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Collaborations and Innovation in Partitioned Industries: An Analysis of U.S. Feature Film Coproductions

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Abstract. In partitioned industries, a small number of generalist organizations occupy the center of the market, whereas a much larger number of specialists populate the periphery. The role of collaborations within and across the center-periphery boundary in these industries has been underexplored. We propose that *hybrid* collaborations between organizations in the center and periphery—combining the broad resource base of generalists with the focused knowledge of specialists—encourage product innovation and result in enhanced organizational adaptation for both populations. We test these ideas in the U.S. motion picture industry, where film production companies face significant unpredictability of success and fluctuating audience tastes. We find that generalist and specialist production companies that partner to produce films introduce more creative content in their films compared with those that collaborate in the same population or produce alone. Generalist film companies benefit further from these collaborations through increased competitive differentiation of their films from other generalists in subsequent productions, whereas specialists experience lower exit rates. These findings suggest that interorganizational collaborations between generalists and specialists provide effective adaptive strategies to compete in markets with uncertain demand and shifting audience preferences. These strategies can sustain, rather than weaken, industry partitioning.

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Introduction

In many settings, organizations sort into two distinct groups: larger-sized generalists and smaller-sized specialists. Generalists serve the popular, more central segments of the market, delivering a variety of products and services at scale, whereas specialists serve the peripheral segments with a limited set of offerings (Verhaal et al. 2017). Such divisions can be found in industries as varied as beer production, newspaper publishing, banking, automobile manufacturing, film and television, software development, and social movements (Carroll 1985, Mezias and Mezias 2000, Park and Podolny 2000, Boone et al. 2002, Dobrev and Carroll 2002, King and Soule 2008, Reis et al. 2013, Negro et al. 2014, Fosfuri et al. 2020). Understanding the development and persistence of this phenomenon has occupied many fields within organizational theory, in particular the theory of resource partitioning (Carroll 1985, Hannan et al. 2007).

In resource partitioning theory, generalist-specialist segmentation follows the separation of resources that support each population and the formation of boundaries that limit cross-border engagement between them. Such boundaries include the resource requirements for scaling to enter the market center or gatekeeping by niche audiences against outsiders (Carroll and Swaminathan 2000, Hannan et al. 2007). Although these separating processes have received considerable attention, cross-boundary collaborations between generalists and specialists have not. Yet they are not only feasible, but frequent. Examples include partnerships between major pharmaceutical firms and dedicated biotechnology firms (Powell et al.1996), alliances between nation-wide social movement organizations and local grassroots groups (King and Soule 2008), and, in our case, major film studios coproducing with independent production companies in Hollywood (Biskind 2004). How do collaborations affect organizations within and between segments of partitioned markets and influence these markets as a whole?

We argue that collaborations play an important role in partitioned markets where demand is uncertain and audience attention is unstable. Cross-boundary, "hybrid"

collaborations between generalists and specialists enhance adaptive innovation when audience preferences shift unpredictably. Hybrid collaborations allow organizations to pool complementary resources and capabilities to adapt to these shifting tastes (Powell et al. 1996, Sears and Hoetker 2014). The frequency of cross-boundary, interorganizational collaborations in certain settings might suggest that they erode boundaries between market center and periphery (Carroll et al. 2002, Fuchs 2009). We argue that the opposite is the case, because hybrid collaborations allow for coordinated deployment of capabilities and assets to capture resources that lie between the center and periphery of the market. Because the size and location of these resources "in the middle" are less viable, temporary organizational arrangements such as collaborations are a more effective adaptive strategy than alternatives such as establishing distinct organizational populations dedicated to serving the middle. The standard account of resource partitioning invokes resource stability when explaining the persistence of the generalist-specialist boundary (Hannan et al. 2007). We address uncertainty, the resource stability assumption, and the role of collaborations in boundary persistence to relax existing assumptions of the theory and extend its understanding.

Drawing on research from interorganizational collaborations and alliances, we propose that hybrid collaborations integrate the broad resources of generalists in the market center with the focused knowledge that specialists have of peripheral niches (Dyer and Singh 1998). These partnerships generate more product innovations needed for adaptation and survival in uncertain market conditions (Powell 1996, Powell et al. 1996, Dussauge et al. 2000, Khanna et al. 2018). Benefits that can accrue include greater opportunities for generalists to differentiate their products from their competitors' and reduce the intensity of competition. For specialists, the benefits come from accessing the material and symbolic resources in the market center, such as funding, production technology, and influential partners, thereby prolonging their survival in a volatile industry.

Three implications follow from these arguments. Hybrid collaborations between specialists and generalists will generate more product innovation—a key strategy for exploration of the market space in changing environments—than other organizational arrangements, including partnerships in the same market segment or producing alone. The creative potential of cross-boundary engagement is of ongoing interest within innovation research (Burt 2004), highlighting the opportunities of combining ideas from disparate populations. Second, access to the specialists' unique knowledge allows generalists to create novel products and differentiate themselves from one another's while retaining their size and scope. Third, hybrid collaborations benefit specialists through access to a generalist's material resources and legitimacy for scaling the resultant product offering. This in turn increases the specialists' chances of survival by letting them access, even if temporarily, a market space outside of their own. U.S. feature film production from 1985 to 2015 serves as the empirical setting for testing these ideas.

Film production is a strategic site because it is an industry beset by high levels of market uncertainty and shifting audience tastes (Caves 2000, Pokorny et al. 2018). Companies are positioned in either mainstream or specialty niches, a structure that previous research has observed since the advent of feature films in the 1910s (Mezias and Mezias 2000). In recent decades, production companies have relied on coproductions to make films with one another. Industry experts suggest that these collaborations between larger and smaller companies match the mainstream conventions of the market center with artistic elements of distinction from the periphery (Biskind 2004, Perren 2012).

We find that companies that coproduce films across the market partition introduce more novel, or never-before seen, creative features in their films, compared with companies that coproduce within segments or produce films alone. Generalist companies that participated in hybrid coproductions subsequently make films with greater and more differentiated creative features. Last, companies that participated more in hybrid coproductions show lower exit rates, especially specialists. In supplementary analyses, we explore some ways in which these survival benefits can manifest, particularly in more mainstream distribution and larger numbers of theatrical release screens.

Resource Partitioning and Market Boundaries in Periods of Environmental Change

Resource partitioning explains the emergence, growth, and decline of organizational populations in markets with economies of scale and heterogeneous audience preferences (Hannan et al. 2007). The model posits that under the presence of (1) heterogeneous audience preferences, (2) scale advantages, and (3) constraints on ever-increasing organizational scope, a separation between organizational forms will occur. Larger firms locate in the resource-abundant segments of the market, dubbed the "center," and smaller firms locate in the fringe or "periphery" (Carroll 1985, Carroll and Swaminathan 2000, Negro et al. 2014). In the market center, economies of scale allow organizations to provide offerings across a broad range of tastes and increase in size. Because of its abundant resources, competition within the center is intense and eventually winnows the field down to a small number of

larger-sized generalist organizations. By contrast, the smaller peripheral market segments outside the center exhibit diverse niche preferences that attract less attention from other producers. Specialist organizations operate in these segments by targeting the narrower range of audience tastes in these positions, reducing their exposure to both generalist and specialist competitors, thereby increasing their survival (Hannan et al. 2007).

Organizations can emerge between center and periphery. These organizations are exposed to competition from both sides and cannot operate at an efficient scale like the generalists or develop the same engagement with audiences like specialists (Hannan et al. 2007, Negro et al. 2014). The inevitable decline of these "near-center" firms releases resources to the rest of the environment. Even if an environment has more firms distributed across the resource space, ecological pressures eventually narrow the populations to generalists and specialists, eliminating other positions and forms—not necessarily the resources—in this near-center space over time (Hannan et al. 2007).

One might expect that generalists or specialists would eventually move against the other by occupying the space between them. However, significant economic and/or cultural barriers limit generalists from leveraging their scale advantages in the periphery. These barriers include increasing organizational costs in serving multiple segments effectively (Carroll 1985); lack of authentic identities to nonmainstream, status-anxious consumers (Carroll and Swaminathan 2000); limited cultural resonance in addressing social activism issues (King and Soule 2008); and reputational stigma in taking on low-quality, fringe offerings (Negro et al. 2014). These factors make the periphery less viable for generalists. Yet, if a specialist was to enter the market center, it would encounter the generalists and their superior, large-scale resources (Carroll and Swaminathan 2000). A specialist entering the market center also faces backlash from audiences that supported its niche offerings (Verhaal et al. 2017). As a result, the market tends to remain partitioned.

A key assumption of resource partitioning theory is stability of audience support and resources. Hannan et al. (2007, p. 206) restricted the claims of resource partitioning theory to "the survival advantages of a narrow niche to stable environments," and characterized "stability as the temporal invariance to the category niche. […] The bet is that the tastes of the focal audience segment will not shift such that the organization loses its appeal to that segment." In markets with rapid change in audience tastes and cultural trends, demographic mobility, or technological change, the basis of resources moves (Powell 1996, Carroll and Swaminathan 2000). Such changes are prevalent in cultural industries such as film, publishing, and music where producer offerings have high satiation, meaning they are consumed rarely more than once. Audience fickleness makes new hits and breakthroughs critical and creates pressure for search and innovation (Elberse 2013). Even with sequels and franchises based on previous hits, firms cannot expect indefinite success from replicating their earlier content.

Organizational inertia, the notion that strategic change is difficult because it triggers cascades of adjustments inside the organization's core processes, limits the speed and degree to which both generalists and specialists can shift their positions or their offerings in these markets (Barnett and Carroll 1995). These adjustments include the challenges of developing new capabilities, shedding existing routines, or changing internal structure or personnel at a pace commensurate to keep up with these environmental changes (Van den Bosch et al. 1999, Hannan et al. 2007, Vasudeva and Anand 2011). For example, Hannan et al. (2007) discuss how a local Berkeley, California, newspaper *Berkeley Barb* faced declining circulation numbers as audiences cooled their enthusiasm for radicalism. Using more advertisements for adult entertainment and services further alienated their original audiences without finding a sustainable replacement. In short, organizational inertia implies that the required rate of adaptation to match environmental change is generally unobtainable and deleterious for the organizations in a partitioned environment.

High market uncertainty imposes structural challenges on both generalists and specialists. For generalists, the greater size and commitment to scaling makes them vulnerable when audience tastes shift significantly. These changes require rapid adaptation that organizational inertia acts against (Barnett and Carroll 1995). Furthermore, if their strategies for adaptation are similar, generalists experience greater intragroup competition. For specialists, since their focus is on narrower niches or a more limited range of offerings, audience changes can lead to the emergence of new organizations with greater fit to the new environment (Hannan et al. 2007). At the same time, if the market for their offerings expands, they frequently lack the capabilities and resources needed to scale it accordingly (Hoffman and Yeh 2018).

Yet, as seen in settings such as biotech, video game development, and film production, uncertainty, resource instability, and regulatory ambiguity are common. We argue that cross-boundary collaborations, which combine and transfer resources—physical, human, and social—across market segments help resolve this apparent contradiction (Schwab and Miner 2008, Parmigiani and Rivera-Santos 2011, Zhang et al. 2019). Collaborations accomplish this through the complementarities of what each partner contributes to and receives (Powell 1996).

Generalists in partitioned markets deploy their large resources to develop novel products that they would have difficulty developing on their own. Doing so allows them to overcome the limitations of organizational inertia and learn about evolving audience interests more effectively. Specialists benefit from applying the size and scaling capabilities of their generalist partners to their focused expertise.

We can think of these collaborations as attempts to build temporary bridges of stability over unstable waters. For example, Powell (1996) and Powell et al. (1996) note that dedicated biotechnology firms operating at the frontiers of medical and scientific investigation were successful in part because of their larger pharmaceutical partners' help in commercializing and distributing their products while dealing with the regulatory hurdles associated with that process. Biotechnology firms specialized in discovery and could focus on their research endeavors rather than the more business-focused areas they were less suited to handle. Similarly, Perren (2012) and Biskind (2004), in their accounts of the rise of independent studios in the 1990s, argue that festivals like Sundance and Slamdance were key to helping small film companies find partners that would fund, market, and distribute their films in New York or Los Angeles.

Key to the success of hybrid collaborations is that producers can move between market segments without significant sanction from audiences. In certain partitioned markets, audience members may penalize producers for violating directly social codes associated with a specific niche. For example, consumers of microbreweries in beer are often hostile to engagement with larger breweries based purely on their identity as mass-market producers (Carroll and Swaminathan 2000). By contrast, in industries such as community banking or pharmaceuticals, producer identity plays a limited role in consumer engagement (Owen-Smith and Powell 2004, Negro et al. 2014), whereas in other contexts, consumers develop "omnivore" tastes for many different offerings and accept the straddling of market categories (Goldberg et al. 2016). In such contexts, which include the recent decades of film production in the United States, consumers appear more focused on the quality or novelty of the offering rather than the producer's identity. Hybrid collaborations as a response to these dynamics underscore producers' prioritization of viability and financial success more than authenticity. That said, "authenticity gatekeeping" observed in markets like beer brewing can occur among nonconsumer audiences, for example, film boards sponsoring movies in countries where film production is state subsidized are motivated less by commercial appeal than creative ambition or merit (Jourdan 2018).

Product Innovation in Interorganizational Collaborations to Adapt to Changing Demand

A basic assumption of interorganizational collaborations is that they are pursued only if all participants expect to benefit from the effort in some way (Dyer and Singh 1998). Thus, collaborations result from the successful matching process based on the parties' belief of their individual benefit out of their cooperation (Fox 2010, Schrank and Whitford 2011, Mindruta et al. 2016). Partners can benefit more from collaborations when they operate in distinct but complementary market segments within an industry (Powell et al. 1996, Chung et al. 2000).

Generalists' contributions often focus on the financial and operational needs of the endeavor. Examples include their operational competences to scale or mobilize material resources, greater access to distribution and marketing channels, and greater legitimacy to a project (Powell 1996, Powell et al. 1996, Burt 2004). Specialists bring their unique vision, talent, and creative commitment. Specialists' ideas, focused technical knowledge, local market expertise, and idiosyncratic talent networks afford them fresher perspectives in visualizing the outcomes of their projects (Rothaermel 2001, Rothaermel and Boeker 2008, Ozcan and Eisenhardt 2009). These features make hybrid collaborations a potentially effective means of pursuing innovation in volatile, partitioned markets.

An example of these qualities coming together is the Warner Bros. adaptation of the *Harry Potter* fantasy series, recounted by Elberse (2013). Warner acquired the film rights to the first book in the series just after its publication. The acquisition occurred through Warner's partnership with the production company Heyday Films, whose founder had previously worked at the studio. An employee at Heyday had noticed the book and recommended it to her boss, who after reading it used their connections with Warner to recommend its adaptation. Initially skeptical, the studio after the recommendation optioned the book even before its major commercial success and meteoric rise with general audiences. Warner committed to developing the project with Heyday at a $125 million budget and released the first film in the franchise in 2000 to enormous critical and financial success.

By contrast, collaborations between generalists, which we refer to as *central* collaborations, tend to be less creative than hybrid collaborations because of their extensive resource overlap. Gulati and Gargiulo (1999) argue that organizational homophily increases the likelihood of associative formations, but this does not make them more effective in exploring the market in periods of change. Burt (2004) and Uzzi and Spiro (2005) have all argued that ideas, understandings, and behaviors are more similar within populations than between them. Furthermore, generalists are direct competitors with one

another, which reduces their incentives to share resources and capabilities that produce competitive advantage (Fey and Birkinshaw 2005). Fosfuri et al. (2020) argue that in partitioned markets generalists have resources that can be traded but they also share or sell less of their assets, particularly intangible ones. In markets where key innovation features cannot be easily protected through legal means, such as creative industries, generalists will contribute less of their more valuable resources to other generalists.

Even if the partners are willing to be more open, the knowledge bases of the few generalists in the center overlap more with one another. Central collaborations are opportunities for generalists to combine resources and apply their common knowledge to new products or manage financial risk rather than to generate new knowledge (Goettler and Leslie 2005). Relatedly, Uzzi and Spiro (2005, p. 464) note that increasing similarity between organizations in the industry "can homogenize the pool of creative material" for new products. Thus, we expect central collaborations to produce less innovative products than hybrid ones.

Conversely, collaborations between specialists, which we refer to as *peripheral* collaborations, may be less desirable strategically for the partners than partnering with a generalist (Rosenkopf and Padula 2008, Ahuja et al. 2009). Each specialist has a limited organizational scope and narrow base of knowledge compared with the magnitude of resources that a generalist partner might bring. In terms of producing innovation, if the collaboration involves specialists in distinct niches in the periphery, then they share few similarities except the structural lack of resources to execute and scale their endeavor. Many specialist organizations operate in diverse market spaces. Their different knowledge, routines, and processes between these organizations are more difficult to match than if one of the partners were a generalist (Aral and Van Alstyne 2011).

Generalists that partner with other generalists can lack exposure to novelty, whereas specialists that partner with specialists lack compatibility or the resources to realize the full potential of their unique ideas. Market uncertainty implies that the market may not reward commitments any one organization makes toward a specific offering, given that audience preferences can change faster than the organization can profit from their investment in adapting. Yet, finding a means to generate novelty and engage in discovery is key to adapting to changing, volatile environments (March 1991). Hybrid collaborations can overcome the limitations to both forms of within-segment collaborations and show greater potential for successfully generating innovation. Because there are more specialists than generalists in partitioned industries, generalists match with specialists that have better complementarities (Gulati and Gargiulo 1999). By drawing on their disparate but complementary resources and expertise, the products of collaborations across the market partition incorporate more innovation, whether through the development of new features or recombination of existing ones.

Hypothesis 1. *Hybrid collaborations are associated with higher levels of product innovation than all other forms of collaborations and individual productions.*

Benefits of Interorganizational Collaborations in Partitioned Markets

Given the size and resource differences between generalist and specialist partners, hybrid collaborations offer significant benefits to the former. This disparity occurs because the smaller partners often relinquish more of their rights or shares to the financial returns or intellectual property (Dussauge et al. 2000, Ahuja et al. 2009). Under resource partitioning, such asymmetry stems not only from the size and scope of the generalists but also from the mismatch between greater numbers of specialists seeking to partner with fewer generalists (Emerson 1962, Salancik and Pfeffer 1978, Ahuja et al. 2009, Lee et al. 2015). In a sense, generalists function as gatekeepers to the resources available in the market center that gives them leverage over their specialist partners (Salancik and Pfeffer 1978, Casciaro and Piskorski 2005). Nevertheless, even if specialists receive a smaller portion of the rewards from the innovation of a hybrid collaboration, their participation gives them opportunities and resources they would otherwise have difficulty acquiring alone or with another specialist.

Hybrid collaborations allow generalists to lean on the expertise of specialist firms engaged with audiences in those segments. Such collaborations serve as bridges to unfamiliar niches, allowing generalists to extend their organizational scope and invest in new product or process discoveries. Generalists can ultimately capture the value of worthwhile discoveries without being committed to these positions indefinitely (Powell et al. 1996). The flexibility of these endeavors is especially beneficial when the environment necessitates rapid adjustments.

In hybrid collaborations, generalists often contribute their ability to scale and rapidly deploy resources. Specialists' creative contributions play a greater role in reshaping the expectations of audiences weary of products from the market center whose offerings can violate cultural norms about what audiences consider "authentic" (Carroll and Swaminathan 2000). Specialists contribute more to this process, having "earned" their reputation for commitment to executing creative vision and/or quality in a market niche. Through

collaboration, both parties can approach the resource space adjacent to the market center cooperatively rather than competitively. As a result, these endeavors and explorations offer generalists a means of differentiating their products from one another's. Generalists grow by relying on economies of scale and efficiency. However, they occupy the same niche in the market and compete directly for the same audiences. Increased niche overlap increases the intensity of competition and the hazard of organizational disbanding (Dobrev et al. 2001). Therefore, it encourages organizational change. When a generalist pursues a strategy that differentiates its products from those of other generalists, this reduces niche overlap. A differentiation strategy that decreases overlap with other generalists allows a generalist to occupy distinct positions within the market center and expand in new positions within the center. Competitive pressure weakens and performance increases (Reis et al. 2013). This leads to our second hypothesis.

Hypothesis 2. *Competitive differentiation of generalist organizations increases with greater experience in hybrid collaborations.*

Rather than violating cultural norms, hybrid collaborations can enhance legitimacy for the organizations involved. For specialists, hybrid partnerships give access to the generalists' professional and institutional networks and makes them more accepted players in more mainstream deals in the future. As Biskind (2004) notes, the companies that produced films like *Pulp Fiction* or *The Full Monty* were not merely interested in winning awards and capturing the market for independent, low-budget films; they wanted box-office success in major cities and residential suburbs. Through hybrid collaborations, generalists become viewed as credible partners that have due regard for the ideas and identities of their associates from the fringe. This can attract more collaborators in the future.

When specialists collaborate with generalists they gain access to vital resources and capabilities controlled by their partners. These include not only generalists' managerial skills, networks, and distribution and marketing expertise, but also capital investment and production facilities to release their products at scale. Through hybrid collaborations, specialists can also approach the resource space near the market center. In film production, the success (or failure) of a single film may not be decisive for a generalist given their portfolio of releases, though it can influence the kinds of films the company makes in the future. For specialist production companies, a single film's success can be life-changing. Specialists rarely have the means to produce more than a single film every few years, and recovery from failure is often difficult. Through their generalist partners, specialists can realize their unique vision or apply their specialized knowledge on a scale previously unavailable to them. Executing their ideas successfully signals their capabilities for subsequent projects or endeavors (Vandaie and Zaheer 2015). After working with generalists, specialists can remain focused on their niche but may engage with larger audiences, which improves their general viability in the market.

A vignette illustrates this point. Imagine a small production company that develops sitcoms and television movies with sentimental themes. One of its producers has great confidence in a script set at a boarding school in the 1950s and the company wants to develop it into a theatrical film. A major studio head reads the script and agrees to develop it with the smaller company. The studio's imprimatur not only attracts major talent to the project, but the studio also brings to bear its marketing and distribution groups to promote and release the picture. The film becomes a top-10 box-office hit and receives multiple prestige award nominations. For the initial production company that found the script, the film's success gives it the latitude and legitimacy to produce more films in the years to come.

This summary describes the production history of *Dead Poets Society*, a movie made by Witt/Thomas Productions and Touchstone Pictures, a division of Disney Film. The film was the second theatrical production by Witt/Thomas. It was the fifth highest grossing film of 1989, securing an Academy Award for its script, along with nominations for best picture, director, and actor. Touchstone Pictures and Disney profited from *Dead Poets Society's* success, as did Witt/Thomas who would move on to make four more motion pictures over the next 20 years. Even when the films were made with other specialists, such as the commercially unsuccessful but academy award–nominated film, *A Better Life* (2011), Witt/Thomas secured distribution from a large distributor or a large distributor's subsidiary. This case illustrates that hybrid collaborations enhance the market viability of all partners but especially the specialists, as the viability of generalists primarily depends on their large scale. In our analysis, we examine market viability in terms of exit rates from film production. Our third hypothesis follows.

Hypothesis 3. *Greater experience in hybrid collaborations is associated with lower organizational exit rates. Specialist organizations will experience greater reduction in exit rates than generalists.*

The U.S. Feature Film Industry

Feature film production in the United States is an ideal setting for testing our predictions on the role of collaborations in partitioned markets. First, it exhibits organizational dynamics of resource partitioning. In the United States, film production has historically been characterized by a group of few large studios

such as Disney and Warner Bros. and a much larger number of less-stable production companies that experience systematic turnover in the market periphery (Mezias and Mezias 2000). Second, the tastes of film audiences, like consumers of other cultural products, are difficult to predict and can shift often (Pokorny et al. 2018). Production companies find it challenging to operate under these environmental conditions and have turned to collaborations ostensibly as one means of adapting (Biskind 2004).

To identify film production companies, coproduction types, and innovation and financial outcomes, we analyzed films produced and released in the United States from 1985 to 2015. We collected data from Variety Insight Archive, the Internet Movie Database, and Box Office Mojo. This produces a sample of approximately 7,400 films with complete records on creative talent, distribution, theatrical release, box office revenues, and "creative features," which we describe later. This excludes some extremely small films that earned less than $30 in box office revenues or are not released on at least one theatrical screen. In the next section, we address assumptions and provide descriptive evidence of resource partitioning in the film industry. Afterward, we discuss our measurement and estimation approach. Finally, we present the regression estimates.

Film as a Partitioned Market

We first replicate the main findings of resource partitioning theory. Prior research, in particular Mezias and Mezias (2000), established that the film industry has experienced partitioning. Empirically, their study focused on the relationship between industry consolidation and entry rates of specialist production companies. Using our data, we show complementary evidence that exit rates of specialist production companies decline with market concentration. We follow Mezias and Mezias (2000) in measuring market concentration as the Gini index of production.

Mezias and Mezias (2000) used vertical integration of production and distribution to distinguish generalist and specialist companies in the early U.S. film industry. In the contemporary industry, the boundary between generalism and specialism is rather defined by content and style of the films and the organizational characteristics of the companies making them. Journalist and film critic Gabler (1997, p. 76) described the separation between center and periphery:

> "Audiences now choose among the products of two entirely distinct movie businesses, each with its own sensibility, economic model, cast of characters and lifestyle. One side is dedicated to making global blockbusters with multimillion-dollar budgets and platinum-plated stars, while the other revolves around ever-shifting notions of artistic freedom, guerrilla-style film making and risky ideas."

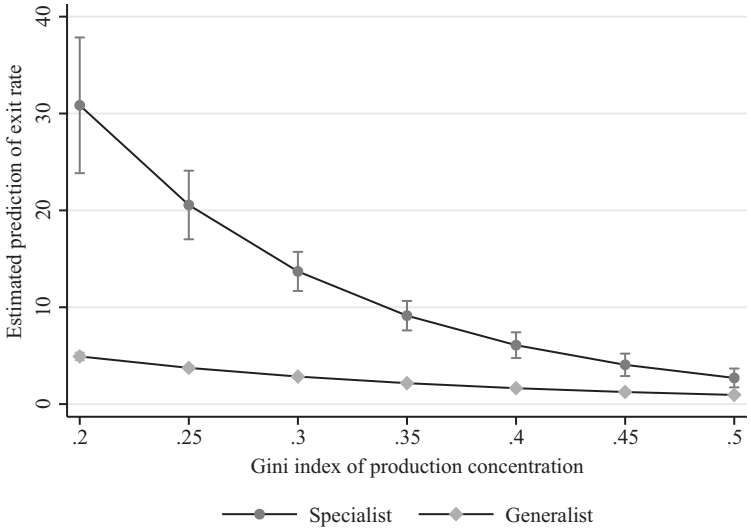
First formulated in the late 1980s, this division was made starker in the next two decades (Perren 2012).

In resource partitioning theory, the distinction between generalists and specialists can draw on continuous measures and/or specific categorical distinctions (Carroll et al. 2002). Generalists are both larger and operate across a wider niche. We follow previous research and measure differences in firm niche width to designate an empirical threshold between generalists and specialists (Carroll 1985, Dobrev et al. 2001, Negro et al. 2014). Our measure of niche width is based on film genres. Genres, for example, Western and horror, are broad categories of features that characterize the structure of dramatic action, the narrative style, the setting, and the nature of protagonists of a film (Altman 1999). Genres reveal not only the features of their products but also the organizational strategies in film making and marketing, customer segment targeting, and distribution management (Perretti and Negro 2006, 2007, Hsu et al. 2012). Prior research on resource partitioning does not provide specific guidance on operationalization. We measure niche width by taking the Jaccard distance of all film genres in each year based on their co-occurrence in all companies' productions. In the online appendix, we provide details for this measurement. A production company is defined as a generalist if it is in the top quartile of niche width in terms of the genres it releases films in a given year of production.

Prior research identified the eight "major" companies including Disney, MGM/UA, and Warner Bros. as occupying the center of the market (Zuckerman and Kim 2003). These companies are coded as generalists in our data, but we take a more flexible approach to the definition. We include as generalists other companies such as Lionsgate that during the study period have become significant players in the industry and have acquired larger market shares than some of the "traditional" majors. Our analysis addresses alternative measurement approaches (Table 6). In our data, being a generalist represents spanning 10 genres per year and being a specialist represents spanning 3 genres per year (each film is labeled with 2.29 genres, on average, by IMDb). For example, in 2015, Walt Disney Pictures had a niche with of 0.951 of a maximum of one. The company released 10 films that spanned 17 genre categories: action, adventure, animation, biography, comedy, crime, documentary, drama, family, fantasy, history, musical, mystery, romance, sci-fi, sport, and thriller.

Table A.1 in the online appendix presents exponential regression estimates of production company exit rates as a function of being a generalist or specialist, interacted with market concentration, and a set of controls. Figure 1 illustrates the estimated prediction of the effect of market concentration on exit rates over

Figure 1. Margins Plot of Specialist Film Production Company Exit Rates and Industry Concentration, 1985–2015



Notes. The *x* axis represents the range of values in the data for the yearly Gini index of production concentration. The *y* axis represents the predictive margins of the coefficient estimate for concentration across the range for specialists and generalists.

the margins of concentration for generalists and specialists. The figure shows that specialist exit rates fall when the market is more concentrated and that the exit rates of specialists and generalists become more similar when the market is more concentrated. This is consistent with the results of Mezias and Mezias (2000) and the main predictions of resource partitioning theory.

Uncertain and Changing Audience Demand in the Film Industry

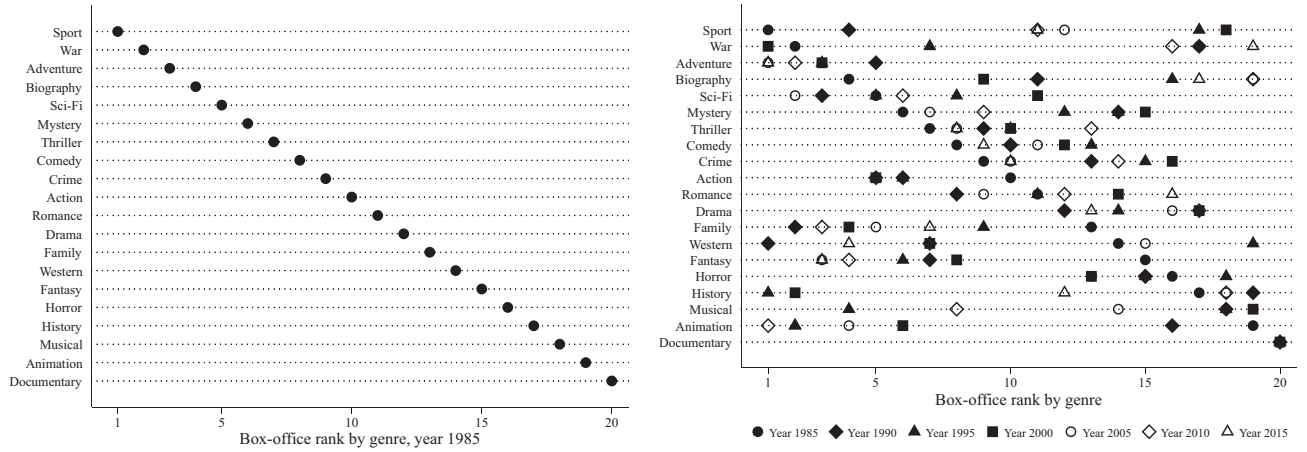
In recent decades, box-office revenues across the film industry have grown, even as filmgoers attend fewer shows. Production companies compete to capture a tighter audience with diverse tastes that each year concentrate on few successful products. Although demand for novelty by film audiences is high, what they will ultimately accept is often uncertain (Caves 2000). Even the appeal of particular film stars or franchises proves to be elusive in renewing interests among audiences and can fail unpredictably (Ravid 1999). The late Oscar-winning screenwriter William Goldman wrote that "Not one person in the entire motion picture field *knows* for a certainty what's going to work. Every time out it's a guess—and, if you're lucky, an educated one" (Goldman 1983, p. 39).

The data support these ideas. Figure 2 illustrates uncertainty in audience preferences across genres over time. The left panel depicts the ranking of the film genres that appear in our data in terms of the box-office revenue their films earn, on average, at the beginning of our sample window in 1985. In 1985, the top-earning genre is sport, followed by war and then adventure. The lowest-earning genre is documentary. The right panel illustrates these rankings over time, measured at five-year intervals. At each interval, the ranking of genres in terms of their box office revenue is overlaid on top of the 45-degree line presented in the left panel of the figure. If audience preferences remained stable over time, we would expect for most of the genre-year points to remain close to the diagonal of the 45-degree baseline and for the horizontal variation within each genre to be small. Although genres such as adventure and action maintain relatively high box-office revenues throughout the sample, most genres show significant variation, and there is an appreciable set of points on the off-diagonals away from the 45-degree baseline that indicate significant shifts in audience preferences over the sample period.

Figure 3 depicts the variance of box-office revenues for each genre in the data for each year, scaled down by a factor of 10^{15}. The points are overlaid with a polynomial fit. The increasing trend of the polynomial fit indicates increasing variance within genres for box-office revenues over our sample period, which is consistent with the idea of increasing uncertainty in audience preferences.

Market uncertainty relates to the resource partitioning dynamics of the film industry. In Table A.1, we also present estimates of company exit rates for generalist versus specialist production companies and their interaction with variance in box-office revenues—averaged across all genres for each year—and a set of controls. Figure 4 illustrates the estimated prediction of the effect of variance in genre box-office revenues over the margins of concentration for generalists and specialists. In the figure, generalist and specialist exit

Figure 2. Box Office Rank of Film Genres, 1985–2015



Notes. (Left) Ranking of the average box office revenue of films in each genre in the data at the beginning of the sample period in 1985, creating a 45-degree baseline of the ranking of each genre. (Right) Overlays of this 45-degree baseline the updated rankings in 1990, 1995, 2000, 2005, 2010, and 2015. Authors' calculations based on data from IMDb.com, boxofficemojo.com, and Variety Insights.

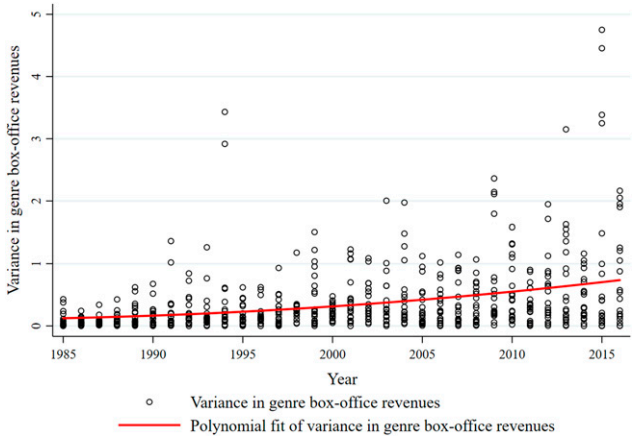
rates rise when variance in genre box office revenues is higher, and exit rates for specialists rise higher than generalists'. Exit rates of specialists also increase as market uncertainty increases, another stylized fact of the niche-based competition in resource partitioning theory (Hannan et al. 2007).

Creative Innovation to Adapt to Uncertainty and Shifting Tastes

Given this uncertainty and volatility in the market conditions, production companies seek to create innovative film content that can appeal to audiences (Hsu et al. 2012). We adopt a recombination approach to examine innovation often used in research on technological inventions (Fleming and Sorenson 2001, Perretti and Negro 2006). Drawing on this approach, we view innovation as a process of search for new creative content in films. Film projects function as coordination mechanisms within established companies or more temporary systems of work organization (Cattani and Ferriani 2008, Jones and Lichtenstein 2008).

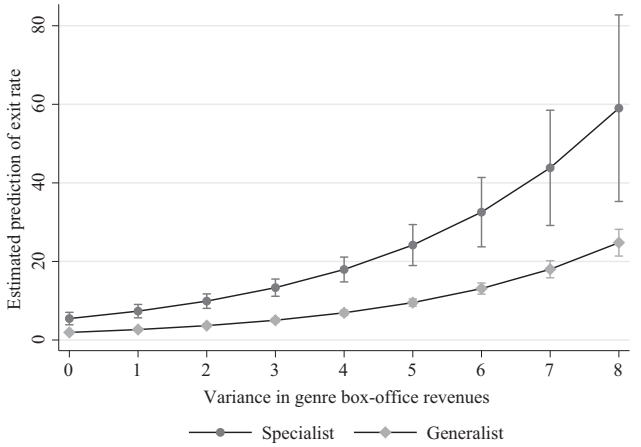
Innovation in mature creative industries occurs as producers add new creative elements and recombine existing ones (Lena 2012). For example, author and screenwriter John Dunne (1997, p. 36) explained how creative content within a film helps to differentiate them from one another. He described the action film

Figure 3. (Color online) Variance in Genre Box-Office Revenues, 1985–2015



Notes. Authors' calculations based on data from IMDb.com, boxofficemojo.com, and Variety Insights. Scatterplot fit with a second-degree polynomial.

Figure 4. Margins Plot of Specialist Film Production Company Exit Rates and Box-Office Variance, 1985–2015



Notes. The x axis represents the range of values in the data for the population-wide yearly variance in genre box office revenues. The y axis represents the predictive margins of the coefficient estimate for variance in box office revenues across the range for specialists and generalists.

Gale Force, to which he contributed, in terms of the films *Die Hard* and *Key Largo*:

> "What they wanted in the next draft was a Die Hard and Key Largo, with our job to supply the love beats and tortured Key Largo morality. What we wanted to write, however, was the Die Hard part, and toward that end we suggested making the bank scheduled to be hit during the hurricane, a cocaine Fort Knox maintained by the DEA, holding tons of confiscated coke and millions of confiscated drug dollars."

We focus on descriptors of creative content at a lower level of aggregation than genres, which we call *creative features*. Creative features represent what King (2009, p. 35) calls the "textual qualities" of characters, story line, and esthetics within a film. We analyze innovation in terms of new creative features and new combinations of existing creative features used by production companies in their films through the keywords used to describe each film. The use of keywords is a relatively new approach to the empirical analysis of innovation in creative industries but has been used in studies of patents and shown to offer a rich account of creative content (Arts et al. 2021).

The source for keyword descriptors is IMDb, a common data source in social science research on the film industry (Wasserman et al. 2015). New keywords and new keyword combinations appear regularly in film. For example, the film *Blackhat*, released in 2015, contains 118 keywords that include ones have not appeared before, such as "cyber terrorist," and new combinations of ones that have appeared before, such as "antihero + brother-sister relationship" and "computer hacker + interracial friendship." Table A.2 in the online appendix shows the 20 most frequent new keywords, and Table A.3 in the online appendix presents the 20 most frequent new keyword combinations (frequency indicates the number of times keywords were used in the first three years after their appearance).

We examined whether film audiences recognize creative features as a source of innovation. We coded data about consumer and expert ratings of films in our sample. Keywords are submitted by users but are reviewed and published by IMDb in-house staff. Moreover, IMDb allows reviewers to rate keywords as being "relevant" to a film. The expert ratings are drawn from critical evaluations aggregated in Metacritic (metacritic.com), a leading website that curates reviews of films, television shows, music albums, and video games. For films, the reviews are gathered from general media such as national newspapers (*New York Times, Los Angeles Times, Wall Street Journal*, etc.) and magazines (*Variety, Hollywood Reporter, Entertainment Weekly*, etc.). The website is used by columnists and commentators as a general reference for critical reception. Metacritic uses an algorithm that converts each review into a percentage score, either mathematically from the mark given or from a qualitative review. We collected the review scores for the films in our data and conducted analyses on these data. We also coded the text content of the IMDb and Metacritic reviews. We searched the text of these reviews analyzing words related to innovation. We used general (multidisciplinary) and applied definitions of innovation (Baregheh et al. 2008, O'Sullivan and Dooley 2009).[1]

We created two samples of films based on higher versus lower number of new IMDb keywords, and split at the median.[2] In Table 1, we report some formal tests comparing responses by consumers and critics for the two samples of films, above the median (ATM) for new creative features versus at or below the median (BTM) for new creative features. ATM films receive higher rating scores than BTM from users. ATM films are also rated higher in the critics' reviews. ATM films are also associated with reviews with more words used to define the meaning of innovation. This is the case for simple word counts and word counts normalized by review length. This result holds for consumer reviews as well as critics' reviews of the films. Finally, ATM films' creative features are associated more systematically with a rating of relevance from IMDb users. The t tests reported are significant at a conventional p-value of 0.05 or lower. Overall, we find evidence that consumers and critics recognize new keywords as representing innovation in film content, reward films with more new keywords with higher ratings, and recognize new keywords as more important to understanding a film.

Coproductions and Innovation in Film

Coproductions describe organizational partnerships in which different companies collaborate for the purpose of film production. Coproductions have become a frequent strategy for producing films that provide a vehicle for film companies to apply and combine their knowledge, money, and other resources on a joint project. Coproductions vary in terms of innovation of the films' creative features.

These differences in innovation reflect the distinct market segments of the coproducing companies. King (2009, p. 2) suggests that connections between large studios and smaller companies—here *hybrid coproductions*—draw on qualities of each sector of the production spectrum, and combine "features associated with dominant, mainstream convention and markers of 'distinction' designed to appeal to more particular, niche-audience constituencies." Figure 5 depicts the number of new, never-before-seen keywords, and new combinations of existing keywords in the films in our data. Coproductions show high levels of creative

Table 1. Comparison of Consumer and Critical Evaluation and Box-Office Revenues for Films, 1990–2015

Two-sample t test	Films above the median for number of new keywords (ATM)	Films at and below the median for number of new keywords (BTM)	p
Mean of IMDb ratings score (0–10)	6.559	6.300	$p < 0.00$
	(0.022)	(0.029)	(2.071e−12)
Mean of Metacritic ratings score (0–100)	57.749	54.451	$p < 0.00$
	(0.304)	(0.353)	(1.738e−12)
Number of innovation words in IMDb reviews per film	192.443	44.789	$p < 0.00$
	(5.748)	(1.828)	(<2.2e−16)
Number of innovation words per IMDb review	0.879	0.856	$p = 0.046$
	(0.006)	(0.009)	
Number of innovation words in Metacritic reviews per film	2.023	0.954	$p < 0.00$
	(0.044)	(0.029)	(<2.2e−16)
Number of innovation words per Metacritic review	1.012	0.058	$p < 0.00$
	(0.002)	(0.002)	(<2.2e−16)
Fraction of votes for relevance in IMDb reviews	0.138	0.126	$p < 0.00$
	(0.002)	(0.001)	(1.239e−12)
Box-office revenues	4.05e + 07	1.25e + 07	$p < 0.00$
	(1,121,626)	(573,852.8)	(< 2.2e−16)

feature innovation, particularly hybrid coproductions. The next section presents the quantitative analysis of these ideas.

Regression Analysis

Outcome Variables: Product Innovation, Competitive Differentiation, and Exit Rates

Product Innovation. Hypothesis 1 proposes that hybrid collaborations are associated with greater product innovation in terms of creative features. The variable *New creative features* measures the count of new keywords introduced in a film. There are 57,000 unique keywords in the data, and a film is comprised of 110 creative features on average. For instance, in 2015, 320 new keywords are catalogued, including "cyberbullying" and "helmet camera." The variable *New combinations of creative features* measures the count of new combinations of keywords introduced in a film in a given year. Examples of new combinations of keywords in 2015 are "dystopia + strong female character" and "graffiti + romantic break-up." Each of these keywords was used in films prior to 2015 but together represent never-before-seen combinations. Although new creative features and new combinations represent related dimensions of innovation, we measure them with distinct, nonnested measures. We account for the delay between when a creative feature is generated and when it is released in a film by considering a keyword new if it is less than three years old. Alternative specifications with one- to five-year windows yield similar patterns.

Competitive Differentiation. Hypothesis 2 predicts that hybrid collaborations increase subsequent competitive differentiation for generalists. We examine differentiation in two ways. In the first, we measure a company's differentiation in terms of the keywords of its films from the keywords of the other companies within the same market segment. The variable *Competitive differentiation from other companies* measures the average pairwise Jaccard distance (one minus Jaccard similarity) of keywords in the films a company produces from the keywords in all films released by other companies within the same market segment in a year. Higher values of this variable represent that the creative content in a company's films is more differentiated from the creative content of its within-segment competitors. Second, we measure a company's differentiation from its own prior products. The variable *Competitive differentiation from prior own products* measures the average pairwise Jaccard distance of keywords in the films a company makes from the keywords it has used in its films in prior years. Higher values again indicate that the creative content in a company's current films is more differentiated from its prior films.

Exit Rates. Hypothesis 3 predicts that hybrid collaborations are associated with lower exit rates, particularly for specialists. To measure exit rates, first we generated an interarrival distribution that measures how much time passes between each production company's prior film and its current film. A production company exits the population if it does not release another film within the 95th percentile of interarrival times—five years—and does not release a subsequent film during the sample period. Alternative specifications using a range from 1 to 10 years for interarrival time produce similar patterns to what we report. If a company satisfies the exit criteria described previously, the variable *Company exit* takes on a value of one in the final observation in which a company releases a film.

Figure 5. (Color online) Total Number of New Keywords and New Combinations of Keywords, by Type of Film Production, 1990–2015

Note. Authors' calculations based on data from IMDb.com, boxofficemojo.com, and Variety Insights.

Covariates: Film Coproduction Type and Hybrid Coproduction Activity

Film Coproduction Type. Films are defined as co-productions when they are made by two or more distinct production companies. The data, compiled by the entertainment business magazine *Variety* via the paid service Variety Insight, provide comprehensive information from metadata around film projects,

creative talent, and companies. Coproducing a film means that multiple companies are responsible for the development, funding, and producing of the project. Data sources including *Variety* assume some participation in each activity of the production process by the coproducing companies. We created dichotomous variables designating each film as belonging to a unique type of coproduction. A *Hybrid coproduction* is a film coproduced by a mixture of at least one generalist and at least one specialist production company. A *Central coproduction* is coproduced by at least two generalists and no specialists. A *Peripheral coproduction* is coproduced by at least two specialists and no generalists. We use the combined categories of solo productions to represent the baseline to test Hypothesis 1. In our data, almost two-thirds of all films are coproductions, rather than solo productions, and there are more peripheral coproductions than hybrid or central coproductions.

In the film-level regressions, statistically significant coefficients for coproduction types will reject the null hypothesis that the expected innovation of a hybrid, central, or peripheral coproduction are the same as for solo productions. We also directly compare the different types of coproductions using Wald tests that evaluate the null hypotheses that (1) a hybrid coproduction has the same effect as a central coproduction, (2) a hybrid coproduction has the same effect as a peripheral coproduction, and (3) a peripheral coproduction has the same effect as a central coproduction. Rejection of these null hypotheses will indicate that one coproduction type reflects different innovation compared with another coproduction type.

Hybrid Coproduction Activity. Like the variable for hybrid coproductions at the film level, we construct a variable for hybrid coproductions at the production company level that measures a company's cumulative experience in hybrid collaborations up to the previous year. The variable *Hybrid coproductions* counts a production company's cumulative hybrid coproduction films in its production history. Generalists have participated in 16 hybrid coproductions on average and specialists have participated in 1.

Controls. To isolate the effects of our main covariates, we included several controls. Making films based on other films (sequels, prequels, interquel, franchise) and existing creative content is a strategy production companies use to manage risk, and it may relate to the innovativeness of a film (Ravid 1999, Pokorny et al. 2018). We identified information on films' connection to prior work based on data maintained by IMDb, similar to their keyword database (Sood and Dréze 2006). The variable *Based on prior work* takes on a value of one if a film is based on other creative content and zero otherwise.

The specific creative features of films can influence a production company's innovation and financial success. For example, companies that produce films that use more technology can develop more new creative features. To isolate the effect of coproduction type from the specific creative content of a film, we control for specific keywords. There are too many keywords to include as fixed effects in the regression model, and we use a two-dimensional scaling based on the Jaccard distance of keywords of each film and company from one another. This scaling generates x and y *coordinates* for each film and production company in a geometric plane of keywords used by all companies over the previous three years. These coordinates are included, but not reported, in all models.

The lag structure for time-varying controls is based on Mindruta et al. (2016). Production companies with different financial resources can show different innovative output, for example through variation in risk-taking. The variable *Company box-office* measures the average theatrical earnings of the production companies involved in a film over a 10-year prior moving average (not including the current year). Similarly, winning major awards can facilitate attracting talent and other production resources. The variable *Company awards* measures the sum of major awards the production companies involved in a film have received for their films in the prior 10 years. The list of awards is compiled by IMDb.com.[3] Similarly, creative talent that is associated with favorable audience demand or critical reception can also influence production strategies (De Vany 2003). We include additional variables at the talent level: *Talent box-office* measures the average theatrical earnings of the major creative talent—actors, directors, writers, producers, and composers—involved in a film over a 10-year prior moving average (not including the current year); *Talent awards* measures the sum of major awards the creative talent involved in a film have received for their films in the prior 10 years.

We include other variables to account for characteristics of production companies. *Company size* measures a company's scale of production as the cumulative count of the films it has released prior to the current year. *Company age* measures the years since the release of the first film for each company. Previous research used a network approach to define central and peripheral participants in film production based on location in the global center of the collaboration network (Cattani and Ferriani 2008). *Network coreness* measures for each production company the level of coreness

(Borgatti and Everett 1999) in the coproduction collaboration network in the prior year.

The film-level models (Tables 2 and 5) include but do not report dummy variables for *MPAA rating*. These data are compiled from IMDb, and the most common rating is 'R', followed by 'PG-13'. We also include but do not report dummy variables for *Month of release* to account for seasonal cycles in release strategies for films. Last, for all models, we include but do not report dummy variables for each *Production year* to isolate the effect of coproductions from temporal effects in the industry.

We treat production companies as distinct organizational entities. However, seven percent of company-year observations are subsidiaries of larger companies. Information about subsidiaries was hand-coded from *Variety* and additional web searches. In the company-level analyses (Tables 3, 4, and 6), we account for heterogeneity between subsidiary and nonsubsidiary companies with the variable *Subsidiary company*, which takes on a value of one if a production company is a subsidiary and zero otherwise. In unreported analyses, we excluded subsidiaries and/or coproductions involving subsidiaries from the estimation and found results consistent with the results reported later. Tables A.6–A.8 contain the descriptive statistics and correlations of the main variables in the analyses.

Model

In the film-level analysis, new keywords and new combinations of keywords are discrete variables, and we estimate them using count models. These counts show overdispersion, and we use negative binomial regression. Creative features introduced in films before our sample period can reappear in films after our sample begins, and we incorporate a "learning period" based on the interarrival times of creative features in the data or the typical period of time before creative features were reused. We calculated the difference between the year when keyword was used and the most recent year in which it had been used. The median time between use and reuse is 1 year, and the mean is 1.8 years. More than 95% of the keywords (95.04%) are reused within 5 years. Less than 1% of the keywords are reused 10 years or later. We begin our estimations in the sixth year of the data in the year 1990, given that using the first 5 years of the data to build the stock of new keywords measures accurately more than 95% of the data. Alternative windows to calculate this learning period show similar patterns (see Figures A.3 and A.4 in the online appendix).

In the company-level analysis of competitive differentiation, we use fixed-effects regression to account for stable, unobserved differences between production companies. In the analysis of exit rates, we use exponential regression to model the hazard of exit. In all company-level regressions, we include but do not report time-varying parameters that control for unobserved differences that can make production companies more likely to collaborate with each another. We adapted a two-stage estimation procedure for selection into coproduction in a generalization of Heckman's method (Lee 1983). We estimated multiple sets of parameters and include them in the regressions. The first is an estimator for matching between production companies (Mindruta et al. 2016). The second is the hazard of entering each coproduction type. We detail these sets of parameters in the online appendix. All models use robust standard errors.

Results

Our first hypothesis predicts that hybrid coproductions are expected to result in greater product innovation. Table 2 displays the first set of estimations. Model 1 estimates the introduction of new keywords in a film as a function of its production type. We find that coproductions correspond to a greater number of expected new keywords compared with solo productions. Incidence rate ratios indicate that hybrid coproductions are associated with about five times as many new keywords compared with solo productions, and central and peripheral coproductions are associated with about three times as many. Wald tests also confirm that hybrid coproductions are associated with more new keywords than both central and peripheral coproductions and that central and peripheral coproductions are not statistically different from each other. Model 2 estimates the rate of new combinations of existing keywords. The results are similar to those for new creative features. Incidence rate ratios indicate that hybrid coproductions are associated with about two and a half times as many new combinations of existing keywords compared with solo productions, and central and peripheral coproductions are associated with around one and a half times as many. Wald tests confirm a similar ordering of the collaboration types. These results support Hypothesis 1.

Hypothesis 2 proposes that competitive differentiation via creative features occurs for generalists after gaining experience in hybrid coproductions. For completeness, we also estimate this effect for specialists. Table 3 displays the estimations for this prediction using fixed-effects regression of film production companies. Models 1 through 3 estimate the model on the sample for generalists. Model 1 estimates generalists' differentiation in film products from the films of other generalist companies. Model 2 estimates differentiation from a company's own prior films. Model 3 estimates differentiation from other companies' films within the same segment, controlling for differentiation from a

Table 2. Negative Binomial Regression Estimates of New Creative Features and New Combinations of Creative Features in U.S. Feature Films, 1990–2015

Variable	Model 1: New creative features	Model 2: New combinations of creative features
Hybrid coproduction	1.669***	0.916***
	(0.057)	(0.089)
Central coproduction	1.267***	0.600***
	(0.086)	(0.126)
Peripheral coproduction	1.242***	0.515***
	(0.051)	(0.081)
Based on prior work	−0.091	−0.146
	(0.106)	(0.140)
Company box-office	−0.001	−0.0001
	(0.003)	(0.0001)
Company awards	−0.0002***	−0.0002*
	(0.0001)	(0.0001)
Company size	0.002***	−0.0001
	(0.0004)	(0.001)
Company age	0.039***	0.113***
	(0.009)	(0.015)
Network coreness	−0.778***	−0.261
	(0.219)	(0.348)
Talent box-office	0.015***	−0.026***
	(0.001)	(0.001)
Talent awards	0.183***	0.148***
	(0.025)	(0.042)
Constant	0.584**	4.596***
	(0.174)	(0.276)
Alpha	1.691	3.521
	(0.043)	(0.052)
Rating	Included	Included
Release month	Included	Included
Production year	Included	Included
Log pseudolikelihood	−19,679.59	−53,003.439
Observations	7,373	7,373
Wald test hybrid versus central coproductions	$Chi^2 = 31.20$ $p \approx 0$	$Chi^2 = 11.81$ $p = 0.00$
Wald test hybrid versus peripheral coproductions	$Chi^2 = 57.85$ $p \approx 0$	$Chi^2 = 22.97$ $p \approx 0$
Wald test peripheral versus central coproductions	$Chi^2 = 0.08$ $p = 0.78$	$Chi^2 = 0.12$ $p = 0.73$

Notes. Robust standard errors in parentheses, clustered by production company. Coefficients on types of coproduction model the effect of a shift in the production company's films from the reference category, solo productions, toward each other type of coproduction. All models include the x and y coordinates of a two-dimensional scaling of a film's use of creative features; dummy variables for MPAA rating; dummy variables for month of release; and dummy variables for production year.

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$ (two-tailed).

company's own prior films. The estimates for *Hybrid coproductions* indicate a positive and significant relationship between experience in hybrid coproductions and differentiation from other generalists' and own prior films. Models 4 through 6 repeat the estimation for specialists only and find a negative and significant relationship between hybrid coproductions and differentiation from other specialists' and own prior films.

Model 7 estimates the model on all companies. This model includes a binary variable for being a generalist. The negative and significant coefficient on *Generalist company* indicates a lower baseline rate of differentiation from other generalists' films. The positive and significant coefficient on *Hybrid coproductions* indicates a general higher rate of differentiation for companies with more experience in hybrid coproductions. Model 8 is also estimated on all companies and includes an interaction term for *Generalist company* and *Hybrid coproductions*. The negative and significant coefficient on *Hybrid coproductions* indicates lower rates of differentiation for specialists with more experience in hybrid coproductions. In contrast, the positive and significant coefficients on *Generalist company* interacted with *Hybrid coproductions* indicate higher rates of differentiation for

Table 3. Fixed-Effects Regression Estimates of Benefits of Hybrid Coproductions: Product Differentiation of Film Production Companies, 1990–2015

	Generalist companies			Specialist companies			All companies	
Variable	Model 1 Product differentiation from other companies' films	Model 2 Product differentiation from prior own films	Model 3 Product differentiation from other companies' films	Model 4 Product differentiation from other companies' films	Model 5 Product differentiation from prior own films	Model 6 Product differentiation from other companies' films	Model 7 Product differentiation from other companies' films	Model 8 Product differentiation from other companies' films
Hybrid coproductions	0.0001**	0.002*	0.0001**	−0.002***	−0.138***	−0.002***	0.0001**	−0.001**
	(0.0001)	(0.001)	(0.0001)	(0.0002)	(0.012)	(0.0003)	(0.0001)	(0.0002)
Product differentiation from prior own products			−0.001			−0.001	0.0001	−0.004
			(0.001)			(0.001)	(0.001)	(0.001)
Generalist company							−0.010***	−0.013***
							(0.001)	(0.001)
Generalist company × Hybrid coproductions								0.001**
								(0.0003)
Company box-office	−0.0001*	−0.0004	−0.0001*	0.0001	−0.001***	0.0001	−0.0001	−0.0001
	(0.0001)	(0.0001)	(0.001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Company awards	0.001	−0.0001	0.0001	0.0001**	0.002*	0.0001**	0.0001	0.0001
	(0.001)	(0.0001)	(0.0001)	(0.0001)	(0.001)	(0.0001)	(0.0001)	(0.0001)
Company age	−0.003**	0.072***	−0.003**	−0.001	0.066**	−0.001	−0.002***	−0.002***
	(0.001)	(0.020)	(0.001)	(0.001)	(0.020)	(0.001)	(0.0004)	(0.0004)
Network coreness	0.005***	−0.006	0.005***	0.021*	1.444***	0.022*	0.005*	0.004*
	(0.002)	(0.051)	(0.002)	(0.010)	(0.406)	(0.010)	(0.002)	(0.002)
Subsidiary	−0.003	0.044	−0.003	−0.007	0.078	−0.007	−0.006*	−0.006**
	(0.002)	(0.053)	(0.002)	(0.005)	(0.128)	(0.005)	(0.002)	(0.002)
Talent box-office	−0.0002***	0.001	−0.0002***	−0.0002***	−0.009***	−0.0002***	−0.0002***	−0.0002***
	(0.0001)	(0.001)	(0.0001)	(0.0001)	(0.001)	(0.0001)	(0.0001)	(0.0001)
Talent awards	−0.001	−0.035*	−0.001	−0.0003	−0.062*	−0.0004	−0.001*	−0.001**
	(0.001)	(0.015)	(0.001)	(0.001)	(0.027)	(0.001)	(0.0003)	(0.0003)
Constant	0.964***	0.552***	0.964***	0.995***	0.220	0.995***	0.979***	0.981***
	(0.006)	(0.093)	(0.006)	(0.006)	(0.185)	(0.006)	(0.003)	(0.003)
Production year	Included	Included	Included	Included	Included	Included	Included	Included
R^2	0.286	0.078	0.286	0.229	0.263	0.229	0.205	0.207
Observations	1,834	1,834	1,834	4,865	4,865	4,865	6,699	6,699

Notes. Robust standard errors in parentheses, clustered by production company. All models include the following: maximum score estimator for partner selection from dyadic differences between coproduction partners; inverse Mills ratios for first-stage estimates of the time-varying hazard of forming (1) peripheral, (2) hybrid, and (3) central coproductions; the x and y coordinates of a two-dimensional scaling of a film's usage of creative features; and dummy variables for production year.

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$ (two-tailed).

generalists with more experience in hybrid coproductions. These results support Hypothesis 2.

Hypothesis 3 predicts that specialists experience higher viability in the industry after gaining more experience in hybrid coproductions. Table 4 displays the estimations for this prediction using exponential regression of exit rates of film production companies. Model 1 considers specialist companies. The negative and significant coefficient on *Hybrid coproductions* indicates lower exit rates for specialist companies that engage in more hybrid collaborations. The hazard ratio indicates a 10% reduction in exit rate for every hybrid coproduction that a specialist participates in. Model 2 repeats this estimation for generalist companies and finds a 5% reduction in exit rate for every hybrid coproduction a generalist participates in that is also significant. Model 3 estimates the model on the sample including generalists and specialists. The model includes a binary variable for being a generalist and an interaction term between being a specialist and experience in hybrid coproductions. The estimates indicate a positive and significant relationship between being a specialist and the hazard of exit and a negative and significant relationship between exit rates and the interaction between being a specialist and experience in hybrid coproductions. These results support Hypothesis 3.

Supplementary Analyses

Resource partitioning theory argues that generalist organizations operate across a wider range of resources than specialists and that the resource sets are located at varying distance from one another. This motivated our use of a niche width-based operationalization of generalism that accounts for similarity between genre categories (Hannan et al. 2019). The theory also argues that generalists are both larger and have wider niche and that specific distinctions beyond simple distance in product or market space are important for partitioning processes (Carroll et al. 2002).

In Table 5, we report estimates obtained with alternative operationalizations of generalism and specialism: (1) a measure based on production scale in which a company is defined as a generalist if it is in the top quartile of the distribution of the number of films made in a given year of production, drawing from prior work that distinguishes generalism based on organizational size (Carroll and Swaminathan 2000); (2) a measure based on coreness in the production company collaboration network in which a company is defined as a generalist if it is in the top quartile of the coreness distribution in a given year of production, drawing from prior work on the film industry by Cattani and Ferriani (2008); and (3) a measure based on a company's classification as a "major" versus

Table 4. Exponential Regression Estimates of Benefits of Hybrid Coproductions: Exit Rates of Specialist Film Production Companies, 1990–2015

Variable	Model 1 Specialist companies	Model 2 Generalist companies	Model 3 All companies
Hybrid coproductions	−0.112**	−0.054**	0.030*
	(0.036)	(0.020)	(0.014)
Specialist company			0.725***
			(0.109)
Specialist company × Hybrid coproductions			−0.236***
			(0.036)
Company box-office	−0.025***	−0.004***	−0.014***
	(0.004)	(0.001)	(0.002)
Company awards	−0.013	−0.005	−0.011**
	(0.008)	(0.003)	(0.004)
Network coreness	6.899	1.806	−1.678
	(25.873)	(1.051)	(1.700)
Subsidiary	−0.627**	−0.317	−0.579**
	(0.242)	(0.242)	(0.197)
Talent box-office	0.048***	−0.017*	0.037***
	(0.003)	(0.008)	(0.003)
Talent awards	0.474***	−0.069	0.306***
	(0.054)	(0.125)	(0.056)
Constant	322.398***	80.306*	294.230***
	(14.013)	(39.169)	(12.301)
Log pseudolikelihood	−3,002.740	−278.497	−3,376.578
Observations	4,865	1,834	6,699

Notes. Robust standard errors in parentheses, clustered by production company. All models include the following: maximum score estimator for partner selection from dyadic differences between coproduction partners; inverse Mills ratios for first-stage estimates of the time-varying hazard of forming (1) peripheral, (2) hybrid, and (3) central coproductions; the x and y coordinates of a two-dimensional scaling of a film's usage of creative features.

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$ (two-tailed).

"independent" (Zuckerman and Kim 2003). (The majors are Disney, Dreamworks, Fox, MGM/UA, New Line, Orion, Paramount, Polygram, Sony, Universal, and Warner Bros. All the other companies are independents, including subsidiaries of majors and mini-majors.) The pattern of results is qualitatively similar to Table 2.

The next analysis explores a possible mechanism through which hybrid coproductions can increase viability for specialists. Hybrid coproductions can enhance survival of specialists by providing access to resources that typically accrue to generalists. One significant difference between generalists and specialists is how they distribute their films to audiences. Empirically, this

Table 5. Negative Binomial Regression Estimates of New Creative Features and New Combinations of Creative Features in U.S. Feature Films, 1990–2015: Alternative Operationalizations

	Scale-based generalism		Network-based generalism		Major vs. independent	
Variable	Model 1 New creative features	Model 2 New combinations of creative features	Model 3 New creative features	Model 4 New combinations of creative features	Model 5 New creative features	Model 6 New combinations of creative features
Hybrid coproduction	1.801***	1.084***	1.748***	1.013***	1.612***	0.883***
	(0.052)	(0.085)	(0.057)	(0.089)	(0.061)	(0.106)
Central coproduction	1.371***	0.787***	1.340***	0.764***	1.246***	0.297
	(0.064)	(0.114)	(0.064)	(0.110)	(0.144)	(0.193)
Peripheral coproduction	1.245***	0.372***	1.186***	0.418***	1.328***	0.590***
	(0.054)	(0.083)	(0.051)	(0.081)	(0.049)	(0.078)
Based on prior work	−0.092	−0.107	−0.111	−0.134	−0.078	−0.159
	(0.096)	(0.140)	(0.094)	(0.138)	(0.112)	(0.135)
Company box-office	0.0003	−0.0001	0.0002	−0.0002	−0.0001	−0.00002
	(0.0003)	(0.0001)	(0.0003)	(0.0002)	(0.0003)	(0.0001)
Company awards	−0.0002***	−0.0002*	−0.0002***	−0.0002**	−0.0003***	−0.0003***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Company size	0.002***	−0.001	0.002***	−0.0002	0.003***	0.0001
	(0.0004)	(0.001)	(0.0004)	(0.001)	(0.001)	(0.001)
Company age	0.039***	0.111***	0.040***	0.106***	0.038***	0.115***
	(0.009)	(0.015)	(0.009)	(0.015)	(0.009)	(0.014)
Network coreness	−0.546*	−0.067	−0.560*	−0.156	−0.613**	−0.163
	(0.213)	(0.344)	(0.222)	(0.358)	(0.219)	(0.352)
Talent box-office	0.014***	−0.024***	0.015***	−0.026***	0.016***	−0.027***
	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)
Talent awards	0.159***	0.146***	0.165***	0.136***	0.196***	0.172***
	(0.025)	(0.046)	(0.025)	(0.042)	(0.023)	(0.044)
Constant	0.434*	4.442***	0.563**	4.519***	0.496**	4.515***
	(0.168)	(0.264)	(0.169)	(0.257)	(0.171)	(0.270)
Alpha	1.641	3.507	1.671	3.509	1.718	3.528
	(0.043)	(0.052)	(0.042)	(0.051)	(0.043)	(0.052)
Rating	Included	Included	Included	Included	Included	Included
Release month	Included	Included	Included	Included	Included	Included
Production year	Included	Included	Included	Included	Included	Included
Log pseudolikelihood	−19,344.59	−52,234.886	−19,650.809	−52,986.089	−19,716.502	−53,013.268
Observations	7,373	7,373	7,373	7,373	7,373	7,373
Wald test hybrid versus central coproductions	$Chi^2 = 60.92$ $p \approx 0$	$Chi^2 = 9.01$ $p = 0.00$	$Chi^2 = 61.04$ $p \approx 0$	$Chi^2 = 7.63$ $p = 0.00$	$Chi^2 = 7.14$ $p = 0.00$	$Chi^2 = 11.15$ $p = 0.00$
Wald test hybrid versus peripheral coproductions	$Chi^2 = 158.83$ $p \approx 0$	$Chi^2 = 71.69$ $p \approx 0$	$Chi^2 = 99.16$ $p \approx 0$	$Chi^2 = 50.23$ $p \approx 0$	$Chi^2 = 25.00$ $p \approx 0$	$Chi^2 = 9.07$ $p = 0.00$
Wald test peripheral versus central coproductions	$Chi^2 = 12.46$ $p = 0.00$	$Chi^2 = 12.10$ $p = 0.00$	$Chi^2 = 4.99$ $p = 0.03$	$Chi^2 = 8.85$ $p = 0.00$	$Chi^2 = 0.32$ $p = 0.57$	$Chi^2 = 2.30$ $p = 0.13$

Notes. Robust standard errors in parentheses, clustered by production company. Coefficients on types of coproduction model the effect of a shift in the production company's films from the reference category, solo productions, toward each other type of coproduction. All models include the x and y coordinates of a two-dimensional scaling of a film's usage of creative features; dummy variables for MPAA rating; dummy variables for month of release; and dummy variables for production year.

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$ (two-tailed).

implies that specialist companies that engage in hybrid coproductions can distribute their subsequent films to larger audiences. We explored this in two ways. First, we computed a measure of genre-based niche width for film distributors, similar to our measure of niche width for production companies, using data on the distributors associated with each film from IMDb. The variable *Generalist distribution* represents the average niche width of distributors that distribute a specialist company's films in a year. Larger values of this variable are associated with having films released by distributors that work across a wider variety of films. Second, we followed an alternative approach to use data on theatrical screen bookings for film releases (Carrillat et al. 2018). The costs of opening a film in theaters can differ by location, but they always entail marketing and other promotional materials to maximize theatrical attendance and box office revenues. These costs increase with increasing number of screen bookings. The number of screen bookings influence the financial return for each film and the end profits shared with production companies. We compute the variable *Number of opening screens* as the number of theatrical screen bookings for a specialist's films in a year. In Table 6, we present fixed-effects regressions at the production company level that estimate specialists' films being distributed by generalist distributors and the number of opening screens booked for their films as a function of their experience in hybrid coproductions. These models are constructed analogously to the analyses in Table 5.

Table 6. Fixed-Effects Regression Estimates of Benefits of Hybrid Coproductions: Market Outcomes of Specialist Film Production Companies, 1990–2015

Variable	Model 1 Generalist distribution	Model 2 Number of opening screens
Hybrid coproductions	0.007*	446.364***
	(0.003)	(61.304)
Company box-office	0.0003	−1.914
	(0.0004)	(1.170)
Company awards	−0.0002	−4.577
	(0.0002)	(3.186)
Company age	0.004	17.976
	(0.006)	(50.162)
Network coreness	0.053	1,925.659***
	(0.099)	(209.372)
Subsidiary	0.008	898.590
	(0.022)	(643.450)
Talent box-office	0.001*	0.0001***
	(0.000)	(0.00001)
Talent awards	−0.004	162.484
	(0.008)	(93.052)
Constant	0.830	−321.699
	(0.060)	(661.448)
Production year	Included	Included
R^2	0.05	0.29
Observations	4,865	4,865

Notes. Robust standard errors in parentheses, clustered by production company. All models include the following: maximum score estimator for partner selection from dyadic differences between coproduction partners; inverse Mills ratios for first-stage estimates of the time-varying hazard of forming (1) peripheral, (2) hybrid, and (3) central coproductions; the x and y coordinates of a two-dimensional scaling of a film's usage of creative features; and dummy variables for production year.

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$ (two-tailed).

Model 1 of Table 6 shows that more experience in hybrid coproductions is related to specialists' subsequent films being distributed by generalist distributors. Model 2 shows that more experience in hybrid coproductions is related to specialists booking a larger number of opening screens. The effect size indicates that each hybrid coproduction is associated with 550 more opening screens for subsequent films. These results help to illustrate a mechanism through which experience in hybrid collaborations can decrease the exit rates of specialist production companies: releasing films to a larger audience.

In sensitivity analyses, we also examined whether semantic similarity between keywords inflate the rate of innovation within our analysis. We used word embeddings models (Devlin et al. 2018) to measure conceptual similarity and examined multiple "thresholds" of similarity to reduce our population of keywords. At each threshold level, we re-estimated the main models in Table 2. The magnitude of these coefficients is stable throughout. This suggests that the association between hybrid coproductions and innovation is unlikely a confound of semantic similarity between keywords. Finally, for the analyses in Table 2, we used a learning period of five years to build the sample of new keywords and new keyword combinations. However, keywords not used in the very recent past may have been used earlier. We varied the learning period from 1 to 12 years and re-estimated the regressions in Table 2 using these different periods. The magnitude and statistical significance of the coefficients on hybrid coproduction are largely similar over the range of learning periods and conform with the pattern of findings in Table 2. Details of these analyses are reported in the online appendix.

Discussion

Resource partitioning theory, and ecological theory more broadly, often assumes that the durability of boundaries between organizational populations follows from stable environments (Hannan et al. 2007). Yet across settings as diverse as venture capital, biotechnology, and film production, generalist and specialist populations endure despite the inherent instability of their environments. If organizational inertia constrains the rate at which organizations can adapt, then the persistence of organizational populations under environmental volatility poses an empirical puzzle for the theory.

In this paper, we argued that collaborations between generalists and specialists can stabilize and reinforce

the boundaries between these two populations under conditions of uncertainty. Cross-boundary collaborations allow generalists to explore shifting market landscapes by tapping into specialist knowledge to help develop offerings for fickle audiences. For specialists, they are an opportunity to overcome resource constraints (Lerner et al. 2003, Ahuja et al. 2009). These differences in why they enter and how they benefit from the collaboration also reaffirm their differences and allow them to persist under these volatile circumstances.

With U.S. film production from 1985 to 2015 as the context, our analysis finds that the films made through coproductions between generalist and specialist production companies feature more novel creative features and novel feature combinations than all other forms of production. This allows generalists to differentiate themselves from their peers and reduces their competitive overlap. We observe this differentiation in Warner Bros.' greater reliance on R-rated dramas compared with Walt Disney Pictures' family-friendly entertainment legacy and Universal's portfolio of blockbuster, action-oriented franchises. For specialists, coproductions imply higher chances of viability than other forms of collaborative and independent film production.

Our focus on cross-boundary collaborations in the exploration of the market landscape underscores how producers—rather than other features of the socioeconomic environment—can maintain the separation between generalists and specialists (Carroll 1985, Carroll and Swaminathan 2000). Because generalists have greater control over the partnership, they select and limit the benefits that specialists receive through these collaborations (Katila et al. 2008, Ozcan and Santos 2015). In other words, generalists can shape the boundaries between themselves and specialists by regulating which specialists can enter and access the market center. Our study highlights a less explored facet of the ecological literature of how organizations shape their environments (Hannan and Freeman 1977).

Finally, a key outcome of the resource partitioning process is the transformation of the near-center, the niche space that overlaps with center and periphery (Hannan et al. 2007). In some settings, near-center organizations occupy this space. Examples include contract brewers or middle-sized financial institutions (Negro et al. 2014). Eventually, the entities in the near-center experience competitive pressure from both generalists and specialists and exit, releasing resources to the market. Collaborations between specialists and generalists allow organizations in the center and periphery to target these resources. This becomes a space where generalists can differentiate and specialists can tap into generalist resources vis-à-vis other specialists who cannot. We saw this in the increasing hazard of exit by specialist firms without generalist partners. In film, hybrid collaborations sustain the activities of certain specialist companies largely characterized by their partnerships with generalists, although they are not subsidiaries of these studios (Cattani et al. 2008, Vandaie and Zaheer 2015).

Beyond ecological studies, prior work on collaborations within partitioned markets, for example, the study of Powell et al. (1996) on dedicated biotechnology firms and major pharmaceuticals or the study of Mathias et al. (2018) on knowledge sharing and competition between specialist breweries, tends to focus on a specific form of production, and our study expands on these works by comparing multiple types. Doing so allows us to highlight their different consequences for participants and the market. For example, within-generalist collaborations are especially significant for exploitation of existing resources, even if they may rely on old ideas. Within-specialist collaborations are less beneficial for specialists in terms of survival than hybrid collaborations but are efficacious in idea generation even if those ideas may be difficult to execute. By using the two-sided matching approach of Mindruta et al. (2016), we also apply a novel method to address methodological concerns that affect some studies in the strategic alliance literature (Yang et al. 2014, Pahnke et al. 2015). Many of the results reported in this literature hold, such as the importance of cross-boundary engagements in generating novelty within the industry (Cattani and Ferriani 2008).

Our study of collaborations and resource partitioning uses U.S. filmmaking as its context (Mezias and Mezias 2000, Zuckerman and Kim 2003, Cattani and Ferriani 2008, Vandaie and Zaheer 2015). A limitation of the setting is the short life cycle of its products compared with durable goods such as cars or consumer products such as beer. On the one hand, film production is a strategic site for studying uncertainty because products do not persist in the theatrical market for very long. However, this feature may limit its generalizability to other settings where product life cycles are more varied. Studies of collaborations in these other settings will allow researchers to examine whether hybrid collaborations are a stable way to manage market uncertainty or also whether distinct forms of organizations emerge and thrive in the space between center and periphery. We also focused on films produced by U.S.-based production companies, although numerous foreign films can be influential and popular in the American market. Studying how international film distribution has affected cross-border film creativity would be a worthwhile extension of our investigation for future research.

As it stands, Hollywood is facing the reality of filmgoers who buy fewer movie tickets and have ever-greater alternatives for media consumption such as video games and video streaming (Zara 2012, Thompson 2020). In this

changing industry environment, generalists still hold a competitive advantage. On the one hand, large producers generate revenues from their films in theaters and through commercial licensing deals and selling streaming rights. On the other hand, large companies are among the few players with enough resources and capabilities to create their own new distribution platforms. They also possess a content catalog that can saturate their pipeline and differentiate them from their competitors.

Specialists that partner with streaming platforms can benefit in this new environment. Streaming has different performance metrics, such as minutes watched or lifetime customer value (Sutton 2021). Aiming at these targets can free specialists from some of the constraints of theatrical distribution imposed through collaborations with major studios while also accessing the resources these platforms can offer. As alternative channels for film production increase, we would expect greater viability for specialists that partner with streaming services, along with specialists that continue to partner with generalists. Insofar as the number of major distributors in either channel remains small and concentrated, specialists will still relinquish significant shares of the value that their products create. As long as audiences remain fickle and seek out novelty, studios and production companies will have to explore and innovate to chase after them. This combination of scale advantages along with the diverse—and ever-changing—preferences of audiences suggests to us that the partitioned structure of the film industry will persist, and so will the role of interorganizational collaborations within it.

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Endnotes

[1] We searched the texts of the reviews for words that describe the meaning of innovation: Add* or Advanc* or Challeng* or Chang* or Contribut* or Creat* or Creativ* or Differenc* or Different* or Disrupt* or Emerg* or Generate* or Grow* or Ideat* or Improve* or Improving or Increment* or Influenc* or Influent* or Innovat* or Introduc* or Invent* or New (but not "News") or Next-generation or Novel* or Radical* or Redesign* or Transform*. We counted how many times each of these words appeared in a review and summed the number of 'innovation words' across reviews for each film.

[2] Using other values of the distribution, for example, the third quartile or the mean, yields the same pattern of results reported in the main estimations.

[3] The list of awards used includes the following awards: Academy Awards, USA; AFI Awards, USA; BAFTA Awards; Broadcast Film Critics Association Awards; BET Awards; Cannes Film Festival; Golden Globes, USA; Grammy Awards; Kids' Choice Awards, USA; MTV Movie + TV Awards; People's Choice Awards, USA; Razzie Awards; Screen Actors Guild Awards; Sundance Film Festival; SXSW Film Festival; Teen Choice Awards.

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