

# Social Boundedness as Market Identity

## Evidence from the Film Industry \*

Amir Goldberg\*\* and Tony Vashevko\*\*

\*\*Stanford Graduate School of Business

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### Abstract

Where does market identity come from? Whereas recent literature has focused on actors' fit with a preconceived notion about what constitutes a category, we argue that an actor's network position is central to how audiences infer what it is. With Hollywood as our empirical setting, we demonstrate that consumer perceptions of films are structured by a strong status hierarchy, and that boundedness – the extent to which a film's production team comprises an exclusive clique within the network of interpersonal collaborations in the film industry – predicts which audience members will like it. We draw on a uniquely detailed dataset of consumer preferences, and take advantage of the lag between film production and consumer evaluation as a means to demonstrate that production team members' career trajectories after a film had been produced have a bearing on audiences' evaluations.

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\*Please do not cite without permission. Direct all correspondence to Amir Goldberg, Stanford Graduate School of Business, Knight Management Center, 655 Knight Way, Stanford, CA 94305 (amirgo@stanford.edu).

## Introduction

Identity has become a dominant theme in organizational and economic research in recent years (Hsu & Hannan 2005, Whetten 2006). Central to this line of work is the assumption that an organization's identity – the set of attributes that characterize it – affects how it is perceived by audiences outside the organization and, as a consequence, the features these audiences expect the organization and its output to possess. Organizational identity, in other words, is not what an organization inherently *is*, but rather what its members and outside audiences think is fundamental and distinctive about it (Gioia, Schultz & Corley 2000).

How do these outside audiences decide which features to measure an organization's identity against? A common argument is that the individuals comprising an audience – customers, investors and other potential stakeholders – assess newcomer organizations in terms of prevalent and familiar templates. An organization's identity therefore inheres in its fit with conventional and recognizable categories. Yet an alternative possibility is that audiences evaluate organizations not solely, or even primarily, on the basis of what they produce, or how they produce it, but rather as a function of the people involved in the process of production (Roberts, Khairi & Rider 2000). These people's identities, and particularly the status associated with these identities, play a significant role in shaping audiences' evaluations (Podolny 2005).

Both of these conceptualizations – which we refer to as categorical and relational notions of identity – rest on the assertion that identity is particularly potent in contexts of market uncertainty; that it structures audience perceptions when unequivocal information about an actor's quality is difficult or impossible to come by (Podolny 2001). But while this scholarship makes assumptions about what goes on in people's heads, it more often than not refrains from actually probing audience members' perceptions. Rather, in a majority of studies, audience preferences are inferred from their aggregate behaviors, as reflected in metrics such as a firm's market value (Zuckerman 1999) or a product's market success

(Hsu 2006).

In contrast, this study relies on an unprecedentedly detailed dataset on film audience preferences to investigate whether identity in the market for feature films is structured by these films' genre classifications, or by the social identities of the people involved in their production. The film industry provides a useful empirical setting because films are, in essence, ad-hoc project-based organizations whereby individuals constantly flow and regroup into newly formed collaborative teams (Faulkner & Anderson 1987). Because a film's quality is not easily distinguishable, or even consensually measurable, audiences need to rely on other forms of information in order to evaluate it.

Drawing on the ratings of roughly three thousand films produced between 1920 and 2005, and provided by almost half a million unique users of the online video rental service *Netflix*, we induce the axial principles that underlie audience evaluations of films. We find that these evaluations are shaped by a highly structured hierarchy that ranges from sophisticated to common films. Though not inconsequential, institutionalized classification of films in the form of genre designations play a secondary role in shaping consumers' evaluations. Rather, in support of a relational conceptualization of organizational identity, the identities of the people involved in a film's production process, and whether or not these individuals were successful in establishing and maintaining high status through boundary work, have a significant bearing on whether a film will be perceived as sophisticated – and by extension 'artistic' – or not. We refer to films whose production team members are embedded in tight-knit clusters as socially bounded films, and demonstrate that a film's boundedness predicts its eventual reception by audiences.

We draw on a unique feature of our data: that there exists high variability in the lag between a film's times of production and its evaluation by *Netflix* users. We use this lag as an instrument to demonstrate that the effect of boundedness on audience evaluation is, at least in part, attributable to the film's team members' career trajectories after the film had been released. Films whose team members went on to collaborate in exclusive circles and thereby, we argue, establishing a high-status identity, tend to enjoy greater post-hoc

appreciation than at the time of their release.

## Where Does Identity Come From?

As an analytical concept, identity is fraught with ambiguity (Brubaker & Cooper 2000). We use the term to denote *identification*, the process by which an object is classified as an instantiation of a generic type. Whereas a large body of extant literature examines how organizational self-identity shapes members' understandings of their organization's objectives and normative ways of doing things, we conceptualize identification as a process exerted on an actor by others (Hsu & Hannan 2005). In market contexts, these others – which are often referred to in the literature as “audience” – might be customers, partners, or other constituencies outside the organization. Such audiences command control over resources that are essential for an organization's success (Zuckerman 1999).

Identity, therefore, is consequential because it inheres in audiences' perceptions, rather than an organization's attributes per-se. It is the taken for granted assumptions that audiences make about an organization, and the products it produces (Hannan, Pólos & Carroll 2007). Identity comes into play when audience members make inferences about an organization's characteristics in the absence of clear-cut information about these characteristics. It is therefore especially significant in contexts that are characterized by what Podolny (2001) calls “altercentric uncertainty:” the uncertainty an evaluator has about the quality of the object being evaluated. Under such circumstances, identity functions as a signal that substitutes for missing information about the objective quality or worth of an actor's output.

The market for consumer electronics, for example, is rife with altercentric uncertainty. Consider the iPhone, Apple Inc's highly popular smartphone introduced in 2007. Consumers assessing the relative advantages and disadvantages of purchasing an iPhone need to take into consideration its functional quality as well as the social status associated with displaying it in public. Apple's identity therefore presumably plays a role in shaping these audiences' assessments. Understood primarily as a computer hardware manufacturer, po-

tential customers might be skeptical about Apple's ability to successfully foray into the domain of cellular telephony. Yet if Apple's most salient characteristic in the eyes of consumers is its flare for innovation, they might – as they actually have in droves – be inclined to interpret its technology as groundbreaking, and its public consumption as carrying a cachét, and concomitantly elect to buy an iPhone.

Similar problems present themselves in the market for feature films. Not only is there rarely consensus, whether among experts or the lay public, on the formal features that distinguish valuable from low quality art (Yogev 2010); like the iPhone, film is often conspicuously consumed as a social status signal (DiMaggio 1987, Baumann 2007). A film like the 2009 *Inglourious Basterds* – a revenge fantasy depicting an alternate history of World War II – might be interpreted as a distastefully inane war film, or a subversively profound observation about the character of human violence. The categorical prism through which the film is perceived has a bearing on its reception by audiences.

A variety of studies demonstrate that identity has an effect on organizational performance (?). These effects, however, are meaningful only to the extent that audiences agree on what criteria to use in order to establish an organization's identity. It is therefore one thing to point out that identity is consequential, and another to highlight what determines how an actor will be identified. Organizational research has given considerable attention to the former, but far fewer to the latter. If an actor's identity depends not on what that actor is, but on how it is perceived by others, then where do these perceptions come from?

### **Categorical and Relational Sources of Identity**

We draw on Brubaker & Cooper (2000) to make a distinction between two primary sources of identity: *categorical* and *relational*. By categorical identity, we refer to an organization's identification as a function of its attributional sameness with other organizations that constitute an institutionalized category. Relational identity, in contrast, inheres in the set of relationships that characterize the people who make up an organization, and the social meanings these relationships imply.

The majority of scholarship on organizational identity, particularly that which draws on insights from organizational ecology, assumes that identity is categorical. Institutional actors such as state bureaucracies, critics and analysts play a central role in reifying and enforcing this categorical landscape. For such systems of classification to enforce order, audiences need to be in agreement about the meanings of the categorical labels they use. A producer categorized as a computer hardware manufacturer, to continue our example, is expected to implement specific production processes and to offer a certain product portfolio. Similarly, a film classified as a war movie is expected to adhere to particular thematic and stylistic genre conventions. Categories thus become central in coordinating audience members' expectations from and evaluations of producers and products in a market. As a result, they also orient producers' strategies in pursuit of these audiences (Hsu, Hannan & Koçak 2009, Negro, Hannan & Rao 2010).

An important implication is that audience members find it difficult to evaluate actors who do not conform to established categorical identities. Actors who send mixed signals are not easy to make sense of; consequently, they are overlooked by potential consumers or, at worst, perceived as inferior to actors with more specialized identities. A variety of studies indeed find that, once a system of classification is institutionalized, categorically incoherent actors are ultimately devalued by the market. This devaluation is especially potent when markets are regimented by gatekeepers such as analysts and critics (Zuckerman 1999, Ruef & Patterson 2009). The negative effects of category-spanning have been particularly studied in the film industry, where genre serves as the categorical sieve through which films are, presumably, perceived. Zuckerman, Kim, Ukanwa & von Rittman (2003), for example, find that actors are incentivized to specialize in narrow cinematic personas, while Hsu (2006) demonstrates that films that target multiple genres are less appealing to audiences.

An assumption implicit in this work is that these institutional taxonomies structure and therefore ostensibly mirror the categorical prisms through which audiences perceive organizational identities. But there are reasons to question this assumption. Most importantly, the different domains that these formal taxonomical labels circumscribe are populated with

actors that are competing for audiences' attention and approval. If all conformed to the same categorical imperatives, they would become indistinguishable from one another.

Though usually less explicit about its use of the term, a tangential strand of scholarship conceptualizes identity in relational terms, as an actor's position within a set of relationships, rather than membership in a distinct categorical label. This line of work normally understands markets as structured by a social hierarchy, whereby one's position in this hierarchy is abstracted as "status." Organizations with greater perceived status receive greater market rewards than lower status actors for outputs of similar quality (Podolny 1993, Podolny 2005, Stuart, Hoang & Hybels 1999).

A variety of studies have investigated the relationship between status and categorical membership in markets. These tend to find that high-status actors have greater latitude to exhibit categorically non-conforming behavior (Phillips & Zuckerman 2001). Rao, Monin & Durand (2003), for example, find that acclaimed chefs were celebrated for straddling the categorical boundary between Nouvelle and classic French cuisine. They were nevertheless still primarily perceived as a function of their fit – or lack thereof – with these two established culinary categories.

A relational conceptualization of identity, in contrast, assumes that audiences assign meaning predominantly as a function of the actor's social position. This notion of identity departs markedly from a categorical one as it assumes that actors are judged not on the basis of what they do, but rather who they do it with. In the absence of concrete information about an actor's worth, audiences seek signs in the relationships this actor has with others. Because actors command only partial control over their relationships with others, others' willingness to form such relationships is interpreted by observers as indications about the focal actor's worth. Thus one's set of relationships is reified as quality (Gould 2002, Lynn, Podolny & Tao 2009).

Categorical and relational approaches to identity, in short, propose different hypotheses about the sources of organizational identity. The former assumes that audience members derive identity by drawing on shared schematic representations; that is, that people identify

organizations in culturally recognizable terms. The latter, on the other hand, highlights the structural roots of identity by arguing that organizations are identified as a function of their social location. The majority of the literature on identity assumes, mostly implicitly, that identity is categorical. Yet, because social location is inferable as worth, we expect to find that relational identity is salient in settings that are characterized by high uncertainty about quality.

### **Boundedness as Identity**

How is social position translated into identity? If status functions as evaluative currency, and inheres in one's set of relationships, then actors have strong incentives to associate with well-regarded others and distance themselves from those of more dubious reputations. Indeed, individuals working with critically acclaimed film actors, for example, are more likely to receive Academy Award nominations themselves (Rossman, Esparza & Bonacich 2010). Evidence from investment banks to NASCAR drivers suggests that organizations and individuals exert effort to maintain exclusivity in their relationships (?), and take significant risks in order to distance themselves from less regarded others when under threat of hierarchical demotion (Bothner, Han Kang & Stuart 2007).

Key to this process is the demarcation of a boundary. As we note earlier, people identify the objects they observe through typification. Research originating in Rosch's (1978) work on prototype theory finds that this process of classification is fuzzy, such that objects can be interpreted as instantiations of multiple types with varying degrees of strength. Perceived boundaries therefore make it easier for people to discriminate between objects. And when these objects have agency, they can partake in the process of demarcating the boundaries that circumscribe them. This is precisely what Gieryn (1983) calls "boundary-work:" actors' attempts to reify their sameness by creating and maintaining a perceived boundary between in-group members and out-group others. Such boundaries often serve to sustain social distance between the groups they distinguish, and reinforce the material and symbolic inequalities this distance entails.

It is therefore in the interest of high status actors not only to distance themselves from those lower on the food chain but also to objectify this distance as an impermeable boundary. Perceived by audiences as such, this boundary signifies high status actors' purity. Low status actors, on the other hand, have only to gain from collaborating with those above them in the hierarchy. If we think of a set of relationships connecting organizational actors in a market as a network, we can imagine this maintenance of affiliational purity as clusters of tightly knit nodes. We refer to an actor's location within such a cluster as its *boundedness*.

Our main argument, therefore, is that boundedness functions as a marker of status. Actors operating within bounded groups are only those who have the repetitional latitude to do so. When conceptualized in network terms, status is often understood as an actor's excess, or lack thereof, of social allocations. Actors who generally initiate fewer relationships than those they are invited to partake in are those who enjoy high status (Gould 2002). Thus an actor's network centrality is often proxied as that actor's social esteem. Yet audiences often lack information about relationship asymmetry, and therefore have no access to one's network centrality. In most settings, they are only aware of the attachments – whether in the form of an inter-organizational partnership or inter-personal collaboration – that have materialized. We therefore hypothesize that, within contexts of altercentric uncertainty, boundedness is correlated, in the eyes of audiences, with quality.

### **Boundedness in the Feature Film Market**

The film industry is a fitting empirical setting for testing the relationship between boundedness and perceived quality for several reasons. First, films are produced by teams comprised of often hundreds of individuals who occupy clearly defined roles. In essence, each film is an ad-hoc organization that is formed, and later dissolved, merely for the purpose of creating one product. Far from random, however, repeat collaboration is very common in these temporary project-based teams (Faulkner & Anderson 1987). Over time, they create an ecology of makeshift organizations in which individual careers crisscross one another. These intersecting career paths form an evolving network structure. Thus the film industry

provides an ideal setting for tracing organizations, their outputs, and the social networks in which they are embedded.<sup>1</sup>

Second, because of their ad-hoc nature, film-based organizations do not have a singular history. Unlike with conventional firms, audiences have no information on a newly formed film crew's past performance as a team. They are therefore pushed to rely on identity as a signal about the potential quality of this production team's output. Finally, the boundary separating authentic artwork from mere craft is particularly potent in art markets (Becker 1982, Bourdieu 1979). Though a relatively young form of creative expression – roughly a century old – American cinema underwent an interpretative transformation during the 1960s. The consecration of certain cinematic works as “art” effectively created a status hierarchy whereby some films were hailed as masterpieces and their creators as “auteurs” (Baumann 2007).

We conceptualize boundedness as the extent to which the individuals who comprise a film production team have collaborated with one another on other films. Highly bounded films are those whose members collaborated with one another on multiple films, whereas low bounded films are those whose members participated in multiple films, but who have collaborated with one another only on one. Our argument rests on the assumption that boundedness is related to how audiences infer identity from their knowledge about team members' other collaborations. Yet boundedness might also be related to the conditions under which a film is produced, regardless of eventual audience perceptions.

Existing literature generally offers two competing hypotheses about how boundedness might be related to audience reception through its effects on production. The first argues that structural consistency is favorably related to performance (Hannan & Freeman 1984). Repeat interaction is particularly conducive to high quality artistic outcomes through the

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<sup>1</sup>The majority of films are produced under the umbrella of a film studio which is an organizational entity that outlives the duration of one cinematic project. Yet the core creative team, comprising such functionaries as the director, producer, actors and screenwriters, tends to vary in composition between one film and the other. During its first four decades, the film industry was dominated by the studio system, whereby films were produced almost exclusively by major studios, and team members were employed by these studios under long term contracts. During that period, studios exercised greater command over the production process than they do today. Nevertheless, production team composition was never fixed, and increasingly so after the studio system's demise in the early 1960s.

formation of what Becker (1982) calls ‘artwolds:’ communities of artists, industry professionals and avid consumers who collectively negotiate the content of different forms of artistic expression. These forms cohere through the process of interpersonal interaction, such that tight-knit circles of creative collaboration and exchange facilitate the emergence of distinct styles (Crossley 2009, Lena 2012).

Yet a variety of other studies find that boundedness can constrain artistic performance. These rest on the idea that artistic creativity is highly valued by audiences, and that creative novelty emerges at the intersections of otherwise disconnected parts of a production network (Burt 2004). In a study of Italian TV production teams, for example, Zaheer & Soda (2009) find that teams whose members spanned structural holes were more likely to succeed commercially. Uzzi & Spiro (2005) similarly find that creativity in the Broadway musical industry peaks in networks that are, on the one hand, sufficiently bounded to facilitate collaborative exchange but at the same time also porous enough to allow new and varied ideas to flow from outside these closed circles.

We argue that boundedness has a an effect on film audience perceptions net of its production-side effects on the quality and characteristics of cinematic output. As we discuss below, our research design enables us to separate production from consumption processes, and isolate the effect of boundedness on audience perceptions.

## **Measuring Identity**

An analytical focus on identity implies an empirical focus on audience perceptions. Surprisingly, however, the vast literature on identity in markets, almost without exception, uses aggregate measures as proxies for audience interpretations. Often, price or market share are assumed to represent consumers’ revealed preferences. A film’s gross income is understood as a product of its categorical coherence (Hsu, Hannan & Koçak 2009) or an investment bank’s profit margin a result of its status (Podolny 1993). While these studies make strong arguments about what goes on in audiences’ heads, these aggregate measure may be obfuscating, rather than elucidating, audience interpretations.

Consider the following thought experiment as illustration. Imagine that a market contains only two similarly priced products, *a* and *b*, with 30% and 70% market share respectively. Imagine furthermore that we have two competing hypotheses about the sources of these products' appeal to consumers. The first hypothesis is, simply, that product *b* is objectively better than *a*, and that audiences are in agreement about this valuation. Thus we should expect to find that all consumers are universally 30% likely to purchase product *a* and 70% likely to purchase product *b*. The second hypothesis, in contrast, is that each product appeals to different audience segments. Thus, 30% of customers are inclined to purchase product *a* whereas 70% are inclined to purchase *b*. By examining aggregate sales we cannot adjudicate between these two theories, as both conditions result in exactly the same aggregate market shares for each product.

This problem can be generalized to our setting. Film theater tickets, as well as video and DVD rental or internet streaming costs, are more or less constant within geographical regions. Different films therefore do not compete with one another on cost; rather, their likelihood of success rests almost exclusively on their perceived quality. Yet, examining films' aggregate appeal or market share, for the reasons discussed above, provides no insight as to whether audiences are in consensus about their qualitative rankings, or whether different audience segments specialize in different types of films. It is therefore impossible to assert how identity – however conceived – is affecting audience valuations.

Consequently, previous scholarship relies on strong assumptions about how audience members perceive market products. Studies that conceptualize identity as categorical implicitly assume that audiences draw on the standard classificatory schemes that are used by institutional actors; that consumers, for example, specialize in particular film genres or electronic product categories.<sup>2</sup> Work on relational identity assumes that status is interpreted as quality, and that audiences are in agreement about this interpretation.

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<sup>2</sup>Recent work in this vein questions the assumption that audiences' perceptions comport to these standard classifications. In a study of technology startups, Pontikes (2012), for example, infers categorical identities from these organizations' descriptions. Though far more nuanced than traditional reliance on formal taxonomies, this approach nevertheless still assumes that organizations' identity claims shape audience perceptions.

An alternative approach is to inductively infer, rather than presuppose, how audiences typify objects, by examining their explicit or revealed preferences individually. Identity, as we discuss earlier, inheres in an observer’s attribution of sameness between objects. Two organizations or products have the same ‘identity’ because, in the eyes of the audience, they are instantiations of the same type. We can use individual audience members’ preferences as a means to infer this perceived sameness. Such an approach conceptualizes these perceived types as latent semantic anchors in a structure of relationships between objects. These anchors serve as the prototypes against which identity is measured (Rosch 1978, Murphy 2004). An object’s identity is therefore a function of its location in this web of associations (Lévi-Strauss 1963, Emirbayer 1997, Mohr 1998).

Consider *Inglourious Basterds* again. Critics’ initial reactions to this fictional portrayal of World War II were mixed. Whereas some saw it as a hyper-violent war film, an inane and “embarrassing ... revenge fantasy,” others found it profound and audacious in a manner that “resists categorization” (?). Imagine that we were to ask viewers to name other films that are like *Inglourious Basterds*. The former interpretation would likely result in an association with similarly violent war films; the latter, on the other hand, with a thematically diverse set of movies that ostensibly possess a similar perceived cinematic profundity. If identity relates to the salient dimensions along which people discriminate between different objects, then we should expect audiences evaluations of these objects to be correlated with one another as a function of their assignment of identity.

Our data include *Netflix* users’ express opinions about the various films they watched, ranging on a 5-point Likert scale. This dataset differs from traditional survey based data in two important ways: (1) individuals vary significantly in the number of films they rate,<sup>3</sup> and (2) in the subsets of films they rate. Consequently, whereas some films were rated by many users, the majority were rated by a relative few. We construct a measure of similarity between films as a function of the correlation between the ratings of the users who rated both films. This correlation measures the extent to which two films were liked,

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<sup>3</sup>The number of films rated follows a heavy-tailed distribution, with the median user rating 96 films, and the average user 209 films.

and disliked, by the same people. We argue that this web of inter-film correlations reflects an underlying intersubjectively shared attribution of identity. A film’s location within this network corresponds to its perceived identity.

Formally, let  $R^i$  denote the set of users who have ranked film  $i$ ,  $R^{i \cap j}$  denote the set of users who have ranked both films  $i$  and  $j$ , and  $R_i^{i \cap j}$  denote the rankings received by film  $i$  from users who have ranked both films  $i$  and  $j$ . The measure of association between two films  $i$  and  $j$  is calculated as the correlation coefficient between their two corresponding sets of rankings, formally:

$$A_{ij} = \rho(R_i^{i \cap j}, R_j^{j \cap i}) \tag{1}$$

$A$  is an  $N \times N$  ( $N$  = number of films) matrix. This matrix can be thought of as a non-directed, weighted network. It can be transformed into a sparse network by removing all non-significant correlations.

This approach has several advantages. First, rather than looking at consumer behaviors in the aggregate, it examines consumers’ tastes as they relate to one another through individual preferences; namely, it does not merely take into account whether two films are similarly appealing, but rather whether they are appealing (or unappealing) to the same people. Second, unlike most work on the topic, it does not essentialize categorical boundaries a-priori but rather assumes these boundaries are implicit in the structure of relationships between films. Finally, this approach examines how films relate to one another, and allows for instances of negative correlation, where there exists significant identity dissimilarity between films.

# Data and Analytical Strategy

## Data

In 2006, *Netflix* released a large dataset of user rankings as part of a competition titled the *Netflix Prize*.<sup>4</sup> The data include raw rankings of 17,770 titles produced by 480,189 users. Users are identified by random unique numbers; no additional user-related information is provided. Each observation includes a rating, timestamp, user ID, free text title, and year of production. Overall the data include roughly 100 million unique user-title pairs.

The almost eighteen thousand unique titles were linked with their corresponding entries on *Netflix*'s website, as well as the publicly available *Internet Movie Database* (IMDB), which includes rich production- and distribution-related information as well as genre assignments and aggregate user ratings.<sup>5</sup> Relying on IMDB's *type* classification, the dataset was cleaned to include only motion pictures (as opposed to TV shows, video movies and other non-film products). Duplicate titles (such as different editions of the same film) were also removed, resulting in 9,845 films, ranked by 479,578 unique users and overall encompassing more than 91 million rankings. The data were also linked with the movie review aggregation website *Rotten Tomatoes*, where each film is assigned a score on a scale of 0 to 100 which is based on the aggregate reviews of U.S. film critics. Films with high scores are those that enjoy great critical acclaim.

To make the data manageable, the dataset was reduced to include the films that were rated by the highest number of users, overall corresponding to 95% of all movie ratings included in the dataset.<sup>6</sup> The resulting dataset, which was used in the following analyses, comprises 2,876 movie titles, rated by 479,087 unique users. It includes films released

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<sup>4</sup>The purpose of the competition, bearing a \$1 million prize, was for contestants to improve Netflix's movie recommendation algorithm by at least 10% of accuracy.

<sup>5</sup>Data from the Netflix database was retrieved using the official Netflix API. See [developer.netflix.com](http://developer.netflix.com) for details. Of the 17,770 titles, 81 could not be found on Netflix's website. These account for 0.03% of all observations in the dataset, and were removed from the dataset. For more information about the data retrieval process, and particularly how Netflix and IMDB titles were matched, please consult Appendix ??.

<sup>6</sup>Two reasons motivate this decision. First, because movie rating frequencies follow a heavy-tailed distribution, a vast majority of films were rated by a relative small number of users. If all were taken into account in generating the film association matrix  $A$ , many cell values would have been estimated using a small or even empty set of intersecting users, resulting in a biased measure of film identity. Second, because we are interested in public perceptions, we purposefully include films with a relative high general visibility.

between 1920 and 2005 (the majority after 1995), mostly produced in the U.S. but not exclusively. The movie with the largest number of user rating, *Miss Congeniality* (released in 2000), was rated by more than 230,000 users, whereas the least rated film in the dataset, the 1954 biographic drama *The Glenn Miller Story* received 4,808 ratings. Year is significantly correlated with number of ratings (yet explains less than 5% of variance) and with a film’s average rating.<sup>7</sup> The most liked film in the dataset is the 2001 fantasy action movie *The Lord of the Rings* (the first of a highly successful trilogy), with an average rating of 4.72, and the least liked is the 2003 *Gigli*, with an average rating of 1.94. With more than \$871 million in gross earnings, *The Lord of the Rings* is the tenth highest grossing film released before 2006, whereas *Gigli* was a box-office failure, netting almost \$70 million in losses. Overall, Netflix users’ ratings, both in volume and average score, correspond to movies’ financial success and do not seem to suggest that this sample represents an audience of film connoisseurs whose tastes are significantly different from the general moviegoing audience’s.<sup>8</sup>

## Identity

We infer identity by constructing the matrix of film associations  $A$  as described above. Figure 1 plots the 500 most popular films (i.e. those rated by the highest number of users) comprising this network.<sup>9</sup> As is clearly visible from the diagram on the left panel, the network is divided into two cliques, with a third more loosely structured group of films in between the two main clusters. A formal partitioning of the network into clusters confirms this intuitive impression. The eigenvalue-based spectral partitioning algorithm for networks with positive and negative links (Traag & Bruggeman 2009) divides the network into three clusters comprising 47.15%, 15.61% and 37.24% of the nodes.<sup>10</sup> This division is color coded

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<sup>7</sup>Generally speaking, the older the film included in the dataset, the more likely it received more favorable ratings.

<sup>8</sup>Number of ratings is strongly correlated with a film’s adjusted gross income, at 0.50. Average rating is correlated with a film’s yield (gross income divided by budget) at 0.29.

<sup>9</sup>To make the image informative, we restricted the network size to 500. Negative edge weights are not visualized. Nodes are spatially positioned using the Fruchtmann-Reingold algorithm.

<sup>10</sup>To reduce noise, we used a bootstrapping method to determine which edge weights are significant at the  $\alpha = 0.05$  level. Insignificant edge weights were reduced to zero before applying the partitioning algorithm. For more details about the bootstrapping method, see Goldberg (2011).

in Figure 1.

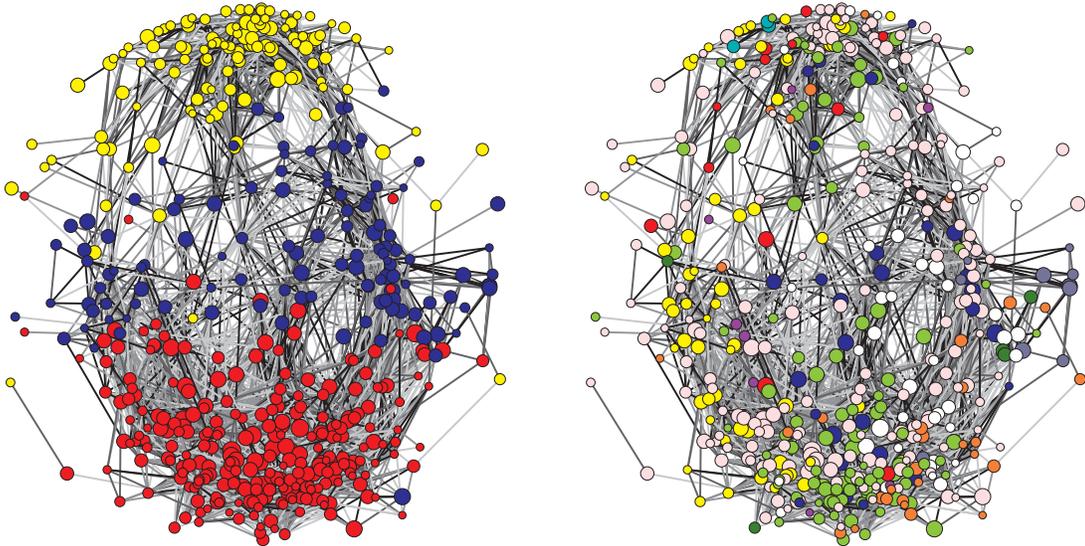


Figure 1: Visualization of the network of the 500 most rated films. Each node corresponds to a film, and edges are weighted by the correlation coefficient between the two films they connect. Edge shading corresponds to this weight. Node sizes correspond to the total number of users ranking a film (log transformed). On the left panel, node color coding corresponds to the partitioning of the network into three clusters. On the right panel, node coloring corresponds to primary IMDB genre assignment.

The structure emerging from the network visualization in Figure 1 is one of a uni-dimensional continuum. Most nodes are clustered around the two poles of this continuum, but some are in between the poles. A principal component analysis (PCA) of the full covariance matrix between films confirms this intuition. PCA is a dimensionality-reduction technique that reduces a set of observations onto components that account for as much variability as possible in a descending order. The scree plot of the principle component eigenvectors is presented in Figure 2. PCA eigenvalues correspond to the amount of variance that each component explains. As is visible from the scree plot, the first dimension produced by PCA explains a significantly greater amount of variance than the other components explain. This component corresponds to the underlying dimension of variability along which the various films are positioned in the network diagram in figure 1. With a Spearman rank

correlation coefficient of 0.894, the first PCA component and the partitioning assignments are almost perfectly overlapping. Both correspond to the same axis of structure, but in different ways. The PCA scale provides a continuous measure of placement on this axis. The partitioning assignment, on the other hand, draws boundaries around three sections of this axis. If network *A* corresponds to an underlying classificatory scheme, as we argue, then these different groups delineate three latent categories that structure people’s sense-making of films.

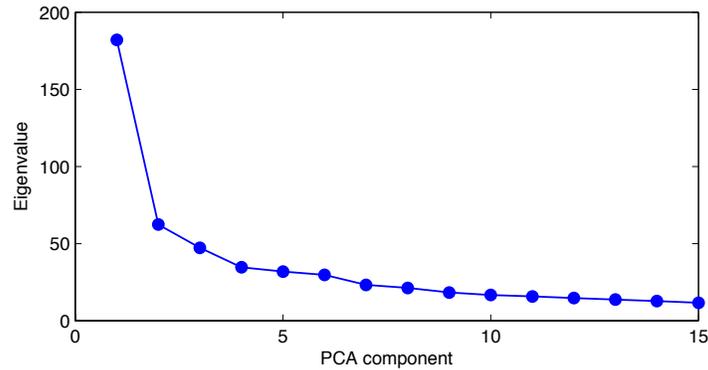


Figure 2: Variance explained by PCA components.

## Boundedness

Our central independent variable of interest is boundedness: the extent to which a film’s team members tend to collaborate with one another on other films. To measure boundedness, we construct a network, whereby each node represents a film, and edges connecting films to one another are weighted as a function of the number of individuals who were involved in both films’ production. An edge weighing 4, for example, implies that four individuals were team members on both of the films it connects. Because we are interested in the effects of boundedness on audience perceptions, we construct this network relying exclusively on functionaries that are significantly visible to audiences: directors(s), producer(s) and actor(s).<sup>11</sup>

<sup>11</sup>These different production roles are often highlighted in marketing materials, and tend to be conspicuously positioned in the opening credit sequence.

Let  $T_i$  denote the set of  $n$  individuals  $\{t_1, t_2 \dots t_n\}$  who are members of film  $i$ 's production team. Network  $S$  is defined as  $S_{ij} = |T_i \cap T_j|$ . Network  $S$  represents the compositional similarity between films' production teams. For each year  $y$  contained in our dataset, we produce two networks: (1)  $\overleftarrow{S}^y$  includes all films produced up until and including year  $y$ , and (2)  $\overrightarrow{S}^y$  which includes all films produced on or after year  $y$ . Whereas  $\overleftarrow{S}^y$  represents the structure of inter-film collaborations at time of production,  $\overrightarrow{S}^y$  represents the structure of collaboration post-production.

Socially bounded films are those films that are enclosed in tight-knit circles in network  $S$ , that is, whose team members tend to repeatedly collaborate with one another. A common measure for network closure is the clustering coefficient. The clustering coefficient measures the extent to which an ego node's network of alters are tied with one another. In a binary network, the clustering coefficient is simply the proportion of realized ties among ego's neighbors, which is calculated as the number of closed triads divided by the number of potential triads (often referred to as "network density"). In a weighted network, the clustering coefficient also takes into account the intensity of each triad, and is calculated as follows (Onnela, Saramäki, Kertész & Kaski 2005):

$$C_i = \frac{2}{k_i(k_i - 1)} \sum_{j,k} (\tilde{S}_{ij} \tilde{S}_{jk} \tilde{S}_{kl})^{\frac{1}{3}} \quad (2)$$

where edge weights are scaled by the largest weight in  $i$ 's neighborhood,  $\tilde{S}_{ij} = S_{ij}/\max(S_{ij})$ , and  $k_i$  is node  $i$ 's degree, or the number of nodes with which it is connected with an edge of *weight*  $> 0$ .<sup>12</sup> Substantively, the clustering coefficient measures the extent to which members of a film's production team also tend to collaborate with one another on other films. For each film  $i$  we construct two measures of boundedness: (1)  $\overleftarrow{C}_i$ , which is calculated over  $\overleftarrow{S}^y$  (where  $y$  is the film's year of production) and represents its *production boundedness*, and (2)  $\overrightarrow{C}_i$ , which is calculated over  $\overrightarrow{S}^y$  and represents the film's *post-production boundedness*. As we explain below, this distinction is central to our research design. Because boundedness follows a positively skewed distribution, we log transform it (and because it ranges from 0

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<sup>12</sup> $C_i = 0$  for nodes that have no neighbors.

to 1, we multiply it by 100 and add 1 before applying the log transformation). Moreover, though  $C_i$  is formulated such that it is adjusted by its network neighborhood size, generally it tends to decrease as the number of individuals making up a production team increases.<sup>13</sup> We therefore include  $\ln(|T_i|)$  as a control measure in the models below, as a means to account for variation in boundedness that is net of team size

### **Additional Film Attributes**

The IMDB database provides a variety of information about the films included in the dataset. Several types of these data are used in the following analysis. We use IMDB’s genre assignments as a means to measure institutional categorical identity. Overall, the films included in the dataset were assigned 22 different and non-mutually exclusive genre labels. These vary significantly in prevalence (from almost 50% of films labeled Drama, to 1.5% labeled Documentary). Films also vary in the number of labels they were assigned. Only a minority are assigned less than two labels. We use the number of genre labels assigned to a film as a measure of its genre niche width, i.e. the extent of its multi-categorical membership (following Hsu (2006) we log transform this variable to account for its skewed distribution). Two additional variables that relate to film content are included in our models: a film’s runtime, and whether or not it is a sequel.

We collect additional information from IMDB about the film’s production process. To account for the organizational and capital resources available at time of production, we differentiate between films produced by major studios (and their subsidiaries) and independent studios. Historically, major studios have enjoyed disproportional market share throughout the industry’s existence. Their unrivaled capital resources, as well as their access to exclusive relationships and distribution channels, provides them with significant commercial advantages over independent studios. At the same time, because major studios account for the vast majority of blockbusters, they are often perceived as willing to make compromises on the artistic quality of their products.<sup>14</sup> The production team size is also included in

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<sup>13</sup>This is largely because the number of triads increases squarely with a linear increase in the number of individuals comprising a film.

<sup>14</sup>We do not include film budget in our models because of the prevalence of missing data, at roughly 35%.

our models. As we explain earlier, we include this variable in order to correctly adjust our boundedness measure, yet in its own right, team size also measures the complexity and labor intensity of the production process.

We use information on all films included in the IMDB database (irrespective of whether or not these films are included in our dataset) to construct additional control variables that represent the cumulative experience of the individuals involved in a film’s production process. To measure team member experience, we use the number of other films that the average team member participated in during the years preceding year of production.<sup>15</sup> We also determine team members’ reputation by enumerating how many have been awarded major awards for their work on films produced in earlier years. As previous research demonstrates (Rossman, Esparza & Bonacich 2010), these forms of consecration significantly affect how individuals are perceived. Roughly 41% of the films in our dataset include no members who have received a major award for prior work.<sup>16</sup>

## Analytical Strategy

Our goal is to show that boundedness affects audiences’ perceptions. To do so, we need to isolate audience- from production-side processes, and demonstrate the former’s implications on moviegoers’ interpretations. By production-side processes, we refer to procedures that shape the product itself, and by audience-side we refer to processes that influence perceptions net of product properties. Though analytically separable, in reality the two are

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Because budget is highly correlated with whether or not a film was produced by a major studio (the latter explaining almost 37% of the variance in the former, adjusted for inflation), we use studio size as a measure of capital resources. Moreover, because major studios have access to exclusive distribution channels, studio size can have an affect on eventual audience reach beyond mere availability of capital resources.

<sup>15</sup>We include only team members who participate in a creative capacity: producers, directors, actors and actresses, screenwriters, cinematographers and editors. For actors, we include only the first ten (or less) by order of credit. For each role, we calculate the average member’s experience, and standardize it on a 0 to 1 scale (where 1 is the maximum per role in the dataset). We then construct the variable by averaging over all roles.

<sup>16</sup>We use the three major and established awarding institutions in three different categories of awards: industry awards (Academy Awards, Golden Globe Awards and BAFTA Awards), festival awards (Cannes Film Festival, Venice Film Festival and Berlin Film Festival) and critics awards (NSFC, NYFCC and LAFCA). The oldest awards in the film industry, these awards are also generally considered the most prestigious. In constructing this measure, we consider only awards awarded to an individual (eg. Best Actress or Best Achievement in Film Direction).

inherently intertwined: boundedness relates both to the organization of production, and to relational identity.

This is where the distinction between production and post-production boundedness comes handy. Production boundedness captures the social position of a film at the time of its production. It likely affects both the production process in and of itself, as well as audience reception. Post-production boundedness, in contrast, relates to production team members' career trajectories after a film had been completed and released. If it has an effect on how a film is received, this effect can only operate through its implications on audience perceptions.<sup>17</sup> The films contained in our sample are evaluated by consumers only after they had been released as DVDs, and in most cases, years after the film's production.<sup>18</sup> This lag allows us to meaningfully isolate post-production boundedness and estimate its effect on audience perceptions. Because boundedness affects perception at time of production as well, post-production boundedness is overall a conservative estimate of relational identity in the film market.

Our's is not a perfect difference-in-differences design, as we do not have information on audience perceptions at time of original release. We therefore cannot measure the full extent to which perceptions explained by post-production boundedness differ from perceptions when the film was first viewed by audiences. This introduces endogeneity bias if post-production boundedness results from an unobserved film characteristic (for example, if an unobserved artistic quality that affects how audiences perceive the film also makes it more likely for team members to collaborate again in the future). Though we have no information about perceived sophistication at time of release, we do know how films were received by contemporaneous critics and award committees. We therefore include in our models a variable that gauges whether, and to what extent, a film was nominated for awards

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<sup>17</sup>As illustration of how films can be historically reinterpreted, consider Douglas Sirk's 1950s melodramas. Though commercially successful, these films were poorly received by contemporaneous critics. By the 1980s, however, a new generation of critics and scholars rediscovered Sirk's work as a staple of subtle irony and cinematic prowess under the strict limitations imposed by the studio production system of the early postwar era. His ingenuity was celebrated in homages by acclaimed art-house directors such as Pedro Almodovár.

<sup>18</sup>The median film is evaluated ten years after it was produced.

by established award-granting institutions immediately after its production.<sup>19</sup> Because established awards tend to be bestowed upon mainstream productions, we also control for whether a film was nominated for the Grand Jury Prize at the independent Sundance Film Festival. As we demonstrate in the following section, these two variables serve as a reasonable approximation of audience perceptions at time of production, allowing us to rule out endogeneity bias.

## Results

### From Genre to Sophistication

What structures the identity space depicted in figure 1? A naked-eye inspection of network A strongly echoes with popular distinctions between commercial and art films. Whereas one group of films – corresponding to one end of the PCA scale – includes critically acclaimed movies such as Francis Ford Coppola’s 1972 *The Godfather* (ranked by the American Film Institute as the second greatest American movie of all time) or the 1996 *Breaking the Waves* (winner of the 1996 Cannes Festival Grand Prix), another group, overlapping with the opposite PCA scale end, includes blockbusters such as the 1998 action movie *Armageddon* or the sex comedy *Striptease*, the latter winner of the 1996 *Razzie Award* for worst picture. A third category of ‘in-between’ movies includes a variety of films that over the years have reached cult status, among them the 1980 horror film *Friday the 13<sup>th</sup>* and the satirical comedy *Airplane!*, also from 1980. A comparison with critics’ opinions gives flesh to this impression.

Figure 3 plots critics’ evaluations as a function of the division into latent categories (box-plot on left) and the PCA scale (right). These diagrams clearly illustrate that audience tastes’ are structured by a hierarchy that strongly corresponds to critics’ evaluations of films. The latent categories map onto a division between what can be described as so-

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<sup>19</sup>For this variable, we include only award nominations that relate to the film as a whole, such as Best Picture, Best Director or Best Screenplay, relying only on the most prominent industry and festival awards (because critic awards do not nominate contenders, we exclude them from this measure). We calculate the proportion of institutions nominating a film for an award out the overall number of institutions giving awards in the year following a film’s release.

phisticated and common movies. These two groups of films are wedged by crossover movies that, like sophisticated movies, tend to be highly evaluated by critics. The PCA scale, as illustrated on the right-hand panel, similarly delineates a hierarchy of sophistication. It explains more than 59% of the variance in critics’ judgements. It appears that, in the eyes of the audiences perceiving them, films are identified primarily as a function of their perceived artistic quality.<sup>20</sup>

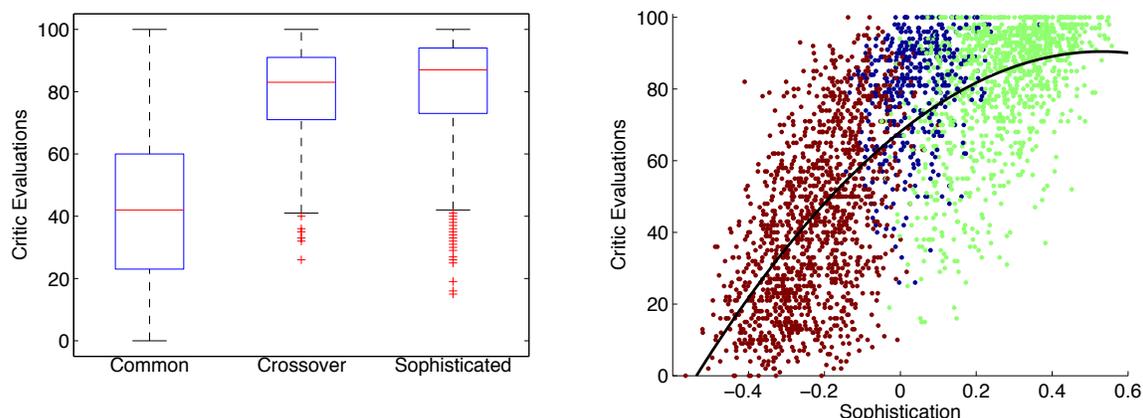


Figure 3: Critic evaluations as a function of the decomposition of network  $A$ . On the left, distributions are plotted by the network’s partitioning into three groups. On the right, evaluations are plotted as function of the first PCA component. Films are color coded by their assignment to different categories. The black line corresponds to a fitted cubic model.

Genre distinctions, on the other hand, seem to explain less variance in audiences’ perceptions. As the network diagram on right panel of Figure 1 illustrates, genres do not do a good job in distinguishing between movies insofar as they cluster by audience tastes. The boxplot on the left panel of Figure 4 plots the distribution of film sophistication by genre. For the majority of genres, the interquartile range of sophistication extends from negative to positive values; that is, genres only weakly discriminate between sophisticated and common films. The category Comedy, for example, includes such celebrated films as Stanley Kubrick’s nuclear-scare satire *Dr. Strangelove*, and, on the other hand, the box-office flop

<sup>20</sup>It is important to distinguish between two types of audiences: critics and regular consumers. It may very well be the case, and in fact highly consistent with theories about identity in markets, that critics’ appraisals of films have a significant impact on consumers’ evaluations. Yet this distinction is outside the scope of this study. Rather, we use critics’ reviews as a means to measure a film’s institutional status. Like consumers, critics also make inferences about quality from categorical and relational signals.

For *Richer or Poorer*, described by one critic as a “bottom of the barrel comedy tripe.”

This is not to say that genre labels are entirely insignificant. The confidence intervals on the right hand panel of Figure 4 demonstrate that most are, on average, significantly different from zero on the sophistication scale. A few exceptional genres have particularly strong sophistication identities: Film-Noir and Documentaries, for example, are overwhelmingly perceived as highly sophisticated whereas Action films are predominantly seen as unsophisticated. Yet other genres, such as Romance and Crime, are so evenly spread across the sophistication scale that they do not significantly signal either identity. Overall, on their own, genre labels are only weakly predictive of whether a film will be perceived by audiences as sophisticated or not.

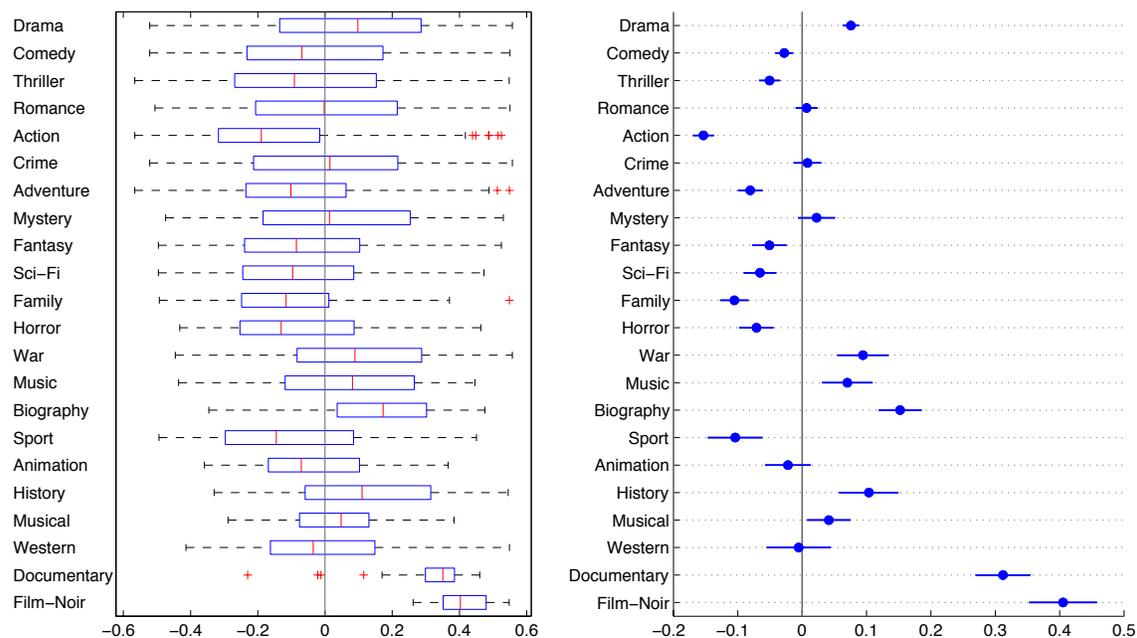


Figure 4: Sophistication by genre. On the left, a boxplot of sophistication by genre. On the right, 95% confidence intervals for mean sophistication by genre. Genres are sorted by pervasiveness in a descending order.

Moreover, multiple categorical membership, though significant, is only weakly predictive of audiences’ perceptions. Consistent with previous research, we find support for the argument that products with an incoherent categorical identity tend to be undervalued by audiences. Yet, as Table 1 (model 1) reports, on its own, categorical niche width explains no

more than 2% of the variance in the sophistication scale. Spanning categorical boundaries is perhaps interpreted as artistic impurity, but appears to function as a fairly weak identity signal.

Table 1: OLS of Sophistication

	(1)	(2)
Ln(Number of genres)	-0.333***	
Production boundedness		0.366***
Ln(Team size)		-0.225***
Intercept	0.327***	0.492**
<i>N</i>	2876	2876
<i>R</i> <sup>2</sup>	0.021	0.100

Sophistication scale is standardized to have a mean of 0 and standard deviation of 1

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

## The Structural Antecedents of Sophistication

Audience perceptions, as we have seen, are structured by a clear hierarchy. While genre labels explain some of this hierarchical variance, much remains unexplained. Where, then, does this ranking come from? Of course, a natural explanation is that something inherent about the products themselves, the ineffable yet presumably recognizable quality that makes certain films artistic, stands at the core of this consensus. But a simple analysis of social structure suggests that boundedness is, at least to some part, accountable. As model 2 in Table 1 demonstrates, production boundedness is strongly related to perceived sophistication.<sup>21</sup> On its own, production boundedness not only explains substantially more variance than does niche width but also, as Figure 5 illustrates, has a significantly larger effect. Whether or not team members collaborated with one another on previous projects appears to be related to how audiences interpret a film’s quality.

This effect remains consistently significant when we control for other film characteristics, as reported in Table 2. We include a complete set of 22 genre dummies, to account for film content, as well as films’ categorical niche width which remains, as expected, neg-

<sup>21</sup>as we explain above, we include team size as control so as not to over-estimate the effect of boundedness on sophistication

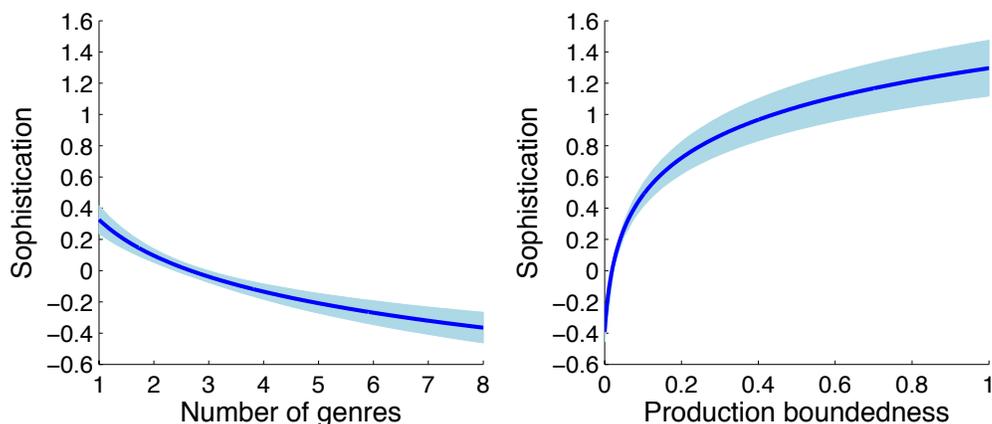


Figure 5: Sophistication by number of genres and production boundedness as estimated by OLS. Shades outline 95% confidence intervals.

atively associated with perceived sophistication (Model 1). Additional attributes are also associated with audience perceptions. As the number of previously awarded individuals in the production team increases, so does the film’s perceived sophistication, suggesting that attributions of quality originate, to some extent, from knowledge about acknowledged talent.<sup>22</sup> In contrast, sophistication generally decreases with production team size and studio size, implying that the large cinematic productions pursued by major studios do not tend to be associated by audiences with artistic quality. Similarly, it decreases with team member experience. Because the older films included in the dataset tend to be those that have already been established as ‘classics,’ we include fixed year effects in the model. Overall, model 1 accounts for almost 44% of variance in sophistication.

Model 2 adds two variables that measure how films were received by expert audiences immediately after their production. The proportion of established award nominations a film receives is substantially associated with its sophistication: films that are recognized by award granting institutions enjoy a sizable increase in sophistication. Nomination to the Sundance Grand Jury Prize similarly results in substantial growth in sophistication. These two variable alone together account for more than 29% in sophistication variance.

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<sup>22</sup>It might also be the case that the objective qualities valued by award committees are similarly valued by audiences who have a preference for sophisticated films.

Table 2: OLS of Perceived Sophistication

	(1)	(2)	(3)	(4)
<i>Boundedness:</i>				
- Production	0.191***	0.158***	0.141***	0.176***
- Post-production			0.092***	0.228***
- Recent*production				0.117*
- Recent*post-production				-0.187***
- Recent				0.094
<i>Recognition:</i>				
- % Established nominations		1.603***	1.606***	1.811***
- Independent nominations		0.766***	0.748***	0.665***
<i>Content:</i>				
- Ln(Niche Width)	-0.282*	-0.224	-0.228*	-0.229*
- Runtime (hours)	0.186***	0.026	0.031	0.053
- Sequel	-0.277***	-0.255***	-0.254***	-0.265***
<i>Human Capital:</i>				
- Mean individual experience	-0.916***	-0.774**	-0.780***	-0.952***
- Awarded individuals	0.090***	0.072***	0.075***	0.073***
<i>Resources:</i>				
- Ln(Team Size)	-0.196***	-0.189***	-0.178***	-0.189***
- Major studio	-0.358***	-0.338***	-0.331***	-0.307***
Intercept	0.351*	0.503***	0.370*	0.264
<i>N</i>	2876	2872	2872	2872
<i>R</i> <sup>2</sup>	0.439	0.493	0.496	0.463
Genre dummies	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	No

Sophistication scale is standardized to have a mean of 0 and standard deviation of 1

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Because sophistication is highly consistent with critics' evaluations, it is not surprising that award nominations are predictive of audience perceptions. There are two plausible explanations for this relationship. First, it is likely that both prize committee members and the general audience rely, at least to some extent, on similar appraisal criteria, irrespective of whether or not these criteria strictly relate to films' inherent and immutable properties. Second, accolades received by these venerable institutions likely influence audiences in and of themselves. We cannot adjudicate between these two mechanisms using our modeling strategy.<sup>23</sup> Nevertheless, because audience perceptions are so strongly aligned with experts', it is reasonable to assume that a film's contemporaneous recognition by award committees also reflects its reception by the general public at the time. We therefore use these two measures as a means to approximate and control for perceived sophistication at time of production. Any changes in perceived sophistication due to team members' subsequent career trajectories, specifically as they affect post-production boundedness, are not endogenous to film characteristics at time of production.

Our central empirical finding is presented in Model 3. This model estimates the effect of post-production boundedness on sophistication. All the variables included in the model predate the audience evaluations that were used to generate the sophistication measure; reverse causality, therefore, can be ruled out. And as we argue above, the distinction between production and post-production boundedness, as well as the inclusion of institutional recognition variables, enable us to identify the effect of boundedness on perceived sophistication that is exclusively attributable to changes in the social positions of the people making up a film's production team after they completed their work on the film, and it was released to the general audience. As we hypothesized, boundedness marks status, and is translated, in the eyes of audiences, into sophistication. At 0.09, the post-production coefficient represents an almost half standard deviation increase in sophistication for films whose post-production boundedness is 1. This is, most likely, a very conservative estimate of the overall effect of boundedness on audience perceptions. It excludes any effects that boundedness at time of

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<sup>23</sup>And, in any case, this analytical objective is outside the scope of our study.

production might have on audience and experts' evaluations of films.

The final model in Table 2 interacts year of production with our two measures of boundedness. For post-production boundedness to have a substantial effect on audience perceptions, a sufficiently long period – during which team members could potentially embark on new projects that would mature into film releases that audiences had the time to become familiar with – must have elapsed since the film was produced. We therefore create a dummy variable that represents whether a film was produced in 2001 or later, a five year window preceding the most recent rating included in our dataset. We expect to find that post-production boundedness affects audience perceptions only for non-recent films. Indeed, as expected, production boundedness increases in effect size for recent films, and post-production decreases (Model 4). The marginal effects of post-production boundedness on sophistication are visualized in Figure 6. Whereas a change in boundedness for recent films has no significant effect on their sophistication, the effect is very substantial for older films. The full range of post-production boundedness translates to more than one standard deviation change in perceived sophistication for films that at least five years have passed since their release. Films' whose members continued to work on other films with one another tend to be perceived as substantially more sophisticated than those whose members did not, net of the films' production circumstances, content, and whether or not they were lauded by the film establishment upon their release.

### **The Commercial Implications of Sophistication**

We began the analysis by arguing that aggregate measures of market success are insufficiently refined for getting a handle on how audiences infer identity. This does not mean, however, that identity is inconsequential for market success. In this final part of the analysis we demonstrate that perceived sophistication is related to how films fare commercially.

As Figure 7 demonstrates (left panel), films on either end of the sophistication scale engender far more disagreement than those in the middle. Disagreement is measured as the standard deviation of a film's ratings; the higher the variance, the higher the overall

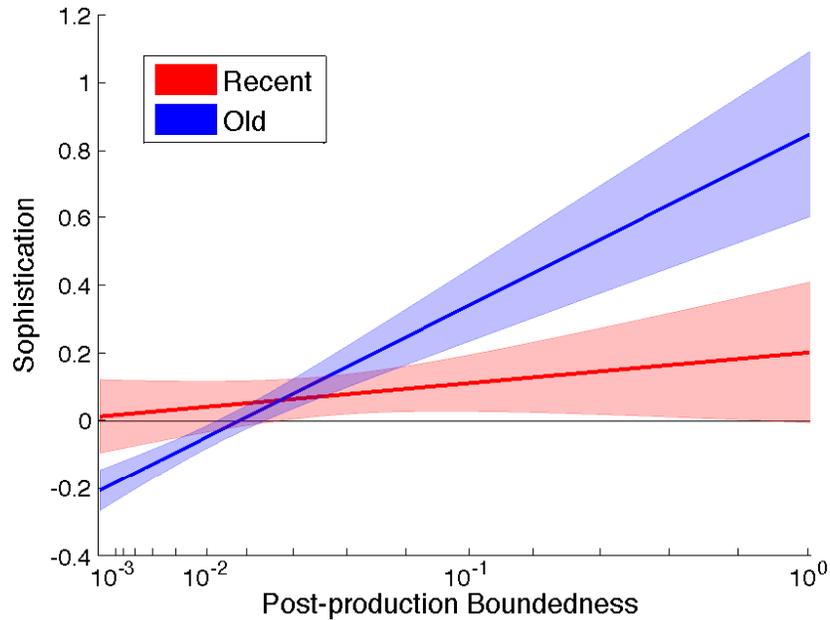


Figure 6: Marginal effects of post-production boundedness, interacted with time of production, on perceived sophistication. Sophistication is standardized to have a mean of 0 and standard deviation of 1. Shades outline 95% confidence intervals.

disagreement between viewers about the film’s quality. The estimates presented in Figure 7 were obtained using a simple bivariate model, where disagreement is estimated as a square function of sophistication. On its own, sophistication explains 13% of audience disagreement. Movies on either end of the sophistication scale tend to exhibit almost two standard deviations higher disagreement than those in the middle of the scale. These are the films that have strong identities, and that elicit strong emotions – whether positive or negative – from moviegoers. The 2003 drama *Dogville*, with the highest rating standard deviation in the dataset, is exemplary of such disagreement. Using a minimalist stage-like set, this parabolic movie directed by critically acclaimed Danish director Lars von Trier, has the unquestionable hallmarks of an art film. But even critics could not agree on its quality. With 70 points on Rotten Tomatoes, *Dogville* was hailed as ‘singular and profound’ by the *San Francisco Chronicle*, but criticized by the *Chicago Sun-Times*’ Roger Ebert for exhibiting the “imagination of an artist and the pedantry of a crank.” On the other hand,

movies around the midrange of the sophistication scale tend to invoke far greater consensus.

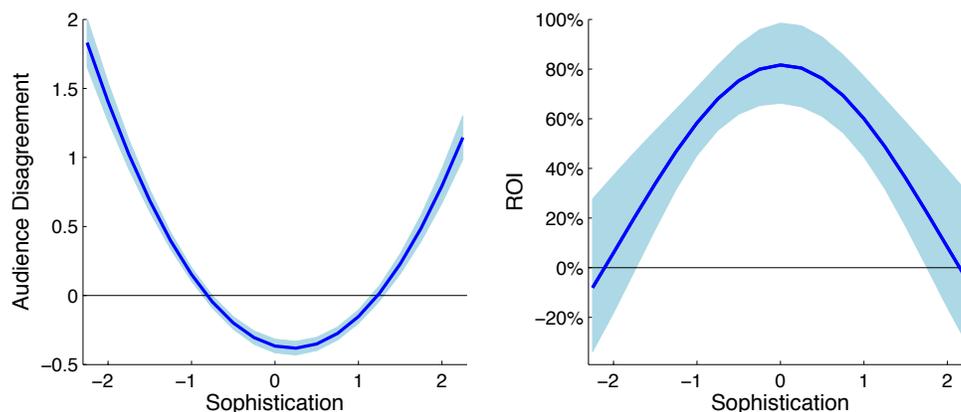


Figure 7: On the left, estimated audience disagreement (rating standard deviation) as a function of sophistication. On the right, estimated return on investment (logged) as a function of sophistication. Sophistication and disagreement are standardized to have a mean of 0 and standard deviation of 1. Shades outline 95% confidence intervals.

And as Figure 7 (right panel) illustrates, this consensus tends to be positive. The diagram plots films' return on investment (ROI) as a function of their sophistication, as estimated by model 1 in Table 3. ROI is a film's percent of net profit, and is calculated by dividing its gross income by its budget (log transformed). We include a variety of control variables that might affect a film's commercial success beyond its perceived quality, such as whether it was produced by a major studio, its runtime and whether or not it is a sequel. Sophistication exhibits an inverted U-shaped relationship with commercial profit (Model 1); its magnitude is highly substantial: films on the upper end of the sophistication scale are expected to yield roughly 80% less profit than those at the center of the scale. Slightly more variance is explained by Model 2, where sophistication is modeled as a categorical variable (corresponding to the latent categories inferred from the partitioning procedure), and crossover films are used as the omitted category. Crossover films are estimated to yield 2.13 times more profit than sophisticated films and 1.76 times more than common movies.

Of course, it would be far fetched to argue that these results describe a causal relationship. Because sophistication is inferred from audiences' ratings, which are recorded after a film had been released and completed its theatrical distribution (in many cases, many years

Table 3: OLS of Return on Investment

	(1)	(2)
Sophistication		
- Sophistication scale	0.005	
- Sophistication scale <sup>2</sup>	-0.132***	
- Common		-0.568***
- Sophisticated		-0.757***
Content		
- Ln(Niche Width)	0.196	0.109
- Runtime (hours)	-0.293*	-0.287*
- Sequel	0.229*	0.237*
Human Capital		
- Awarded individuals	-0.050*	-0.044*
Resources		
- Ln(Team Size)	0.163*	0.100
- Major studio	0.174**	0.138*
Intercept	0.643	1.291***
<i>N</i>	1740	1740
<i>R</i> <sup>2</sup>	0.233	0.252
Genre dummies	Yes	Yes
Year fixed effects	Yes	Yes

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

after its release), it is impossible to determine whether films are perceived as crossover as a result of their theatrical success, or whether their success is ipso facto the result of their inherent crossover appeal. We are therefore cautious not to draw any unwarranted conclusions. What these results do demonstrate, however, is that ultimately a film’s commercial profit is strongly related to its ability to cross over audiences on both ends of the sophistication scale. Identity and market success are intertwined, but in a manner that undermines the intuitions informing recent scholarship on the detrimental effects of category spanning. Films that bridge the divide between sophisticated and low-status offerings are most likely to yield high return on investment.

## Conclusions

Theories of market behavior often treat aggregate measures of success – such as a film’s gross income – as information about consumers’ revealed preferences. In contrast, this study examines consumers’ actual stated preferences in great detail as a means to make more fine grained distinctions between the ways in which products – in this case, films – are perceived by audiences. Rather than making assumptions about how audiences interpret products, we infer these interpretations from individual ranking behaviors. Relying on the lag between time of production and evaluation in our dataset, we were able to demonstrate that viewers’ assessments of a film are influenced by team members’ career paths years after the production team’s disbandment.

Our findings add flesh to the oft recited conjecture that ‘quality’ is socially constructed, in three different ways. First, we demonstrate that consumer perceptions are structured by a rigid hierarchy, spanning from common to sophisticated movies and embodying an implicit boundary between commercial films and ‘art.’ Whereas previous studies have focused on the manner by which institutionalized categories provide shared schematic templates that structure consumer expectations, this study finds that genre labels have, for the most part, only weak discriminatory power insofar as movies are ordered by sophistication. Of course, we cannot generalize beyond the film market and argue that all market domains are equally

perceived by audiences as hierarchical. Yet our findings indicate that categorical identity is not as pervasive as most scholarship seems to assume. Moreover, we show that sophistication has an inverted U-shaped relationship with commercial success, suggesting that a coherent market identity is not necessarily financially beneficial.

Second, we find that this hierarchy traces to the social boundedness of cinematic production teams. Sociological literature on market competition tends to conceptualize status as cumulative advantage that inheres in ties to prominent others (Merton 1968, Podolny 1993, Stuart, Hoang & Hybels 1999). Our analysis shifts focus to the structural production of exclusivity through boundary work. In the eyes of observers, these emergent boundaries are interpreted as signals about quality. We do not argue that audience members are lay network analysts who are computing clustering coefficients on the fly. Rather, boundedness captures the extent to which a group of people tend to collaborate with one another repeatedly. When noticed by others, this groupness becomes reified as identity (White 1992).

Finally, our analytical strategy enables us to isolate the effects of post-production from production boundedness, thereby singling out how network structures function as prisms through which market actors ascertain each other's qualities (Podolny 2001). We demonstrate that the boundedness of films is related to their perceived sophistication because of the identities of the people involved in their production, and not exclusively due to the organizational circumstances of production and how those affect product properties. This finding is highly consequential to our understanding of how perceived quality is related to the interpersonal organization of artistic production. The majority of the literature on networks and creative output conceptualizes social structure as the material infrastructure upon which information, knowledge and ideas travel. It finds that a fine balance between structural porousness and cohesion is necessary for facilitating the kind of conceptual conductivity that catalyzes new ideas (Burt 2004, Uzzi & Spiro 2005, Vedres & Stark 2010). Yet, networks also confer identity to those they are made up of. To the same extent that network closure generates a sense of belongingness among its members (Podolny & Baron 1997), we find that it bestows them with quality in the eyes of observers.

Sociological research has focused extensively in recent years on how identity mitigates problems of uncertainty in markets. A central piece of this puzzle relates to where identity comes from. Though we have focused only on one industry, its project-based inter-organizational mobility is also characteristic of a variety of other creative and entrepreneurial market domains. It remains to be seen whether relational identity, and the exclusionary identity-building dynamics it is structured on, is as salient in those domains as it is in Hollywood.

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