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***PRODUCING PROJECTS, ASSEMBLING TEAMS:
EVIDENCE OF LEARNING AMONG HOLLYWOOD
PRODUCERS.***

Theme: The Social Processes of OL and KM

Skilton, Paul F.

Arizona State University - East

Contact author: Skilton, Paul F.
Arizona State University - East
East College
7001 E. Williams Field Road
Mesa, AZ, USA

85212

Telephone: (480) 727-1209
E-mail: Paul.Skilton@asu.edu

Abstract

This study develops alternatives to prior theory that asserts that producers tend to work with partners who have similar cumulative career profiles. This study tests equivalence against a standard learning model and a model based on the coordination benefits of shared experience. This study also examines how the complexity of each project alters the need to work with experienced partners. To establish the boundary conditions for these learning processes, the study examines them in the creative sub-team (director, writers, designers, etc.) and the sub-team of producers that manages the project. Using data from motion pictures released in the U. S. during the 1990's, the study finds support for multiple learning forces, asymmetrically operating in the two sub-teams.

This study examines the patterns of learning expressed in the formation of project teams by motion picture producers. Motion picture production offers a unique setting for studying the problems of learning across projects because the episodic nature of production creates repeated occasions for structuring project teams. Motion picture producers are the focus of this study because it is they who originate projects and assemble the teams that transform ideas into finished products (Faulkner & Anderson, 1987). This study attempts to understand whether and how producers learn to put teams together, and the impact this learning has on project structure over the producer's career.

This attempt takes as its starting point a study by Faulkner and Anderson (1987) that also focused on the career structures of motion picture producers. In their study, Faulkner and Anderson developed theory about the market matching proclivities of producers with directors and cinematographers. Using career profiles based on number of projects, average project revenues and number of Oscar nominations they found that there were 'high densities of transactions among persons with similar cumulative career profiles.' (p. 893, 1987). Like tended to work with like – novice with novice, master with master – a pattern they label 'equivalence'. The uniform quality of partners produced by equivalence tends to create better project outcomes, and thus better reputation and better future prospects for established producers. Equivalence is a function of the relative experience of team members. While partners would become more experienced over the course of a career, under equivalence relative experience would be constant.

Adopting organizational learning as a starting point helps to unpack Faulkner and Anderson's notion of equivalence. A central idea of their study is that producers learn to work with a cohort of partners. While average experience would increase, relative experience would be constant. A strict interpretation of equivalence suggests that producers would lock in to working with peers, and would stay with that pattern. An obvious problem with a strict interpretation is that the pool of partners would decrease as the career progressed, since long careers are not the norm among producers.

A learning orientation raises several additional questions about the phenomenon of increasing experience of partners. First, to what extent does equivalence actually occur? Is the experience of the project team a function of the producer's career stage?

Second, to what extent is the experience level of the project team explained by simple learning by doing? In other learning contexts, learners refine their actions over many trials to some relatively stable asymptotic level of expertise (Bateson, 1972). If learning by doing leads to a progressive improvement in the experience level of the team, the equivalence Faulkner and Anderson's observed (1987) may simply be an artifact of ordinary learning, and provide a simpler explanation than matching.

Third, within the general framework of persistence, how much of equivalence is a function of *shared experience*? Equivalence as Faulkner and Anderson described it may be a function of learning to work not merely with similar peers, but with the *same* peers on many projects. Because of the coordination benefits of recurrent experience, shared experience is qualitatively different from simply assembling teams of equivalent partners.

A further limitation of the Faulkner and Anderson study (1987) is that in it the choice of partners for a project depends entirely on the characteristics of producers and their partners. Because the model does not consider the characteristics of the projects involved, it is necessarily incomplete. It seems clear that the administrative and conceptual complexity of any project would influence the choice of partners, particularly with respect to experience. Do complex projects require greater experience?

The present study asks these questions in the context of two sub-teams motion picture producers are involved with. These are the creative sub-team that makes the motion picture, and the producer sub-team that has become integral to Hollywood motion picture production. Compared to the creative team of craft specialists, the producer team may be less familiar to most readers. In the post studio era the producer role has increasingly been carried out by a sub-team of producers, executive producers and associate producers (Producer's Guild, 2002). The creative team (director, writers, designers, technicians) is a community of interaction (Nonaka, 1994) where craft specialists combine their different specializations, while the producer team is a local expression of the larger community of practice for producers (Lave & Wenger, 1991; Wenger, 1998). The producer team is where new producers can negotiate the journey from peripheral to core membership in the larger community.

Examining these questions in distinct sub-teams permits the development of hypotheses about how the effects of producer experience, simple learning, shared experience and project characteristics on experience will vary in the different contexts. The hypotheses are formed at the population level, concerning producers in general rather than specific careers. I test these hypotheses using a database of motion pictures released in the United States between 1981 and 2000. This database includes credits and business data for more than 3000 motion picture projects, making it possible to construct detailed data for careers and the evolution of team structure.

Theory development

The question of how to become progressively better at executing projects has emerged as an important question for managers and researchers concerned with project management. Many of the innovative processes and practices learned in project teams do not carry forward successfully to future projects (Dougherty & Hardy, 1996; Keegan & Turner, 2001; Kotonour, 1999; Meyers & Wilemon, 1989; Szulanski, 1996; 2000). Useful lessons are more readily carried forward to future projects when teams undertake the same kinds of projects repeatedly, as happens in motion picture production (DeFillippi & Arthur, 1998; Faulkner & Anderson, 1987), construction (Cooper, Lyneis & Bryant, 2002) and in the development of product platforms (Bowen, Clark, Holloway & Wheelwright, 1994; Brown & Eisenhardt, 1999; Lynn, 1998). Using relatively stable project teams or having overlapping concurrent project teams (Kotonour, 2000; Lynn, 1998; Smedds, Olivari & Corso, 2000; Meyers & Wilemon, 1989) may also make it easier to retain and exploit learning from project to project - up to a point. Keeping teams together too long creates potential problems for learning. When teams stay together too long, learning is reduced as the team settles into its own idiosyncratic routines (Leonard-Barton, 1995). Some level of turn-over permits the regeneration of the team's knowledge base and practices (Starbuck, 1992). Inter-project learning for teams is therefore most likely when the projects in the stream are similar, and when team membership is neither too volatile or too stable.

Understanding the role of the project manager, sponsor or leader in the creation of project teams offers an alternative mechanism for understanding progressive improvement in project execution. If project managers learn to put better teams together, project outcomes and inter-project learning may be a function of the manager rather than the project stream or the team. Producers, like other project managers, have many possible strategies for assembling teams.

As producers learn their trade one of the areas where their developing knowledge is put to use is in choosing who to work with. (This is framed as an active, positive choice, although it is equally possible that experience and reputation play roles in being chosen (Faulkner & Anderson, 1987). Since the producer must positively accept being chosen to work on a project, the effect is the same.) Producers can learn to work with unfamiliar collaborators whose experience matches their own (as Faulkner and Anderson found (1987)), or with unfamiliar collaborators of more or less experience, or with partners the producer has worked with in the past (shared experience).

Collaborator experience is an indicator of the ability team members bring to the performance of their tasks on the production team (Faulkner & Anderson, 1987). All other things being equal, working with individuals of greater experience will produce a better outcome than working with an inexperienced team (Ancona & Caldwell, 1992; Leonard-Barton, 1995; Simon, 1991). In the case of motion picture production, this is most likely to be true of the experience level of the creative team, which actually makes the movie. The impact of producer team experience on the final outcome is likely to be much less direct.

There are some obvious disincentives for working with highly experienced partners, especially in an entrepreneurial setting like motion pictures. Because more experienced team members command greater compensation and may demand greater control of projects, the choice of working with a more experienced team is not as simple as it appears. Producers must learn when to choose more experienced collaborators and accept the attendant costs.

A learning orientation thus implies more strategic choice than Faulkner and Anderson's findings of equivalence suggest (1987). The level of experience in a team might also be driven by matches between dissimilar, complementary career profiles as when novices work with experts. This idea may have been omitted from Faulkner and Anderson's study because they looked only at the relative experience of specialists in different areas: producers, directors and cinematographers. For them, complementarity is embodied in the different creative roles while equivalence is a property of experience and reputation. This conforms to Nonaka's notion of the project team as community of interaction (1994), where equivalence and mutual respect among complementary specialists in different areas improve the quality of outcomes. In a community of interaction, the homogeneity of experience that defines equivalence seems to be a logical way to produce better projects. Under this logic, for novices to survive they need to be fortunate in their choice of equally novice peers, while experienced practitioners have access to demonstrated competence.

It is important to point out that equivalence in communities of interaction need not be strict, especially as careers progress. It might be beneficial for producers with more developed careers to work with creative partners who are relatively less experienced (but still experienced enough). In this way the producer would retain more control of the project while benefiting from partner experience. Under this logic one would expect producers with n projects worth of experience to be more likely to work with directors who have n or fewer

projects behind them, than they would with directors with more than n projects. This pattern is in fact borne out in Faulkner and Anderson's data (1987), and provides an explanation of how relative novices might manage to join experienced communities of interaction. Equivalence, seen in this light, is really *relative* homogeneity of experience. Learning to balance relative experience is more complex than blindly pursuing simple equivalence.

When we turn to the producer sub-team, the complementarity of career stages in the task of producing the project is more salient. The producer sub-team is where novice producers learn their trade and where experts supervise them as they do so. It is not a community of interaction, but rather the local expression of a larger community of practice concerned with what producers do. As in any community of practice (Lave & Wenger, 1991), matching includes collaboration between senior practitioners and novices. Unlike the community of interaction of the creative team, practitioners on the producer team more obviously gain from working with dissimilar partners. Novices learn their own craft by being supervised and by working with the creative peers of the senior producer. By working with relatively junior producers senior practitioners retain control of the project (which they would have to share if they worked with peers) and may have their knowledge bases refreshed as well.

Equivalence is thus only one form of matching. Underlying the concept are the complex choices the focal producer makes about who to work with in project sub-teams. The outcomes of choices about who to work with are directly expressed in the experience levels of the sub-teams. For the creative sub-team directly and the producer sub-team indirectly, experience is linked with the success of the product in the market. This reasoning leads to the choice of sub-team experience as the dependent concept for hypothesis development.

As noted earlier, there are several barriers to strict equivalence being realized. Not only are there incentives for and against working with peers, the number of peers will decrease as producer careers extend, since only relatively few producers actually develop extended careers. Thus rather than hypothesize about whether relative experience is constant, which is the most obvious form of equivalence, we examine the underlying question of whether producer experience drives the average experience of the sub-teams.

Equivalence logic suggests that the experience of the project team is a simple function of the level of the producer's experience. A positive linear relationship between producer experience and the experience of the sub-teams would tend to support the idea that matching (rather than conventional learning) drives team structure. In this logic, novices would work with inexperienced teams, and senior producers with teams of experienced peers. Faulkner and Anderson's results (1987) deal only with the producer director relationship, and it makes sense that experienced producers will be better able to attract more experienced directors, writers and so on. Because the experience levels of the creative sub-team directly influence product quality, and because the producer controls the allocation of compensation, there seems to be little reason for producers to ever pursue any strategy but hiring experienced team members.

In the producer sub-team, where peers are rare and compete directly for the material rewards of projects, it is reasonable to suppose that the relationship between producer experience and team experience will be concave, because as producers become more experienced they will have incentives to go back to working with less experienced producer sub-teams.

Hypothesis 1a. Producer experience will be positively related to creative sub-team experience.

Hypothesis 1b. Producer experience will have an inverted U shaped relationship with producer sub-team experience.

Learning by doing is a fundamental explanation for understanding improvement over multiple similar trials (Bateson, 1972, Meyers & Wilemon, 1989; Simon, 1991; Weick, 1991). As with any learning by doing, we expect producers to re-use whatever team structure they have adopted in the past, making progressively smaller adjustments as they reach the limits of improvement. Indeed, for Hollywood producers, immersed in a strong industry context (Faulkner & Anderson, 1987), we expect relatively strong pressure on producers to adopt and persist in the practices of successful peers and mentors (Miner & Haunschild, 1995). Persistence in a learned pattern avoids the costs of learning wholly new practice for each project and permits the refinement of existing skills. Learning is thus simultaneously restrained in one direction (by excluding alternative team structures) and enhanced in another (by increased practice in the techniques of a specific structure). Persistent use of team structures should also be expected for individual level reasons. Producers may specialize in different parts of the total task and would therefore structure teams to exploit their own expertise and to benefit from the complementary idiosyncratic knowledge of team members. Other producers may learn to be effective at working with novices, or to be effective at stepping into a project to take a modular role as a peer among unfamiliar experts. In all cases, structures developed earlier in the career largely determines the structure of the current project.

Implicit in this reasoning is the idea of a non-linear relationship of the present to the past. 'More of the same' is conventionally held to imply that the 'more' increases at a decreasing rate, as the learner exploits progressively less effective opportunities to refine his or her knowledge. This gives rise to a learning curve, where learning is diminished over time. In itself, of course, persistence (and even persistent matching) is not especially interesting. This is in contrast to equivalence, where we would expect a direct linear relationship rather than an asymptotic one. There is no reason in theory to suppose that learning by doing would be different between the two sub teams. Support for the following hypothesis will suggest that producers persist in patterns of project team structure.

Hypothesis 2. The level of partner experience in each sub-team increases at a decreasing rate with respect to the level in the immediately prior project.

A related dimension of project team structure is the level of *shared* experience between producers and team members. Shared experience is the result of recurrent ties with the *same* partners rather than merely similar ones. Working with the same partners repeatedly would produce the appearance of equivalence.

Shared experience is a qualitatively distinct explanation of team structure, even though it is an extreme form of matching. Theories of social capital in motion picture production (Baker & Faulkner, 1991; DeFillippi & Arthur, 1998; Jones & DeFillippi, 1996) suggest that sustained relationships might reduce coordination and opportunism costs through the creation of trust and familiarity (Demsetz, 1991; Leonard-Barton, 1995; Nonaka, 1994). This reduction in coordination costs is distinct from the improvement in skills resulting from

increased experience. Working with unfamiliar but more experienced peers would still require investment in the development of coordinating routines, although perhaps not to the extent that would occur when working with novices.

It has been suggested that sustained cooperation may be unnecessary in the motion picture industry because substitutes exist in the role structure and strong industry recipe (Faulkner & Anderson, 1987; Spender, 1996). In the industry we observe highly modular competencies (Chesbrough & Teece, 1996) linked by an architecture consisting of detailed labor agreements and strong practice based on a century of experience (Baker & Faulkner, 1991; DeFillippi & Arthur, 1999; Miller and Shamsie, 1993). As Chesbrough and Teece (1996) point out, modular competencies linked by a well defined open architecture strongly reduce the level of coordination costs required, while at the same time encouraging entrepreneurial rent seeking. This does not mean, however that presence of a standardized role structure and industry recipes must *substitute* for trust and familiarity. Where coordination is the central problem, they may enhance the value of shared experience.

There is also a knowledge base oriented learning argument against too much shared experience (Leonard-Barton, 1995; Starbuck, 1992). Limiting the level of repeat engagements with partners may keep the knowledge base of the team from growing stale. Retaining a core team keeps critical knowledge readily available, and reduces the effort spent in re-learning that often accompanies turn-over. Maintaining some turn-over keeps the team from being degraded by lower quality members and refreshes the team knowledge base. This logic suggests that are benefits to a consistent element of shared experience in project based enterprises, but not to a dominant element. Even so, this logic provides an alternative to both the equivalence and simple learning arguments.

In the case of shared experience, the logic of positive benefits applies in both sub-teams. However, the coordination benefits would be much stronger in the creative sub-team, where coordination is the central problem, than in the producer sub-team, where supervision by the senior producer is more likely to come into play. In a community of interaction outcomes need to be coordinated by participants; fiat by the producer would be a poor substitute for negotiation. In a community of practice the gradient of experience between senior and junior partners suggests that direction by senior partners would be an efficient method of controlling team activities.

Hypothesis 3a. The level of shared experience in each sub-team is positively related to the level of partner experience in that sub-team.

Hypothesis 3b. The effect of shared experience on the level of sub-team experience will be stronger in the creative sub-team than in the producer sub-team.

The administrative complexity of the current project also determines levels of partner experience. Big complex projects require larger teams (Faulkner & Anderson, 1987) which increases administrative complexity. Larger teams involve project managers with more individual team members and with more relationships between team members. In an environment where experienced partners are rare and relatively more expensive, increasing team size may also tend to reduce partner experience.

Again, the effects of administrative complexity vary between the sub teams. Adding inexperienced producers to a producer sub-team may actually increase the administrative

burden on senior team members, since junior producers would require more supervision by senior team members. Increasing the size of the producer team to deal with a more complex project would be most effective when relatively experienced producers were added. That is, administrative complexity should increase the experience level of the producer sub-team.

Where coordination rather than supervision is the central problem, as in the creative sub-team, this might not be the case. In an administratively complex project producers would need to interact with a larger number of creative team members, but there would be little incentive to avoid relative novices, who might bring fresh ideas and skills, and who would be likely to be working with experienced creative team partners. Further, in the creative sub-team, producers can rely to some extent on the industry system of roles to mitigate the problems associated with less experienced team members. This would lead to an asymmetry in the relationship between team size (as a proxy for administrative complexity) and experience for the sub-teams.

Hypothesis 4a. Creative team size will be negatively related to the level of creative partner experience.

Hypothesis 4b. Producer sub-team size will be positively related to the level of producer partner experience.

The conceptual complexity of the project should have symmetrical effects on the structure of sub-teams. Conceptual complexity refers to the artistic element in motion picture production, and in particular to the extent that the project departs from well known formulas. Conceptual complexity increases the demand for creative acumen, and should therefore lead to an increase in creative partner experience. While the producer sub-team is less directly involved in the creative process, anecdotal evidence suggests that complex projects are often simplified by inept producers or by nervous investors or distributors to fit existing formulas. More experienced producer teams may be more able to resist this tendency, so that conceptually complex projects should have more experienced producers. In addition, greater levels of experience among producers should ease the problems of achieving a conceptually complex result by improving communication with the creative team.

Hypothesis 5. Conceptual complexity will be positively related to partner experience in both sub-teams.

Data and methods

Data was drawn from the publicly available version of the Internet Movie Database (2001a, 2001b). The Internet Movie Database is a commercial Internet site, owned by Amazon.com and largely supported through advertising. The database originated in an on-line Usenet community of motion picture fans, movies.arts.rec (Internet Movie Database, 2001c), and some of the data is still submitted by community members. Other data is taken directly from motion picture credits. Data is validated by a staff of 7. Box office data is supplied to the site by ACNielsen EDI.

In order to control for changes in the industry environment, I chose to focus on a single decade. The fact that data for more recent motion pictures is more likely to be complete led me to choose the period from 1981 to 2000 as the data source. This period is also characterized by large producer sub-teams. The data for the present study are derived from

motion pictures that began and ended theatrical runs in the U.S. between 1981 and 2000. Data are drawn from this twenty year period in order to have ten years of projects to sample from (1991-2000), and ten years prior to the beginning of the sample to construct cumulative measures of experience and shared experience for the producers and their partners (Faulkner & Anderson, 1987). When the data was downloaded on November 1, 2001, this database included records for 3,135 motion pictures released in the period 1991 to 200. These motion pictures had unique 6,552 producers, for a total of 12,648 producer credits.

Because the focus of this study is on learning over the course of producer careers, hypothesis testing requires a sample of careers that encompass many projects. Analysis of the data identified 240 producers with 7 or more projects released in the decade of the study. Less than 4 percent of producers worked on 7 or more projects during the decade. In the decade these producers earned a total of 2,529 credits on 1,646 motion pictures. These producers worked on 52 percent of all projects and generated 20 percent of all producer credits. These proportions are highly consistent to those reported by Faulkner and Anderson, (1987) for the 1970's. For the 240 producers and the associated motion pictures they produced during the 1990's the following measures were calculated from the archival data.

Sub-team experience. This measure was adapted from Faulkner and Anderson (1987), with the difference that the present study uses a 10 year rather than 5 year lag, and produces a team average rather than an individual experience measure. Following Faulkner and Anderson, (1987) for each motion picture a focal producer worked on, I calculated the number of motion pictures each member of each sub-team had worked on in the decade prior to the release of the picture. For members of the producer sub-team I counted only prior producer credits, omitting the focal producer in each case. For members of the creative sub-team I counted all non-acting, non-producer credits, again omitting the focal producer if he or she also had a non-producer credit. Acting credits were omitted because actors provide the raw material the creative team works on. For each sub-team I calculated the average experience of the producer's partners on the project. The final step was to take the natural log of average experience, to conform to conventional practice in learning curve studies. (All analyses were also performed without the log transformation, with no substantive difference in results.)

Producer prior experience. This measure was adapted from Faulkner and Anderson (1987), as noted above. For each producer, for each motion picture, prior experience consists of the number of motion pictures where that producer had a producer credit released in the period prior to year of the release of the picture in question. Thus for a motion picture released in 1995, all producer credits from 1981 to 1994 would be counted. If several pictures for a single producer were released in a single year, all would have the same prior experience value. 134 of the 240 producers had 1 or more credits during the 1980's; the remaining producers began their producing careers in the 1990's. A squared term, using a centered version of the variable (Aiken & West, 1991) was created.

Learning by doing. To estimate learning by doing in sub-team experience a lagged measure of average team experience was used. This was based on the prior motion picture most recently released for each producer. Thus if a producer had a motion picture released in 1993 and one in 1995, the 1993 project partner experience value was used as lagged values for the 1995 project. The natural logarithm of these lagged variables was used to test the persistence hypotheses, as is usual in learning curve studies.

Shared experience. To capture shared experience I counted the number of times each team member had worked on projects with the focal producer in the decade prior to the release of the picture. For members of the producer sub-team I counted only producer to producer contacts. For members of the creative sub-team I counted all non-acting, non-producer contacts. For each sub-team I calculated the average number of prior contacts the focal producer had with partners on the project.

Team size. To measure the size of teams I counted the number of members on each sub-team for each project. For producer teams I counted only producers; for the creative team I counted all persons with director, writer, editor, designer and composer credits. Persons with more than one credit were counted once. Team size is conceptually a measure of the administrative complexity of the project, since the number of team members should drive the level of coordination effort required.

Conceptual complexity. I measured conceptual complexity by counting the number of genre categories assigned to each motion picture. The genre categories used in the Internet Movie Database are: action, adventure, animation, comedy, crime, documentary, drama, family, fantasy, horror, musical, mystery, romance, science fiction, short, thriller, war and western. Motion pictures that fall into multiple categories have elements of each, which must be integrated to achieve a successful project (Faulkner & Anderson, 1987). This presumably becomes more difficult as the number of categories increases. The number of categories assigned to a motion picture is a measure of the conceptual complexity of the project, as opposed to the administrative complexity captured by team size measures.

Controls. Year of release was considered as a control, but since it never had a significant relationship to any dependent variable in any of the analyses, it is omitted from the present analyses. The number of other roles (director and writer) taken by each producer on each project was considered for inclusion, following the logic in Baker and Faulkner (1991) that this would serve as a measure of the level of control the producer had over the project. This variable did not contribute to the explanatory power of the models, and is therefore omitted. Also omitted, for the same reason, is producer gender.

Power. Because it is reasonable to expect the effect sizes of the current project variables (especially team size and conceptual complexity) to be very small relative to the effects of the other independent variables variables, statistical power becomes an important problem. The total number of data points available is 2,529. For a population effect size for the current project variables of $Rho^2 = .05$ and an alpha level of .05, using the full data set would lead to a power level greater than .9997. Clearly using the full data set would over-expose the study to the risk of Type 2 error. Following the procedures outlined in Cohen (1988) I estimated that detecting an effect of the magnitude of $Rho^2 = .05$, with an alpha level of .05 and power of .80 required a sample size of 300 data points. I therefore drew a random sample of 300 motion pictures from the total data set. (This procedure made it possible to replicate the analysis with alternative random samples. The results reported here were all robust across several random samples.) Random sampling is also valuable for mitigating the fact that in the overall data set, the data are not independent, since they are drawn from only 240 careers.

Results

The correlation table derived from the random sample is given in Table 1. All signs and correlation levels are as we would expect. To validate the assertion that creative team experience influences project outcomes, it is important to note that this variable is highly correlated ($.20, p < .001$) with final gross box office receipts and the length of run (as proxies for rental revenue (Faulkner & Anderson, 1987)). Creative team size and conceptual complexity are also significantly correlated with these outcome measures. This is consistent with Faulkner and Anderson (1987) and other studies. Producers thus have incentives to work with larger, experienced creative teams on complex projects.

Table 1. Correlations and Descriptive Statistics ^a

	Mean	Standard Deviation	1	2	3	4	5	6	7	8	9
1 Producer Team Average Experience (natural log)	1.54	.58									
2 Creative Team Average Experience (natural log)	1.79	.55	.25***								
3 Lagged Producer Team Average Experience (natural log)	1.36	.71	.48***	.15*							
4 Lagged Creative Team Average Experience (natural log)	1.70	.68	.13*	.37***	.30***						
5 Producer Prior Experience	6.64	5.06	.48***	.11	.56***	.26***					
6 Shared Experience with Producer Team	1.92	1.28	.40***	.14*	.40***	.18**	.45***				
7 Shared Experience with Creative Team	1.37	.94	.08	.31***	.12*	.24***	.11	.36***			
8 Producer Team Size	5.69	2.31	.16*	-.03	.12*	-.08	.04	-.07	-.05		
9 Creative Team Size	9.65	4.03	.03	-.04	.11	.001	-.01	-.02	-.08	.25***	
10 Conceptual Complexity	2.09	1.14	.22***	.10	.05	-.06	.08	.08	.01	.14*	.14*

^a N = 300.

* $p < .05$

** $p < .01$

*** $p < .001$

The hypotheses were tested using hierarchical multiple regression analysis. The coefficients in all tables are unstandardized regression b's. Because the sample size was determined using an alpha level of .05, significant results are reported only when $p < .05$. Hypotheses are supported when the regression coefficient is significantly different from zero at $p < .05$ or better, the sign is as expected and the associated R^2_{change} is also significantly different from zero at $p < .05$ or better.

The first tests concern the influence of producer experience on the experience level in the project sub teams. As shown in Model 1 in Table 2, Hypothesis 1a, concerning a linear relationship between the prior experience of the producer and the experience level of the creative sub-team, is not supported. (As noted earlier, substituting an untransformed dependent variable did not alter this result.) Equivalence does not appear to contribute to the experience level of the creative team, a result which contradicts Faulkner and Anderson (1987). As shown in Models 6 and 7, however, there is support for Hypothesis 1b, of a curvilinear relationship between producer experience and the experience level of producer teams. Producers start their careers working with relatively inexperienced teams, gain experience with peers and then become more likely to work with novices as they become more senior.

Table 2. Regression Analyses ^a

Creative Team Average Experience						
	Model	1	2	3	4	5
Constant		1.72*** (.05)	1.72*** (.05)	1.28*** (.08)	1.17*** (.09)	1.09*** (.12)
Producer Prior Experience		.001 (.006)	.001 (.008)	.0001 (.008)	-.0009 (.008)	-.002 (.007)
Producer Prior Experience Squared			.0001 (.001)	.0003 (.001)	.0004 (.001)	.0003 (.001)
Lagged Creative Team Average Experience (natural log)				.30*** (.05)	.25*** (.05)	.26*** (.05)
Shared Experience with Creative Team					.14*** (.04)	.13*** (.04)
Creative Team Size						-.005 (.007)
Conceptual Complexity						.06* (.03)
	R squared Change	-	0.0	.12***	.06***	.01*
	Adjusted R squared	.01	.01	.13***	.18***	.19***
Producer Team Average Experience						
	Model	6	7	8	9	10
Constant		1.18*** (.05)	1.17*** (.05)	.98*** (.06)	.91*** (.10)	.60*** (.10)
Producer Prior Experience		.05*** (.006)	.07*** (.007)	.05*** (.007)	.04*** (.007)	.04*** (.007)
Producer Prior Experience Squared			-.003** (.001)	-.002* (.001)	-.002* (.001)	-.002* (.001)

Lagged Producer Team Average Experience (natural log)		.23***	.19***	.18***
		(.05)	(.05)	(.05)
Shared Experience with Producer Team			.08**	.08**
			(.03)	(.03)
Producer Team Size				.03*
				(.01)
Conceptual Complexity				.08**
				(.02)
	R squared Change	-	.02**	.05***
	Adjusted R squared	.23***	.25***	.30***
			.32***	.37***

^a The main table entries are unstandardized regression coefficients (b's), with standard errors given in parentheses. N = 300.

* $p < .05$

** $p < .01$

*** $p < .001$

Hypothesis 2, that the level of sub-team experience would increase at a decreasing rate, as we would expect from learning by doing, was supported in both sub-teams (Models 3 and 8). Both sub-teams become progressively more experienced, but the rate of change slows as the prior level of experience increases.

Hypothesis 3a, that shared experience would increase the level of experience in both sub-teams, is supported (Models 4 and 9). The effect sizes are relatively small, as we would expect if shared experience is not the dominant element of increasing sub-team experience. (Note to the reader, for OLK5. Hypothesis 3b has not yet been tested; the deadline caught me without one of my references.)

Hypothesis 4a, that team size would be negatively related to creative team experience was not supported (Model 5). Producers apparently don't discriminate between more or less experienced creative partners as they increase the size of the creative sub-team. Hypothesis 4b that producer team size would be positively related to producer team experience was supported (Model 10). When producer sub-teams grow, they tend to grow more experienced, suggesting that they are required for more complex projects. Hypothesis 5, that conceptual complexity would be positively related to experience levels was supported for both sub-teams (Models 5 and 10).

In summary, the results show strong asymmetries in the mechanisms that determine the experience level of the current project team. Equivalence appears to play some role in the formation of producer sub-teams, but not the role implied by a strict interpretation of Faulkner and Anderson (1987). Instead of a linear correspondence between producer experience and producer sub-team experience, this study finds a curvilinear relationship, indicating that as producer careers develop, producers go back to working with novices. In the creative sub-team, there was no support for equivalence as a career mechanism.

Instead, both sub-teams also showed evidence of significant learning by doing and of learning through shared experience. It is easy to see how these effects might be interpreted as equivalence if the detailed forms of the relationships were not examined, as they have been in this study. The study found that as hypothesized, the impact of shared experience on the level of sub-team experience was significantly greater in the creative sub-team. Experience in the creative sub-team is thus driven more by personal relationships with producers than producer sub-team experience is.

The hypothesis that sub-team size would be positively related to experience in the producer sub-team was supported. When producer sub-teams grow, they are more likely to do so by recruiting more experienced team members. The hypothesized negative effect of sub-team size on experience in the creative sub-team was not supported. The size of the creative sub-team does not influence its experience level, indicating that producers do not systematically seek more less experienced creative team members for large projects. The conceptual complexity of the project was found to increase the experience level in both sub teams. Producers seek more experienced partners for conceptually complex projects. As expected, the effect sizes associated with team size and the complexity of the current project are relatively small compared to the effects of producer experience, shared experience and prior team experience.

Discussion

In the producer sub-team strict equivalence does not characterize producer careers. The relationship between producer experience and sub-team experience is curvilinear in an inverted U shape. Thus while the early stages of producer careers are characterized by work with increasingly experienced partners, at around the third project producer partner experience begins to decrease. One explanation for this phenomenon, borne out by post hoc analysis, is that novices begin their careers working with senior partners, that they fairly quickly mature and begin to work with more junior partners.

Simple learning by doing also appears to play a major role in producer careers. Producers make progressively smaller changes to the experience level of teams as they gain experience in working with experienced producer partners. This suggests that either there are learned limits to the benefits of more experienced teams, or that there are learned benefits to balancing experience with inexperience. Both lend themselves to the idea that producers learn to structure teams they can control.

Both explanations are also consistent with the results of the shared experience hypothesis in producer sub-teams. As expected, shared experience has a positive influence on sub-team experience. This influence, while strong, accounts for little more than 5% of the effect of the fully specified model. Cursory post hoc analysis suggests that producers most often share experience in pairs, and that more than half of pairs stay together for only two projects. A core pair, working with a mix of unfamiliar inexperienced and experienced partners, is the scenario most compatible with the results for the producer sub-team. The resulting trend might be interpreted as equivalence if the details were not examined.

The effects of the complexity of the project on experience in the producer sub-team are also as hypothesized. Larger producer teams are more experienced, despite the scarcity of experienced producers. This suggests that large teams are a response to more complex projects. Conceptually complex projects also have more experienced producer teams, which is consistent with the idea that experience is required to shepherd such projects through the production process with their complexity intact.

All of these results are consistent with the characterization of the producer sub-team as a community of practice. In it we appear to have a mechanism for the legitimate peripheral participation of novices (Lave & Wenger, 1991) and legitimate centrality for senior producers. Movement from the periphery to more central positions in the community is

supported by the curvilinear relationship between producer experience and sub-team experience. The importance of learning by doing and the close associations some producers develop with each other, while less definitively constitutive of communities of practice, are certainly features that characterize them.

Exploration of the results for the creative sub-team bolsters this conclusion. On the face of things, members of the creative sub-team do not share practice with producers. This is consistent with the complete lack of evidence for equivalence in the creative sub-team. Producer experience does not predict creative sub-team experience. An obvious explanation for the absence of equivalence is that when junior producers work with senior producers, the creative teams they work with are composed not primarily of their own junior peers, but of the peers of the senior producers. Junior producers who are fortunate enough to begin their careers under the aegis of senior producers wind up in a privileged position with respect to learning how to manage creative talent. Again post hoc analysis bears this out.

Thus in the producer creative sub-team relationship there appears to be room for peripheral participation by novice producers, but no indication of a career path. The creative sub-team is one of the things novice producers learn to assemble; it is a principal object of practice in the producer community. Thus while we do not find evidence of a career path in the producer creative team relationship, we do find evidence of learning. In the creative sub-team simple learning by doing plays the largest role in determining sub-team experience. Producers appear to learn how experienced a team should be and make only small modifications to the basic level. A significant proportion of creative sub-team experience is driven by shared experience between the producer and his or her creative partners, especially with directors and writers. The average level of shared experience is less than in the producer sub-team (because the teams are larger for the same number of recurrent pairs), but as we have seen its effect is considerably greater. The fact that recurrent relationships matter does indicate that some level of equivalence operates, but only within the recurrent pairs.

The fact that creative team size does not influence team experience is also consistent with the other findings. A larger creative team need not be more experienced; experience would not decrease the administrative burden on producers. Adding creative team members does not create more roles - it simply disperses responsibility for each role among more individuals. Conceptual complexity once again drives experience in a fairly obvious way-- more conceptually complex projects benefit from greater creative experience. Producers, like other project managers, learn to assemble the community of interaction that will actually complete the project.

They learn this as they learn to be producers. The processes of learning in each sub-team differ in that the producer's own experience matters directly only in the producer community of practice. Being part of a producer sub-team gives novices opportunities they would not have as independent agents. It is more viable to learn to be a producer among producers than to try to go it alone. Comparing the first projects of producers in this sample (who had long careers) with those whose attempts at producing never became careers bears this out. The first projects of survivors are populated with many more senior producers than those of non-survivors.

Future research that examines individual careers more directly will shed stronger light on the patterns of team formation that producers enact. There is also an opportunity in this stream of

research to understand how producers influence market outcomes for motion pictures. This influence appears to be largely indirect but ought to be significant -- otherwise producers with prolonged successful careers would be much less common than they are. A study investigating the process of choosing projects, and the survival of projects into production might provide interesting insight into this problem.

As usual with a single industry study, it is important to point out that the results may not be generalizable to other contexts. In the present case, where the comparable contexts are other project based enterprises such as construction, consulting and new product development, this limitation may be less critical than usual. A further limitation is that this study includes only the projects that survive to be produced and exhibited. Many projects are developed part way and then dropped for a wide variety of reasons, so that a focus on success keeps us from seeing all the projects a producer works on. This study also did not develop career data prior to the first project each individual produced. Before they become full fledged producers, individuals often work as production assistants and in other staff jobs. This early data may play an important role in the development of later stage patterns, so that its omission places a limitation on this study. This early data would also be critical for the study of social networks. Because this study is based on data about shared work experience that occurs only after individuals become producers, the potential for understanding social network effects is greatly diminished.

This study has developed a more encompassing picture of how motion picture producers learn to assemble project teams over their careers. The motion picture context, with its public episodes of team formation, makes it possible to study processes that are hidden in most other project based enterprises. Understanding how and what project managers learn in general opens the door for more detailed studies of how individual learning contributes to progressive improvement in project based enterprises.

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