Can the Red Queen Help?

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Over three decades ago in his landmark article “The Origins and Maintenance of Interest Groups in America” (1983), political scientist Jack Walker asked: “[W]hy does the current set of [interest] groups exist [in America] rather than some other set one might imagine, which would represent other segments of society? (p. 390)” Ever since Walker’s study, interest group scholars have been preoccupied with this question; yet a definitive answer remains elusive. For most of the last 30 years, scholars have addressed the question primarily by focusing internally on the exchange of benefits between group leaders and group supporters. Indeed, Walker himself adopted a basic “exchange theory” perspective of interest group development (though breaking with past scholarship by emphasizing the role of group patrons rather than members in formation and survival). More recently, despite the substantial progress made by exchange theorists, interest group scholars have begun to look outside groups to address questions of group formation and survival.

Most prominent among outward-looking studies are those that utilize the population ecology (PE) framework (see Gray and Lowery 1995; 1996a; 1996b; 1997; 2001). This broad framework focuses on the evolution of organizational populations, focusing on how competition between like-groups affects the group-level vital events of birth (formation) and death (disbandment). Within PE, one theory fragment has received particular attention—the theory of density dependence. The theory, which posits that population density (operationalized as the number of groups in a population) affects selection in group populations and thus is a prime mover of change in the organizational world, has garnered support from several empirical studies of populations of politically active organizations (Gray and Lowery 1995; 2001; Minkoff 1995; 1997; Nownes 2004; Nownes and Lipinski 2005; Stretesky et al. 2011). Yet the theory is a rather blunt instrument, as it treats all groups in a given population as essentially equal in the amount of competition they exert. This is problematic, as we know that in the real world some groups generate more competition than others.

In this paper, we undertake an initial test of the theory of “Red Queen” competition. This promising theory has been tested against data on non-political organizations, but we are the first to test it against data on political organizations. The theory is an extension of density dependence theory that jettisons the assumption that all groups in a population are equivalent. The theory posits that competition among groups in a population is history-dependent such that each organization’s competitiveness is a function of its historical experience. Specifically, the theory holds that some groups—groups with a great deal of recent competitive experience—are fiercer competitors than others, and that this has implications for population dynamics. From here, the theory predicts that populations relatively full of recently experienced incumbent organizations are extremely uninviting for newcomers, while populations relatively devoid of recently experienced competitors (thusly full of incumbents whose competitive experiences are either minimal or concentrated in the distant past) are relatively inviting for newcomers. The theory of Red Queen competition gives rise to two substantive hypotheses, both of which we test here against data on the formation of gay rights interest groups in the United States. In the end, we find strong support for the theory of Red Queen competition, a theory that holds substantial promise for understanding the contours of interest group representation in America and elsewhere.

**Group Formation and Survival: Inside or Out?**

How do interest groups form and then develop over time? Addressing this question suggests answers to Walker’s more general question of why the interest group universe looks the way it does. In the past two decades, the “centre of gravity in the literature’s discussion” (to use Halpin’s words, 2014: 22) of this question gradually has shifted outward, first from individual to group, then from group to population. Early work in the Olsonian vein (including Olson [1965], Salisbury [1969], and Walker [1983; 1991]) focused on “the decision-making processes of individuals” (Hojnacki et al., 2012: 9.5) who weighed the costs and benefits of group joining or sponsorship. Subsequently, many scholars viewed this approach as constraining and chose the group as the unit of analysis, examining how environmental factors affected group strategy, tactics, adaptation, and learning (see, for example, Crowley and Skocpol 2001, Skocpol et al. 2000). And finally, a burgeoning PE literature has emerged that approaches questions of group development from a population-level perspective (see especially Gray and Lowery, 1995; 1996a; 2001). Population ecology (PE) studies examine the group-level vital events of birth and death, but do so with little reference to what actually happens within groups themselves. Instead, PE studies focus on the larger environment in which groups in a population exist.

 In short, some scholars of group formation and survival use the individual as their unit of analysis, others use the group, and still others use the population of groups. It is striking how little scholars in each camp speak to one another. PE scholars are particularly cordoned off, essentially implying that what happens within individual groups (especially between birth and death) is not particularly important for understanding group formation and survival. Indeed, many PE studies explicitly make two assumptions that lead to an eschewing of individual and group-level analysis. First, PE studies assume “structural inertia” within groups (Halpin 2014: 44). In other words, PE studies assume that groups do not change much over time. Second, PE studies more or less “assume…some basic homogeneity in organizational formats” within group populations (Halpin 2014: 6). In other words, PE studies assume that groups within a population tend to be functionally equivalent to one another. These two assumptions lead PE scholars inexorably outward to a focus on population rather than individual or organization.

*PE Scholarship and the Theory of Density Dependence*

Some of the most influential studies of group development of the past 25 years have had a strong PE tint (see, for example, Gray and Lowery, 1995, 1996a, 1997, 2001). Especially noteworthy here is the work of Virginia Gray and David Lowery (and their collaborators), whose PE work draws heavily upon the work of organizational sociologists, who themselves draw heavily on the work of population biologists (see, for example, Hannan and Freeman 1987, 1988). One theoretical fragment from PE work has proven particularly useful in helping us understand why interest group communities look the way they do—the theory of density dependence. The theory identifies density—the number of organizations within a defined population—as a crucially important driver of change in organizational populations in particular and in the organizational world in general. Density, the theory goes, affects both foundings (births) and disbandments (deaths).

We turn first to foundings. The theory of density dependence holds that density affects foundings through the dueling sociological processes of legitimation and competition. The theory’s conception of competition is straightforward and intuitive; competition is the extent to which groups in the same population (e.g., the population of automobile manufacturers, environmental groups, or labor unions) vie for the resources necessary for formation and survival. Density dependence theory posits a negative relationship between the level of competition within an organizational population and the founding rate. In short, more groups mean more competition, which means fewer resources available for new groups, which leads to fewer foundings (Carroll and Hannan 1995). Conceptually speaking, legitimation is less straightforward than competition. It generally is defined by PE scholars as “the status of an organizational form as a taken-for-granted feature of the society” (Hannan 1995:127). What “taken for granted” means in the real world is not entirely clear. Generally, PE scholars consider an organizational form legitimate when it is viewed by society at large as a natural and customary way for people or organizations to work together to achieve collective ends. Density dependence theory holds that there is a positive relationship between the level of legitimation and the organizational founding rate within a population (Carroll and Hannan 1995). In short, more groups mean more legitimacy for the organizational form, and more legitimacy means that group founders and leaders can spend more resources on organizing and fewer resources on justifying and explaining, which leads to an enhanced founding rate.

From here, once establishing that competition and legitimation affect founding rates (legitimation positively, and competition negatively), the theory postulates that density profoundly affects both processes. Turning to competition first, the theory holds that higher density means more competition, but that the relationship between density and competition, while positive, is not linear. “[G]rowing density,” the theory goes, “intensifies competition at an increasing rate” (Carroll and Hannan 1995: 117). Thus, for example, when density is near zero, competition between groups is likely to be low, even as new groups enter the population. At some point, however, when a population comprises many more organizations, competitive pressures are high and the founding of even one new group puts considerable pressure on existing groups. All of this leads to the proposition that within an organizational population, competition processes always exists, but come to dominate at high density. As for legitimation, the theory of density dependence holds that at a very low density, legitimation is difficult. The first entrants into an organizational population face a difficult road, as group organizers selling a “new product” to a skeptical world expend substantial resources on justification and explanation. At some point, however, when a population reaches some substantial size, legitimation pressures abate. Within a population, when an organizational form becomes widely accepted, group leaders no longer are forced to spend valuable resources on justification and explanation. At this point, the level of legitimation within a population no longer substantially affects the founding rate. In all, this leads to the general proposition that within an organizational population, legitimation processes dominate at low density.

Taken together, these postulates about the effects of legitimation and competition on foundings, and the effects of density on legitimation and competition, produce the following general prediction, which is one of the baseline predictions of density dependence theory: *within an organizational population there is density dependence in the founding rate which is “non-monotonic in the general shape of an inverted U”* (Carroll and Hannan 1995: 118). At a density near zero, increases in density increase legitimation but have little effect on competition, and thus the founding rate increases. Later, however, increases in density lead to more intense competition but have little impact on legitimation, which depresses the founding rate.

As for the relationship between density and the disbandment rate within a population, the theory posits the following (another baseline prediction): *within an organizational population, there is density dependence in the death rate which is “non-monotonic in the general shape of a U”* (Carroll and Hannan 1995: 118). Where does this prediction come from? First, the theory holds that because organizations within the same population require resources, there is a positive relationship between competition and the death rate. Second, the theory holds that because group organizers expend relatively few resources on justification and explanation when legitimation is high, within a population there is a negative relationship between level of legitimation and the death rate. Finally, the theory (again) holds that legitimation dominates at low density while competition dominates at high density, which leads to the predicted U-shape of the death function.

 In political science, the theory of density dependence has received strong empirical support. In an early effort, Gray and Lowery (1995), using data on exits from state lobbying communities, confirmed the theory’s hypothesized relationship between density and the disbandment rate. Later, Gray and Lowery (2001), using data on entrants into state lobbying communities, provided further support for density dependence theory by confirming that: a) in dense interest group communities organizational founding rates are relatively low while death rates are relatively high; and b) in not-so-dense interest group communities birth rates are relatively high and death rates are relatively low. In addition, drawing heavily upon Gray and Lowery’s work, Nownes (2004), using data on gay and lesbian rights interest groups in the United States, provided support for density dependence theory’s hypothesized relationship between density and group foundings. In a follow up study, Nownes and Lipinski (2005) provided empirical support for density dependence theory’s prediction about the relationship between density and group disbandments. As for work outside of political science, the theory of density dependence has received empirical support from numerous studies of market actors (Carroll et al. 1993; Hannan et al. 1995; Hannan, West, and Barron 1994; Ingram and Inman 1996; Ranger-Moore, Banaszak-Holl and Hannan 1991; Wholey et al. 1992), as well as from studies of non-market actors including labor unions (Hannan and Freeman 1987; 1988), local environmental groups (Stretesky et al. 2011), and women’s rights groups (Minkoff 1995).

*The Red Queen*

 In short, accumulating evidence suggests that interest group populations tend to develop just as the PE theory of density dependence predicts. However, some scholars argue that the theory (and the PE approach in general) obscures as much as it reveals. Halpin (2014), for example, concludes that PE’s assumptions about structural inertia and group homogeneity are simply mistaken. While implicitly accepting the aphorism that one cannot judge theories solely on the basis of their assumptions, Halpin nonetheless sees the assumptions as problematic for understanding interest group communities, because they cause us to ignore the substantial adaptation that many groups undertake during their “careers” between founding and disbandment. PE theories, Halpin (2014: 33) notes:

…[assume groups] to be structurally inert—largely unchanging in terms of form—and thus organizationally interchangeable and homogeneous: one group is assumed to be the equivalent of another. Thus, while it is possible to confirm fluctuations in the numbers of groups in a given ‘population’, little is known about whether any changes in the way group organizations are configured has occurred during the same period. This presents groups as somewhat of a black box.

While Halpin does not direct this critique specifically at the theory of density dependence, it is particularly troublesome for the theory’s ability to explain what we see in the organizational world. It is troublesome because the theory of density dependence more or less rests upon the putatively mistaken notion that “all organizations in a population have equal influence on each other” (Carroll and Hannan 2000: 232). In other words, the primary assumptions of group inertia and group homogeneity, which are problematic, lead to another assumption that is also problematic: that the effect of the addition of a new group to the population on the founding rate (or the death rate) does not depend upon the specific characteristics of the new organization (or the other organizations in the population for that matter). This assumption strikes many scholars as tenuous at best.

Halpin and others (see, for example, Halpin and Jordan 2009; Wollebaek 2009; Young 2010) argue that to fully understand what happens in group populations we must acknowledge that what goes on inside groups is at least as important as what goes on outside groups. While political scientists have not done much either to rectify the problems with density dependence theory or to consider both population level and group level factors simultaneously in their models of group formation and development, organizational ecologists in other disciplines have done both. Particularly noteworthy are studies based on theories which assume that the contours of organizational populations are a function of density (that is, population size) *and* organizational learning (a group-level phenomenon). The theory of Red Queen competition is one such theory.

*The Red Queen: Groups are not all the same.* The theory of Red Queen competition, unlike the theory of density dependence, begins with assumptions about what happens *within* organizations. Specifically, from organizational learning theory (March and Simon 1958; Cyert and March 1963; March 1988, 1994), Red Queen theory borrows the postulate that within an organization, leaders constantly “satisfice” as they search for “alternatives when performance falls below some aspiration level…” (Barnett and Sorenson 2002: 291). The “problemistic search” in which organizational leaders engage “takes place sequentially and locally (Barnett and Sorenson 2002: 291),” as an organization first searches for “close” alternatives, and only moves on to more “distant” alternatives if the former fail to restore performance. If an organization’s search does not restore performance, Red Queen theory assumes that the organization will adjust its aspirations downward. Red Queen theory, in contrast to density dependence theory, assumes that organizations respond to their environment by adjusting “either performance or aspirations” until they reach equilibrium (Barnett and Sorenson 2002: 291).

 The theory of Red Queen competition does not eschew the insights of density dependence theory. To the contrary, it assumes a very large role for competition. Competition from like-groups, the theory goes, is an all-important spur to problemistic search and subsequent organizational learning. In other words, it is competition that lowers organizational performance and triggers attempts at adaptive change. If we look only at what happens within a single organization, this is where organizational learning theory (at least as it is utilized in the theory of Red Queen competition) stops—a threatened group responds to competition by attempting to change, and this attempt results in either restored performance or lowered aspirations. But the theory of Red Queen competition considers what happens in other organizations in a population as well. Specifically, the theory assumes that the response of one organization to competition from other organizations within its population increases that organization’s fitness (unless it dies) and enhances its competitiveness, which in turn spurs a similar search and adaptive change process in the organization’s rivals, which then increases again the competitive pressures faced by the initial organization. In short, increased competitive pressures from newly invigorated rivals trigger “the search for improvements in the first organizations and so the cycle continues” (Barnett and Hansen 1996: 139 in Carroll and Hannan 2000: 235). In all, the theory goes, “The complete process of organizational development involves an ecology of learning organizations, with each organizational solution sowing the seeds of a rival’s next challenge” (Barnett and Sorenson 2002: 292). At the center of Red Queen theory is a paradox—long term, intense competition creates stronger, better adapted organizations, but it also creates stronger rivals.[[1]](#footnote-1)

*The competitive hysteresis hypothesis*. In a perfect world, organizations within a population engage in their problemistic search for alternatives without constraint. But in the real world, organizations are constrained by many factors, especially, according to Red Queen theory, their own histories. Organizational learning theory posits that organizations are particularly constrained by problems arising from imperfect organizational memory (March 1994). Specifically, organizations are likely to forget lessons they learned long ago, even if these lessons might prove helpful in the present time. “[T]he lessons of history,” the theory goes, are “less available the further back in time they occurred” (Barnett 2008: 60). This means that “…organizations are more likely to remake the wheel, or to repeat past errors, as experience fades into the distant past” (Barnett 2008: 60). In contrast, organizations are not as likely to forget the lessons they learned recently, especially if these lessons will prove helpful at present. Thus, the lessons of history are *more* available the more recently they occurred. If we think of competition as a way for an organization to “sample” the logic of competition that exists within its population at a given time, the presence of organizational forgetfulness means that organizations sample recent experience rather than distant experience when they seek to make adaptive change. If an organization has faced a great deal of competition in its recent history, this means it has a high probability of having a good understanding of the logic of competition that prevails at the current time. Another way to put this is that the organization has a lot of lessons to draw upon when seeking to make adaptive change. If the organization has not faced a great deal of competition recently—if it either has faced little or no competition in its entire history or it has faced all or most of its competition in the distant past—it has no recent lessons to draw upon, and thus has little sense of the prevailing logic of competition. If an organization has not faced substantial competition in its recent history, it has an imperfect understanding of “what it takes” to survive at the present time, and thus is a less viable organization and a relatively weak competitor.

In all, the existence of organizational forgetfulness and the concomitant tendency for organizations to rely on recent experience when engaging in problemistic search leads to one of the Red Queen’s main generic hypotheses, the Competitive Hysteresis Hypothesis: *“Organizations with more exposure to a recent history of competition are more viable and generate stronger competition”* (Barnett 2008: 60).

*The competency trap hypothesis*. But organizational learning theorists acknowledge that organizations do not forget the past entirely, even though they may forget most of its lessons. In fact, empirical studies confirm that practices and structures present early in an organization’s history tend to persist (Stinchcombe 1965). Empirical studies also show that organizations tend toward stability in their structure and routines (Hannan and Freeman 1984). Thus, it is not the case that organizations forget everything; they may largely forget lessons learned in the past, but they do not forget or dispense with the structures and rules and procedures that these forgotten lessons inspired.

While routines and structure may persist, the rationales for these routines and structures often do not. As Barnett states (2008: 60): “To the extent that understanding the rationale behind a practice would help make practices mindful, organizational memory becomes increasingly applied unthinkingly as time passes—an especially dire outcome if a context’s logic of competition changes.” When the environment within which an organization and its competitors exist and compete changes, samples (competitive experiences) from the past are unlikely to be very helpful because they do not reflect the current-time logic of competition. Nonetheless, organizations maintain structures and rules that reflect these distant-past lessons. Because the logic of competition within a population is likely to change with time, an organization whose structures and rules reflect distant-past lessons is likely to be dysfunctional. The “competency trap” is the term given to the situation faced by organizations in which they “fare…badly by applying yesterday’s well-learned solutions to today’s very different problems” (Barnett and Sorenson 2002: 294). The competency trap is most likely to obtain in organizations that have few recent-past competitive experiences to draw upon when searching for solutions to current problems. The competency trap is particularly troublesome for organizations because Red Queen competition is a collective process. Organizational ecologists have demonstrated that when engaging in problemistic searches, organizations often look to other groups within their population for solutions. If selection processes eliminate unfit groups, this is not a problem; for a group in the present-time may look to other organizations—organizations that were founded more recently, for example—for clues on how to change. But if they do not—and there are examples in which selection does not occur because relative fitness rather than absolute fitness is the key to survival within a population—and entire cohorts of organizations look to one another during Red Queen competition, then “entire cohorts” or even populations “of coevolving rivals may collectively suffer from a competency trap” (Barnett 2008: 61). In the case of cohorts of groups or a population of groups falling together into a competency trap, selection may knock off not just individual groups, but also perhaps entire cohorts of groups or the entire population of groups.

 The competency trap in the evolution of organizational populations may arise from either organizational learning or selection processes. In the organizational learning model at the center of Red Queen theory, organizations apply distant past solutions (embodied in structures and rules) to current problems, which leads to dysfunction. In the selection model, organizations “selected under one set of environmental conditions” are left with strengths that “are particularly poorly suited if the environment changes” (Barnett 2008: 62). For (hypothetical) example, a large population of environmental groups formed in the 1960s and designed to rely heavily on face to face recruitment and interaction and grassroots political activity may be poorly adapted for the current environment in which “checkbook” membership is widespread, member recruitment and retention is increasingly done via social networking sites and the Internet, and grassroots political activity is less common and effective than highly professionalized, institutionalized, direct lobbying campaigns. In a scenario such as this, Red Queen competition operating at one point in time (the 1960s) leads to intense competition between groups that leads to and reinforces structures and routines that are ill-suited to competing in the environment at a later point in time when the context has changed dramatically.

 In sum, notions about the effect of the competency trap on organizational evolution lead to the second of the Red Queen’s main generic hypotheses, the Competency Trap Hypothesis: *“Organizations with more exposure to competition in the distant past are less viable and generate weaker competition”* (Barnett 2008: 62).

**Data, Methods, and the Competitive Experience Distribution**

The theory of Red Queen competition adopts PE’s focus on population-level factors—especially density—as important determinants of group-level vital events. It also, however, explicitly recognizes (and indeed assumes) that groups can and do change (to be specific, they learn) over time. In this sense, the theory has the power to address at least some of the concerns raised by scholars who decry PE’s troublesome assumptions that groups within a population do not change and are essentially equivalent to one another. In short, the theory of Red Queen competition (if supported) can nudge us closer to a more complete and accurate and nuanced theory of interest group formation and survival.

Here, we test the theory of Red Queen competition against data on the foundings of nationally active, gay and lesbian rights interest groups in the United States from 1945-2006. We chose this population for several reasons. First, there is little question that policy on gay rights has changed tremendously in recent years, partially due to the efforts of gay rights groups (Frank 2014; Haider-Markel and Meier 1996; Hirshman 2012; Rimmerman, et al. 2000). Thus, this population of groups is important in its own right. The second reason we chose this population is practical; most of the data needed to test the theory—especially counts of foundings, death, and density—have already been collected. Collecting population-level data is no small task, so practical concerns are non-trivial. The third reason we chose this population to study is also practical. The population of gay rights groups in America is relatively young (compared to say, the population of environmental groups or civil rights groups), and thus suitable to study.

 Following Nownes and Lipinski (2005: 307), we define the population under study as “the set of politically active organizations that lobby at the national level and advocate a public policy favourable to gays and lesbians in the United States.” We used Nownes and Lipinski’s data as a starting point, but embarked on our own data-gathering mission as well. First, we retraced Nownes and Lipinski’s proverbial footsteps by examining all the sources (including the *Encyclopedia of Associations*, the Factiva database, and the *New York Times Index*) they examined. Second, we took advantage of improvements in technology to search several gay and lesbian archival websites (including the websites of the One Archives at the USC Libraries, and The Center: The Lesbian, Gay, Bisexual, and Transgender Community Center) for information on interest groups they may have missed. Finally, we extended the time period under study from 1945-1998 to 1945-2006 to make this study more up-to-date. In all, our data are very similar to, though not identical to, the data gathered by Nownes and Lipinski. Ultimately, we identified a total of 137 groups. In the end, our numbers for group foundings and population density are similar though not identical to those of Nownes and Lipinski. All the data necessary to replicate this study are available at the author’s website at --------------.edu.

Here, to test the theory of Red Queen competition, we focus on interest group formation.[[2]](#footnote-2) The data available to us—counts of numbers of gay and lesbian rights interest groups founded and disbanded each year for the period under study—allow us to estimate the organizational founding rate within the population using *Number of foundings*, measured on a yearly basis, as the dependent variable. We specify these counts as a negative binomial process. This method allows us to test two specific substantive hypotheses gleaned from Red Queen theory. The first is:

**Hypothesis 1**: In the American gay and lesbian rights interest group population, the relationship between recent historical competition faced by groups and the founding rate is negative.

Hypothesis 1 flows from the generic competitive hysteresis hypothesis, which implies that the more that extant gay and lesbian rights interest groups have been exposed to competition from other gay and lesbian rights interest groups in recent years, the stronger competitors they become. As stronger, fiercer competitors, these recently experienced incumbent organizations deter new foundings. In short, a market full of recently-experienced incumbent gay and lesbian rights groups is unfriendly to new entrants.

However, as the generic competency trap hypothesis suggests, gay and lesbian rights groups’ experience becomes anachronous after a time. This leads to our second hypothesis:

**Hypothesis 2**: In the American gay and lesbian rights interest group population, the relationship between distant-past historical competition faced by groups and the founding rate is positive.

Hypothesis 2 rests upon the generic competency trap hypothesis, which implies that the more that extant gay and lesbian rights interest groups have been exposed to competition from other gay and lesbian interest groups in the distant past, the weaker competitors they are. A large set of weak, enervated competitors fails to deter new foundings. In short, a market full of incumbent gay and lesbian rights groups with only or primarily distant-past competitive experience is an attractive one for potential new entrants.

 Finally, to ensure that our models are fully specified, we test the following hypothesis as well:

**Hypothesis 3**: In the American gay and lesbian rights interest group population, the relationship between density and the founding rate is non-monotonic in the general shape of an inverted U.

The theory of density dependence has already been tested against data from this population, so we believe it is wise to test for the effects of density here as well.

*Calculating Competitive Experience*

 Testing the first two hypotheses requires us to create measures of each organization’s competitive relationships over time. To do this, we first had to break each group’s history into a series of yearly spells. In all, 137 groups contributed 2,559 spells to our analysis. After putting the data into event-history form, we created a variable called *Historical competition*. Following Barnett (2008: 243), we coded this variable as “the sum of the number of competitors faced in each year by an organization over its history, without including the current year competition.” Next, again following Barnett (2008: 243), we created a variable called *Recent historical competition*, which we coded “by weighting each year’s contribution to the organization’s historical competition term by 1/√δ where δ measures a year’s distance back in time prior to the current year.” *Distant past historical competition* is defined as *Historical competition - Recent historical competition*. When we were finished with this exercise, we had a value for each of these three variables—*Historical competition*, *Recent historical competition*, and *Distant historical competition*—for each year, for each group. Our next step was to create three independent variables for use in the negative binomial count models. The first independent variable is *Total historical competition*, which is the sum of organization-years of competition faced historically over time by extant groups in any given year. *Total recent historical competition* and *Total distant historical competition* result from the decomposition of *Total historical competition*. For our count models then, each of these variables is measured on a yearly basis. As our hypotheses suggest, we expect a negative relationship between *Total recent historical competition* and the dependent variable, and a positive relationship between *Total distant historical competition* and the dependent variable.

*Other Independent Variables*

To test Hypothesis 3—the general density dependence hypothesis—we consider two density-related independent variables. First, there is *Density*, which is calculated on a yearly basis and is the total number of nationally active gay and lesbian rights interest groups alive at the beginning of the year. Second, there is *Density2*, a quadratic term which is required to test Hypothesis 3. In our count models we include a one year lagged version of each of these variables.

 We also considered several control variables in our models. First, there is the yearly measure *Issue salience*. We created this variable by examining the *New York Times* *Index* for each year of the study. For each year we counted the number of stories concerning gay and lesbian issues, and then divided this number by the total number of pages in the index. High values on this variable mean greater salience. Second, we consider the public opinion related variable we call *Civil rights and liberties mood*. This is a yearly measure of the public’s mood concerning civil rights and liberties as measured by James Stimson and Elilzabeth Coggins for the Policy Agendas Project (Policy Agendas Project 2013)[[3]](#footnote-3). The measure is not perfect, and, in fact, it comes from a pastiche of answers to several questions about civil rights and civil liberties. We include it in our model because we believe it is the best possible substitute for a straightforward “public opinion on gay rights” variable. Pollsters and academics did not ask respondents about gay rights before the 1970s, and this mood variable is available for the entire period under study. Higher values on this variable mean more liberal views on civil rights and civil liberties. Finally, we included a variable called *Average cumulative hazard of death* in our models. Following Barnett (2008: 79), we include this variable to control for the possibility that the Red Queen can “come about purely through selection processes” rather than via organizational learning. As Barnett (2008: 79) notes:

Without any variation over time in fitness within the lives of individual organizations, if competition enhances the strength of selection among organizations, than those that survive a history of competition will be more viable. These survivors consequently will generate stronger competition, in turn intensifying selection, and so on. If the Red Queen model finds support, therefore, it is possible that such results come about by selection alone, and that learning by organizations played no significant role.

We calculate the cumulative hazard of death using the Nelson-Aalen estimator, and include a yearly average of the cumulative hazard in our count models. Table 1 contains the descriptive statistics for the variables we utilize.

[Table 1 about here]

**Results: The Red Queen Can Help**

We begin with a brief look at the development of the population of gay and lesbian rights interest groups in the United States since World War II. Figure 1 shows the evolution of the population under study. Specifically, it displays density and the number of foundings by year. The first viable, nationally active gay and lesbian rights group—the Veterans Benevolent Association—formed in 1945. From 1945 to the late 1960s, the size of the population remained very small, with a smattering of groups formed between 1950 and 1967. After 1967, the number of groups formed and the size of the population grew sharply. In fact, between 1970 and 1980 the population quadrupled in size. The population grew slowly throughout the 1980s, as the number of foundings fell from a late-1970s peak. The number of foundings peaked in 1990 (at 8), and fell subsequently, though the size of the population continued to increase from 1990-2006. There has been little population growth since 2000, though there was a surge of foundings in 2006 (compared to the previous six years). Of course, Figure 1 tells us nothing about the effects of historical competition on foundings. It does, however, provide graphical support for Hypothesis 3. Just as the theory of density dependence suggests, the population started small (as all populations tend to do), grew slowly early as legitimation processes dominated, then picked up steam, then levelled off later as competition processes dominated. Overall, the foundings data series has the shape of an inverted U just as density dependence theory predicts (though the relative lack of foundings in the 1980s makes the inverted U somewhat hollow in the middle).

A test of Hypotheses 1 and 2 (and a more stringent test of Hypothesis 3) requires statistical analyses. We report the estimates of our founding count models in Table 2. Model 1 is a baseline specification including the two density terms, *Issue salience* and *Civil rights and liberties mood*, and *Average* *cumulative hazard of death*. Model 2 is identical to Model 1 except that it contains a total historical competition term, which is a sum of the organization-years of competition faced by incumbent organizations in the population as of each year. Finally, Model 3 breaks the total historical competition term into two terms, one for recent historical competition and the other for distant historical competition.

[Figure 1 about here]

 Model 1 clearly shows that exogenous environmental factors profoundly affected the

founding rate in the population under study. The large, significant estimate on *Issue salience* indicates that foundings increased with the salience of gay and lesbian rights issues, and the significant estimate on *Civil rights and liberties mood* indicates that as public opinion grew more liberal over time on issues related to civil rights and civil liberties, foundings of gay and lesbian rights interest groups increased. The estimates on these environmental variables are significant in Models 2 and 3 as well, providing further support for the notion that extra-population factors affected population dynamics over time. Model 1 also provides support for Hypothesis 3, and thus the generic density dependence hypothesis concerning the relationship between density and foundings. The results show that the effect of density is nonmonotonic, as the first-order density effect is positive and the second-order density effect is negative. In short, just as Hypothesis 3 states, the founding rate increases as density increases up to a point (the data indicate that this point is approximately a density of 53), and then decreases with increases in density thereafter. This finding supports the findings reported in Nownes (2004), even with the extended time period and a slightly modified data set. Support for Hypothesis 3 comes from Models 2 and 3 as well; though the coefficients change a bit, the substantive results are virtually the same.

 We turn next to our primary substantive hypotheses and our tests of the theory of Red Queen competition. Model 2 contains the overall total historical competition term, and its results suggest that competition does indeed affect the founding rate. The coefficient on *Total historical competition* is statistically significant, and indicates that more competition increases the founding rate. Overall, Model 2 fits the data better than Model 1. A true test of Hypotheses 1 and 2, however, requires that we break the total historical competition term into its component parts. This is what we do in Model 3. Model 3 provides strong evidence for both Hypothesis 1 and Hypothesis 2, and thus provides support for both the general competitive hysteresis hypothesis and the competency trap hypothesis derived from the Red Queen theory of competition. The negative and statistically significant (p<.05, two-tailed test) estimate on *Total recent historical competition* indicates that the more that extant organizations in the gay and lesbian rights interest group population have been exposed to competition in recent years, the stronger and fiercer competition they project. In other words, as extant organizations accumulate recent competitive experience, founding rates (i.e., entries into the population) fall. The positive and statistically significant (p<.01, two-tailed test) estimate on *Total distant historical competition* indicates that at some point competitive experience becomes anachronous and ceases to deter new foundings. In fact, the more distant-past experience extant organizations have, the more likely new groups are to be founded. In sum, the statistically significant estimates on *Total recent historical competition* and *Total distant historical competition* provide evidence in support of competitive hysteresis hypothesis and the competency trap hypothesis, respectively.

[Table 2 about here]

 To illustrate how the Red Queen affects founding rates, we will consider several hypothetical scenarios.[[4]](#footnote-4) First, let us assume that the size of the population is 15. In the actual data, when (lagged) population density is equal to 15, the value on *Total recent historical competition* is 658, and the value on *Total distant historical competition* is 515. When we set all the other variables to their means, the predicted number of foundings is 3.7. If we maximize the value of *Total recent historical competition* (that is, set it at 1173, which would indicate essentially that all competition is in the recent past), the predicted number of foundings falls to 3.0. In contrast, if we maximize the value of *Total distant historical competition*—which would indicate that all competition is in the distant past—the predicted number of foundings jumps to 4.91. The effects of different competition distributions are especially evident at higher densities. Consider, for example, the situation when the size of the population is 56 (which it was in 1980). In the actual data, when (lagged) population density is equal to 56, the value on *Total recent historical competition* is 8,348, and the value on *Total distant historical competition* is 6,035. When we set all the other variables to their means, the predicted number of foundings is 3.44. If we assume that all competition is recent (thus, the value of *Total recent historical competition* is 10,961), the predicted number of foundings falls to 0.76. In contrast, if we assume that all competition is distant, the predicted number of foundings rises to well over 100. This scenario, of course, in which all competition is either distant or recent, is silly, especially at a relatively high level of density (where there are numerous incumbent organizations that entered the population at various times). In the actual data (and probably in most real data) there are not such huge disparities—especially at high densities—between levels of total distant and total past competition. Consider, for example, the predicted number of foundings when the size of the population is 75. In the actual data, when (lagged) population density is equal to 75, the value on *Total recent historical competition* is 26,291, and the value on *Total distant historical competition* is 33,140. When we set all the other variables to their means, the predicted number of foundings is 1.06. Simply swapping the values on *Total recent historical competition* and *Total distant historical competition*, which means increasing the former and decreasing the latter by approximately 8,000, reduces the predicted number of foundings to .144. Increasing the value on *Total recent historical competition* just a bit more leads to a prediction of virtually no foundings, while increasing value of *Total distant historical competition* by 10,000 (and thus decreasing the value of *Total recent historical competition* by the same amount) leads to a prediction of 4.18 foundings.

Our findings in support of Hypotheses 1 and 2, and thus Red Queen theory, obtain even when we consider the effects of density and exogenous factors. This means that the population of gay and lesbian rights interest groups in the United States developed as the theory of Red Queen competition predicts, with existing organizations learning from competition, becoming fiercer competitors, and discouraging new entries, but at some point becoming weaker competitors and not discouraging new entries as their competitive experience becomes outdated. We can be confident that the effects we uncover are not pure selection effects, as we include *Average cumulative hazard of death* in our models. Though the estimate on *Average cumulative hazard of death* is in the expected direction in all three models (which implies that extant organizations that had survived over time generate stronger competition and thus depress the founding rate), in no model is the coefficient statistically significant. Selection effects may exist, but our results do not allow us to conclude this with any certainty.

**Conclusion**

The population ecology approach to the study of interest groups has contributed a great deal to our understanding of group formation and maintenance since its introduction in political science two decades ago. One strand of organizational ecology research—the theory fragment generally called density dependence theory—has been particularly helpful in explaining how populations of political active groups evolve over time. The tried and true temporal relationship between population size and the founding rate has been uncovered in populations of politically active groups including state lobbying organizations, labor unions, and gay and lesbian rights interest groups. And yet there is something about density dependence theory that strikes many scholars as problematic—its treatment of all organizations within a population as virtually equal. In real life groups are not equal.

 Our findings provide strong support for the notion that the experience distributions of interest groups within a population affect the rate of foundings within that population. Groups with a great deal of recent experience are stronger competitors who deter new foundings. After a time, however, the effects of experience reverse; groups with a great deal of distant-past experience become weaker competitors and invite new foundings. In all, our findings in support of the theory of Red Queen competition suggest that organizations learn through competition—through “sampling” the logic of competition that obtains at a given point in time. Recent historical competition leads to “good” learning that makes organizations stronger competitors who deter competition. Distant past historical competition led to learning in its time, but the lessons of this competition are not so good; they lead to the competency trap that weakens organizations and thus invites new rivals. Of course, one weakness of this study (and others like it) is that it does not and cannot provide direct evidence of organizational learning. This raises the possibility that our results reflect processes other than learning. The most obvious alternative explanation for our findings is that selection processes weed out weak organizations, which makes existing organizations stronger competitors. There is probably some truth in this explanation. Even though we attempt to control for selection processes, they probably account for some of the competitive effects we uncover. But we believe they do not account for all of them.

 It is also worth noting that our findings provide a persuasive explanation for how it is that in many populations of organizations generalists are driven out by specialists over time (see Lowery, Gray, and Kirkland 2012). Research suggests that the earliest entrants into a population tend to be generalists, while specialist organizations tend to come later. At some (later) stage in a population’s history, older generalist organizations are heavy on distant competition but light on recent competition; this makes them vulnerable. In contrast, younger specialist organizations are heavy on recent competition (as they tend to enter already crowded interest group communities) and light on distant past competition, which makes them formidable rivals. To fully test this notion we must learn more about how Red Queen competition affects death rates, and we intend to explore this issue in the near future.

We see this first (that we know of) test of the Red Queen in political science as a summons to further refine density dependence theory specifically, and organizational ecology models in general. Population ecology studies more or less assume that organizational inertia is a fact of life. But our data (and indeed, organizational learning theory) imply that organizations do learn; they learn through competition. And as we continue applying the ideas of population ecology to the study of politically active groups, we must begin to consider this.

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**Table 1. Description of Data Used in Count Models**

Variable Min. Max. Mean S.D.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Number of foundings 0 8 2.2097 2.1964

Total historical competition 0 148,378 31,205.82 44,265.85

Total recent historical competition 0 56,076.40 13,329.14 17,721.71

Total distant historical competition 0 92,301.61 17,874.18 26,657.05

Density 0 95 39.677 36.375

Density2 0 9025 2876.065 3280.308

Issue salience 0 .3580 .0928 .10063

Civil rights and liberties mood 39.741 60.023 51.676 4.7999

Cumulative hazard of death 0 .4722 .1922 .1145

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*Source*: Various, and authors’ data.

**Figure 1. Density and Foundings of Gay and Lesbian Rights Interest Groups in the United States, 1945-2006.**

*Source*: Various, and authors’ data.

**Table 2. The Founding Rate of Gay and Lesbian Rights Interest Groups in the United States, 1945-2006: Negative Binomial Regression Results**

Variable 1 2 3

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Density (t-1) .05696\*\*\* .1029\*\*\* .101\*\*\*

 (.01527) (.0194) (.1946)

Density2 (t-1) -.00081\*\*\* -.00176\*\*\* -.0011\*\*\*

(.0002) (.0003) (.0004)

Issue salience 4.4991\*\*\* 4.5688\*\*\* 4.232\*\*\*

 (1.3691) (1.490) (1.486)

Civil rights and liberties mood .14195\*\*\* .09985\*\* .1648\*\*\*

 (.04506) (.0464) (.0554)

Avg. cumulative hazard of death -.95779 -1.631 -2.4726

 (2.0800) (1.732) (1.953)

Total historical competition .00004\*\*\*

 (.00001)

Total recent historical competition -.00025\*\*

 (.0001)

Total distant historical competition .00015\*\*\*

 (.0000)

Constant -7.0469\*\*\* -5.116\*\* -8.314\*\*\*

 (2.0799) (2.3111) (2.596)

Log likelihood -98.0134 -91.1872 -88.273

Pseudo R2 .2621 .3135 .33541

No. on observations 61 61 61

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*Source*: Authors’ data. *Notes*: Numbers are coefficient estimates, standard errors are in parentheses.\*\*\*p<.01 (two-tailed test), \*\*p<.05 (two-tailed test).

1. It is important to note that as Barnett and Sorenson (2002: 293) argue, Red Queen theory “does not require strong assumptions about organizational rationality. The theory assumes only that individuals within organizations respond to competitive pressures by attempting to improve performance.” [↑](#footnote-ref-1)
2. We hope to examine disbandments in a future paper. [↑](#footnote-ref-2)
3. The Policy Agendas Project data were originally collected by Frank R. Baumgartner and Bryan D. Jones, with the support of National Science Foundation grant numbers SBR 9320922 and 0111611, and were distributed through the Department of Government at the University of Texas at Austin. Neither NSF nor the original collectors of the data bear any responsibility for the analysis reported here. [↑](#footnote-ref-3)
4. We calculated all predicted values using CLARIFY software (see Tomz et al. 2003) [↑](#footnote-ref-4)