Networks and Rewards among Hollywood Artists:

Evidence for a Social Structural Ordering of Creativity

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INTRODUCTION

Organizational research on individual creativity has expanded rapidly in the last decade. Initially focused on the individual traits presumed to affect creativity (Sternberg, 1985; Tardif and Sternberg, 1988), over the years this research has concentrated more squarely on the role of social interactions and social facets of the environment (Amabile, 1988; Woodman, Sawyer and Griffin, 1993; Glynn, 1996). Building on social-psychologists' key idea "that the creative individual be placed within a network of interpersonal relationships" (Simonton, 1984: 1273), organizational scholars interested in the social side of creativity recently have begun to incorporate social network concepts into their models and explanations of the determinants of individual creativity to gain deeper understanding of how creative work is generated (Perry-Smith and Shalley, 2003; Burt, 2004; Uzzi and Spiro, 2005).

These studies have shown how the adoption of a social network perspective is fruitful in informing creativity literature and thus enhancing our understanding of creativity at work. Yet, by focusing mainly on structural explanations of creativity, this research has left largely underexplored another key dimension of creativity: the need for field legitimation, i.e., the process by which the new and unaccepted is rendered valid and accepted through field consensus (Zelditch, 2001; Johnson, Dowd and Ridgeway, 2006). We seek to fill this gap by integrating established sociological perspectives on creativity that emphasize how creativity is embedded in networks of social relationships and support (Csikszentmihályi, 1994, 1996; Uzzi and Spiro, 2005) with recent research on legitimacy that uses an audience-candidate interface framework (Zuckerman, 1999; Zuckerman, Kim, Ukanwa and von Rittman, 2003, Cattani, Ferriani, Negro and Perretti, 2008). The framework we advance explains audiences' (henceforth evaluators) rewarding of candidates' (henceforth agents) creative work as a function of candidates' positioning within the social structure of their field, as well as of the type of audience under

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consideration. In particular, we suggest that evaluators who are industry peers —i.e., members who occupy the same social position within the field as the agents they evaluate, and therefore may compete for the same material and symbolic resources—tend to reproduce dominant social beliefs and norms. As a result, they are more likely to grant recognition to agents who are 'core' rather than 'peripheral' members of the network. This socio-structural ordering of creativity, whereby disproportionate benefits accrue to highly embedded agents, makes it especially hard for peripheral agents to gain peer evaluators' attention, thus reducing the chance that their creative work will be legitimated. By accentuating inequalities in status, resources, and opportunities between core and peripheral agents, a socio-structural ordering of creativity resonates with the so-called "Matthew effect" in science, which shows how recognition for scientific work tends to be skewed in favor of established scientists (Merton, 1968).

We explore these ideas within the context of the Hollywood motion picture industry, which we traced over the period 1992-2004. This industry provides an ideal context for testing the implications from our theoretical framework. First, the industry has long embraced arrangements featuring flexible and short-term relationships that rely on enduring networks, in which mutual trust and reputations have been cemented over time (Faulkner and Anderson, 1987). Second, the industry grants systematic recognition to its members for their creative achievements through a large number of organizations that bestow awards on those seen as having made significant contributions to the field (Simonton, 2004a; Gemser, Leenders and Wijnberg, 2008). In particular, in this study we consider industry 'peers' as the focal audience of evaluators. Third, creativity is central to the film production process since each movie is a unique product whose completion requires the sustained collaboration of several individuals (Simonton, 2004b).

Social Structure and Rewards

The relationship between institutional norms and standards and how creativity becomes manifest is central to our explanation of why and how we should expect evaluators' attributions of creativity to map onto the social networks of the field. In this paper we refer in particular to the degree of socio-structural embeddedness, because agents who are deeply embedded in their social system are more likely to conform to those norms that characterize their area of expertise, and thus reproduce ideas or styles currently deemed acceptable. As Jones and colleagues (1997: 929) pointed out: "The more structurally embedded (e.g., the more connected and frequently interacting) the industry participants, the more deeply they share their values, assumptions and role understandings." Strong structural embeddedness also makes deviance from existing norms and standards harder to hide and, therefore, more likely to be punished (Granovetter, 1985). In contrast, agents who are less deeply embedded, and not subject to such strong assimilative pressures, are freer to pursue divergent ideas (White, 1993).

The core-periphery imagery provides an intuitive and evocative illustration of this socio-structural trade-off between demands for conformity and freedom to diverge (Cattani and Ferriani, 2008). Insofar as individual agents remain peripheral to their social field they can more easily attend to fresh new ideas, knowledge and perspectives without the anxiety of clashing with the field's accepted rules (Perry-Smith and Shalley, 2003) – which in turn results in radically new solutions (i.e., technologies, theories, practices, etc.) often being pioneered at the fringe or periphery of a given social field (Leblebici et al., 1991).[1] However, insulation from conformity

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[1] On this point the famous abstract Italian painter Giorgio Morandi once said: "When most Italian artists of my generation were afraid to be too 'modern' or 'international' and not 'national' or 'imperial' enough, I was left in peace, perhaps because I demanded so little recognition. In the eyes of the Grand Inquisitors of Italian art, I remained but a provincial professor of etching at the Fine Arts Academy of Bologna." (Reported in the article "Art

pressures also means that peripheral agents are likely to suffer a legitimacy denial due to their departure from evaluators' normative expectations and standards. In addition, peripheral agents usually have only limited ability to mobilize attention from within their own field. As Collins (2004: 436) noted, "[…] a peripheral position condemns one to coming too late into the sophisticated centre of the action." As individual agents progress towards the core and therefore become more embedded within the field's social structure, deviant ideas are foreclosed and adherence to the field's institutionalized norms and standards is increasingly stimulated and even rewarded. But proximity to the core also implies greater leverage to elicit attention from relevant evaluators. Thus, not only are core agents more likely to produce work that adheres to norms and standards that reflect evaluators' beliefs and preferences, but they also have superior access to the material and symbolic resources they need to further their work.

Following the above arguments, it is plausible to expect evaluators to exhibit a systematic tendency to favor core players relative to peripheral ones when relinquishing symbolic and material resources. This prediction appears especially warranted insofar as evaluators have strong, uniform incentives to enforce established norms and standards of evaluation and thereby preserve the institutional logics of their field. For example, this is likely the case when evaluators are peers from the same community.[2] In fact, not only are peer evaluators likely to have vested interests in preserving the status quo but also to use their influence to protect it. Sociologists of art and science have provided extensive evidence about peer resistance (White and White, 1965;

View; Giorgio Morandi: A Quality of Private Mediation" by Hilton Kramer, The New York Times, December 6, 1981).

[2] The assertion that peer evaluators allocate conservatively resources and recognition is recurrent but not absolute. Because these individuals are often high status members of their professional community they may have significant degree of latitude in endorsing deviant ideas without worrying too much about being penalized for their unconventional choices. Evidence consistent with this idea can be found in Phillips and Zuckerman (2001). It should be noted, however, that the question of whether high status favors or hinders departure from established norms and standards is still open and competing perspectives have been offered on this matter (for a recent discussion see in particular Phillips, Turco and Zuckerman, 2010).

Merton, 1968). As an example of this dynamic, consider the French Academy of Fine Arts (Académie des Beaux Arts) in the 19th century. The French Academy assessed artwork and rewarded artists based on the evaluation of gatekeepers, who were members of the Academy. Success in the system depended upon receiving recognition from the Academy. In theory, the work by the artist was evaluated objectively; in practice, the gatekeepers increasingly attempted to maintain their own power and that of their followers. As a result, artists associated with Academy members were more likely to win awards. Over the years, the members of the Academy took turns obtaining symbolic rewards for their own students, thus effectively assuring the continuity of the Academy's orthodoxy (White and White, 1965).

In science, medical specialists have a long history of resisting inventions from what they define as 'the outside': Pasteur, for instance, faced violent resistance from contemporary medical specialists when he advanced his germ theory. He regretted that he was not a medical specialist, who he felt regarding himself as a 'mere' chemist poaching on their scientific preserves, and thus not worthy of their attention (Olmsted and Fulton, 2008). In addition, when evaluators are peers, agents who are positioned at the core of a given field's social structure are more likely to share particular cognitive and social networks with them, resulting in a strong bias towards work emanating from the core. This effect has been documented in academic evaluation systems where evaluators are typically established scholars who inevitably "have students, colleagues, and friends with whom they share what is often a fairly small cognitive universe and they are frequently asked to adjudicate the work of individuals with whom they have only a few degrees of separation … Evaluators [therefore] often favour their own type of research while being firmly committed to rewarding the strongest proposal" (Lamont, 2009: 8).

The previous arguments suggest the existence of a socially structured ordering of creativity whereby a disproportionate amount of symbolic and material resources accrue to those at the core of the social field. They point, in other words, to a misallocation of recognition as predicated by the notion of cumulative advantage and disadvantage, known in science as "the Matthew effect" – the tendency for eminent scientists to receive disproportionate credit for their work compared to comparable scientific contributions by relatively unknown scientists (Merton, 1968).[3] While the Matthew effect implies the existence of a social stratification in science that translates into a *de facto* hierarchical structure based on reputation (whereby eminent scientists stay at the top of the 'pyramid' and unknown ones at its bottom), the distinction between core and peripheral agents instead depends on their degree of embeddedness within the social field and, by implication, the extent to which they tend to conform as well as their ability to leverage social network resources to enhance visibility. In light of the previous considerations, we thus argue that evaluators who are industry peers tend to reproduce dominant social beliefs and norms, and hence are more likely to grant recognition to core as opposed to peripheral members of a given field's the social network.

SETTING AND DATA

Our analysis is situated within the context of the Hollywood film industry. This is a very promising setting to study the relationship between social structure, peers' evaluation and rewards for creativity. First, as we noted before, creativity is central to the film production process, since each movie is a unique product this requires the collaborative work of cast and

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[3] This perspective echoes Collins' concern: "Are we dealing only with fame, not with creativity itself?" (1998: 61). Collins effectively questions why there have been many creative individuals who were "buried in obscurity" (1998: 61) because they never received credit for their works: "This is a powerful image because it sustains most of us intellectuals, who rarely get the credit we think we deserve" (ibid.).

crew members. These diverse contributions are both so individualized in terms of their specialization, and so essential to a movie's success, that special honors (e.g., the Academy Awards) have been established to recognize those contributors whose work is judged to be noteworthy in each specialty (Simonton, 2004b). Thus, this is an industry that allows us to study simultaneously the peers who evaluate and the individual agents who compete with one another for their approval. In this industry context, the results of these evaluations are made (very) public every year through the conferring of prestigious awards that celebrate outstanding cinematic achievements, which establish a level of social validation in the field unachievable by other means (Simonton, 2004a, 2004b; Cattani and Ferriani, 2008).

Our data consist of the population of crew and cast members (hereafter 'professionals') who worked on at least one of the 2,297 movies distributed in the United States by the 8 major studios – i.e., the seven historical majors plus the more recently founded (1994) Dreamworks – and their various subsidiaries over the twelve-year-period 1992-2004. We collected information on the composition of the production team of each movie in the sample, as well as the level of recognition their creative work on each movie had gained by recording the awards and nominations each professionals' work had received from several award-granting organizations. While movie-making is essentially a collaborative venture – the list of "credits" at the close of any move shows the wealth of individuals who contribute their creative input, unique talents and technical expertise to each project – only a very restricted group of people is normally credited (in terms of awards) with the critical creative work. Our analysis focused on the following set of professionals: producer, director, writer, leading actor/actress, editor, cinematographer, production designer and composer. Using the Internet Movie Database we then identified 12,679 of these 'critical creators' as distributed across these 8 roles in the movies in our dataset.

Finally, to unveil the socio-relational fabric of the industry we analyzed the bipartite affiliation network between professionals and movies. An affiliation network is a network of vertices connected by common group memberships such as projects, teams or organizations. We thus constructed networks of film professionals in which a link between any two professionals indicates collaboration on the making of a movie. In the global network, professionals are directly connected to each other when they worked on the same movie project, and indirectly when they are linked through at least one professional who worked on two or more movies[4]. We used a three-year moving window to control for the duration of each tie, hence making the adjacency matrixes time-varying (but the results are qualitatively similar when different time windows – e.g., a two- or four-year window – are used in the analysis). We started with the core crewmembers that worked in 1995 and used the earlier three-year data to construct the accumulative relational profiles. We then used the resulting ten time-varying matrices to compute all individual level network measures.

VARIABLES

Dependent Variable

We used a discrete-choice approach to model the industry's peer-agent evaluation process, in which peer evaluators select agents' work by bestowing an award or nomination. In this context, the evaluators are the following peer-based awarding organizations: the *Academy of Motion Picture Arts & Sciences*, the *Producers Guild of America*, the *Directors Guild of America*, the *Writers Guild of America*, the *Screen Actors Guild*, the *Art Directors Guild*, the *American*

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[4] The affiliation network was therefore created starting from an individual-by-movie matrix X where xij = 1 if the ith individual participated in making the jth movie, and xij = 0 otherwise. We then multiplied matrix X and its transpose X', whose ijth cell indicates the number of movies to which both professional i and professional j contributed. This value can be interpreted as an index of the strength of social proximity between the two individuals (Borgatti and Everett, 1997).

Society of Cinematographers, the *American Cinema Editors*, and the *Film Independent* (originally *Independent Feature Project/West)*. We collected data on the accolades awarded by them in each year.[5] The primary data sources were Tom O'Neil's (2003) *Movie Awards* and the organization's official web sites. The dependent variable thus takes the value 1 when in a given year a professional receives one award/nomination from one of the previous awarding organizations, and 0 otherwise.

Independent Variable

In order to detect the core-periphery structure in our data we followed the procedure implemented in UCINET (Borgatti, Everett and Freeman, 2002) using a genetic algorithm. The definition of the core is here a group of nodes that are connected to all other nodes of the core and the periphery. The periphery is defined a group of nodes that are not connected to each other but only to the nodes in the core. The algorithm is designed to maximize the density within the core (between the regions belonging to the core) and to minimize the density within the periphery (in an ideal core-periphery structure there are zero relations between the peripheral nodes). Since the density of the core-periphery interaction has no ideal value, these observations are treated as missing (see Appendix for the formalized version of this algorithm). Using this procedure we created the binary variable *Individual Core-Periphery* – which takes on the value 1 when individuals are partitioned into the core and 0 for those who are partitioned into the periphery of the Hollywood network. We created this variable adopting a 3-year moving

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[5] We focused on these organizations for various reasons. All have been in existence for several years, are widely regarded as reliable and competent organizations. As Gemser et al. (2008: 31) noticed, "[...] the announcements of the winners of all these awards receive national coverage in the printed press and/or on national television, and the jury process is transparent for the outside world." Together, the selected awards reflect the judgments of hundreds of interested expert peers from the worlds of film practice in identifying and rewarding exceptional film-making achievement. The range of awards used in the analysis allow us to minimize the risk of including only awards – e.g., Oscars – whose assignment is sometimes driven by commercial considerations (Holbrook, 1999).

window, i.e., for the three years (t-3, t-2 and t-1) prior to the focal year *t* (the results do not vary much using a different time window). The measure was computed using UCINET VI (Borgatti, Everett and Freeman, 2002).[6]

Control Variables

To rule out possible alternative explanations for the hypothesized relationships we included several control variables in the final model specification.

Team Reputation. An individual's status stems from both their past achievements and the status of their partners, and they can receive greater recognition by collaborating with higher-status colleagues. This implies that "higher status affiliations help to increase returns to a given quality of output" (Benjamin and Podolny, 1999: 565). We accounted for these possibilities by measuring the quality of the team as the average number of accolades team members other than the focal individual had received in the three years (i.e., *t*-1, *t*-2, and *t*-3) prior to the focal year *t*.

Individual Role. As noted above, our analysis is focused on a restricted group of professional roles, and, because each one embodies different artistic and technical dimensions and draws on diverse cognitive and practical abilities, the assumption that the same relational mechanisms are equally important across different roles might be inappropriate. Controlling for role is also important because different organizations bestow awards in different role categories, and the number of these has changed over time in some cases. While the *Academy of Motion Picture Arts and Sciences* and *Film Independent* tend to assign awards to all (or most) categories (thus covering all roles in the analysis), the various guilds only award their members. As a result, individuals performing roles with more award categories have greater chances of receiving

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[6] It is worth noting that while all agents in the core are highly central as calculated by virtually any measure, not every set of central agents forms a core. Indeed, they "may have high centrality by being strongly connected to different cohesive regions of the graph and need not have any ties to each other" (Borgatti and Everett, 1999: 393).

accolades for their creative work. We accounted for this possibility and professionals' particular roles by including a fixed effect for the role each professional performed in a given movie. This was achieved in SAS using the STRATA statement which considers each role as a separate stratum – i.e., grouping all observations for each role in the process of constructing the likelihood function. When the same professional covered multiple roles in the same movie or across different movies, the attribution was based on the role s/he undertook most often during the study period.

Individual Degree of Control. Prior research has shown how intrinsic motivation is more conducive to creativity than extrinsic motivation (Amabile, 1996). When the primary motivations are interest in and enjoyment of an activity, outputs tend to be more creative than when the motivation is achieving goals set by others. It is thus quite possible that individuals performing multiple roles also have more freedom in the pursuit of their goals and are in a better position to express their skills and talents. As a result of being more intrinsically motivated they are more likely to generate creative work and even increase their visibility in the field. We therefore created the variable *Individual Degree of Control* to capture the extent to which professionals enjoy enough latitude to express their creativity, by measuring the average number of different roles each performed in their movies in a given year. While in most cases there was only one specialist per role, a professional sometimes performed multiple roles in a single movie (e.g., Clint Eastwood was director, actor and producer for *Unforgiven* in 1992) or the same role was collectively performed by multiple individuals (e.g., Joel and Ethan Cohen co-directed *Fargo* in 1996).

Individual Artistic Reputation. Peers' judgments are influenced by agents' past achievements (Podolny, 1993): a high number of accolades in an individual's career would

probably indicate an exceptional talent and skills. Past research in the film industry also suggests that the most successful professionals often enjoy preferential access to better resources and information (Faulkner and Anderson, 1987). Since recognition through accolades is highly valued by industry members, recipients enjoy greater media attention than their lower-status counterparts (Hsu, 2005). Accordingly, we controlled for an individual professional's talent and skills by creating the variable *Individual Artistic Reputation*, i.e., the number of awards won and nominations gained by each professional in the three years (i.e., t-3, t-2, and t-1) prior to the focal year t (again, the results did not change with a different time window).

Individual Commercial Reputation. Following previous research (e.g., Elberse, 2007), we looked at a professional's *commercial* reputation based on how well or poorly their movies had fared commercially. Specifically, we computed the cumulative number of 'top 10 box office' movies in each year in which each professional worked until the year prior to the focal one using data on top-grossing movies from the IMDB online database. We chose the number of 'top 10 box office' movies in a given year to have a conservative measure of each professional's commercial reputation. But the results are qualitatively similar when the top 20 or top 30 box office movies are used.

Movie Sequel. The extent to which movies reflect a genuine search for artistic novelty or focus instead on more formulaic content (which one could say was the case with sequels), might affect the likelihood of a professional receiving an accolade. This variable was thus computed as a dummy, taking the value 1 when a movie was a sequel and 0 otherwise.

Movie Rating. Another important factor in measuring the level of creativity inherent in a particular movie is the rating assigned by the Motion Picture Association of America (MPAA). Ratings signal the degree of sexually graphic sequences, violence and strong language in a

movie. Prior research suggests that features produced for mature audiences (R and NC-17) perform less well at the box office (Ravid, 1999). Movies rated G, PG and PG-13 have greater audience potential, and indeed movie theater's landlords may sometimes contractually prohibit them from showing NC-17 films. As a result studios quite often exert some pressure on producers and directors to ensure films receive a rating aligned with their market aspirations. This practice can obviously constrain creativity. We accounted for this by including a categorical variable with six categories: G, PG, PG-13, R, NC-17, and no available rating.

Movie Genre. The likelihood of an accolade being bestowed could also depend on movie genre, on the premise that a movie's artistic content might vary across genres: one could argue that a professional working on an action movie is less likely to gain such recognition, as action movies typically reflect more formulaic conventions. We created a categorical variable (with 18 categories) to control for each movie's genre using data from the American Film Institute (AFI).

Number of Movies. The chance of receiving an award or nomination is also likely to depend on the number of movie each professional makes in a given year. Also, as they make more movies, the very same professionals can expand the number of ties to other professionals in the industry, which in turn can affect the chance of receiving an award or a nomination. Accordingly, we controlled for the number of movie a professional was involved in during the focal year.

Awarding Organizations. We accounted for the impact of stable unobserved differences between the selected groups of peer evaluators by stratifying by awarding organizations, which is tantamount to estimating a fixed effects model for awarding organizations.

Year. Since we had no *a priori* expectations about the existence of time trend(s) over the study period, we controlled for the effect of all unobserved factors (e.g., macro-economic trends,

changes in taste or fashion, and other factors that might affect the movie industry) that might affect peers' evaluation by also stratifying by year.

MODEL

For any given role, we modeled the impact of a professional's characteristics on the probability of a peer-based awarding organization bestowing an accolade on that professional rather than any other. This can be framed as a series of discrete choice problems with one professional selected in each category (role) each year from a discrete set of professionals. Let y_{ij} be equal to 1 if awarding organization i (with i = 1, ... , n) chooses option j (with j= 1,... , J_i), 0 otherwise; and x_{ij} be a vector of explanatory variables describing option j for awarding organization i. The number of possible choices is J_i to indicate that different peer-based awarding organizations may have different sets of options to choose from. The conditional logit model introduced by McFadden assumes the following general form:

$$\Pr(y_{ij} = 1) = \frac{e^{\beta x_{ij}}}{e^{\beta x_{i1}} + e^{b x_{i2}} + ... + e^{\beta x_{ij_i}}}$$

[a]

This equation implies that the odds awarding organization i will choose professional j over professional k is given by the difference in the vector of explanatory variables describing each option as

$$\exp\{\beta(x_{ij} - x_{ik})\}$$

[b]

If the values of any explanatory variable are the same, then this variable has no effect on the choice between professional j and professional k. Suppose that awarding organization i has a

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stable preference for each option j, denoted μ_{ij}, and that the actual utility U_{ij} for a particular option varies randomly around μ_{ij} so that

$$U_{ij} = \mu_{ij} + \varepsilon_{ij}$$

[c]

where ε_{ij} is a random variable having a standard extreme value distribution and the ε_{ij}'s are independent across the different options. If an awarding organization chooses the option with the highest utility U_{ij} and if the logarithm of μ_{ij} is a linear function of the explanatory variables, then the probability that awarding organization i chooses option j is given by equation [a][7].

RESULTS

Tables 1 and 2 present the descriptive statistics and the correlation values, which are relatively low. We also checked for the existence of multicollinearity by computing the variance inflation factors (VIFs) using PROC REG in SAS, and found it was not a problem. As mentioned before, we estimated these models by stratifying by organization, role and year.

Table 3 presents the coefficient estimates for the discrete choice models predicting the likelihood that peer organizations will choose to give an accolade. Model 1 is the baseline model with all controls. Although the coefficient estimates are not reported, the overall impact of the dummies for *movie genre* and *movie rating* are significant. The coefficient estimate of the

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[7] If these conditions are satisfied, the conditional logit model is reasonable because the assumption of the 'independence of irrelevant alternatives' (IIA), a key assumption of the discrete choice model, is not violated (Allison, 1999). This means that the odds of choosing option j rather than option k are not affected by the other available options. The IIA assumption can only be tested when awarding organizations are presented with different choices. In our context, it is reasonable to assume IIA because "nominees are unlikely to be considered close substitutes for one another" (Pardoe and Simonton, 2007: 381). A possible exception to IIA might be the relatively rare occasion when a professional receives multiple nominations in the same category in the same year. In the case of Oscars, for example, this has happened only very rarely – e.g., for Best Director (Clarence Brown in 1930, Michael Curtiz in 1938, and Steven Soderbergh in 2000) – because "[…] the Oscar rules prevent this from happening in the lead acting categories" (Pardoe and Simonton, 2007: 381-392). Similar considerations hold for other awards as well. In the analysis, we stratified by awarding organization, professional's role and year. We estimated the conditional logit model by maximum likelihood using PROC LOGISTIC in SAS (version 9.1).

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variable *Movie Sequel* is significant, and the sign of the coefficient is in the expected direction, showing that the professionals working in movies that are more formulaic are less likely to receive an accolade. Professionals working in a team whose members received accolades in previous years (*Team Reputation*) are more likely to receive themselves an accolade, a result consistent with findings from Esparza et al. (2010). At the individual level, the quality of each professional's human capital (*Individual Artistic Reputation*) and the number of roles each professional performed in the same movie (*Individual Degree of Control*) turned out to be significant and in the postulated direction. Similarly, professionals whose status stems from having worked in the past in commercially successful movies (*Individual Commercial Reputation*) was significant, suggesting they enjoy greater visibility and therefore are more likely to receive an accolade. By contrast, when professionals work on more than one movie per year (*Individual Number of Movies*) the likelihood they will receive an accolade declines, possibly because the quality of their performance deteriorates as they get involved in too many projects. The global test of the null hypothesis that all the coefficients are equal to 0 is highly statistically significant (the likelihood ratio test is 1982.23 with 27 df and Pr>ChiSq = 0.0001).

Model 2 shows the results after we entered our variable of central theoretical interest, i.e., *Individual Core-periphery*. The coefficient (0.793) is in the hypothesized direction and is statistically significant (p<0.001), either by a Wald test or a likelihood ratio test. The odds ratio of exp(0.793) = 2.21 indicates that core professionals have an odds of receiving an accolade that is more than double the odds of those in the periphery. Also, all the control variables are significant and the signs of their coefficients remain unchanged relative to the baseline.

A potential problem in the analysis is that the likelihood of being rewarded by peers might affect a professional's position in the core or the periphery of the field. At a general level,

we believe that the way we constructed the core-periphery measure makes it unlikely that our results are driven simply by reverse causation. For a professional in a given year, the core-periphery measure is constructed from affiliation data for the three preceding years. Creative performance is then taken as the award bestowed in the focal year. Thus, we relate individuals' likelihood of being consecrated to their past network position.

DISCUSSION AND CONCLUSIONS

Over the past 20 years increasing sociological evidence has accumulated suggesting that creativity is very often embedded within broader social structures that shape access to both novel ideas and social support. Creative achievements in fields as diverse as science, art and business all exhibit a very similar pattern, in that 'creators' are embedded in a network of actors who share ideas and act as both critics and supporters of each other's work (Collins, 1998; Simonton, 1999; Uzzi and Spiro, 2005). These accounts do not deny the role of individual talents and/or dispositions; but they suggest that these qualities are mobilized and channelled into a context of intersecting relationships through which conventions are learned and ideas recombined. The present study has expanded upon this line of work by establishing a framework for understanding creativity as a joint result of socio-structural conditions at the individual level and social systems making judgments about individuals' efforts.

Building on socio-institutional perspectives on creativity (Csikszentmihályi, 1996; Ford, 1996) and combining structural explanations of creativity with recent organizational insights on the social structure of consensus (Cattani, Ferriani, Negro and Perretti, 2008), we framed the relationship between novelty and its recognition as an ongoing tension between the core and periphery of the social field. We also noted that whether these creative efforts are socially

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validated, and therefore rewarded, depends on the norms and standards of judgment used by relevant evaluators, which in turn reflect evaluators' incentives to preserve the institutional logics of the field. We reasoned that individuals positioned closer to the core of their field are more likely to appeal to peer evaluators because closeness to the core induces adherence to the prevailing field's norms and standards.

Our results suggest that rewards for creativity are socially structured: where individuals stand within the field's social structure may affect the recognition of their work and thus shape their reputation for creativity. This is an important finding that complements the vast research that has treated individual abilities as the main explanation for the production of creative work (Sternberg, 1985; Gardner, 1993). As a result, little attention has been devoted to how creativity is shaped by a wider set of constraints that operate via social validation and are enforced by external evaluators. This paper shows how creativity is embedded in patterns of relationships and judged by evaluators (gatekeepers) that participate in the social stratification of the field by granting or denying recognition to individuals' creative work. Also, by focusing on peer evaluators and socio-structural conditions affecting the process of validation, our study extends research on the determinants of social stratification which tends to focus on agents (e.g., individuals, organizations) vying for recognition rather than the gatekeepers responsible for conferring it. Research on the social structure of markets, for instance, has predominantly looked at attributes such as the position in the status ordering of market actors and its effect on the opportunities available to them (Podolny, 1994; Benjamin and Podolny, 1999). On the other hand, drawing from the audience-candidate framework (Zuckerman, 1999), organizational ecologists have only recently started to explicitly incorporate audience (evaluator) level features

and variables in their models of organizational survival (Hsu and Hannan, 2005; Hannan, Pólos and Carroll, 2007).

Our research contributes to this line of inquiry by establishing a theoretical and empirical framework for better appreciating the implications that peer evaluators may bear on the distribution of rewards to individual agents, independent of agents' specific attributes. Our findings thus enhance current understanding of competitive dynamics in markets by highlighting the influence of agents' position in the social structure on their ability to establish themselves as legitimate players in the market. The finding that there is a significant relationship between individuals' position in the social structure and their likelihood of appealing to relevant peers provides considerable empirical substance to Merton's (1968) central claim that in order to investigate the processes shaping the advancement of knowledge in a given field, it is important to consider the social mechanisms that curb or facilitate the incorporation of possible contributions into the domain.

Based on our theoretical framework, individuals who are routinely peripheral to the field and therefore not deeply (if at all) assimilated into existing norms and standards will struggle to achieve symbolic and material resources for their creative efforts. This is typically the case, for instance, of *mavericks* in the art world. Unlike core individuals who are tied to the field's centre of influence and therefore likely to follow more conventional perspectives in their work, mavericks retain some loose connection with their field "but no longer participate in its activities … They propose innovations the art world refuses to accept as within the limits of what it ordinarily produces" (Becker, 1982: 233). As an illustration consider iconic film director Stanley Kubrick's decision to reject the production logics of the Hollywood establishment (which he referred to as "film by fiat, film by frenzy") and move to a secluded town in England in 1962,

despite the success of his last Hollywood production *Spartacus* (Ciment, 2003). Frustrated by the lack of creative freedom in Hollywood, he established his own independent production company in the UK. Film historians and critics now concur that Kubrick's cinematic creativity benefited from his radical decision as he started to explore themes and ideas that were far removed from Hollywood's prevailing canons, yet he also suffered a significant legitimacy discount for standing outside the establishment, which never granted him an Academy Award for best picture or director. These ideas are also consistent with Kuhn's (1970) argument that exponents of a dominant paradigm often will counter fundamental novelties, which typically originate from the periphery of the field, because they are subversive and pose a challenge to the existing paradigm. Clearly, these processes of social selection that regulate the allocation of rewards can counter efforts to introduce new ideas and practices that do not conform to the dominant conventions. They also raise the broader question of how change is triggered in an established institutional field when new ideas and practices, once introduced, challenge the position of established participants (Leblebici et al., 1991). This is a fundamental question which merits further investigation.

The study suffers from obvious limitations that nevertheless represent opportunities for future research. First, we studied an art field rather than a scientific one where knowledge can be more easily codified and evaluation of changes is likely to be premised more on technical criteria than on the fit with normative criteria (Becker, 1982). As a consequence, the results should be generalized with caution to other settings where external evaluations might be related more closely to technical prowess and mastery. Also, it is important to stress how, from our data, we can only observe evaluators' choice – the awarding of an accolade – but not the process leading to the final choice. The complex process by which evaluators screen and select falls outside the

scope of this study. A different research design and analytical approach (e.g., an ethnographic study or a survey) would be better suited to address this question explicitly. Finally, we looked only at peer evaluators who are likely to have a vested interest in preserving existing institutional field arrangements and therefore oppose attempts to challenge or depart from them. Focusing on critics might however offer a completely different picture. Critics and peers have in fact different incentives, in that critics' reputation within the field depends significantly on their ability to discover new talents. The role of critics and, more generally, of different kinds of evaluators in creating countervailing mechanisms that may curb the socio-structural ordering of creativity is an important area of research that deserves future attention. For instance, contexts such as the Cannes Film Festival and the Venice Film Festival, where the composition of juries in terms of peers and critics has varied dramatically over their long history, provide exciting empirical settings for further exploring and extending the ideas developed here.

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Table 1

Descriptive Statistics

Variable	Mean	Std Dev	Min	Max
Audience (stratifying variable)			1	8
Role (stratifying variable)			1	8
Year (stratifying variable)			1992	2004
Movie Genre (categorical)			1	18
Movie Rating (categorical)			0	5
Movie Sequel	0.098	0.298	0	1
Team Reputation	0.548	1.048	0	16.417
Individual Degree of Control	1.202	0.562	1	7
Individual Commercial Reputation	0.351	0.896	0	12
Individual Artistic Reputation	0.095	0.358	0	9
Individual Number of Movies	1.580	1.026	1	15
Individual Core-periphery	0.004	0.065	0	1

Table 2

Pearson Correlation Coefficients*

Variable	1	2	3	4	5	6	7
1. Movie Sequel	1						
2. Team Reputation	0.023	1					
3. Individual Degree of Control	-0.018	0.094	1				
4. Individual Commercial Reputation	-0.038	0.199	0.022	1			
5. Individual Artistic Reputation	0.020	0.238	0.091	0.158	1		
6. Individual Number of Movies	(0.000)	0.085	0.518	0.261	0.085	1	
7. Individual Core-periphery	-0.055	0.041	0.171	0.081	0.027	0.260	1

All correlations significant at the <.001 level with the only exception of the correlation reported in parenthesis (not significant).

Table 3

Results for Discrete Choice Model Predicting *Peers'* Choice

Variables	Model 1		Model 2	
	Coeff.	Std. Err.	Coeff.	Std. Err.
Movie Genre (dummies)	included	--	included	--
Movie Rating (dummies)	included	--	included	--
Movie Sequel (dummy)	-0.721**	0.144	-0.768**	0.146
Team Reputation	0.196**	0.015	0.195**	0.015
Individual Degree of Control	0.386**	0.050	0.396**	0.050
Individual Commercial Reputation	0.171**	0.022	0.169**	0.022
Individual Artistic Reputation	0.387**	0.039	0.383**	0.040
Individual Number of Movies	-0.135**	0.032	-0.156**	0.032
Individual Core-periphery			0.793**	0.251
Fixed Effects:				
Awarding Organization	included		included	
Year	included		included	
Individual Role	included		included	
ChiSq vs null	1982.23**		1990.98**	
ChiSq vs Model 1			18.18**	
Number of Strata	266		266	
Number of Observations	82594		82594	

* $p < 0.05$, ** $p < 0.01$ – Two-tailed tests for all variables

APPENDIX

The core/periphery algorithm

The discrete version of the core-periphery algorithm is formalized by Borgatti and Everett (1999) as

$$(1) \quad \rho = \sum_{ij} \alpha_{ij}\delta_{ij}$$

$$(2) \quad \delta_{ij} = \left\{ \begin{array}{l} 1 \; if \; c_i = CORE \quad and \quad c_j = CORE \\ \\ 0 \; if \; c_i = PERIPHERY \quad and \quad c_j = PERIPHERY \\ \\ . \; \text{otherwise} \end{array} \right.$$

where ρ is a measure for the correlation between the real network structure and the theoretical structure, which is maximized if A (the matrix of a_{ij}) and Δ (the matrix of δ_{ij}) are the same. In the equations, a_{ij} indicates the presence or absence of a relation between actor i and j, c_i refers to the group (core or periphery) actor i belongs to and δ_{ij} □indicates the presence or absence of a relation between actor i and j in the ideal image. In the equations, α_{ij} indicates the presence or absence of a relation between actor i and j in the observed data, c_i refers to the group (core or periphery) actor i belongs and δ_{ij}□ indicates the presence or absence of a relation between actor i and j in the ideal core-periphery image. Where ρ is a measure for the correspondence between the real network structure and the theoretical structure, which is maximized if A (the matrix of a_{ij}) and Δ (the matrix of δ_{ij}□) are the same. Note that "." indicates a missing value. The reason is that off-diagonal regions (core-to-periphery ties and periphery-to-core) of the ideal core-

periphery matrix are treated as missing data: the genetic algorithm thus seeks only to maximize density in the core and minimize density in the periphery, without regard to the density of ties between those off-diagonal regions. The genetic algorithm is designed to find the core-periphery partition that maximizes the fit statistic (ρ). The partition obtained by applying model (2) to our data then places the various actors either in the core or the periphery.