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The Oxpecker and the Rhino: The Positive Effects of Symbiotic Mutualism on Organizational Survival

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ABSTRACT

The theoretical foundation and empirical thrust of strategic management is largely grounded in competition, competitive positioning and competitive advantage. It is ironic then that symbiotic mutualism - a relationship between individuals of different species, in which both derive benefit - may be more prevalent among surviving firms than zero-sum competition and may be a more potent selective force in determining the sustainability of successful organizational forms. The purpose of this paper is to articulate a framework for the future study of symbiotic mutualism. Extending the perspective of organizational ecology, I will assert that (a) symbiotic mutualism is a necessary but insufficient condition for firm sustainability; (b) organizations can be structured and staffed for symbiotic behaviors; (c) mutualistic proclivities will, on average, result in significantly higher survival rates; and, (d) new firms that fail to adopt a mutualistic orientation face dim prospects for long-term survival.

Keywords: Mutualism, Symbiosis, Population ecology, Organizational ecology, competition, Predation, Selection, Organizational survival

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The theoretical foundation and empirical thrust of strategic management is largely grounded in competition, competitive positioning and competitive advantage. It is ironic then that symbiotic mutualism - a relationship between individuals of different species, in which both derive benefit – may be more prevalent among surviving firms than zero-sum competition and may be a more potent selective force in determining the sustainability of successful organizational forms. The purpose of this paper is to articulate a framework for the future study of symbiotic mutualism. Extending the perspective of organizational ecology, I will assert that (a) symbiotic mutualism is a necessary but insufficient condition for firm sustainability; (b) organizations can be structured and staffed for symbiotic behaviors; (c) mutualistic proclivities will, on average, result in significantly higher survival rates; and, (d) new firms that fail to adopt a mutualistic orientation face dim prospects for long-term survival.
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-- Margulis & Sagan (2003)

- In more than 155,000 articles on management theory, there is not a single mention of *amphiprion ocellaris*, despite the fact that he is arguably the most loyal and effective asset protection expert in the world.

- It would be odd to start a board meeting with a brief introduction of *buphagus erythrorhynchus*, although he is likely to be a more astute consultant on operational efficiency and quality control than the high-priced seers wandering the halls of corporate headquarters.

- And, even a stealthy CEO might cringe at the sight of *escherichia coli*, not realizing that millions of them labor day and night to keep him functioning and healthy.

The main reason for the relative neglect accorded these three specimina in the annals of management literature is no doubt due to the fact that the clownfish, the oxpecker and intestinal bacteria are biological wonders, far afield from the study of firms, industries and factor markets. Then too, their relative obscurity may also be due to the fact that each of the three engages in a survival mode that is notoriously understated in the study of organizational management: they each survive through symbiotic mutualism, which, in the broadest sense, is a relationship between individuals of different species, where both individuals derive benefit (Smith & Douglas 1987). In

nature, species are naturally endowed with such features. Among organizations, firms create the capacity for symbiotic mutualism, intentionally or unintentionally, in response to environmental conditions.

Though hardly scientific, it is nonetheless telling that of 100 management works recently plucked from the business and economics canon for a compendium of "management classics" (Covert & Shattersten 2010), 67 pertain to competition, competitive positioning and competitive advantage, 18 deal with leadership, 9 address organizational and operational effectiveness, and 6 cover a miscellaneous array of topics on creativity, motivation and self-growth. Not one volume deals exclusively with the structures and behaviors of symbiotic mutualism and only a handful implicitly relate to this biologically and organizationally dominant framework.

While historically, symbiosis has received less attention than other interactions such as predation or competition, it is often regarded by biologists as constituting the prevalent selective force behind evolution, with many species having a long history of interdependent co-evolution (Smith & Douglas 1987; Sapp 1994). Real-life examples of symbiosis abound, including the relationship famously existing between the African black rhinoceros and the oxpecker (*buphagus erythrorhynchus*), a smallish bird that feeds off ticks, flies, and maggots in the rhino's hide. The ubiquitous pair traverses the African savannah, the rhino benefiting from the pest-removal services of the oxpecker and the oxpecker enjoying restful transit and the all-you-can-eat buffet that the rhino's hide offers (Bar-Yam 2011). Similarly ubiquitous is the "piggy-backing" of software application developers for hand-held electronic appliances, such as the symbiotic mutualism existing between Apple's iPhone and the hundreds of thousands of applications that have been developed for the device. Without the applications, electronic tablets would have no content and without the appliance, the content would have no delivery mechanism.

Whether in business or biology, the relative neglect of symbiosis no doubt plays well to the fixation on the dynamics of competition (Sapp 1994), but the neglect does not square with reality, even in nature. Biologist Lynn Margulis contends that symbiosis is a major driving force behind evolution. She considers Darwin's notion of evolution, driven by competition, as incomplete and claims that evolution is more frequently based on cooperation, interaction, and mutual dependence among organisms (Margulis 2003). According to Margulis and Sagan, "Life did not take over the globe by combat, but by networking" (2003).

The purpose of this paper is to articulate a framework for the future study of symbiotic mutualism in organizational management. Extending the perspective of organizational ecology (i.e. Hannan & Freeman 1977, 1989; Carroll 1985; Barnett & Carroll 1987; Aldrich 1990, 2006), I will assert that symbiotic mutualism is a necessary but insufficient condition for firm survival.

By dislodging organizational ecology from its singular focus on populations and communities of populations as the primary levels of analysis, I will make the case that organizational ecology (OE) can be made relevant to management theory if one allows for a relaxation in OE's rigid level of analysis stipulations. Towards that end, I propose that organizations can be structured and staffed for symbiotic behaviors, and that these proclivities will, on average, result in significantly higher survival rates and superior returns.

This paper advances organizational theory and strategic management in two important respects. First, by better defining the constructs associated with organizational symbiosis and by developing a framework with clear, testable propositions related to the antecedents and outcomes of symbiotic structures and behaviors. Second, I provide the means by which the perspectives of organizational ecology can be more relevant to strategic management and firm-level decision-making. By virtue of its population-level analysis, OE has remained on the sidelines of strategic

management research, to the detriment of management scholarship and to the unnecessary limitation of studies in organizational ecology (Aldrich & Ruef 2006).

The conceptual framework of this paper is built principally on the theories of organizational ecology, enhanced by important insights of institutional theory (Meyer & Rowan 1977; DiMaggio & Powell 1983) and systems thinking (Ackoff & Emery 1972; Ackoff 1999), Through this composite lens, I propose that symbiotic-mutualistic structures and behaviors are a necessary but insufficient condition for firm survival. I will assert that by failing to adopt a symbiotic mutualistic orientation new firms face dim prospects for long-term survival.

The remainder of this paper will proceed in four parts. Section one is devoted to a review of organizational ecology as it relates to competition, inertia, symbiosis and the determinants of firm survival. In the second section, I will present an omnibus framework for organizational symbiosis, including a prescriptive road map that advances an agenda for future empirical studies. Section three explores the causes of firms' failure to incorporate symbiotic mutualism. A discussion of these barriers to adoption proceeds by invoking the systems thinking approach of Russell Ackoff (Ackoff & Emery 1972; Ackoff 1999). Finally, I will conclude with a distillation of the symbiotic mutualism framework while signaling several opportunities for future research.

I. Organizational Ecology, Competition and Symbiotic Mutualism

Mutualism versus the Competition Bias. If there is a sense that symbiotic mutualism gets short-shrift in biology, scholars would do well to consider the infinitesimal concern accorded to it in organizational management, where the dominant mode continues to be grounded in the misperception that surviving firms possess superior competitive capabilities and that competition is the primary mechanism of selection (Caves & Porter 1977; Hannan & Freeman 1977; Porter 1980; Quinn 1980). Dominant or not, there is reason to doubt the viability of this competitive perspective on both descriptive and prescriptive grounds.

Descriptively, the contention that competition is the "selective force" driving the evolution of organizational forms is suspect because the study of competition constitutes a self-fulfilling line of inquiry. If the focus of one's research is to differentiate performance on the basis of competitive capabilities, then symbiotic mutualism is largely out-of-scope. This competitive bias in research and theory building is consequential since, similar to biology, organizational symbiosis is extremely common, but relatively understudied. Indeed, it may well be that firms engaging in symbiotic mutualism are themselves unaware of the behaviors. Certainly, there is ample evidence of conscious mutualism, through joint ventures (Kogut 1988), research consortia (Branstetter & Sakaakibara 2002), incubators (Mian 1996), and alliances (Hamel 1991). How much more mutualism may lay hidden from conscious investigation? Regardless of whether the mutualism is conscious or unconscious, and whether or not firms enter such arrangements out of self-interest or even to simply minimize transaction costs (Coase 1931; Williamson 1975, 1985), the presence of mutualism suggests that organizational structures and management activities dedicated to symbiosis may constitute a far greater proportion of the factors affecting firm survival than is noted in the literature (Chertow 2000).

Prescriptively, the contention that competition is the "selective force" driving the evolution of organizational forms is equally suspect because the extraordinarily high failure rate for new ventures – including both firm foundings and new, non-core activities by existing firms – suggests that "launch conditions" fueled by a focus on competitive capabilities may be a handicap rather than an asset in dictating firm survivability. The competitive prescription is an alluring premise

for new ventures, but it is derived from research on a tiny fragment of all companies. As Aldrich wrote, "Contemporary books and journals tend to focus heavily on publicly traded firms, numbering less than 20,000 businesses in the United States…as if the Fortune 500 were the only creatures in the organizational zoo" (Aldrich 2006:7). Hannan and Freeman also indicate "significant diversity within and across industries, with hundreds of forms that people don't notice" (Hannan & Freeman 1989). Any prescriptive tool is only apropos to the extent that it is applicable to the pool of subjects, and the same is true for competition. With 23 million businesses in the U.S. alone, there is ample reason to question the degree to which competition-biased prescriptions are fully relevant (Aldrich 2006). If instead, a "launch-ready" firm possesses structures, staffing and behaviors oriented towards symbiotic mutualism rather than full competition, it may have the capacity to engage market challenges through supplementarianism and complementariansim (Barnett & Carroll 1987). Prescriptively, this orientation may constitute a more robust array of capabilities with which to survive. Put another way, being competitive is not likely in and of itself to hurt a firm, but failing to possess symbiotic capabilities may.

Organizational Ecology and the Matter of Symbiosis. The strengths, and the limitations of OE, lie in its highly focused study of organizational diversity. Although its intellectual roots clearly lie in the study of human ecology (Hawley 1950) the connection is more inspirational than literal. As Singh and Lumsden noted, the key concerns of OE are to "investigate how social conditions influence (a) the rates of creation of new organizational forms and new organizations, (b) the rates of demise of organizational forms and organizations, and (c) the rates of change in organizational forms" (1990). Contrary to virtually every other organizational theory, organizational ecology flouts the widely propagated notion that firms adapt to changing environmental circumstances. Rather, the central tenet of organizational ecology is that: "once founded, organizations are subject to strong inertial pressures, and alterations in organizational populations are largely due to demographic processes of organizational foundings (births) and dissolutions (deaths)" (Hanna & Freeman 1977). With an over-arching emphasis on the process of selection, OE has sometimes suffered from disparaging claims that it is trying to advance a "law of the jungle" mentality.

Such criticism misses the point and oversimplifies the theory. In actuality, OE has taken at least cursory note of symbiotic mutualism, albeit in the context of population-level studies (i.e. Brittain & Freeman 1980; Wholey & Brittain 1986; Barnett & Carroll, 1987). A thorough analysis of the OE literature (see Table 1 below) reveals a small number of explicit references to symbiosis. It also, provides a large body of *implicit* evidence of symbiotic-mutualism. Since OE examines populations, it is prone to overlooking symbiotic mutualism, which is generally visible at the firm level. Accordingly, explicit references to symbiosis are rare. However, in conducting longitudinal industry studies, it is common for researchers to supply implicit evidence of symbiotic behavior. For example, research of mortality rates and population density in the California wine industry, 1941 - 1985 (Delacroix et al. 1989) did not explicitly focus on the extent to which industry participants employed symbiotic structures and behaviors to build market legitimacy for the population of wine producers. Nonetheless, symbiosis is implicitly evident in data relationships that formed the basis of the study, including: the voluntary commitment to quality standards, formation of an association, collaborative marketing and price positioning vis a vis French producers. Explicit references to symbiosis, while rare, do exist, serving as important indicators of the lurking, underexplored role of mutualism. For instance, Barnett & Carroll (1987)

contributed directly to the study of "shared fates among organizations" (1987: 400), with the authors noting: "when organizations enhance each other's viability, they are mutualistic."

Table 1: Selected References to Symbiosis in Organizational Ecology Literature

Symbiosis Domain	Reference to Symbiosis	Population	Citation
Legitimacy of Population	Implicit	Worker Coops in Canada (1940-1987)	Staber (1989)
	Implicit	California Wineries (1940 - 1985)	Delacroix, Swaminathan & Solt (1989)
	Explicit	Toronto Child Care (1971-1987)	Baum & Oliver (1991)
Customer Niches	Explicit	Semiconductors (1948-1984)	Hannan & Freeman (1989)
	Explicit	CO asbestos abatement firms (1984-2010)	Hunt (2011 working paper)
Geographical Niches	Explicit	PA telephone firms (1877 – 1933)	Barnett & Carroll (1987)
	Explicit	CO asbestos abatement firms (1984-2010)	Hunt (2011 working paper)
Product Compatibility	Implicit	Glass Container Industry (1899 – 1984)	Anderson (1988)
Research & Development	Explicit	Tech Alliances (1990-2005)	Patrick (2007)
Human Resources	Explicit	Silicon Valley Start-Ups (1994-2002)	Baron & Hannan (2002)
	Implicit	Belgian Auditors (1896-1992)	Boone & Meuwissen (2008)
Sales	Implicit	Local Newspaper Industry (1870 – 1995)	Carroll & Huo (1998)
Marketing	Implicit	U.S. Computer Industry (195-1994)	Barnett, et al. (2003)
	Implicit	Greek Money Managers (1996-2005)	Gotsopoulos (2010)
Distribution	Implicit	Cement industry (1886-1982)	Anderson (1988)
	Explicit	Indonesian accounting & law firms (1946-2010)	Hunt (2011 working paper)
Manufacturing	Implicit	U.S. Brewing Industry (1633-1988)	Carroll & Swaminathan (1989)
		U.S. Auto Industry (1885-1981)	Carroll, et al. (1996)

Barnett and Carroll summarized the role of mutualism in this fashion:

> "By the ecological conception, shared fates among organizations indicate interdependence. When organizations negatively affect one another, they are competitive. When they enhance each other's viability, organizations are mutualistic. Organizational interdependence can exist at several levels: between

> individual organizations, between populations of organizations, and between communities of organizations." (1987: 403)

True to their OE roots, Barnett and Carroll's rigorous adherence to the analysis of populations limited the follow-through of this key finding. Since it appears that the most significant effects of symbiosis on organizational selection are derived at the firm level, there is limited interest in mutualistic effects among population ecologists. As a consequence, the extent to which symbiotic mutualism may influence the probability of firm survival has received scant attention from organizational ecologists in the ensuing years. That which has been implicitly compiled has lacked a coherent theoretical structure, clear constructs and a guiding framework. Here, the impact of symbiotic mutualism will be addressed as a fundamental precondition of firm survival:

Proposition 1: Firms that adopt a mutualistic orientation at founding will, on average, survive longer and perform better than firms that adopt a strictly competitive orientation.

Organizational Inertia. Although there are a wide variety of ecological perspectives, they all ultimately focus on selection. That is, they attribute patterns in nature to the action of selection processes. Meanwhile, the bulk of the non-OE literature on organizations subscribes to a different view, one that adopts the "adaptation perspective" (Nelson & Winters 1982). According to the adaptation perspective, subunits of the organization, usually managers or dominant coalitions, scan the relevant environment for opportunities and threats, formulate managerial responses, and adjust organizational structure appropriately (Nelson & Winters 1982; Levitt & March 1988; Mintzberg et al. 1985). OE has taken issue with the assumption that organizations are plastic and changeable, asking why, if this is so, is failure so common? (Hannan & Freeman 1977; Aldrich 2006)

The belief that organizational structures contain a large inertial component is not an OE creation. The concept was first formally suggested by Burns and Stalker (1961) and Stinchcombe (1965), though of course, they borrowed heavily from Weber (1947) in developing their respective treatments of inertia. Inertial tendencies and the short-term selection benefits that accompany it have been roundly embraced by management scholars (e.g. Meyer & Rowan 1977; DiMaggio & Powell 1983; Hannan & Freeman 1984, Snell & Dean 1994) since it provides a robust explanation for how predictable, stable, well-understood organizational forms cushion their customers, suppliers, shareholders and partners from decision-making under conditions of uncertainty. At equilibrium, inertial qualities are efficient and effective in meeting customer demands and returning market-level returns to shareholders.

While virtually all organizational management scholars, post-Weber, accept that mature organizations are at least somewhat inertial, organizational ecology is unique in tracking inertia to its logical extreme: stasis. Even at the level of populations, OE holds that the driving mechanism for an industry's evolution is unlikely to be the adaptation of its individual firms (Hannan & Freeman 1977). Instead, it is believed that the selective replacement of outdated organizations occurs as industries adapt. In the airline industry, for example, the once-dominant Pan Am, TWA, and Eastern are all no more. Old household names in retailing such as Montgomery Ward, Sears, and J.C. Penney have given way to Wal-Mart and Target. And steel giants such as Bethlehem and U.S. Steel have lost out to mini-mills such as Nucor. Thus, companies that are largely inertial will die even while the industries themselves evolve.

Indeed, recent studies within organizational ecology suggest that attempts by firms to change course often have deleterious effects (Hannan & Freeman 1984). The Stanford Project on Emerging Companies (SPEC), directed by Hannan and Baron, tracked the evolution of nearly 200 high-technology startups in Silicon Valley between 1994 and 2002, creating one of the most comprehensive databases on the histories, structures, and human resource practices (Baron and Hannan 2002) of start-ups. The study found — in line with organizational ecology's theories about the disruptive effects of change — that companies reorganizing their human resource blueprints tended to suffer higher employee turnover and diminished performance. Enterprises in which the blueprint changed were more than twice as likely to fail as similar firms with blueprints that were stable. Over a three-year period, the latter firms grew at almost triple the rate of the former.

Most important of all the observations was this: Given the benefits of staying the course, entrepreneurs should pay more attention to picking an appropriate organizational model from the start (Baron & Hannan 2002). The initial blueprint at founding should be a compromise between the current and the expected future needs—a point that few company founders seem to care about. "It's by no means uncommon to see a founder spend more time and energy fretting about the scalability of the phone system or IT platform than about the scalability of the culture and practices for managing employees," write Hannan and Baron (2002: 87).

In this context, it is apparent that once formed, surviving organizations will, on average, display little or no change in their respective structures and operational orientations. The same is expected to be true with respect to a firm's adoption of a symbiotic-mutualistic orientation:

> *Proposition 2: Firms that do not adopt a mutualistic orientation at the time of firm founding are unlikely to ever do so.*

Legitimation, Structure and Survival. Efforts by new firms and new populations of firms to attain legitimacy are both a cause and a consequence of organizational inertia. Legitimation is the socially framed process by which a certain way of doing things comes to be seen as natural or taken for granted (Carroll & Hannan 1989; Baum & Oliver 1991). Legitimation increases founding rates and reduces mortality rates (Baum & Oliver 1991). Competition arises when organizations need to rely on the same pool of resources, such as capital and customers. Competition has the opposite effect of legitimation: It reduces founding rates and raises mortality rates (Carroll & Hannan 1989).

OE holds that new organizations are more likely to fail than industry incumbents (Swaminathan 1995). Since this is so intuitively and empirically evident, the focus is instead on question of why new organizations fail at a higher rate. Contrary to prevailing sentiment among other organizational theories, OE holds that it is not the youth of new organizations but their small size that constitutes the biggest risk factor (Singh & Lumsden 1990). Whether the symbiotic perspective finds fault in both lines of analysis. Rather than explicitly pertaining to either smallness or newness, new organizations are postulated to fail with greater frequency because of their persistent failure to construct the proper set of structures and behaviors at the time of founding, including features that are patently symbiotic. In this sense, legitimation is the key. Newness and smallness are simply moderators of the drive to attain legitimacy. Symbiosis, by bridging structures and behaviors to other entities should hasten the drive to legitimacy. Therefore, it is proposed that:

Proposition 3a: Symbiosis will enhance the likelihood of attaining organizational legitimacy.

Proposition 3b: Symbiosis will expedite the process of attaining organizational legitimacy.

Marketplace interactions. Overwhelmingly, ecologists have focused on competition. This is partially due to the relative availability of data but also due to a deeply engrained bias to consider competition as the dominant mode of firm interaction. Given that early decisions are virtually "locked in stone" (Hannan & Freeman 1984, 1989) it is little wonder that new firms relenting to mimetic isomorphism (Haveman 1993a) of the dominant organizational forms would commit, often irreversibly, to a competitive orientation, regardless of whether or not it is in long-term interest to do so. This focus on competition is ironic in the broader scheme of natural reality since symbiosis is dramatically more prevalent in nature than is competition. This is, no doubt, at least partially attributable tot eh fact that species have very little ability to impact an environment through their own actions and must, therefore, adapt or be selected out. Nonetheless, in the face of high failure rates, why would firms persist in formulating organizational forms and behaviors that are oriented towards complete competition, rather than a mutualistic orientation?

A key contribution of OE involves its analyses of the interactions between populations. Decisive empirical research has supported the existence of population-level influence (i.e. Barnett 1987; Haveman 1993; Aldrich & Ruef 2006) Over the course of this research, six forms of interaction have been identified, each of which involves a predicted impact by one population on other populations within the same environment. Although OE theorists constructed the framework to describe phenomena at the population level of analysis, relaxing the level of analysis strictures, enables us to construct an interesting parallel at the firm level. For the sake of clarity, consider a modified version of the Brittain and Wholey (1988) population-level model, oriented here towards an articulation of firm-level proclivities for two firms, A and B.

Table 2: Taxonomy of Competitive and Symbiotic Combinations

Interaction	Impact	Description	Examples
Full competition	(- , -)	The presence of A or B negatively impacts the other.	Lowe's and Home Depot within one block of each other.
Partial competition	(- , 0)	A's growth decreases in the presence of B, but B is unaffected.	Local hardware store when Home deport moves in.
Predatory Competition	(+ , -)	A's benefit comes at the expense of B.	Digital downloads versus video stores
Neutrality	(0 , 0)	A and B do not affect one another	Video store and Home Depot – no effect on one another.
Commensalism	(+ , 0)	A benefits from presence of B, but B is unaffected by presence of A	Video store gets more traffic by being near Home Depot. (but no gain for Home Depot)
Symbiosis	(+ , +)	A and B benefit form the presence of each other.	Video store inside a supermarket.

Source: Modified from Brittain & Wholey (1988) and Aldrich (1990)

In all likelihood, firm founders rarely if ever consciously opt for a competitive orientation. Rather, they infer from their cognitively limited scanning of the environment that existing firms must be the top competitors, suggesting a widespread belief that mimetic isomorphism (Haveman

1993a) will support the odds of competing successfully. Alternatively, the founders may decide to compete by developing and implementing a novel organizational form, unwittingly handicapping their new enterprise by saddling it with an ill-fated competitive orientation ***and*** an unfamiliar organizational form that lacks legitimacy and market-proven assuredness. Either way, the decision-making framework is bounded by a competitive orientation that will rarely result in a viable business form.

Mimetic isomorphism (DiMaggio and Powell 1983 Haveman 1993a) goes a long way towards explaining why organizational forms appear the way they do at the time of firm founding. And, others (Haveman 1993b) have sought to use this model to explain why organizations change over time to become more similar to other organizations within their respective environments. Mimetic isomorphism can result from efficient responses to uncertainty (DiMaggio and Powell 1983: 151). When faced with uncertainty, organizations economize on search costs (Cyert and March 1963) and initiate actions of other organizations. According to March's model once enough social actors do things a certain way, that particular course of action becomes taken for granted or institutionalized, and thereafter, other social actors will undertake that course of action without thinking. Evidence of mimetic change comes from a wide array of studies examining a diverse set of organizational outcomes: the evolution of the hospital structure (Starr 1982), municipal government (Tolbert and Zucker 1983) and multidivisional corporations (Porter 1980) Although imitation has long been regarded as a sensible guide to organizational change (e.g. Levitt & March 1988), there has been little theoretical analysis to determine which social factors will be imitated. The critical absence of a "causal mechanism" limits the applicability of organizational ecology. This is exactly what needs to be addressed next.

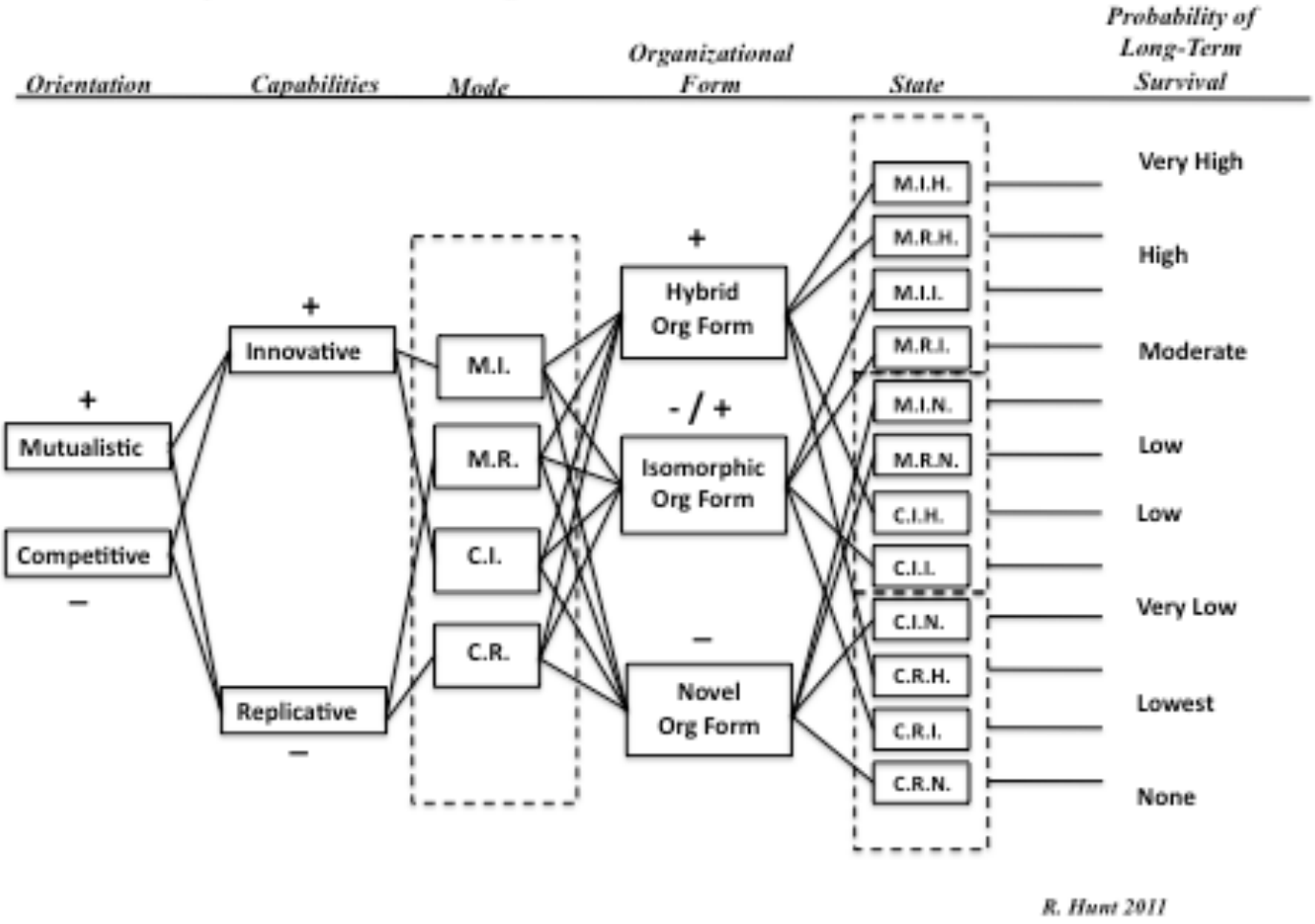
II. Framework for Organizational Symbiotic Mutualism

A multitude of determinants exist that ultimately influence the success or failure of an individual firm. It is well beyond the scope of this article, or any extant set of articles, to catalogue, much less detail, the full range of criteria that ultimately drive the selection of surviving organizational forms. Rather, the more modest goal here is to develop an effective framework (see Figure 1) to ask the following questions:

- Can intentional or unintentional adoption of symbiotic structures and behaviors meaningfully forestall the effects of selection?

- And, in light of persistently high new venture failure rates, why do firms opt for organizational structures and behaviors that routinely fail to survive?

FIGURE 1: Symbiotic Mutualism – Long-Term Outcomes



This framework provides the basis for conducting empirical investigations survival rates involving comparisons between new firms employing symbiotic mutualism versus those that engage in fully competition. The model incorporates three of the most salient levers that the management of a new firm must engage prior to launching the venture: orientation (mutualism versus competition), positioning (innovation versus replication) and organizational form (isomorphic, novel or hybrid).

Mutualism versus Competition. As noted earlier in the modified Brittain & Wholey (1988) relational typology, symbiotic mutualism arises when separate and distinct firms benefit from one another's presence. A simple example would be the proximal location of hardware stores and lumber yards. The competitive permutation of this example would involve a Home Depot or Lowe's carrying hardware and lumber, thereby engaging in full competition. For new ventures, it is postulated that symbiotic mutualism will increase the probability of survival while a competitive orientation will reduce the probability.

Proposition 4a: Symbiotic mutualism is positively associated with firm survival, with more symbiosis being better than less.

Proposition 4b: A symbiotic mutualism orientation, when coupled with innovative capabilities and a hybrid organizational structure, will exhibit the highest rates of firm survival.

Proposition 4c: A competitive orientation, when coupled with replicative capabilities and a novel organizational structure, will exhibit the lowest rates of firm survival.

Innovative versus Replicative. Even among new ventures, there is a decisive split between those that have the capabilities to introduce innovations to the marketplace versus that intend to largely replicate existing product or service offerings. For instance, in the 1980s and 1990s, innovative biotech companies and replicative generic drug manufacturers began to challenge larger pharmaceutical incumbents. Some biotech companies sought to develop their own sales forces and to launch their own new drugs rather than partnering with major pharmaceutical companies, while others chose the partnership route (Powell 2008). Companies that partnered performed significantly better than those that elected to go it alone (Kellogg & Chanes 2000). Generic drug companies are by definition replicative businesses, yet new generic firms that developed viable ways of working symbiotically with pharmaceutical companies, rather than competitively, displayed high survival rates and superior long-term financial performance (Powell 2008).

Innovation, which varies considerably by industry, does not guarantee survival, nor does replication guarantee failure. Rather, the relative rates of success or failure are a function of attaining legitimacy and acceptance in the marketplace. In this context, few considerations are more consequential than whether an innovative or replicative firm intends to operationalize their business model by employing symbiotic mutualistic structures and behaviors. Given the liabilities of smallness (Singh & Lumsden 1990) and newness (Singh & Lumsden 1990; Aldrich & Auster 1986) combative full competition can leave incumbents with little choice but to crush the an aggressive new competitor. Instead, by addressing the marketplace with a mutualistic orientation, the general industry legitimacy is enhanced for all member-firms while other firms are vested in the eventual success of the technology and, implicitly, the new entrant.

Regardless of whether or not a company is innovative or replicative, it will always enhance its probability of survival by engaging in symbiotic behaviors.

Proposition 5a: The presence of symbiotic mutualism will be a positive moderator for a new venture independent of whether the firm's business model is primarily innovative or replicative, with more symbiosis being better than less.

Proposition 5b: Innovative new firms that employ symbiotic mutualism will, on average, survive longer and perform better than firms employing a full competition orientation.

Proposition 5c: Replicative new firms that employ symbiotic mutualism will, on average, survive longer and perform better than firms employing a full competition orientation.

Organizational Form. Mimetic isomorphism (DiMaggio & Powell 1983; Haveman 1993a) will overwhelmingly dictate the organizational form selected by most new ventures, and for good reason. Nascent firms and populations of firms lack legitimacy (Meyer & Rowan 1977). So, while other priorities may lead a new venture down the path of considering novel organizational forms, the need for perceived legitimacy is the "trump card." An isomorphic organizational form is one that substantively resembles the industry incumbents in terms of structure, governance and key relationships (i.e. customer relations, suppliers, distributors). While perhaps restrictive in light of innovative aspirations, mimetic isomorphism of organizational forms has the advantage of being immediately recognizable, predictable and legitimate. A novel organizational form is one that possesses features that runs contrary to the norm among industry incumbents; for instance, a firm seeking to implement a franchising model into an industry with independent, stand-alone incumbents. A hybrid organizational form is one that is based on a combination of incumbent features and futuristic, aspirational features. The initial blueprint at founding should be a compromise between the current and the expected future needs (Baron & Hannan 2002). Extending these findings for new ventures it is postulated that hybrid organizational forms will yield the highest probability of survival, followed by isomorphic forms. Consistent with prior research, the framework allows that c*eteris paribas*, novel organizational forms have the lowest probability of survival (Baron & Hannan 2002). However, all three of these are fundamentally and favorably moderated by the presence of symbiotic mutualism.

Proposition 6: The presence of symbiotic mutualism will be a positive moderator for all organizational forms, with more symbiosis being better than less.

In the worst of all possible circumstances are those firms that are replicative with a competitive orientation and that opt for a novel organizational form. While there are many instances of replicative firms successfully competing on price, service or features (e.g. Caves & Porter 1977), the odds are clearly stacked against them, particularly if the founders pursue a novel organizational form (DiMaggio & Powell 1983. By seeking to compete with "me-too" products or services with an organizational form that lacks acceptance and legitimacy, it is predicted that the probability of firm survival asymptotically approaches zero. Therefore:

Proposition 7: Firms electing to implement a novel organizational form with a competitive orientation and replicative capabilities face the lowest probability of survival.

III. Systems Thinking and the Question of Symbiotic "Uptake"

Earlier, we asked the question: Why do so many firms select organizational forms and behaviors that result in failure? One answer of course, is that clearly they do not expect failure when the pathway is originally selected. Simple as it may seem, this is exactly the problem. Individuals have so little ability to see the potential consequences of their decisions that the ultimate success or failure is virtually a random occurrence, because the system is impossibly complex. What we do know is that reductionistic thinking, vague heuristics and isomorphism will not work. This is the essence of systems thinking. Ackoff sized up the issue in the following fashion:

> Missions are typically built around only a partial understanding of the system, its features, dynamics, risks and rewards. Over-confidence is bred from defining heuristics in which we are too heavily invested. Since we cannot comprehend the full dimensionality of a system, we rationalize the task and exaggerate our understanding of small components through careful analysis of a mere fraction of all that the system is. Through this, we encounter the inability to understand that a company is a system within a larger nexus of systems that may or may not accept modifications to the system's whole. (Ackoff 1999)

It is far more than mere coincidence that the very first article ever published in Organizational Science suggested that it is inappropriate for organizations to settle prematurely into a normal science mindset, because organizations are enormously complex (Daft and Lewin 1990).

In this sense, systems theory is not merely receptive to the concept of symbiotic mutualism, it is the very embodiment of it. In the most general sense, a system is a configuration of parts connected and joined together by a web of relationships (Ackoff & Emery 1972) Bánáthy's Primer group defined system as "a family of relationships among the members acting as a whole" (2000) For sociology and anthropology systems theory is an approach to interpret society as a structure with interrelated parts, and thereby addressing society as a whole in terms of the function of its constituent elements (Bánáthy 2000).

Although systems theory has its roots in operations, it has become germane to management science through the traditions of systems thinking, articulated by prominent theorists, particularly Ackoff. To Ackoff, systems thinking is the process of understanding the linkages and interactions between the elements that compose the entirety of the system (Ackoff 1999). It has also been defined as an approach to problem solving, by viewing "problems" as parts of an overall system, rather than reacting to specific part, outcomes or events and potentially contributing to further development of unintended consequences. Systems thinking is not one thing but a set of habits or practices within a framework that is based on the belief that the component parts of a system can best be understood in the context of relationships with each other and with other systems, rather than in isolation (Ackoff & Emery 1972). As Ackoff was fond of saying: "No part of a human being is human; only the whole is" (1999: 132).

Organizations are not created in vacuums. They are socially constructed groupings (Bánáthy 2000) formed within a context that simultaneously embodies the entirety of human history and the agglomerated expectations for the future. So often the metaphor of "giving birth" is invoked to capture the essence of creating a new business. Not only is this metaphor wrong, it is dangerous. It represents a crystallization of all the misguided assumptions regarding firm formation and firm survival. Far from creating new organisms, the formation of new firms is best thought of as an organ transplant, whereby an existing biological system requires viable, simpatico entrants that provide supplementary or complementary capabilities (Ackoff 1999). An organ that does not meet these criteria will be "rejected" by the existing system.

Even if the structure and commercial intents of a firm appear to be straightforward, the system to which it is attaching itself is unimaginably complex. Because we are creatures of the modern, industrial age we tend to think reductionistically (Ackoff 1999). By breaking problems into a variety of smaller parts we try to gain understanding of the whole by better understanding the constituent parts. Because we are boundedly rational with a finite cognitive capacity to process

information and stimuli, we necessarily only comprehend a small part of the systems that we so eagerly dissect.

In business it is no different. Well-optimized firms will be those that are conceived and implemented in the context of systems thinking. New businesses do not create new systems, they merely influence pre-existing systems, usually with poor results as a consequence of ineffectively "attaching" to the existing system.

Proposition 8: Firms with founders who employ a systems thinking perspective will more frequently adopt a mutualistic business orientation.

IV. Conclusions and Opportunities

The framework for organizational symbiotic mutualism that has been presented in this paper contributes to a better understanding of the factors influencing organizational survival. It also advances a number of thought-provoking implications for both scholars and practitioners.

First and foremost, the model situates symbiotic mutualism more centrally in the study of firm survival, providing a long overdue counterpoint to the dominant orientation of competition and competitive positioning. It was asserted here that symbiotic mutualism is a necessary but insufficient determinant of firm survival. Under all scenarios involving firm capabilities and organizational forms, mutualistic structures and behaviors are predicted to enhance survivability. Due to cognitive limitations and misunderstandings about incumbent firms, most new ventures opt for a competitive orientation and, as a result, do not survive.

Another contribution stemming from the framework is the roadmap it provides for scholars and practitioners to test the viability of symbiotic mutualism. By defining and contextualizing constructs based on mutualism, the framework can be vigorously subjected to empirical scrutiny, often by utilizing data that is already in-hand from previous studies. Theoretically, the symbiotic mutualism framework reignites opportunities to make fuller use of the longitudinal studies performed by organizational ecologists. By relaxing the strict level-of-analysis boundary conditions imposed by organizational ecologists, it was shown that the key tenets of OE can be deployed to useful means in the domain of organizational management, including firm-specific effects.

Though sometimes overlooked by management scholars, Ackoff's systems thinking approach (1999) was introduced in this paper to demonstrate why symbiotic mutualism is underutilized by practitioners and understudied by scholars. The interface between organizational ecology and systems thinking led to a key contribution pertaining to the "launch conditions" of new ventures. Given the highly inertial nature of extant firms, the extraordinary importance was made clear that orientation, capabilities and organizational form at the time of a new venture's launch. Then, too, given limited cognitive capacity and the vast complexity of the system to which firms are seeking to "attach," it is hardly surprising that most new enterprises fail.

As Aldrich noted, it is easy to forget that large companies started as small companies (1999). Among other things, this deceptively simple observation implies that there was a point in time when size could not have been singularly instrumental to firm survival. Something else created the conditions necessary for survival. What was it? The clear tendency in the management literature is to look for competitive advantages (Caves & Porter 1977; Porter 1985), impregnable defensive walls (Barney 2004), dynamic capabilities (Teece et al. 1997), superior learning (Levitt

& March 1988), more efficient and more effective contracting processes (Coase 1937; Williamson 1975), optimal governance structures (Williamson 1985). In some form or fashion all of these perspectives are grounded in the assumption that the vital equipment to enhance the prospects of firm survival have a competitive purpose. Herein lies the need to incorporate symbiotic mutualism.

Empirically and theoretically, mutualistic structures and behaviors are not only possible in capitalism, they may actually predominate among surviving firms. If so, this should actually be of little surprise. For all the focus and attention accorded competition, mutualism is vastly more prevalent among surviving species in nature and, it has been posited here, more pertinent to surviving organizations in business. Game Theory long ago understood that there is a middle ground between domination and capitulation (i.e. Krebs et al. 1982). Social welfare is maximized when the participants intentionally or unintentionally opt for mutualistic outcomes (Hochman et al., 1969). Symbiotic mutualism thereby serves as a headline, not a footnote, in the processes and outcomes associated with organizational selection.

Opportunities abound to empirically scrutinize the symbiotic mutualism framework. The good news is that many of the propositions that have been advanced in this appear can be readily examined using a number of predictor and data sets that are already employed today. Although much of the data was not collected with an analysis of mutualism in mind, that raw data, especially that which was collected in a number of longitudinal OE studies, is highly apropos.

Regarding key variables to test the propositions, it might at first appear that apprehending central elements of the framework are elusive, such as the propensity to engage in competitive or mutualistic behaviors or the specific characteristics of a firm expressing a mutualistic orientation. In fact, however, these variables can be readily examined taking into account industry-specific characteristics. For instance, a longitudinal study of the asbestos abatement industry (Hunt 2011) revealed that the competition versus mutualistic orientation was detectable in a whole host of new company structures and behaviors, including: the frequency with which firms would collaborate on specific projects; the extent to which new firms respected geographical boundaries; the extent to which new firms respected project size boundaries; the frequency with which firms shared personnel, including supervisors; and, the extent to which different size companies split up different size projects with the same customers. Such studies of complete populations will further define the predictors and outcomes of symbiotic mutualism.

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