains why perfectly content beer drinkers look crestfallen when told that the specialty beer they are consuming actually comes from a major brewing corporation or a company without a brewery at all.²⁴ Legitimacy as a producer of specialty beers requires operating a brewing facility using hand-crafted techniques.

What drives consumers to purchase on the basis of organizational form identity rather than product characteristics? This is a matter for future empirical research but Carroll and Swaminathan (2000) do offer four theoretical speculations. First, consumers might place great faith in the ability of small organizations to produce and deliver high-quality specialty products. This belief may or may not be factually sound; it might possibly come from an individual's negative experience with large bureaucratic organizations rather than positive experiences with small production organizations. Second, by choosing products made by traditional methods, consumers might be reacting against mass society, its production techniques and its corporate organizations (Peterson, 1997). Such behavior would be consistent with Inglehardt's (1997) well-documented claims about "postmaterialism" and associated lifestyles, which purportedly emphasize self-expression and quality of life. Among other things, this reaction would explain the continued appeal of these products in light of obvious imperfections and quality defects. Third, consumers may be enacting a form of self-expression in purchasing the products of small obscure producers. This too might be seen as a reaction against mass society but we would be hesitant to call it a general postmaterialistic one, if for no other reason than the preponderance of affluent young professional consumers who otherwise embrace materialistic values and mass-produced objects such as German sports cars. The anti-mass-production sentiment for these individuals seems to be confined to certain isolated parts of their lives, usually related to private personal consumption. Fourth, consumers may be using specialty brewing as a forum for status generation. Like many specialty products, malt beverages are inherently difficult to categorize and evaluate because of their subtle and ambiguous complexities. Expert knowledge is required; however, expert status is subjective and relative - one appears knowledgeable simply by virtue of knowing more about particular types of products and their characteristics than others. Public displays of this knowledge commonly yield social approval and confer status. With products associated with personal taste and lifestyle, the status conferred is more general than that of expert: it invokes an overall image of sophistication and refinement. Consumers may seek obscure specialty products particularly because they are believed to possess unusual but attractive qualities; however, the fact that they potentially generate status for knowledgeable consumers may constitute a large part of their appeal.

Carroll and Swaminathan (2000) note that microbreweries and brewpubs have attempted to define cognitively the specialty beer segment in ways that exclude major brewers and contract brewers, thereby enacting strategies based on identity.²⁵ Such oppositional identity strategies work in this context because the microbrewery movement resembles a true social movement in many respects (Carroll, 1997; Swaminathan & Wade, 2001). Among other things, the social movement-like character of the segment means that craft producers and consumers constitute a self-conscious community characterized by a dense and redundant social network of self-styled 'experts,' including many homebrewers (see Bradford, 2000). Information flows rapidly and pervasively through this network, which revolves around the many brewpubs, tap houses, beer clubs (many with selective incentives), organized trips, brewers' guilds, festivals, magazines, newsletters found in the 'microbrewery' segment.²⁶ Misinformation - such as deceptive or inauthentic identity - eventually gets discovered and ferreted out through ridicule, boycott, and other normatively imposed sanctions. Consequently, the robust identity (Padgett & Ansell, 1993; Stark, 1996) strategies attempted by the major breweries and the illusory authenticity of the contract brewers is effective only for short periods, if at all. The ineffectiveness of these strategies explains why many major brewers and some contract brewers have now adopted approaches that minimize (if not avoid) these problems. For major breweries, the most viable route apparently involves strategic alliances with microbreweries based on large initial equity investments.²⁷ For contract brewers, the solution to problems of identity is to buy and operate a brewery.²⁸

Identity mechanisms such as those confronted in the beer market do not necessarily invalidate the core predictions of resource-partitioning theory (although they may weaken some effects as location recedes in importance) but rather imply additional arguments. Identity problems of the kind faced by mass production and contract brewers emanate from questions of legitimation: aspects of these organizational forms conflict with specialty brewers' claims about tradition and authenticity, which accord with consumers' and others' normative notions about how specialty beers should be made and marketed in American society. Accordingly, Carroll and Swaminathan (2000) use organizational ecology's model of density-dependent legitimation and competition (Hannan & Carroll, 1992) to make predictions about how the effects of specialist density differ by organizational form.

By their view, norms about the organizational forms in brewing are maintained and sanctioned by an existing knowledgeable tight-knit community of consumers and producers, thus making it very difficult for a form such as contract brewing to be legitimated. The normative problems confronted by contract brewers occur because, upon inspection, this organizational form cannot live up to these claims - there are inconsistencies that eventually become obvious. Carroll and Swaminathan (2000) thus not only expect this kind of form not to be legitimated as it proliferates, they also expect that its spread exacerbates identity problems because greater numbers of consumers and others come into closer contact with organizations using it and learn about the inconsistencies. At the same time, Carroll and Swaminathan expect organizational forms such as microbreweries and brewpubs possessing characteristics that apparently satisfy identity claims to benefit from the density-driven legitimation process. Moreover, they also expect organizational forms such as brewpubs whose claims are more readily inspected (i.e. greater social visibility) to display a stronger legitimation process (i.e. greater returns to density). Given the oppositional nature of the form identities, they further expect the densities of the various forms to interact in predictable ways: an "identity-consistent" form should aid the legitimation process of associated forms while an inconsistent form should diminish legitimation when it can be visibly distinguished.

Statistical analysis of the American beer brewing population in the post-Prohibition period generally bears out these claims, for both founding rates and mortality rates (Carroll & Swaminathan, 2000).²⁹ Density-based legitimation effects on specialist mortality show many of the expected patterns. For microbreweries and brewpubs, own density shows a strong and significant negative effect, suggesting that the form becomes legitimated as it proliferates. By contrast, the contract brewers show no evidence of legitimation from density.

The "cross-effects" of the specialist form density variables on the mortality of other forms also often support Carroll and Swaminathan's (2000) hypotheses. For microbreweries, the contract brewer density shows both a positive main effect and interaction effect, suggesting the counternormative form slows the legitimation of its not-readily distinguishable cousin. By contrast, the socially visible brewpub form shows only a single cross-effect, that of microbrewery density. For contract brewers, the cross-effects show striking parallels to the founding rates: microbrewer density shows negative (legitimating) effects while brewpub density shows a positive interaction effect with contract brewer density. So, mortality among contract brewers rises when many of them encounter many visible examples of authentic-looking craft breweries using the brewpub form. These findings agreed with their qualitative work, which showed that craft-like form identity plays a critical role in the appeal and life chances of specialist breweries.

Conspicuous Status Consumption

Organizational status as a mechanism of resource partitioning first became central in the study of investment banks by Park and Podolny (2000). These analysts showed that among American investment banks, partitioning occurred along both dimensions of niche width and organizational status or prestige. They also reported tests showing that predictions of theories of both niche width and status explained market exit in this context. In fact, Park and Podolny conclude that the status-partitioning mechanism is dominant in this context.³⁰

Organizational status is a potentially important mechanism behind resource partitioning, with apparent application to diverse product markets such as wine and automobiles. At present, understanding of the status partitioning process is not well developed and deserves further theoretical and empirical investigation. Park and Podolny's (2000) study provides an excellent start but it does raise two issues that warrant further consideration, in our opinion.

First, Park and Podolny (2000) follow Podolny's (1993) theoretical strategy in conceptualizing organizational status as overt acts of deference between social actors. That is, status is indicated by the deference ordering among producers of a particular kind (reflected by the "tombstone" ordering among investment banks). Although this conceptualization captures an essential part of many status phenomena, it may not reflect the most critical aspect of status for resource partitioning. In our view, the conspicuous consumption of status goods by individual consumers may be more critical for market partitioning than the status ordering of producers relative to each other. In other words, the appeal of certain products may derive more from public displays of consumption by consumers and the status conferrals of others arising from these displays rather than from the deference acts of producers. In this alternative view, organizational status is socially constructed directly by the consumption patterns of consumers rather than by producers.

Of course, the status conferrals of the public may correspond exactly to those of the producers among themselves but this need not be the case and sometimes is not. For instance, in wine, although there is a rough correspondence between public orderings and industry-producer orderings (see Benjamin & Podolny, 1999), it is far from exact. Wines such as Gallo's Hearty Burgundy are unlikely to yield a high public status conferral and thus correspond to their industry rating. Others high in public approval, however, often would not be high on an industry list (it seems best not to name any names here). In general, it is an open question in any context as to how strong the correspondence between the two status conceptions will be. The issue is further confounded by potential local variation in the publicly conferred status orderings. For instance, in wine the knowledge and products that might be conferred with status approval in Kentucky likely differ markedly from those so honored in California.

The second potentially problematic issue left open by Park and Podolny (2000) is the question of how niche width and organizational status covary. In investment banking, they argue that generalism corresponds to high status, while noting that the reverse appears to be true in many other resource-partitioning contexts, including beer and wine (where they say specialists have higher status).³¹ Industries such as airline passenger service, auditing, banking, and stock brokering appear to follow the pattern of investment banking.

Park and Podolny (2000) do not attempt to address the niche width/ generalism covariation question, as it can be taken as given in any particular context. But the question clearly merits attention if we are to develop a fuller understanding of how status mechanisms might produce resource partitioning. What might drive the covariation of these two variables?

Our conjecture is that the direction of the covariation likely depends on two factors:

- (1) production uncertainty; and
- (2) the costs of a breakdown.

When uncertainty is high and the costs of a breakdown are high (as is the case with investment banking or airline passenger service), the generalists receive status approval. Conversely, when uncertainty is low and the costs of a breakdown are low (as is the case with beer), the specialists receive status approval.³² As Podolny (1993) explains, these conferrals derive from attributions about product quality and are not exact, only loosely linked. When breakdown costs are high, this view accords with Hannan and Freeman's (1984) claim that larger and older organizations are often attributed with reliability and accountability.

OPERATIONALIZING AND MEASURING NICHE WIDTH

Applying theories of niche width, including resource-partitioning, to explain organizational viability in any actual organizational population rests on using relevant contextual knowledge of two types – it requires an assessment of environmental conditions (the first type), which then has to be related to the organizational characteristics defining niche width (the second type). One way to do this involves measuring both relevant environmental and organizational characteristics and then formulating tests based on the interaction terms between the two.³³ Alternatively, direct measures of the external context can be supplanted with suppositions about the nature of environmental states. Moreover, measures of organizational niche too can vary based on the partitioning mechanism that redistributes resources across the market.

Assessing Environmental Features

Occasionally, researchers have embarked on collecting detailed empirical data to measure environmental states. Freeman and Hannan (1983), for example, took this approach in studying failure rates among 985 restaurants in eighteen cities in California. To measure environmental variation, they used aggregate city restaurant sales data and constructed measures of variability in sales and seasonality in sales. To measure organizational niche width, they used survey data on menus, hours of operation, seating, and staffing to construct a threecategory classification of organizational form indicating generalism, specialism, and a fast-food orientation. Consistent with the original theory, they found that fine-grained environmental variations favored specialist organizations while coarse-grained fluctuation favored generalists.

A practical but real limitation of this approach is that it makes great data collection demands on the researcher, requiring direct measurement of both environmental and organizational variables over time. Organizational researchers often cannot afford to make such investments; moreover, for the study of long-lived historical populations such tasks will normally be impossible to accomplish, as the necessary information no longer exists.

An alternative way to apply niche width theory involves using historical and institutional knowledge to make suppositions about the nature of some aspects of environmental change rather than attempting to measure it directly. Provided that the organizations in a population all face a similar environment (or that the major differences in environments faced can be identified based on other observable characteristics and thus treated separately), one can then develop and test theoretical predictions about organizational viability based on observable dimensions of niche width.

Dobrev et al. (2001) take this second approach in investigating several major European automobile industries. They focus on technology in terms of engine capacity as a key dimension of organizational niches and measure it directly for each firm at each year of its existence. But for the environment, they use historical and institutional knowledge to make assumptions; they reckon that changes in technology and in consumer tastes over most of the history of the industry were highly uncertain; these changes also were believed to occur irregularly over time. The trade-off entailed in this qualitative approach to defining environmental features is that it lacks the detailed precision of a direct measure but - by relaxing the demand for collecting rarely available quantitative data dating back centuries - it makes it possible to analyze cumulatively and compare directly the fates of firms that have existed in disparate historical periods while also taking into account environmental conditions. Translated into theoretical terms, Dobrev et al. (2001) claim that environmental variations along this key technological dimension were highly uncertain and coarse-grained. Accordingly, their analysis reveals that firms producing a wide range of engine capacity models (i.e. firms with broad technological niches) are less likely to fail. Similarly, Dowell and Swaminathan (2000, p. 406) argue that the nascent phase of industry evolution features greater technological uncertainty and provides a survival advantage to generalists.

Measuring Organizational Niches

Empirical studies of resource partitioning often follow Freeman and Hannan (1983) in using very simple classifications of organizations (typically as either generalists or specialists) rather than the continuous measures of organizational niche width used by Dobrev et al. (2001, 2002) who focus on an organization's position in a technological space.³⁴ Specifically, they conceptualize the niche width of an automobile producer in terms of the spread of engine capacity over all models that it produces at any given point in time (a realized niche). By this view, producers situate themselves by choosing an array of products. Specialists offer products with a small range of variation on the dimension (for example, the Bartholomew Co. of Peoria, Illinois, U.S. in 1919 offered a single model – the Glide – with engine horsepower of 45); generalists display a broad range (for example, South Bend, Indiana, U.S.-based Studebaker Corp. in 1953 made cars with engines ranging from 147 to 270 horsepower).

The difference in measurement strategy might be mistakenly viewed as a purely methodological matter. Indeed, some studies do rely on the cruder distinction because of data limitations and the more precise approach potentially provides more analytic flexibility. But by itself, a single continuous measure of organizational niche width implies that only the distances between points on the scale are important. Accordingly, a single continuous measure of width does not capture any locational differences; these differences must be incorporated by constructing an additional measure of niche position, as Dobrev et al. (2001) do with their automobile data, using the actual value indicating the mid-point of a firm's technological width. However, further qualitative distinctions among specific groups or classes of organizations can only be indicated by separating out certain specific positions on the scale, e.g. microbrewers, boutique wineries. Failure to make these specific distinctions might be important because, as we saw above for anti-mass-production cultural sentiment in beer and social status in investment banking, some partitioning mechanisms involve more than simple distance in product or market space – they involve social separation on the basis of solidarity or identity of groups of organizations perceived as similar.

In fact, in contexts where solidarity or identity produces the segmentation between organizations, fine-grained differences in organizational niche width may not be highly important. Instead, what seems most critical here is to capture the operative distinctions behind the socially constructed organizational groupings or classifications.³⁵ These distinctions, when normatively sanctioned, define organizational forms (Pólos et al., 2001).

Form boundaries may be socially enforced in ways that do not correspond exactly to the niche width or product space location of individual organizations. Of course, in an ideal design a researcher would have measures of both kinds and might be able to capture differences both across specific categories and within them (e.g. niche width differences among microbreweries and brewpubs). But when practical constraints force a choice, we think the dominant measurement strategy should reflect theoretical or conceptual claims about the types of mechanisms held to be driving the partitioning. When specialist organizations arise from solidarity or identity-based mechanisms, such as antimass-production cultural sentiment or status, they represent distinct organizational forms and a categorical coding is important. When specialists arise primarily from opportunities found in unoccupied resource space, the precision of a continuous measure of location seems very useful.

DISCUSSION

We began by noting that by the logic of many theories of organization, the dominance of large firms in an industry should hinder the emergence and operation of small specialist firms. Yet many industries in modern economies show organizational trends of both increased concentration and specialist proliferation. Resource-partitioning theory views these two trends as interdependent. The theory holds that under certain environmental and organizational conditions, the increased dominance of large firms in an industry will enhance the life chances of specialist organizations.

In this article, we reviewed the theory of resource partitioning and the evidence that has been offered in its support. We discussed the various theoretical mechanisms that are believed to generate resource partitioning: location, customization, anti-mass-production cultural sentiment, and conspicuous status consumption. We also explored some empirical issues involved in investigating these mechanisms.

In wrapping up our discussion, we speculate about four additional research problems that seem relevant to the theory but have not been sufficiently studied in out view. A first issue concerns organizational growth rates. In many ecological theories, viability of an organizational form can be interpreted in terms of founding, mortality, or growth without much implication - these are almost alternative measures. For resource partitioning, however, organizational growth seems to be a much more complex issue. For generalists, scale competition implies that relative size matters as well as organizational form. For specialists, the strength of boundaries between the various resource pockets in which they operate might impose strong constraints on growth, even when founding rates are high (and failure rates low) because new pockets are opening up. Indeed, Jaffee's (2001a, b) study of Silicon Valley law firms shows clearly that the dynamics of growth in these markets are complex and interesting for theoretical development. He finds that specialists display lower growth under the same conditions that generate high founding rates and low mortality rates; generalists behave otherwise.

A second interesting issue for further theory and research is inertia and niche shifting. As we have seen, in the conventional rendering of resource partitioning, industry consolidation drives failing generalists out of the market and stimulates the entry of new specialized organizations. But generalists can occasionally respond to intensified competition in the center by successfully changing the width and/or positions of their niches, that is, they can sometimes transform themselves into specialists to avoid scale-based selection pressures in the market center (Dobrev et al., 2001). Changing a firm's range of product offerings and its location may have vital consequences, however. As Dobrev et al. (2001) show in their analysis of European auto-manufacturers, competitive crowding has a second-order effect on mortality by decreasing the survival chances of organizations exploring less competitive market segments (see also Dobrev et al., 2002). So, it is possible that the survival advantages associated with location on the periphery might hold most strongly for newly founded market entrants, because the deleterious effects of changes in niche width and position might offset those advantages for moving firms.

Though we are intrigued with the possibilities raised by Dobrev et al.'s (2001) study, we believe that more research is necessary on the issue. Obviously, additional empirical evidence needs to be collected and examined on the actual flexibility of small specialists and large generalists in these markets. Perhaps other factors (in addition to inertia and crowding) play a role in determining whether generalists can successfully transition from the center to the periphery. One such factor may have to do with the extent to which a new market niche is legitimated. To test this conjecture, future research would need to examine the collective movement of all firms in the population tracking their transition trajectories between the market center and clearly bounded peripheral niches.

A third issue meriting additional attention is the potential reversibility of resource partitioning. Resource-partitioning theory does not directly address the issue of decreasing concentration. If the process is indeed reversible and the effect of concentration is symmetric, then decreasing concentration should decrease both the survival chances and the entry rate of specialist organizations. At least two developments can lead to this outcome: industry deregulation and resource scarcity are likely to impact negatively the positional and cost-related scale advantage of large generalists. In both cases, generalists may be forced to engage in competition with specialists, most likely to the detriment of the latter. In a study of Bulgarian newspapers following the collapse of state socialism, Dobrev (2000) shows that the reversibility can occur along expected lines with specialist survival rates falling as a function of decreasing industry concentration driven by deregulation and resource depletion. But under different conditions where a combination of greater resource abundance (increased population carrying capacity) and a flattening of the resource distribution (such that more resources become available in the periphery without lowering the resource base in the center) may lead to lower concentration, the outcome may be a replication rather than a reversal of resource partitioning. Among other factors, such conditions may occur during periods of rapid technological innovation.

A final unresolved issue involves the evolution of the specialist segment. At least two scenarios deserve increased scrutiny. First, if resource partitioning is a cyclical process, the specialist segment may fragment repeatedly. It is possible that as the initial specialist segment matures, a few large specialist firms that occupy the center of the specialist resource space dominate it. Such a development may in turn lead to the emergence of a new generation of specialists that attempt to differentiate themselves from the initial specialist subpopulation. For instance, a relatively recent trend in the wine industry is the proliferation of microwineries, a new specialist organizational form that is much smaller in size than the farm winery (Fisher, 1993). Microwineries produce less than 2,000 cases a year, in contrast to farm wineries, which can produce as many as 40,000 cases a year. Industry data indicate that of the 1,099 farm wineries alive at the end of 1990, 330 were microwineries (Swaminathan, 1995). All but four of these microwineries were founded after 1970. Similarly, in the brewing industry, new specialist organizational forms such as brew-on-premise operations and draft-only microbreweries are growing in numbers. Second, the environmental resource distribution may change so drastically that the market center shifts to a region previously occupied by specialist organizations. The U.S. bicycle industry seems to have experienced such a change. Firms such as Specialized and Trek manufacturing mountain and touring bicycles entered the industry as specialists in the late 1970s but dominate the present day industry. Since we believe such dramatic shifts to be endogenous, it would be useful to link industry transformation to the competitive actions of generalist and specialist organizations.

NOTES

1. For American beer drinkers, the year 1997 marked an organizational milestone. For the first time in centuries, the number of American breweries exceeded that of Germany: 1,273 breweries operated in the United States as of June 1997 and Germany was home to 1,234 breweries, by the counts of the Institute of Brewing Studies (1997, 1999). Nonetheless, Germany's per capita consumption of beer currently remains second or third in the world (behind the Czech Republic and Ireland), reflecting its strong and pervasive brewing tradition.

2. According to Jovanovic (2001, p. 108), if the pattern is widespread, then the Gort and Klepper (1982) list of industry-life-cycle facts needs to be modified to something like the following four stages:

(1) Pioneers introduce a product;

(2) Mass entry follows;

(3) A shakeout and consolidation may then occur; and

(4) New fact: A secondary entry of new firms and products then takes place.

3. Not all of these observations and studies have been confirmed with systematic empirical evidence.

4. Consider, for example, the environmental pockets in which DaimlerChrysler operates: its various markets range from gas, diesel, and electric automobiles to commercial vehicles (trucks and buses) to armored vehicles to gas and diesel engines and turbines. Yet the similarities among all these operational domains are obvious both in terms of technological competencies (engine technologies and vehicle assembly) and commercial markets.

5. Obviously, it is confusing to use the same label of "generalism" for two different but related concepts. Future theoretical work would do well to develop this distinction further and to give unique names to the two concepts. 6. Although the previous research concentrates on the specialist component, it does contain many of the ideas about the other two components, albeit often in implicit or unhighlighted fashion.

7. Advertisers would constitute a second major resource base for newspapers.

8. In many resource-partitioning contexts, such as newspapers, price competition among firms is minimal or unimportant. In these cases, it makes sense to calculate the resource distribution as described here. In other contexts, such as auditing or automobiles, the average price of products may vary by segment or location along a resource dimension. In these cases, it likely makes more sense to calculate the resource distribution as the potentially available purchasing power – the average price of products purchased in this segment times the relative size of the consumer base located there.

9. The idea of a 'market center' has also been proposed in research on consumer preference formation as the 'ideal point' (Carpenter, 1989). A brand's closeness to the ideal point in a given market is associated with greater profitability. Carpenter and Nakamoto (1989) also show that pioneering brands have a competitive advantage because they endogenously influence the formation of the ideal point in a market.

10. Note that this estimated probability is different than the conditional probability of a consumer drinking beer given his/her age or political outlook, which can represented as Prob(drinks beer age). In fact, what we plot as the distribution of resources is:

Prob(drinks beer) = Prob(drinks beer | age) Prob(age). Note that this estimated probability is different than the conditional probability of a consumer drinking beer given his/her age or political outlook, which can represented as Prob(drinks beer | age). In fact, what we plot as the distribution of resources is Prob(drinks beer | age). Prob(drinks beer | age) Prob(age). It should be noted that, despite the large sample, the Simmons data are not collected via true random sampling and thus may lead to some bias in the estimates.

11. We refer here to the choice of initial location in a resource space. Both specialists and generalists are constrained by inertial factors when seeking to move from their initial locations.

12. Obviously, if there are economies of scope between the market center and the peripheral regions of the resource space, then the process will operate differently.

13. As Péli and Nooteboom (1999) suggest, introducing uneven resources and scale competition among generalists would presumably strengthen these conclusions, although it seems unlikely that an analytical result could be obtained with these messier assumptions. So if a more precise answer is required, the issue might be best addressed with computer simulation methods.

14. Organizational growth rates are a more complex matter in this context because the specialist organizational form often faces size constraints emanating from its identity, as we discuss briefly below.

15. Of course, one can always redefine product space to incorporate identity and dynamic capabilities of firms. But in our view, such ad hoc redefinitions would undermine the intuitive meaning of space as well as trivialize the insights of these other mechanisms.

16. Parts of this section are adapted from Boone et al. (2000).

17. Boone et al. (2000) note that although they equate generalism with organizational size in auditing, a one-to-one relationship does not necessarily hold between the concepts. This is because organizations can 'generalize' along several distinct dimensions, such as types of products or services offered and types of clients served. Large audit firms can clearly be labeled generalists as far as their service portfolio and the size distribution of clients is concerned. That is, large audit firms target their products to various resource segments by:

(1) offering a range of diversified services, including auditing; and by

(2) competing on both the large as the small client segment.

Small audit firms predominantly focus their services to small clients, which constitute a relatively narrow segment.

18. This implies that junior auditors are frequently evaluated concerning their potential for being a partner. If not, they have to leave the company.

19. Parts of this section are adapted from Carroll and Swaminathan (2000).

20. They also note that identity problems plague companies with another organizational form in the industry, that of the so-called contract brewers who are often associated with the microbrewery movement because they sell specialty beers. Contract brewers, however, do not own brewing facilities and do not actually make their own beer – they contract for its production with other companies. Early contract brewers included such highly visible and successful entities as the Boston Beer Company (seller of the popular Sam Adams lager) and Pete's Brewing Company (seller of Pete's Wicked Ale, among other products). By their count, 114 contract brewing firms were in operation in 1997. Contract brewers almost always conceal the true origins of their beer, which often comes from the plants of mass production breweries with excess capacity (Ono, 1996). It is not unusual to see them referred to in the craft industry literature as "faux," "stealth," "virtual," and "pretend" breweries (see for example Cottone, 1995).

21. The organizational form distinction is very operative in the industry: the Institute of Brewing Studies and the Association of Brewers (the major associations for craft brewers and home brewers) developed and rely on organizational classifications of brewing firms rather than products. For a rigorous analysis of the identity basis of organizational forms, see Pólos et al. (1998, 2001). For an insightful analysis of authenticity in a different commercial context, see Peterson (1997). For empirical demonstrations of the costs of violating normative codes about forms, see Zuckerman (1999) and Zuckerman and Kim (2002).

22. There are also subtle aspects to distributing beer with this appeal, including never selling it in cans or green bottles, using traditional crowns rather than twist-off tops, getting it placed in the 'right' venues, and not using traditional marketing methods.

23. For example, about mass produced beers, Papazian (1998, p. 9) says: "I would hesitate – dare I say – to call some of that mass produced stuff 'beer.' Given the choice, I'd rather pay to drink wine or water." About deception, Van Munching (1997, p. 258) quotes August Busch IV: "50% of the consumers go haywire when they find out [that Plank Road] is not a real brewery."

24. Consider, for example, the following typical query from a microbrewery newspaper: "When I go to the supermarket now, I am faced with a choice: Do I purchase a megabrewed ale, which may be (for all I know) a tasty, high quality, true-to-style beer, or do I instead give my money (sometimes paying more) to the craft brewers who have built this market from scratch, who have worked hard to earn my dollar and my respect, and who have contributed enormously to the beer environment in this country?" (Jones, 1997, p. 6). Megabrewed ale refers to an ale made by a major brewery.

25. There is a great deal of irony here when the larger microbreweries and brewpub chains begin to feel the negative effects of some of the movement's own rhetoric about corporations making beer. Perhaps for this reason, George Hancock, the CEO of Pyramid Breweries (one of the larger and more corporatized micros) complained that the classification system based on a firm's annual production level was "nonsense" and that "the industry would be better served by a definition of craft beers – focused on ingredients and brewing process – rather than craft brewers" (New Brewer, 1997). This alternative classification scheme would, of course, allow mass producers to offer craft beers sanctioned as legitimate by the microbrewery movement, a development likely to be resisted strenuously.

26. It is difficult to estimate the numbers of some of these activities and groups, especially the more local and less formal ones. Among the more established activities and groups, The Institute for Brewing Studies (1998) lists 33 state brewers guilds (with 3 more in formation), 37 beer journals, 13 regional beer journals, and 6 beer Internet publications. Beer festivals of all kinds are routinely advertised; there are scores of them every year, the largest of which draw tens of thousands of persons. Beer clubs are ubiquitous. A few microbreweries have also publicly offered equity in the company and encouraged their customers to buy small amounts of shares as a way to stay connected and involved.

27. The solution is perhaps the best available but it is still not perfect. Microbrewers who enter into these alliances are frequently criticized for "selling out" and their products lose some appeal to hard-core microbrew drinkers. For instance, a recent headline in a craft beer magazine asked, "Who owns Redhook?" (*All About Beer*, 1999). With time and integration into the larger company, there will also likely be some real change in these companies' products and their approaches to the market.

28. For instance, Jim Koch, the CEO of Boston Beer Company who is widely considered a brilliant marketer, tried many pitches to overcome this identity problem, the most famous of which compared beer brewing with gourmet cooking and asked whether the quality of Julia Child's cooking came from the cook or the kitchen (see Van Munching, 1997). Koch also operated a small showcase brewery for a while to counter claims that he did not own a brewery, but most of the company's beer was still made by other breweries on contract.

29. Though specialist organizations such as microbreweries and brewpubs have reemerged relatively recently in the U.S., they were theoretically at risk of emerging at any time after the repeal of Prohibition in 1933. Carroll and Swaminathan's (2000) analysis covers the period 1938–1997, when complete data on the population of brewing firms was available.

30. Although we accept their evidence as interesting and insightful, we do not regard it as definitive on the particular matter. In our view, for the finding to be conclusive a more comprehensive set of alternatives needs to be compared, including a model with all relevant interactions, which their data apparently preclude for statistical reasons.

31. We accept this division for the moment but note that the comparison may be mixing the two conceptualizations of status. A consistent comparison may yield a different comparison. For instance, although consuming microbrewed beer confers public status approval, we are not sure that larger generalists such as Anheuser Busch engage in any deferential acts towards microbrewers.

32. In a personal communication, Joel Podolny adds that for the specialists to receive high status may depend additionally on the development of an adequate institutional

environment, with reliable suppliers and a developed legal infrastructure. This added condition can explain why generalist beer brewers receive high status in less developed countries.

33. Ecological theory decouples the construct of the fundamental niche – the multidimensional social space in which an organization (or an organizational form) can grow or at least sustain itself – from that of the realized niche, a subset of the fundamental niche in which an organization can sustain itself in the presence of competitors (Hannan & Freeman, 1989). We work here with the realized niches, as is common in studies in this tradition.

34. For an earlier application of this kind, see Podolny et al. (1996).

35. Detailed qualitative understanding of an industry is required to recognize the socially constructed grouping of organizations within that industry.

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