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Entrepreneurial Learning in Project Ventures: Implications of Prior Venture Experience for Error Avoidance, Innovation, and Project Performance

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ENTREPRENEURIAL LEARNING IN PROJECT VENTURES: IMPLICATIONS OF PRIOR VENTURE EXPERIENCE FOR ERROR AVOIDANCE, INNOVATION, AND PROJECT PERFORMANCE

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ABSTRACT

This dissertation builds on the organizational learning literature to develop and test a model of entrepreneurial learning in an increasingly prevalent organizational context – project ventures. Complementing prior research on project ventures, the focus is on the individual in charge of project venture execution. In extension of prior organizational learning research, this study examines the cross-level relationships between sub-dimensions of the entrepreneur's prior venture experience and project-level learning outcomes. Specifically, this study investigates how the entrepreneur's depth and breadth of experience affect three project-level outcomes: errors in project execution, novelty of project outcomes, and financial project performance. Testing the theory-based conjectures of this dissertation in a sample drawn from projects executed in the U.S. motion picture industry between 2000 and 2005 provides support for a model of learning across project ventures that accounts for sub-dimensions of prior venture experience and their differential effect on project-level outcomes. Depth of experience aids the avoidance of execution errors while breadth of experience increases the novelty of project outcomes. There is no conclusive support for a relationship of either depth or breadth of experience with the financial performance of project ventures. The implications of the findings for research on organizational learning and entrepreneurial learning are discussed and opportunities for future research are outlined. This dissertation contributes to recent research that has successfully applied organizational learning theory to better understand entrepreneurial behavior in project-venture settings.

CHAPTER 1: INTRODUCTION

Organizational learning has been defined as a systematic change in behavior or knowledge resulting from experience (Argote, 1999). Rooted in Cyert & March's (1963) behavioral theory of the firm, the organizational learning perspective has generated considerable theoretical and empirical work examining the effect of experience on knowledge and behavior (see Argote, 1999; and Greve, 2003 for summaries of important work). Prior research has considered various types of experience -- including experiential experience (e.g., Van de Ven & Polley, 1999; Miner, Bassoff, & Moorman, 2001), vicarious experience (e.g., Haunschild & Miner, 1997), as well as hypothetical experience (e.g., March, Sproull, & Tamuz, 1991). The effect of accumulated experiential experience has received considerable research attention (see Argote, 2003 for a review of the pertinent studies). Although sub-dimensions of experience have been discussed conceptually (e.g. Cohen & Levinthal, 1990), their effect on learning outcomes has not been systematically studied. This dissertation extends organizational learning theory by introducing and empirically investigating two theoretical sub-dimensions of accumulated experience: depth of experience and breadth of experience. Depth of experience is defined as accumulated experience within the same knowledge domain. Breadth of experience is the variety of accumulated experience across knowledge domains.

The theory-based hypotheses were empirically tested in an under-researched but increasingly important organizational context: project ventures. Data compiled for a sample of 148 project ventures in the U.S. motion picture industry executed between 2000 and 2005 provided the database for the statistical analyses.

Project ventures are defined as short-term organizational entities that combine several contributors for the purpose of delivering a product or service within a pre-determined time frame and budget (Sydow, Lindkvist, & DeFillippi, 2004; Schwab & Miner, 2008). Prior research has shown that the production of goods and services in various industries is increasingly managed via project ventures and other types of modular organizational forms rather than hierarchical organizations, because the former provide flexibility advantages (Davies & Hobday, 2005; Hobday, 2000; Schilling & Steensma, 2001). Academic research on project ventures is limited, but the context is particularly interesting from an organizational learning perspective because the temporary nature of this organizational form poses unique challenges for organizational memory and learning across projects or tasks (Grabher, 2004; Schwab, 2006).

I focus on the individual entrepreneur in charge of executing project ventures and, consistent with prior research on organizational learning, I examine the effect of the two sub-dimensions of experience on three project-level learning outcomes: execution errors, novelty, and financial performance. The investigation of cross-level effect of individual learning by entrepreneurs addresses an area that has received scant research attention: the micro-foundations of organizational learning.

Focus and Merit of This Research

This dissertation draws on and extends organizational learning theory and research on entrepreneurship. Testing the developed theoretical framework in a sample of project ventures sidesteps typical limitations of entrepreneurship research and yields valuable insights about the organizational learning processes in this empirical context. Although organizational learning theory acknowledges the multilevel nature of

organizational learning, most of the related empirical research has focused on the organizational level of analysis (Argote, 1999; Cyert & March, 1963; Huber, 1991). Theoretical and empirical advances have highlighted the important role of learning processes at the individual (Crossan, Lane, & White, 1999; Fiol, 1983), group (Argote, 1999), and population level (Miner & Haunschild, 1995). This study investigates the effect of individual learning processes on organizational outcomes.

The theoretical development of this research links complementary research in the organizational learning literature and the entrepreneurship literature. At the individual level of analysis, studies in the organizational learning literature (Crossan et al., 1999; Fiol, 1983) dovetail with recent advances in the entrepreneurship literature focusing on entrepreneurial learning (Minniti & Bygrave, 2001; Lumpkin & Lichtenstein, 2005; Parker, 2006). Consistent with prior theoretical and empirical organizational learning research, research on entrepreneurial learning found entrepreneurial experience can have a positive effect (Schollhammer, 1991), no effect (Kolvereid & Bullvag, 1993; Westhead et al., 2005; Westhead & Wright, 1998; Wright, Robbie, & Ennew, 1997), or a negative effect on venture performance (Ucbasaran et al., 2006). We currently do not know what contingency factors may cause these divergent findings. Recourse to explanations furnished by extant organizational learning theory is of limited value, due to the focus on different levels of analysis in both literatures: the entrepreneurship literature focuses on the individual level of analysis and cross-level effects of individual learning, whereas most causal models provided by organizational learning theory focus on the organizational-level of analysis. By developing a theoretical framework that draws on and extends organizational learning theory, and by testing this framework at the nexus of

individual learning processes and entrepreneurial activities, this dissertation contributes to both literatures. Figure 1 illustrates the unique focus of this dissertation by foreshadowing the major components of this dissertation's theoretical framework. Depth of experience and breadth of experience -- the constructs whose effect on execution errors, novelty, and financial performance is examined by this study -- have not been considered in either literature. The following general research question highlights the focus of this dissertation:

How do different dimensions of an entrepreneur's prior venture experience affect project venture outcomes?

The entrepreneurship literature serves as an appropriate theoretical foundation for this study's focus on the project manager in charge of project ventures. This dissertation draws on the entrepreneurship literature, because the directors in charge of executing the production of motion pictures in the U.S. movie industry are entrepreneurs carrying out new combinations of resources (Guth & Ginsberg, 1990; Schumpeter, 1934). Movie directors assemble and manage the organizational entities that produce motion pictures. They manage the budget they receive from investors (i.e. producers), recruit key contributors (i.e. actors and technical and administrative personnel), manage the organizational processes that coordinate the various elements of a movie project, and directly supervise key elements of the day to day production process. Furthermore, the professional and financial success of movie directors is directly linked to the outcomes produced by their entrepreneurial activities: future employment opportunities in the U.S. motion picture industry are positively influenced by the success of previous ventures

(Schwab & Miner, 2008) and royalties can tie directors directly to the financial performance of their project ventures in the marketplace.

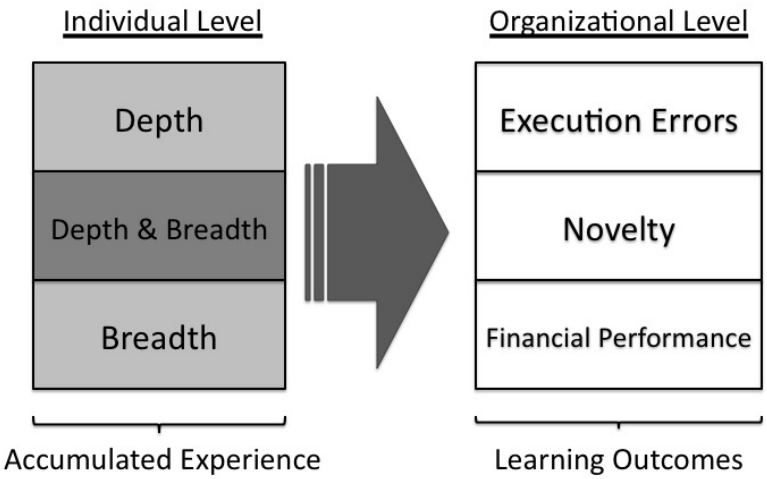

Figure 1: Focus of the Dissertation

Testing the theory-based framework developed in this dissertation in the context of movie project ventures offers methodological advantages and offers additional relevant insights for theory. The fairly standardized nature of production in the motion picture industry provides a sizeable population of comparable ventures to sample from. Prior empirical research on the effect of entrepreneurial experience has typically relied on small non-random samples, due to the challenges associated with identifying entrepreneurs that have venture experience across several ventures (e.g., Schollhammer, 1991; Westhead et al., 2005). The motion picture industry is well documented and ample information at the project level is available from industry data sources. The availability of such comprehensive secondary data sources is somewhat unique for entrepreneurship research. Most empirical studies, in particular those on the effect of entrepreneurial

experience (e.g., Westhead et al., 2005) have relied on self-report data. Aside from these methodological advantages, the empirical context of this study provides the opportunity to investigate whether individual-level learning can complement the organizational learning at the level of permanent project-governing organizations highlighted in prior research (Grabher, 2004; Schwab & Miner, 2008). Addressing this question is of theoretical interest, because the temporary nature of project ventures prevents organizational learning at the level of these modular organizational units.

Study Outline

The second chapter contains a review of the relevant literature. First, I introduce the organizational learning perspective and discuss key concepts relevant to the present study. Subsequently, I summarize relevant conceptual and empirical work in the literature on entrepreneurship that speaks to the issues considered in this dissertation. I explicitly address level of analysis issues and outline the benefits of empirically investigating the focus of this dissertation in a project venture setting. In the third chapter, I motivate and outline the study's hypotheses. The motivation of the hypotheses builds on theory introduced in the literature review in the second chapter. In chapter four, I introduce the empirical setting - the movie industry. I will discuss important background information about the nature of production in the U.S. motion picture industry and outline the role of the director as entrepreneur. I will also discuss movie genres and their role in the movie industry. The fifth chapter outlines the study's methodology by describing the sampling procedure and the variables employed in testing the study's hypotheses. The data analysis along with an overview of the results will be featured in the sixth chapter. The seventh chapter will relate the empirical findings to the research questions and discuss specific

implications for our understanding of the link between sub-dimensions of entrepreneurial experience and subsequent entrepreneurial behavior. In this section, I also discuss the limitations of the study and directions for future research.

CHAPTER 2: THEORY

This dissertation draws on organizational learning theory and entrepreneurship theory to develop the framework of hypotheses that is tested empirically. The nature of the literature, especially that associated with organizational learning, combined with the specific focus of this study makes a succinct and well-structured literature review challenging. Organizational learning theory is an umbrella for related research investigating learning processes that may (a) take place at different levels of analysis, (b) involve different learning mechanisms, (c) be affected by different contingency factors, and (d) have an effect on different learning outcomes. Any two organizational learning studies may differ on one or all of these dimensions, and while a rich theory has emerged, our understanding of organizational learning remains spotty and the insights we have are often disjointed. Regarding the levels of analysis, for example, the boundary conditions of theoretical explanations and constructs are often not clearly delineated. Furthermore, the distribution of research attention to learning processes at these different levels of analyses has been uneven. This has two immediate and interrelated implications for this study: (1) learning processes at the individual level of analysis examined in this dissertation have received limited attention by prior research (Argote, 1999) and (2) established theoretical concepts and explanations must be used with caution and with explicit attention to their generalizability to the individual level of analysis. Even if a theoretical concept or explanation could be applicable at different levels of analysis, empirical support is often scarce or lacking.

Given the outlined challenges, this literature review is structured as follows. In the first part of this chapter, the organizational learning literature is reviewed with a focus on relevant concepts and causal relations that underpin the theoretical model developed in the next chapter. Whenever existing theory development or empirical support has been confined to a specific level of analysis, it will be acknowledged accordingly. A more thorough discussion of extensions (of concepts or theoretical explanations) from another level of analysis to the level of analysis of this dissertation will be provided in the second part of the chapter. The second part of this chapter also explains why this dissertation borrows a concept developed in the entrepreneurship literature to bridge a gap in the existing organizational learning literature: limited attention to cross-level implications of learning processes. The third part of this chapter reviews the relevant theory and empirical research in the entrepreneurship literature. The fourth part of this chapter summarizes the findings of the literature review for this dissertation. The last part of this chapter discusses the benefits of investigating the research question of this dissertation in a project venture setting.

Organizational Learning

Rooted in Cyert and March's (1963) behavioral theory of the firm, the organizational learning perspective has developed into a major theoretical foundation for research in organizational theory and strategic management. While theoretical developments and empirical research have systematically refined the theoretical substance of organizational learning theory, important questions remain unanswered.

Organizational learning theory outlines how experience affects knowledge and behavioral tendencies (Cyert & March, 1963; Levitt & March, 1988; Argote, 1999). Early

research on organizational learning focused on the relationship between cumulative production and performance improvements (e.g., Yelle, 1979). Subsequently, the focus of learning research has broadened and Cyert and March's original work has guided a stream of research that has investigated different sources of experience (Haunschild & Miner, 1997; Yelle, 1979), learning mechanisms (Greve, 1998; Lant, 1992), and contingency factors (e.g., Beckman & Haunschild, 2002; Cohen & Levinthal, 1990; March, 1991). Extant research has provided systematic support for the premise of organizational learning theory, namely that experience affects knowledge and behavior (see Argote, 1999; Greve, 2003 for overviews).

The effect of learning processes may vary depending on contingency factors. In developing their behavioral theory of the firm, Cyert and March (1963) merely described organizational learning as a way by which organizations adapt, regardless of the outcomes of this adaptation. Despite of this core idea, the construct is often viewed as describing the positive effect of experience on performance. Hence, it is important to note that experience can affect performance positively (e.g., Haunschild & Sullivan, 2002), negatively (e.g., Denrell, 2003; Abrahamson & Fairchild, 1999), or not at all (Weick, 1993). Organizational learning research has studied the causes of this differential effect of experience on learning outcomes. One line of inquiry in this area focuses on the nature of experience as an important contingency factor for organizational learning. Related empirical research has shown that the type of experience can moderate the relationship between experience and learning outcomes. We know that learning can be based on one's own experience (Van de Ven & Polley, 1992; Miner, Bassoff, & Mooreman, 2001) as well as the experience of others (Haunschild & Miner, 1997). The learning process

associated with one's own experience has been refereed to as experiential learning, while learning from the experience of others is often described as vicarious learning. This dissertation refers to 'own experience' and 'experience of others' as types of experience. One type of experience can be available from different sources (e.g. vicarious experience may be made available through relationships with similar or dissimilar organizations; e.g., experiential experience may be available from one kind of behavior or different kinds of behaviors, or based on feedback from one kind of performance outcome versus feedback from several kinds of performance outcomes).

Different types of experience can influence learning outcomes systematically. For example, Baum, Li, and Usher's study (2000) showed that learning processes based on different types of experience systematically influenced the acquisitions location choices of nursing chains in Ontario between 1971 and 1996. Experiential learning caused these organizations to execute acquisitions that were very similar to acquisitions they had done previously. Vicarious learning led chains to imitate the acquisition behavior of visible or comparable rivals.

The learning effect of one type of experience can also vary systematically, depending on other contingency factors. Among others (e.g., Kraatz, 1998), Haunschild and colleagues have studied contingency factors of vicarious learning. In their study of medium and large-sized U.S. firms in four industries from 1981 and 1990, Haunschild and Miner (1997) found that external experience had a stronger effect on learning outcomes if the external experience originated from similar others or if other sources of information corroborated it. Examining the performance of business acquisitions, Beckman and Haunschild (2002) found that acquiring firms performed better (as

measured by stock-market performance) if they had inter-organizational network ties to other firms with more heterogeneous acquisition experience. The authors studied the acquisitions of the 300 largest publicly held service and manufacturing firms in the U.S. between 1986 and 1997. Together with another colleague, Haunschild has studied contingency factors of experiential learning as well. Haunschild and Sullivan (2002) found that specialist airlines learned more (as measured by a reduction in accidents) from their own accident or incident experiences if the causes of errors were more heterogeneous. The authors' study of commercial airlines between 1983 and 1997 also found that generalist airlines benefited less from their own experience and tended to learn vicariously.

Extant research has begun to identify and examine contingency factors of organizational learning that are related to the nature of the available experience. Empirical research has shown that different types of experiences (i.e. experiential vs. vicarious experience) make different information available, leading to systematically different outcomes. Furthermore, existing research has shown that additional contingency factors influence the information that is provided even from the same type of experience. The redundancy of experience (i.e. extent to which the same or similar information is provided) and the diversity of experience (i.e. extent to which new or dissimilar information is provided) have been identified as important contingency factors. However, important gaps in our understanding of these contingency factors remain. Apart from questions about the boundary conditions of redundancy and diversity of experience (e.g. with regard to different contexts or levels of analysis), we do not know whether, and if so how, these two contingency factors interact with each other. Moreover, we do not know

how redundancy and diversity of experience may affect other learning outcomes besides those studied by Haunschild and colleagues. Additional research examining both factors jointly as well as their individual and joint effect on other learning outcomes would build on and extend the existing research. The remainder of this dissertation will refer to redundancy and diversity as dimensions of experience.

Learning Mechanism and Outcomes

Experience affects outcomes through learning mechanisms and this relationship is influenced by other contingency factors. This dissertation focuses on learning-by-doing, a special kind of organizational learning, defined as a systematic change in behavior or knowledge based on direct experience with the execution of particular task. The theoretical framework I outline in the next chapter posits that the independent effects of depth and breadth of experience -- two sub-dimensions of experience -- affect learning outcomes differently. My conjectures also propose that one dimension of experience affects how information provided by the other dimension of experience can be exploited. The organizational learning literature defines absorptive capacity as the ability to value, assimilate, and exploit knowledge (Cohen and Levinthal, 1990). The review of prior research on learning-by-doing and absorptive capacity below informs the conceptual model outlined in the next chapter.

Learning-by-Doing

Learning-by-doing can cause systematic changes in behavior or knowledge (Argote, 1999). For example, learning-by-doing can validate a specific way of doing something (change in knowledge/no change in behavior), or it can reveal causes of problems and prompt the search for an alternative way of doing something (change in

knowledge/change in behavior). Prior research has paid particular attention to learning-by-doing that causes changes in behavior or knowledge and thereby affects performance outcomes (e.g. Haunschild & Sullivan, 2002; Haunschild & Beckman, 2002). Early research of this kind at the organizational level of analysis focused on the negative relationship between cumulative production experience and unit production costs in manufacturing settings (e.g., Yelle, 1979). Argote (1999) provides an extensive overview of this research. Hence, only insights from this research that are particularly relevant to this dissertation are reviewed here. The first important insight from prior research on learning-by-doing is that positive effects of experience on performance outcomes may require the repeated or continued execution of the same or similar tasks. Related research in manufacturing has established the existence of a typical learning curve, that describes how performance outcomes (e.g., unit production costs) improve systematically with the accumulation of experience in executing the same or similar tasks (Argote, 1999). The second important insight from this research is that the rate of learning may differ substantially because contingency factors moderate the relationship between accumulated experience and performance outcomes. Learning curve research at the organizational level of analysis has so far identified organizational "forgetting," employee turnover, transfer of knowledge from other products and other organizations, and economies of scale as important contingency factors (Darr, et al., 1990). In addition to the early focus on production cost changes as a function of cumulative production experience, learning curves were found to influence various outcomes in a variety of settings. Research has shown the positive effect accumulated experience can have on the reduction of unit costs for settings outside of manufacturing. Darr, Argote, and Epple (1995), for example,

showed that learning-by-doing improves performance in the service industry. The researchers studied data obtained from 36 pizza stores located in the northeastern United States over a time period of 18 months and found that unit costs of production declined significantly as the organizations in their sample gained operating experience.

Aside from the context, learning curve effects have also been found in relation to several other performance outcomes besides unit production costs and at other levels of analysis. Joskow and Rozanski (1979) examined operating data for 73 nuclear reactors during a 12-month period between 1975 and 1976. Their study showed that industry-level learning curve effects increased the plant operating reliability of nuclear reactors. Examining time series data from eight movie studios between 1925 and 1941, Moul (2001) showed that studio revenues increased systematically as movie studios gained experience with the new sound technology that was introduced to the industry during the timeframe of the study. The associated study showed that simply switching production to the new technology did not cause the increases in revenue. Rather, revenue increased as movie studios gained experience with sound recording technology and improved the quality of sound movies. Learning curve effects have also been found at the individual level of analysis. Kelsey et al. 's (1984) study of a surgical procedure called "Percutaneous Transluminal Coronary Angioplasty" (PTCA) showed that the success rate of the intervention increased with accumulated experience of the executing doctors. The study analyzed clinical data on 3,101 PTCA procedures performed at 105 clinical centers between September 1977 and September 1981. Kelsey et al. found that the increasing success rate of PTCA interventions was largely caused by improvements in the execution of the executing physician.

The research reviewed here provides some initial support for the argument that theoretical explanations based on learning-by-doing arguments can be applied to the level of analysis of this dissertation (i.e. the individual level). This extension is discussed in a later section of this chapter, where additional empirical evidence outside of the organizational learning literature supporting the relevance of learning-by-doing at the individual level of analysis is reviewed as well. The prior research reviewed here informed the choice of outcome variables for the theoretical framework developed and tested by this dissertation. While support for learning-by-doing explanations has been found with regard to various tasks, our understanding of the contingency factors affecting learning-by-doing is still limited and would benefit from further research. The findings of prior research seem to suggest that the outcomes of learning-by-doing may differ depending on the nature of the learning-by-doing experience. Repeatedly executing the same task or repeatedly executing similar but more diverse tasks may lead to systematically different learning-by-doing outcomes. I propose that the knowledge base generated from prior experience affects the ability to utilize knowledge acquired through subsequent experience.

Absorptive Capacity

The ability to assimilate, exploit and transform knowledge from prior experience can benefit learning processes. Absorptive capacity has been introduced as a construct to the organizational learning literature to describe this ability (Cohen & Levinthal, 1990) and subsequent empirical research has supported its relevance (e.g. Lane, Salk, & Lyles, 2001).

Research on absorptive capacity relevant to the focus of this dissertation has been largely limited to conceptual development and discussion, although the limited empirical evidence is encouraging. Research on absorptive capacity assumes that learning is cumulative and learning performance differs systematically contingent on what is already known (Cohen an Levinthal, 1990; Lane et al., 2001; Zahra & George, 2002). Cohen and Levinthal suggested that routine activities create a knowledge base confined to a specific knowledge domain. The ability to absorb knowledge in new domains would require the deliberate acquisition of the requisite 'breadth of knowledge' (1990: p.150). The related empirical research evidence is limited but consistent with this argument. In a qualitative study of the Hyundai Motor Company in the 1990s, Kim (1995, 1997) found that the automobile manufacturer deliberately acquired basic knowledge in new knowledge domains to improve its ability to assimilate and build on innovations in those domains. Much research on absorptive capacity has focused on the benefits for assimilating external experience. However, recent research has extended the application of the concept to the utilization of internal experience. Analyzing data collected on a random sample of 205 firms that undertook restructuring efforts, Bergh and Lim (2008) found cumulative prior experience with spin-offs was positively related to the subsequent use of spin-offs as well as to the financial performance of subsequent spin-offs.

The absorptive capacity literature explains why cumulative experience can lead to different outcomes: experience within a specific knowledge domain and breadth of experience across different knowledge domains both create unique knowledge bases. The characteristics of the accumulated knowledge base in turn moderate the effect of any subsequent experience (Kim, 1995) and systematically influence subsequent behavior

(Bergh & Lim, 2008). Our understanding of how these knowledge bases may interact is still limited. We do not know, for example, whether a well-developed knowledge base in one domain would be more beneficial in combination with breadth of experience or without it. Conversely, we do not know whether breadth of experience has any benefits by itself or whether it is only useful in conjunction with a well-developed knowledge base in a particular domain. The answer to these questions will likely depend on the outcome that is considered.

Outcomes Associated with Learning-by-Doing and Absorptive Capacity

The learning outcomes considered in prior research on learning-by-doing and absorptive capacity are a good starting point for a systematic investigation of the independent and interactive effects of experience accumulated from the execution of tasks involving the same or diverse knowledge domains. Prior organizational learning research relevant to this dissertation has identified financial performance, execution errors and the novelty of output as outcome variables relevant to learning processes. Research on learning-by-doing has considered learning effects on the quality (Joskow & Rozanski, 1979) of and the financial performance (Moul, 2001) of task outputs. Success in Kelsey et al.'s (1984) study on PTCA procedures was a direct consequence of another learning outcome: the avoidance of errors in the execution of the task. Based on a review of extant empirical research on absorptive capacity, Zahra and George (2002) found support for a relationship between absorptive capacity and innovative or novel outcomes. The authors argued that knowledge accumulated from past experience could positively affect subsequent search. On the organizational level of analysis, Van Wijk and

colleagues (2001) found that accumulated knowledge positively influences an organization's propensity to explore and use new and related knowledge.

Our understanding of the independent and interaction effect of different dimensions of experience can benefit from considering the effect on these various learning outcomes identified by prior research in the same empirical study. Hence, the conceptual model developed in the next chapter builds on this prior research and develops propositions regarding three learning outcomes: the financial performance of the task output, execution errors, and the novelty of the task output.

Micro-Foundations and Cross-Level Effects of Learning

While most of the existing research (both conceptual work and empirical studies) on learning-by-doing and absorptive capacity has been at the organizational level of analysis there are theoretical arguments as well as empirical evidence supporting the extension of the concepts and associated theory to the level of analysis of this dissertation - the individual level. Researchers have studied learning at the individual (Crossan et al., 1999; Fiol, 1983), group (Argote, 1999), organization (Greve, 1998; Haunschild & Miner, 1997; Ingram & Baum, 1997), and population level (Miner & Anderson, 1999; Abrahamson & Fairchild, 1999; Miner & Haunschild, 1995) but the micro foundations of organizational learning have received limited research attention and most research in this direction has focused on the group level (Argote, 1999) and the challenges of knowledge transfer in organizations (Darr et al., 1995; Haas & Hansen, 2005; Hansen, 1999, 2002).

Empirical research has investigated learning-by-doing and absorptive capacity at the individual level of analysis. Organizational learning research on learning-by-doing and the associated learning curves is rooted in earlier research in psychology. Related

studies have found that the time individuals required to perform a moderately difficult manual task and the number of mistakes they committed decreased at a decreasing rate as they gained experience with the task (Mazur and Hastie, 1978; Argote, 1999). Similarly, Thurstone (1919), for example, found learning curve effects to characterize the progression of students through a typing course. Empirical research has investigated the nature and implications of absorptive capacity at various levels of analysis including the organizational (Cohen & Levinthal, 1990; Kim, 1998; Szulanski, 1996), interorganizational (Lane & Lubatkin, 1998), and country level of analysis (Lui & White, 1997). The individual level of analysis has received only limited attention in organizational learning studies so far (Lofstrom, 2000). However, there is some empirical support for the relevance of absorptive capacity at the individual level. Studying the development of computer programming skills, Pirolli and Anderson (1985) found that most students developed new computer programs by analogy to example programs. Successful development was more likely if prior experience allowed a student to understand why the examples worked.

Theoretical arguments support the extension of both learning concepts that are relevant to this dissertation and the associated theory to the individual level. Aside from the empirical findings highlighted here it is important to note that the theoretical development of both concepts is rooted in research in psychology. Argote (1999) traced the origins of learning curve research to its roots in psychology and Levinthal and Cohen (2000) acknowledged the intellectual indebtedness of their concept (i.e. absorptive capacity) and their theoretical development to Harlow's (1949, 1959) work on learning

set theory. Moreover, the authors argue for a direct link between individual-level and organizational-level absorptive capacity (2000: p. 300).

Empirical organizational learning research has yet to systematically test the relevance and implications of learning-by-doing and absorptive capacity at the individual level within an organizational context. The review presented here strongly suggests that individual learning-by-doing and absorptive capacity matter. However, it is unclear how they may impact organizational outcomes. Extant research provides little insights regarding the potential relationship between individual learning and organizational outcomes. Prior research has acknowledged cross-level effects and a few studies have begun to develop a multi-level perspective of organizational learning (e.g., Crossan, et al., 1999; Schwab & Miner, 2008). This review acknowledges prior work by Crossan & colleagues (Crossan et al, 1999; Dutta & Crossan, 2005) in particular. The authors proposed a theoretical framework linking individual- and organizational-level learning. The framework is not reviewed here, because this dissertation does not use it for conceptual and methodological reasons: the framework developed by Crossan and colleagues is expansive and very abstract. These features may explain why the framework has not been tested empirically so far. Nevertheless, overlap exists between this dissertation's and Crossan and colleagues' theoretical framework: both posit organizational leaders as key drivers of organizational behavior in entrepreneurial ventures (see Dutta & Crossan, 2005).

The theoretical guidance from the organizational learning literature regarding the relationship between individual learning and organizational outcomes is very limited. The entrepreneurship literature, on the other hand, has introduced a concept explicitly linking

individual learning and organizational outcomes of entrepreneurial ventures. Thus, the conceptual framework developed in the next chapter is partially informed by the related entrepreneurship literature.

Entrepreneurial Learning

Entrepreneurship scholars have introduced entrepreneurial learning as a concept linking individual experience with entrepreneurial activities and venture outcomes (Minniti & Bygrave, 2001; Polities, 2005). The focus on entrepreneurial activities distinguishes entrepreneurial learning from other forms of learning-by-doing. A generally accepted definition of entrepreneurial activity has yet to be developed, but support is emerging for the view that entrepreneurship emerges from the nexus of two phenomena – the simultaneous presence of opportunities and enterprising individuals (Venkataraman, 1997). In line with this perspective, this dissertation defines entrepreneurial activity as the creation and management of a new organizational entity designed to exploit a profit opportunity. Entrepreneurial learning is a systematic change in knowledge or behavior based on direct experience with the execution of an entrepreneurial activity. The definition used here is conservative and in line with the specific focus of this dissertation. Therefore, its scope excludes some pursuits that are discussed and researched within the entrepreneurship literature. The definition excludes activities that are motivated by non-profit objectives (e.g., social entrepreneurship), because the effect of altruistic motives on entrepreneurial behavior is not focus of this research. Corporate entrepreneurship (e.g., Amit, Glosten, & Mueller, 1993; Casson, 1982) is excluded because the focus in this dissertation is on stand-alone organizations, and self-employment is excluded because the focus here is on the cross-level effects of individual learning on organizational outcomes.

In other words, the focus here is how the accumulated prior experience of an entrepreneur affects outcomes through the entrepreneur's influence on organizational resources (e.g. personnel, technology) and routines (e.g. operating procedures). Defining entrepreneurial activity as above implies nothing about the outcomes of entrepreneurial activity. Entrepreneurial activity may be profitable or not, it may result in direct success or it may produce a variety of mistakes, and the resulting products or services may be mundane or highly innovative. The focus on a new organizational entity links this definition to an important perspective in the entrepreneurship literature, which associates entrepreneurship with new or changing combinations of resources (e.g., Guth & Ginsberg, 1990; Schumpeter, 1934).

Related theoretical development has focused on the general benefits of entrepreneurial learning for the selection of the most appropriate course of action during the execution of a new venture, but another line of research suggested that entrepreneurial learning can in particular benefit the opportunity recognition of entrepreneurs. Minniti and Bygrave (2001) propose that entrepreneurs learn both from success and failure in prior ventures by updating their decision algorithms. They propose that knowledge gained in earlier ventures becomes embedded in expectations and beliefs. Evidence gained through subsequent experience reinforces or weakens these expectations and beliefs and thereby systematically influences whether they will be applied in subsequent venture situations. The uncertainty of the learning context associated with entrepreneurial activities has unique implications that distinguish entrepreneurial learning from other forms of learning-by-doing at the individual level of analysis. The majority of the contemporary entrepreneurship literature adopts the perspective of Austrian economics,

which emphasizes the uneven distribution of knowledge in society (e.g., Kirzner, 1973; Schumpeter, 1934). Unequal distribution of knowledge in an economic system is a source of uncertainty confronting entrepreneurs because it renders evaluating alternative courses of action speculative at any point in time (Hayek, 1945). The uneven distribution of knowledge can create both challenges and opportunities for entrepreneurs. It can make learning from accumulated entrepreneurial experience more difficult if information from the entrepreneur's knowledge base remains inconsistent. On the other hand, accumulated entrepreneurial experience may create a unique knowledge base that lets the entrepreneur identify and exploit opportunities not readily recognizable by others. Anecdotal evidence in the entrepreneurship literature supports the notion that the distinctive knowledge base created by prior experience enables entrepreneurs to identify and exploit unique opportunities. In a qualitative study involving eight entrepreneurial ventures based on the same technology, Shane (2000) found that the distinctive knowledge base of each entrepreneur allowed them to identify and pursue very different opportunities. In a survey of 126 university students, Krueger (1993) showed that the breadth of exposure to entrepreneurial activities (either through own experience or the experience of others) related positively to the perceived feasibility and desirability of engaging in entrepreneurial activities. The existing empirical evidence is not conclusive, but highlights the possibility that accumulated entrepreneurial experience may systematically influence opportunity perception and exploitation.

Without explicitly considering the role of opportunity recognition, entrepreneurship research has investigated the relationship between entrepreneurial experience and organizational outcomes. Some comparative empirical research on novice

and experienced entrepreneurs has found no effect of accumulated entrepreneurial experience on organizational outcomes (Kolvereid & Bullvag, 1993; Westhead et al., 2003). The most recent research by Westhead et al. (2003), for example, is based on data collected from 354 ventures in Scotland. The authors report that ventures run by individuals with accumulated entrepreneurial experience did not differ (statistically) significantly from ventures run by inexperienced entrepreneurs in terms of organizational capabilities or profitability. Other studies have found a positive relationship between accumulated entrepreneurial experience and venture outcomes. Schollhammer's (1991) study of multiple entrepreneurship found that the success rate increased with an increasing number of entrepreneurial initiatives. Based on analyzing survey data gathered from 159 Norwegian ventures, Alsos and Kolvereid (1998) reported that accumulated entrepreneurial experience had a positive influence on gestation activities, but only when entrepreneurs retained control of a previous venture and ran it concurrently with the new venture.

The knowledge base developed by accumulated (entrepreneurial) experience may have unique implications in the context of entrepreneurial activity. The nature of prior entrepreneurial experience may influence whether expectations and beliefs held by the entrepreneur are applicable to a new venture. Furthermore, theoretical development and anecdotal evidence suggest that a distinctive knowledge base enables entrepreneurs to identify and exploit unique opportunities (Shane, 2000). Existing theory suggests that the recognition and exploitation of unique opportunities may mediate the relationship between accumulated entrepreneurial experience and venture outcomes. Empirical research that establishes a systematic link between the nature of accumulated

entrepreneurial experience and venture outcomes may provide additional evidence for the plausibility of such a relationship. For example, empirical research showing a systematic relationship between the dimensions of accumulated entrepreneurial experience and extraordinary venture outcomes (e.g. in terms of profitability or innovativeness) would provide support for the theoretical argument. Thus, a better understanding of entrepreneurial learning effects on venture outcomes would be beneficial.

Further theoretical development and empirical research is needed to understand the effect of entrepreneurial learning. Conceptual work in the entrepreneurship literature proposed that entrepreneurial learning affects venture outcomes (e.g., Politis, 2005; Minniti & Bygrave, 2001). The stated assumption is that the effect on venture outcomes (e.g., profitability) is positive (Minniti & Bygrave, 2001). The findings of empirical research on serial entrepreneurs suggests that research on entrepreneurial learning can benefit from attention to the well-developed literature on learning-by-doing in the organizational learning literature, which has systematically considered positive, negative, as well as neutral effects of prior experience. Preliminary evidence gathered by empirical research on the relationship between prior entrepreneurial experience and venture outcomes does not provide unequivocal support for a positive relationship. This suggests that additional research would aid in clarifying the effect of entrepreneurial experience. Research considering the dimensions of entrepreneurial experience as contingency factors may be a good starting point.

Conclusion of the Literature Review

This literature review has identified the gap in our understanding of organizational learning processes that is addressed by this dissertation. The theoretical

foundation for the framework developed in the next chapter has been reviewed and several ways in which this study can extend prior research have been identified. We currently do not know how the dimensions of accumulated experience affect organizational outcomes. Learning-by-doing creates a knowledge base that can affect behavior as well as subsequent learning-by-doing. Investigating the outcomes of entrepreneurial learning extends the limited prior research on individual learning and its cross-level effects on organizational outcomes. Prior organizational learning research suggests that execution errors, novelty of output, and financial performance are suitable outcome variables for a conceptual framework that seeks to model the effect of accumulated experience on organizational outcomes. The findings of this literature review guided the development of the conceptual framework outlined in the next chapter.

Investigating Entrepreneurial Learning in a Project Venture Setting

The characteristics of project ventures make them ideally suited for studying entrepreneurial learning. The temporary nature of this organizational form and the production of a distinct and clearly identifiable project deliverable are key features of project ventures. Project ventures are short-term organizational entities that combine several contributors for the purpose of delivering a product or service within a pre-determined time frame and budget (Sydow, Lindkvist, & DeFillippi, 2004; Schwab & Miner, 2008). Due to the temporary nature of project ventures, some of the learning mechanisms that organizational learning research has investigated in more permanent organizational forms are not relevant in the context of project organizing (e.g., the adaptation over time through the creation and modification of organizational routines). Instead, prior research has highlighted the role of individuals as well as higher-level

permanent organizations (in which projects are embedded) for cross-project learning. Prior research has found that overarching organizations can facilitate cross-project learning (Schwab, 2008). However, prior research has not systematically examined the individual in charge of project execution as enabler of cross-project learning. In the absence of higher-level permanent organizations, the individuals in charge of project execution should be even more important as enablers of cross-project learning.

The institutional environment of project ventures can provide basic role definitions and coordinating routines for the contributors of a project venture, but the temporary nature of project ventures does not permit organizational learning across tasks. Although project ventures are short-term organizational entities with a pre-determined timeline, the co-ordination of actors and activities takes place against the background of past experience and future expectations. Sydow and Staber (2002) state that project organizing depends on regulative and normative resources which give practices meaning that are furnished by supportive institutions in the surrounding organizational field. Jones (2001) describes the role of the institutional environment of the project-based U.S. motion picture industry in shaping the career of project contributors. Role expectations, conventions, and coordinating routines that are widely shared throughout the industry facilitate the collaboration of contributors in any project. The institutional environment of project ventures has been referred to as project ecologies (Grabher, 2004). Project ecologies include the project team, potentially a higher-level permanent organization in which the project is embedded, communities of practice, and the personal networks of the project team. Despite the embeddedness of project ventures, project-based organizing lacks the formal structures and incentives for cross-project learning (Ekstedt et al., 1999).

The mobility of project participants and a strong focus on deadlines constrains cross-level learning. Knowledge that is accumulated through the execution of a project venture is dispersed when the project team dissolves and its members go on to work on a different task with a new team (DeFillippi & Arthur, 1998). Prior research has also found that project organizing is characterized by an overarching focus on deadlines. This focus on deadlines creates an organizational culture that leaves little time to reflect on previous assignments (Hobday, 2000).

The production of a distinct project deliverable simplifies the evaluation of learning outcomes in project ventures compared to other organizational forms. The entire project effort culminates in the final project deliverable. Settings where project deliverables are fairly standardized on some dimensions provide another benefit for the investigation of organizational learning: comparability. Project ventures in the U.S. motion picture industry, for example, produce deliverables (i.e. motion pictures) that are fairly standardized in their technical aspects. This facilitates the evaluation of systematic differences in other respects.

Project ventures are an ideal setting in which to investigate entrepreneurial learning. The role of entrepreneurs in charge of executing project ventures in cross-project learning can be investigated better than in other settings, because other organizational learning mechanisms do not play a role. Furthermore, project ventures in the same industry that share key characteristics in common facilitate the investigation of systematic differences between project outcomes.

CHAPTER 3: HYPOTHESES

The organizational learning literature has accumulated systematic evidence that prior experience affects subsequent behavior (Cyert & March, 1963; Greve, 1998; Haunschild & Sullivan, 2002). The literature review has introduced entrepreneurial learning as a construct that links individual level learning with organizational outcomes of entrepreneurial ventures. (Minniti & Bygrave, 2001). This chapter employs insights from organizational learning research to develop a theory-based framework of hypotheses outlining the effect of depth and breadth of experience, as well as the interaction of both, on three organizational outcomes of project ventures: execution errors, novelty of project output, and financial performance. There is no reason to believe that depth or breadth of experience will have a uniform effect on all three of these outcomes. Rather, theoretical arguments suggest different implications for learning processes associated with different outcomes. Therefore, the hypotheses developed here propose a systematically different effect across the outcome variables. Empirically testing the developed framework of hypotheses with data on project ventures in the U.S. movie industry is a first step towards the development of a theoretical model of entrepreneurial learning.

The organizational learning literature recognizes that depth and breadth are crucial dimensions of prior experience (Beckman & Haunschild, 2002; Haunschild & Sullivan, 2002). Deep experience in one knowledge domain provides greater exposure to a restricted range of performance-relevant cause-effect relationships. Breadth of exposure to experience in multiple knowledge domains provides a broader, albeit more superficial, sample of cause-effect relationships. Based on the reviewed theory and empirical

evidence, both deep experience in a specific domain and breadth of experience across different domains should enable entrepreneurial learning, albeit in a different way. In addition, a combination of depth and breadth of experience may have unique implications for entrepreneurial learning. The empirical test of the hypotheses will focus on differences between different types of project ventures as a proxy for distinct knowledge domains. In line with this focus the hypotheses distinguish between accumulated experience with the same type of project ventures (i.e. depth of experience) and accumulated experience across different types of project ventures (i.e. breadth of experience). The motivation of the hypotheses outlined in this section will strive to illustrate potential for the hypothesized effects in the context of the empirical setting of this dissertation. This requires that I briefly foreshadow how I distinguished between the same and different types of projects for the empirical test of the hypotheses. Movie project ventures in the U.S. motion picture industry share key features due to industry-wide role definitions and conventions that provide the institutional underpinnings of project organization in this setting (Jones, 2001). However, movie project ventures differ in other important aspects as chapter four will discuss in detail. Project ventures that produce movies in the same genre are more similar to each other than project ventures that produce movies for different genres. Action movie projects, for example, involve the filming of highly dynamic and often high-paced movie sequences whereas the making of thrillers require directors to utilize camera and sound techniques to convey images and sound effects that later create suspense among the audience. I propose that executing different movie project ventures within the same genre has different learning implications than executing different movie project ventures in various genres. The potential

consequences for entrepreneurial learning in movie project ventures are outlined in the motivation of my hypotheses.

Depth of Entrepreneurial Experience

Learning curve research provides ample evidence that the repeated execution of the same task can have a positive effect on various task outcomes (e.g., Argote, 1999; Darr et al., 1995; Yelle, 1979). There is some evidence that this relationship between accumulated experience within a specific domain and task outcomes generalizes to the individual level of analysis (Kelsey et al, 1984), and research on entrepreneurial learning has begun to investigate the cross-level effects of accumulated experience with entrepreneurial activities on venture outcomes (Minniti & Bygrave, 2001).

The accumulation of experience within a particular knowledge domain provides increasingly more information about that knowledge domain, but that knowledge domain only. March (1991) proposed that this can shape the learning process such that reliability is increased and the probability of experimentation with new ways of doing something is decreased. Minniti and Bygrave (2001) also discuss the potential for a path dependent nature of entrepreneurial learning. In extension of March's theoretical argument, the following hypotheses propose a differential effect of depth of experience on the three outcome variables that are considered.

Avoidance of Execution Errors

Learning-by-doing can reduce the number of errors during the subsequent execution of the same type of projects. The literature in psychology and the organizational learning literature provide systematic evidence that repeated execution of activities reduces the number of mistakes individuals commit while executing a task

(Thurstone, 1919; Uzumeri & Nembhard, 1998). Such learning-by-doing is one of the underlying explanations researchers have offered to explain the well-established positive effect of learning curves in permanent organizations (Argote, 1999; Yelle, 1979).

Learning-by-doing across different project ventures may occur when entrepreneurs learn from their errors by identifying underlying causes and avoiding them in subsequent ventures (Minniti & Bygrave, 2001). The likelihood of such knowledge transfer across projects increases when subsequent project ventures are similar to those undertaken earlier. With similar project ventures entrepreneurs are likely to experience the same or similar potential causes of errors. The knowledge base provided by accumulated experience enables entrepreneurs to sidestep causes for mistakes or put in place provisions that remedy their impact. More depth of experience provides more reliable information based on more date points. In addition, current focal projects that are similar to other projects undertaken in the past increase the chance that entrepreneurs will actually apply their knowledge base and the chances that this knowledge application will improve project performance. Repeated experience in the past may also increase the entrepreneurs' confidence in the way they manage a project.

Error experiences provide guidance regarding what actions to repeat and what actions to avoid. There is the strong assumption in the literature on entrepreneurial learning that entrepreneurial experience allows individuals to learn not to repeat their mistakes and repeat behaviors that have yielded positive results in the past (e.g., Minniti & Bygrave, 2001). Avoiding errors promises to improve project performance and therefore represents an important learning outcome. Experiences during prior projects can enable an entrepreneur in charge of project execution to learn from prior mistakes and

avoid them during the execution of a new venture. The learning curve literature and empirical research of learning across projects suggest that such learning is contingent on reasonable levels of task and task context similarity.

In the context of movie project ventures, directors may learn to execute dynamic movie sequences (e.g., a car chase) more effectively and efficiently when they repeatedly execute project ventures designed to produce action movies. Although the set-up and approach may be different -- depending on the kind of action scene (e.g., a car chase versus a police pursuit on foot) -- directors may acquire general knowledge about the execution of highly dynamic action scenes from executing action movies. As they gain experience with such similar kinds of tasks, directors may be able to systematically reduce the sources of errors that would undermine the realism of the movie sequence.

I propose that knowledge accumulated during multiple prior projects of the same type (deep knowledge) decreases errors only for ventures that are similar in type. In other words, entrepreneurs that engaged in prior projects of the same type have a better understanding of potential causes of errors and a better chance to avoid them in the future. Formally, I hypothesize:

> **H1a: An entrepreneur's depth of experience with a specific type of project reduces the number of errors during the execution of future projects of the same type.**

Novelty of Project Outcomes

The knowledge base created by experience with the repeated execution of the same type of project can reduce the probability that entrepreneurs experiment with new ways of doing something and it can constrain the kind of opportunities that are recognized. Innovation can be an integral part of entrepreneurship (Schumpeter, 1934)

and project settings in particular have been considered a "hot bed" for innovation (e.g., Hobday, 2000). However, entrepreneurial activities may produce outcomes that vary in their degree of novelty. Entrepreneurs may start up a venture to manufacture and market an entirely new product or service, or they may create a venture designed to introduce an existing product or service to a new market (e.g., a new franchise restaurant). Here, I focus on the effect of prior project experience with a specific type of project on the degree of novelty of the product created by a current focal project venture of the same type.

Research on absorptive capacity in the learning literature has investigated the effect of accumulated experience on knowledge transformation and exploitation (Cohen & Levinthal, 1990; Lane & Lubatkin, 1998; Zahra & George, 2002). Part of this research indicates that accumulated experience can lead to competency traps which inhibit the ability to move beyond already established routines (Levitt & March, 1988; March, 1991). Research in psychology provides additional support for the constraining effect of depth of experience. There is indication in the literature on creativity that both knowledge depth and breadth are relevant for the innovation process (Gordon, 1961). Alone, knowledge depth decreases the likelihood of innovation because it tends to focus thinking on already known solutions (Adams, 1974, Amabile, 1998). Complementary research has found that increasing experience can channel thoughts in ways such that the experienced decision maker falls into mental ruts (e.g., Fiske & Taylor, 1991). Researchers of creativity have suggested that this phenomenon arises because knowledge depth encourages the narrow definition of a creative task or problem (de Bono, 1968).

Movie directors, for example, may be inclined to use similar storylines or depict characters in similar ways in different projects of the same type. This tendency is acknowledged in the motion picture industry and often prompts movie franchises built around a character or theme (e.g., James Bond, Lord of the Rings, etc.) to deliberately work with different directors for the installments of their franchise. The Harry Potter franchise, for example, is said to have worked with different directors to set apart the installments that were released in close sequence. The five Harry Potter movies released between 2001 and 2007 were directed by four different directors. Only the first two installments were directed by the same individual.

The entrepreneurship literature suggests another causal mechanism through which depth of experience may constrain the novelty of project outcomes. Related research suggests that the distinctive knowledge base created by prior experience enables entrepreneurs to identify and exploit unique opportunities (Shane, 2000; Krueger, 1993). Shane (2000) in particular showed that the unique prior experience of entrepreneurs determined the opportunities they perceived and exploited. Prior experience with the same type of project may increase the probability that entrepreneurs perceive and exploit opportunities that are similar to those exploited in prior project ventures. For example, movie directors may specialize in executing project ventures in the same genre that share similar features because they perceive opportunities associated with these features. Following the presented arguments -- indicating that depth of experience constraints subsequent behavior as well as the opportunity recognition of entrepreneurs -- I hypothesize:

H1b: An entrepreneur's depth of experience with a specific type of project decreases the novelty of project outcomes for projects of the same type.

Project Performance

Project performance is affected by a variety of factors, including execution errors, the ability to recognize attractive opportunities, and the novelty of project outcomes. Conceptual arguments and empirical findings suggest a positive relationship between depth of experience and project performance. Learning-by-doing research provides systematic evidence for the performance enhancing effect of accumulated experience (e.g., Darr et al., 1995; Kelsey et al., 1984). In line with this finding, entrepreneurial learning research has argued for a positive relationship between prior entrepreneurial experience and venture performance (Minniti & Bygrave, 2001). Some empirical research supports this argument. Schollhammer (1991) found that prior entrepreneurial experience increased the probability of a successful venture.

Support for a positive effect of depth of experience on project outcomes is also provided by the literature on new product development. The literature on product development has found evidence that the quality of execution increases the likelihood of commercial success of newly developed products (Brown & Eisenhardt, 1995; Cooper & Kleinschmidt, 1986, 1987). The avoidance of execution errors is a proxy for the quality of project execution. If depth of experience improves the quality of project execution (i.e. decreases the number of execution errors) and the quality of execution during development is positively related to the commercial success of new products, I would expect a positive relationship between depth of experience and project performance.

The effect of a knowledge base derived from accumulated entrepreneurial experience on opportunity recognition has been investigated by prior research, but the implications for project performance are not straightforward. Shane (2000) showed that the opportunities entrepreneurs recognized were systematically related to their prior entrepreneurial experience. Shane's qualitative study did not focus on venture outcomes and it did not investigate the effects of depth and breadth of knowledge. However, a review of the information provided by Shane indicates a trend: those ventures in the sample that had received venture capital funding and had created a product with high market potential were created by entrepreneurs with a more sophisticated knowledge base (created from education, work experience, or both). Thus, deep knowledge in a specific domain may improve an entrepreneur's propensity to recognize more attractive market opportunities in that domain.

The relationship between novelty of project outcomes and project performance is not straightforward as well. A cursory survey of various industries indicates that organizations frequently introduce and profitably marketed products with a low degree of novelty (often referred to as me-too products). Several automobile manufacturers successfully market their own version of the mini-van after Chrysler pioneered this concept. In some cases, the me-too product may even perform better than the original. Even in industries that seem to reward innovation, novelty does not necessarily translate into higher performance. The U.S. movie industry is an example. Often movies featuring the variation of a familiar story combined with a high quality execution results in higher box-office performance compared to the original movie, even though that does not have to be the case. 'Shrek 2', for example, far outperformed the prior installment of the

animated movie at the box-office. The first installments of 'Star Wars', 'Spiderman', and 'Men in Black', on the other hand, all performed better than the sequels that followed them. This suggests that novelty is not a necessary condition for high project performance in an empirical context such as the movie industry and the performance of projects can, but does not always, benefit from repeating elements of prior projects.

The conceptual arguments and empirical evidence presented regarding the effect of accumulated prior experience with the same type of project on subsequent venture performance are not conclusive. However, there are conceptual arguments that support a positive effect of depth of experience on project performance and what I consider here as depth of experience (experience with prior projects of similar type) has been shown to improve task performance of individuals (Saraswat & Gorgone, 1990) and project teams (Uzumeri & Nembhard, 1998). Thus, I formally state the following hypothesis:

> **H1c: An entrepreneur's depth of experience with a specific type of project increases project performance for projects of the same type.**

Breadth of Entrepreneurial Experience

I propose that experience with different types of project ventures has unique learning implications. A central thesis of this study is that depth and breadth of experience have different implications for entrepreneurial learning and therefore affect the outcomes of project ventures differently. Both dimensions of experience are not mutually exclusive. Entrepreneurs can have depth of experience, or breadth of experience, or both depth and breadth of experience. Hypotheses regarding the interaction of depth and breadth of experience are developed in a later section.

Breadth of experience has advantages as well as disadvantages. The creativity literature suggest that experience with the execution of different types of projects can create a knowledge base with more unique information that can benefit creative problem solving and can broaden the scope of perceived opportunities. Prior organizational learning research suggests that the positive performance effects of learning-by-doing are associated with the repeated execution of the same type of project (Yelle, 1979; Argote, 1999). This section outlines the effect of breadth of experience on the learning outcomes considered in this dissertation.

Avoidance of Execution Errors

Deep experience from similar prior projects can lead to the better understanding of cause-effect relationships based on trial-and-error learning. In contrast, breadth of experiences with different types of projects provides an exposure to a wide, albeit more superficial, set of potentially diverse cause-effect relationships. As a consequence, differences between types of projects can increase the probability of superstitious learning, which occurs when "the subjective experience of learning is compelling, but the connections between actions and outcomes are mis-specified" Levitt & March, 1988: p. 325). The motivation of hypothesis H1a suggested two consequences of accumulated experience with projects of the same type: entrepreneurs gain competence in sidestepping errors or avoiding problems, and they gain confidence in their competence. The latter increases the probability that entrepreneurs will actually apply their knowledge base and the chances that this knowledge application will improve project execution and outcomes. Different types of projects pose different challenges and provide different opportunities for errors, reducing the probability that information from one type of project is applicable

in another type of project. What works in one type of project may not work in another type of project and vice-versa. Levitt and March (1988) suggest that the incorrect generalization of experience creates negative learning effects.

The context of entrepreneurial activity and the characteristics of entrepreneurs increase the probability of superstitious learning. In the context of entrepreneurial activities the relationship between causes and effects is often complex and in most cases uncertain. Prior research has found that entrepreneurs are especially prone to manifest heuristics and biases in decision making due to the complexity and uncertainty they confront in their activities (Barney & Busenitz, 1997). Research has also found that entrepreneurs have a tendency to attribute positive outcomes to their own actions and negative outcomes to factors not under their control (Rogoff et al., 2004). This suggests that entrepreneurs are prone to draw inferences about cause and effect relationships and use these inferences as a basis for future decision making. While making inferences entrepreneurs may fail to appreciate or underestimate the context-dependency of the observed cause-effect relationships. As a consequence entrepreneurs would be prone to apply the decision-making heuristics generated through prior venture experience to a new venture, even if the underlying inferences are not valid or useful in the context of the new venture. In the motion picture setting this may, for example, mean that a director with prior experience in directing dramas may inappropriately assume that the approach to set management and interaction with the cast he has honed in previous projects will serve him well in a subsequent project venture focusing on the production of an action movie. Prior research suggest that entrepreneurs are often overconfident in their inferences, increasing the probability that knowledge gained from prior experience is generalized and

applied in other projects, even if these other projects are different. In particular inferences linking positive outcomes to actions undertaken by the entrepreneurs are likely to be generalized to other situations because of the self-attribution bias that entrepreneurs can have (Busenitz & Barney, 1997).

Superficial experience in various domains increases the chance of superstitious learning as project entrepreneurs draw faulty conclusions about the actions that caused valuable outcomes based on misspecified means-ends relationships (Levitt & March, 1988). Superstitious learning can include incorrect mental models of potential causes for problems and errors during project execution. Thus, I hypothesize:

H2a: An entrepreneur's breadth of experience with different types of projects increases the number of errors during project execution.

Novelty of Project Outcomes

Breadth of experience can help entrepreneurs avoid competency traps and can benefit creative thinking. It can also change the way opportunities are perceived and evaluated. The ability to generate novel outcomes is a function of experimenting with new ways of doing things (March, 1991). Exposure to a variety of knowledge domains makes diverse experiences available to entrepreneurs, which may help them to break out of perceptual and cognitive patterns limiting their choice set. In this case, breadth of experience can serve as an important antidote against defining a new creative problem-solving task too narrowly or perceiving only those opportunities within a narrow domain.

The benefits of breadth of experience for novelty have been recognized in the organizational learning and the creativity literature. Cohen and Levinthal have suggested that "knowledge diversity [also] facilitates the innovative process by enabling the

individual to make novel associations and linkages" (2000: p. 300). Research on creativity provides support for the claim that breadth of experience increases the propensity of entrepreneurs to experiment with novel ideas and to explore the potential of novel resource combinations. Knowledge breadth facilitates lateral thinking (de Bono, 1968) that can help individuals broaden their definition of the creative problem (Adams, 1974). A richer basis of diverse experience to draw from can facilitate cognitive re-combinations and unusual connections (Mumford & Gustafson, 1988; Simonton, 1999). Thus, the exposure to a greater variety of ideas can increase individual creativity (Parnes & Noller, 1972). Executing different movie projects across a variety of genres may allow movie directors to build a more diverse repertoire of techniques and ideas that can be recombined in subsequent project ventures. A movie director with experience in the drama and comedy genre, for example, may subsequently be able to push the envelope when directing an action movie while a director with only experience in the action genre may tend to produce a more stereotypical action movie.

Entrepreneurship research on opportunity recognition suggests another way in which breadth of experience can increase the novelty of venture outcomes: broader perception of opportunities and more favorable evaluation of the feasibility of novel ideas. Prior experience limits the scope of opportunities an entrepreneur perceives (Shane, 2000). An entrepreneur's unique knowledge base contains information associated with opportunities that are related to prior experience, but it does not provide information associated with opportunities that are unrelated to prior experience. Thus, breadth of experience with different types of projects provides information associated with a broader range of opportunities than prior experience with only the same type of project. Apart

from providing more unique information, the diversity of information provided by breadth of experience can provide the foundation for enhanced creativity in the opportunity recognition process itself (Mumford & Gustafson, 1988; Simonton, 1999). Cognitive re-combinations and unusual connections may reveal opportunities never before imagined. Experience with different types of projects can also increase the belief that the exploitation of an opportunity is feasible and desirable (Krueger, 1993). Given the uncertainty involved with the opportunity recognition process, a strong belief in the feasibility and desirability of exploiting an opportunity should increase the probability that entrepreneurs act upon creative ideas and have the commitment to overcome resistance by relevant others (e.g., investors, business-partners, employees, etc.) who do not (yet) perceive the same opportunity. Movie directors that have gained experience across a variety of genres may recognize unique opportunities that arise from the recombination of project features or approaches used in different genres. Their diversity of experience with project ventures in different genres may provide them with the confidence to pursue such opportunities and the motivation to convince other project contributors to support them in that endeavor.

Based on the above arguments, it is plausible that breath of experience, in terms of prior experience across a variety of different types of projects, increases the likelihood that entrepreneurs perceive novel and creative opportunities and experiment with new ideas during the execution of a project venture. Regarding the effect of knowledge breadth on the innovativeness of project deliverables produced by subsequent projects, I hypothesize:

H2b: An entrepreneur's breadth of experience with different types of projects increases the novelty of project outcomes.

Project Performance

Learning research highlights that diverse experience can enhance performance through the identification and realization of more attractive opportunities. Beckman and Haunschild (2002) showed that not simply access to any prior experience counts, but that access to heterogeneous experience helps top management teams achieve better outcomes in merger and acquisition deals. Merger and acquisition decisions are characterized by a high level of uncertainty about acquisition premiums. Access to others that had accumulated experience with transactions involving more diverse premiums helped acquirers identify and evaluate potential acquisition targets. In addition to their quantitative analyses of access to experience and merger and acquisition deals, the authors gathered interviewed organizational decision makers to better understand the underlying cause for their finding. The qualitative data they gathered indicated that access to diversity of experience provided more non-redundant information that aided in evaluating potential acquisition targets and helped making a deal work after a specific target was selected. Breadth of entrepreneurial experience with different types of projects can as well provide more non-redundant information, allowing entrepreneurs to select more attractive projects to pursue.

Prior research indicates that the integration of diverse knowledge can increase creativity in the recognition of opportunities and during the execution of projects designed to create entertainment products. Recently, Taylor and Greve (2006) showed the effects of diversity of experience on the individual and group level of analysis by

studying authors and author teams engaged in projects creating comic books. They found that knowledge breadth across different types of projects increased the variance of comic book performance, while extensive breadth of experience produced outputs with high average performance. The performance of projects led by individual creators seems to benefit especially if the creators had previously gained extensive experience across different types of projects. Integrating diverse information provided by breadth of experience with different types of projects seemed to be challenging but especially rewarding if it was accomplished. The challenge of integrating diverse information provided by experience with different types of projects may sometimes be overwhelming and can therefore create integration challenges. However, if the integration challenges are overcome, the diversity of experience may enable the identification and realization of extraordinary outcomes.

The emerging literature on entrepreneurship has not yet examined the relationship between breadth (or depth) of experience and venture outcomes. However, existing entrepreneurship research on the link between opportunity recognition and accumulated experience provides some support for a positive effect of breadth of experience on the recognition of more attractive opportunities (Shane, 2000). We can consider the implications in the context of the empirical setting of this study. If each type of project provides information about future opportunities associated with the same type of project but not information about opportunities associated with other types of projects, then directors with experience across various types of projects should have gained information about more opportunities overall than directors with less diverse prior venture experience. Moreover, movie directors with more diverse experience across various types of projects

should also be better able to recognize opportunities that arise from combining elements of different types of movie projects. A movie director having experience with action as well as horror movies, for example, has the opportunity to improve the viewer experience of a horror movie by exploiting special effect techniques learned during the previous execution of an action movie.

In sum, breadth of experience can help entrepreneurs identify projects with higher profit potential. For the execution of such projects breadth of experience can pose a challenge that increases the volatility of but also the average of project performance outcomes. Thus, I hypothesize that:

> **H2c: An entrepreneur's breadth of work experience with different types of projects increases project performance.**

Joint Effects of Experience Dimensions

I have argued that depth and breadth of experience have unique effects on the learning outcomes this study considers. However, conceptual considerations suggest that the effects of these different types of knowledge are not independent. Movie directors, and other project managers in general, may accumulate experience both with the same type of projects as well as with different types of projects. The interaction effect of depth and breadth of experience is not straightforward, considering the different effects on project venture outcomes outlined previously. In the following section I will outline the nature of potential interaction effects and the corresponding implications for each of the three learning outcomes considered in this study.

In some cases the literature provides compelling theoretical arguments for opposing joint effects of different learning processes. Due to the paucity of guidance

from prior empirical research in this area, especially with regard to project-venture settings, I formulate competing hypotheses whenever plausible rival theoretical perspectives suggest it.

Joint Effect of Knowledge Depth and Breadth on Error Avoidance

Hypothesis H1a argues that accumulated experiences with the same type of project ventures will enhance the entrepreneur's ability to avoid execution errors in future projects. H2a argues that diverse experience across different types of project ventures undermines useful learning-by-doing by increasing the likelihood of superstitious learning. As a result, depth and breadth of experience in combination can lead to higher levels of execution errors in future projects. I propose, however, that a foundation of experience in a specific knowledge domain can help entrepreneurs avoid superstitious learning. Entrepreneurs' depth of experience with the same type of project ventures builds absorptive capacity, which can help them to correctly evaluate the relevance and value of information gained from experience with other types of projects (Cohen & Levinthal, 1990). As argued in the motivation of hypotheses 2a, more diverse experience across different types of projects provides more non-redundant information to entrepreneurs. However, the diversity of experiences and the associated information makes it more difficult for entrepreneurs to understand its implications and therefore increases the probability of superstitious learning. If depth of experience increases the probability of useful inferences (as argued in the motivation of hypothesis H1a) related to projects of the same type, combining the resulting knowledge base with additional non-redundant information (provided by breadth of experience) can increase the probability of

additional useful inferences. The interaction of depth and breadth of experience can enhance the capacity to create new knowledge (Cohen & Levinthal, 2000).

Based on the outlined logic, I expect a supplemental effect of depth and breadth of experience on error avoidance. Increasing depth of experience will decrease errors committed during new project execution more when breadth of experience is high and to a lesser extent if breadth is low. Accumulated experience in a specific knowledge domain (depth of experience) can help an entrepreneur see the relevance of knowledge from another domain. For example, repeatedly encountering the issue of exposed video or audio equipment during shooting of dynamic scenes in the comedy genre project ventures can enable a director to see the relevance of set-up arrangements that avoid the problem in other genre projects (e.g. action genre). Thus, a director with accumulated experience in the comedy genre could benefit from experience with the execution of a project in a different genre. Depth of experience in the comedy genre can help the director identify and assimilate relevant insights that he or she can then use in future projects. Based on the arguments outlined here I hypothesize:

H3a: An entrepreneur's breadth of experience strengthens the positive effect of depth of experience on error avoidance.

Hypothesis H4a posits that entrepreneurs with accumulated experience in a specific domain will be better able to see the relevance of knowledge from other domains that they have some experience with. However, another stream of research in the organizational learning literature suggests an alternative perspective. Argote's (1999) research on knowledge decay has highlighted the negative consequences of interrupting learning processes. Executing project ventures of a different type can interrupt the

accumulation of experience across projects of the same type. Receiving and processing new information that is unrelated to previously received information may decrease the probability that the previously received information will be remembered. Research on individual learning provides some support for this argument. Harlow (1959) suggested that a series of experiences with related problems are necessary to learn how to solve these problems. However, if a series such learning experiences are interrupted before problem solving is reliably learned little knowledge transfer may occur. A movie director may, for example, begin to realize that a particular non-standard set arrangement works especially well for action movies. However, if he works on a comedy next (or a different type of project or a series of different types of projects) he may not remember about the benefits of the specific set arrangement the next time he directs an action movie project. Even if the director recalls the alternative set arrangement, he may not choose to use it over a standard set arrangement during the execution of the next action movie project, because the change to the execution of a different type of movie occurred before the director had developed confidence in the benefits of the alternative set arrangement for action movies. Following this logic, accumulated experience with a specific type of project (depth of experience) may have a weaker effect on error avoidance for project managers with higher levels of experience across different types of projects (breadth of experience). I formulate the following counterhypothesis to H4a:

> **H3b: An entrepreneur's breadth of experience weakens the positive effect of depth of experience on error avoidance.**

Joint Effect of Knowledge Depth and Breadth on Novelty

I proposed that repeated experience with the same type of projects (depth of knowledge) is likely to constrain entrepreneurial behavior around known solutions and therefore reduce the probability of novel project outcomes (H1b). However, in conjunction with experience in the execution of diverse types of entrepreneurial projects (breadth of experience), depth of experience can facilitate the integration of new ideas and novel insights towards the creation of innovative project outcomes. The combination of depth and breadth of experience should also facilitate creative thinking based on mutually incompatible frames of reference (Koestler, 1964). Increased familiarity with one frame of reference can make entrepreneurs more alert to ways in which a second frame of reference is incompatible or challenges existing notions and expectations.

Depth combined with breadth of experience may also increase the confidence that novel ideas represent viable opportunities. Confidence in one's ability to judge what works and what does not work in the context of the same type of project (due to depth of experience) may increase confidence in the viability of opportunities that are perceived based on the information provided by breadth of experience.

The findings of prior research support a supplemental interaction effect between depth and breadth of experience. The combination of high breadth of experience with high depth of experience may have a stronger joint positive effect on novelty of project outcomes. For example, directors with accumulated experience in a specific genre (depth of experience) that have executed projects in other genres as well (breadth of experience) will be better able to import aspects of character development and story lines from those other genres. Their deep knowledge in the specific knowledge domain allows them to

better integrate these novelties into the existing frame of reference for a genre. I formulate the following hypothesis:

H4a: An entrepreneur's depth of experience strengthens the positive effect of breadth of experience on novelty of project outcomes.

This hypothesis builds on the premise that depth of experience will foremost increase an entrepreneur's ability to integrate insights from diverse knowledge domains and use this knowledge in new ways. In the motivation of hypothesis H1b, however, I have discussed a potential negative consequence of accumulated experience in a specific knowledge domain: such accumulated experience can lead to competency traps, restricting thinking around known solutions and reducing the likelihood of innovation. This effect of accumulated experience has been discussed in the creativity (Adams, 1974; de Bono, 1968) and organizational learning literature (Levitt & March, 1988; March, 1991). Thus, it is possible that an entrepreneur's breadth of experience has only a strong positive effect on novelty at low levels of depth of experience. As depth of an entrepreneur's experience in a specific knowledge domain increases, this experience can start to dominate his or her thinking and can consequently weaken the positive effect of breadth of experience on novelty. A movie director who has depth of experience in one genre may be prone to overlook valuable insights when occasionally executing a project venture in a different genre. I posit the corresponding counterhypothesis to H5a:

H4b: An entrepreneur's depth of experience weakens the positive effect of breadth of experience on novelty of project outcomes.

Joint Effects of Knowledge Depth and Breadth and Project Performance

I have previously hypothesized positive main effects of depth (H1c) and breadth of experience (H2c) on project performance. I briefly recap the causal arguments before I

discuss the interaction of both experience sub-dimensions. Depth of experience can lead to a better quality of project execution, increasing the probability of commercial success even though the novelty of the project outcome may not be high. Breadth of experience can improve the choice of projects designed to produce novel outcomes.

Depth and breadth of experience can reinforce each other's positive effects when depth of experience aids entrepreneurs in overcoming the integration challenges associated with creativity. I expect that the effects of depth of experience and breadth of experience are mutually reinforcing each other. Entrepreneurs that previously developed a knowledge base through experience with the same type of projects (i.e. depth of knowledge) will be better able to integrate and exploit experience in other knowledge domains (i.e. breadth of knowledge) to execute higher quality and more innovative project ventures (Cohen & Levinthal, 2000; Zahra & George, 2002). Integrating diverse information (provided by breadth of experience) in the creative processes required to develop novel outcomes poses integration challenges (Taylor & Greve, 2006). A richer knowledge base in one area (due to depth of experience) may help to overcome these integration challenges by providing a better foundation for new associations and increased confidence in the benefits of novel combinations. A director that has learned how computer animation can enhance the viewing experience of science-fiction movies while executing a series of these types of movies may be better able and more motivated to adapt the technology to enhance the viewing experience of a car chase in an action movie. Especially the confidence based on depth of experience may be important, as the creativity literature emphasizes that task motivation for creativity is important for generating creative outcomes (Amabile, 1983; Drazin et al., 1999). High confidence in

their knowledge and skills may increase the probability that entrepreneurs are motivated to experiment with novel ways of doing something. Based on the conceptual arguments presented above, I hypothesize:

H5a: An entrepreneur's breadth of experience strengthens the positive effect of depth of experience on project performance.

A substitutional interaction effect of depth and breadth of experience would be conceivable as well. Hypothesis 6a proposes a supplemental effect of breadth of experience and depth of experience. It presupposes that both breadth and depth of an entrepreneur's experience add unique information to the knowledge available for his or her future project ventures. If, however, both experience with the execution of project ventures within (depth of experience) and across (breadth of experience) knowledge domains predominantly contributes general knowledge about project execution, then both types of accumulated experience would provide redundant knowledge. With breadth of knowledge and depth of knowledge contributing predominantly redundant knowledge, I would expect a substitutional joint effect of both types of experience, not the supplemental effect hypothesized in H6a.

A director may, for example, have a thematic orientation and even though he executes different types of movies he tends to revisit and focus on a common theme (e.g. family relationships as background for a comedies, dramas, or even thrillers). Executing different types of projects may provide less unique and more redundant information. Thematic orientations are not uncommon among movie directors. Woody Allen, for example, reportedly likes to incorporate obsessions into his movies.

Based on the argument developed here, a substitutional interaction of depth and

breadth is possible. In line with the formulation of the previous interaction hypotheses focusing on the effect of breadth of experience on the effect of depth of experience I formulate the following counterhypotheses to H6a:

H5b: An entrepreneur's breadth of experience weakens the positive effect of depth of experience on project performance.

This chapter has outlined the independent and joint effects of two sub-dimensions of accumulated experience on project venture outcomes. The motivation of the hypotheses has outlined why this dissertation proposes and investigates differential effects of depth and breadth of accumulated experience on three qualitatively different project outcomes: execution errors, degree of novelty of project outcomes, and the revenue generated by project outcomes. Table 1 on the next page summarizes the hypotheses of this dissertation. The next chapter discusses the empirical setting in which the outlined hypotheses have been tested. At the end of chapter four I will discuss in more detail why the categorization of movie project ventures provides a way to distinguish between project ventures of the same type and project ventures of different type.

Table 1: Summary of the Hypotheses Developed and Tested in this Dissertation

Hypothesis	Experience Dimension	Effect	Project Outcome
H1a	Depth	-	Execution Errors
H1b	Depth	-	Project Outcome Novelty
H1c	Depth	+	Project Performance
H2a	Breadth	+	Execution Errors
H2b	Breadth	+	Project Outcome Novelty
H2c	Breadth	+	Project Performance
H3a	Depth & Breadth	+	Execution Errors
H3b	Depth & Breadth	-	
H4a	Depth & Breadth	+	Project Outcome Novelty
H4b	Depth & Breadth	-	
H5a	Depth & Breadth	+	Project Performance
H5b	Depth & Breadth	-	

CHAPTER 4: SETTING – THE U.S. MOVIE INDUSTRY

This chapter describes the empirical context in which the hypotheses outlined previously were tested. It reviews findings of prior research on the motion picture industry relevant to this dissertation. The focus is on the overall organization of production in the motion picture industry, the characteristics of the environment in which movie project ventures operate, and the way execution in project ventures proceeds as well as the individuals involved. Movie genres are discussed as important knowledge domains in the motion picture industry and the benefits of the comprehensive and independent documentation of industry information are discussed.

The movie business is a vibrant sector of the U.S. economy. In 2004 the U.S. motion picture industry generated $9 billion in revenues inside the United States and Canada from theatrical ticket sales alone. Foreign markets generate another $11 billion in revenue (Eliashberg, Elberse, & Lenders, 2006). The motion picture industry provides considerable employment opportunities as well. In the United States the industry employs over half a million people (U.S. Bureau of Labor Statistics, 2008).

Emergence of a Project-Network Industry Structure

The setting for this study differs in important aspects from the setting of other recent organizational studies in the U.S. motion picture industry (e.g., Mezias & Mezias, 2000; Perretti & Negro, 2006, 2007; Schwab, 2007; Schwab & Miner, 2008), because these studies focused on the way the industry operated during its 'Golden Age' (i.e. the time between 1920 and the early 1940s). The empirical context of this study has resulted from important changes since that time.

Changes in the structure of the industry altered the competitive environment and the mode of production in the U.S. motion picture industry. The motion picture industry emerged in its current form after a considerable shift during the time between the 1950s and the 1970s (Christopherson & Storper, 1989). Prior to the shift, the industry was dominated by vertically integrated firms (i.e. the major studios). The production process itself was similar to the one used today, but all aspects of the execution of movie projects were controlled by the major studios (e.g., Warner Brothers, Metro-Goldwyn-Mayer, and 20th Century Fox). The major studios employed permanent staff that produced standardized pictures in volume. This mass-production approach in the motion picture industry emerged in the 1920s and prevailed through the 1940s. The approach has become known as the studio system (Christopherson & Storper, 1989). Partially enabled by their oligopolistic market positions, the major studios devised a number of approaches to mitigate the uncertainty associated with producing and marketing movies and thereby reduced their business risk. New movies were made based on standardized formulas (e.g. storyline, characters, etc.) that had proved successful in past movies. The major studios also controlled key contributors such as stars and technical personnel and deployed them strategically. Furthermore, they used their market position to effectively control the distribution of movies. The major studios directly owned many of the existing movie theaters and theater chains at the time; the remaining independent movie theaters or theater chains had to acquire movies of lesser quality along with higher quality and potentially very successful movies.

Two developments lead to the demise of the studio system (Storper, 1989): the emergence of a powerful substitute and the forced breakup of the major studio's

dominant market position. Beginning in the late 1940s and continuing in the early 1950s, the size of the market for movies declined in concurrence with the advent and the proliferation of the television in the United States. Another development accelerated the decline of the studio system: as a result of the Paramount antitrust decision in 1948, the dominance of the major studios declined, as they had to change their business model and practices. As one consequence of the Paramount antitrust decision, for example, movie studios had to divest their distribution operation. Henceforth, studios focused increasingly on financing and distributing movies, leaving the production to independent firms (some of which were established for the production of a single movie). The shift in the industry increased the uncertainty and competitive intensity in the industry (Christopherson & Storper, 1989).

Network of Project Ventures

After the advent of the television and the 1948 antitrust decision the motion picture industry changed gradually. Research has convincingly argued that for two decades now the motion picture industry in the United States has been characterized by a project-based network organization (Hirsch, 1972; Miles & Snow, 1986; Powell, 1990; Reich, 1991). The production of unique products is organized in projects rather than permanent organizations, and employment is organized such that contributors move from project to project instead of being steadily employed by one organization (Faulkner, 1987; Eccles, 1981; Peterson & Berger, 1971). This form of organizing has been found in a variety of other industries as well, including the construction industry (Eccles, 1981) and the semiconductor industry (Saxenian, 1990).

Project networks can provide unique flexibility advantages. Jones (2001) argues that two aspects are characteristic for project networks: they focus on the execution of complex and non-routine tasks and they operate in dynamic and uncertain environments. Project organization facilitates horizontal information flows and thereby reduces the time required to execute complex tasks (Clark & Fujimoto, 1989; Imai, Nonaka, & Takeuchi, 1985). Unpredictable and quickly shifting consumer preferences induce the uncertainty in the movie industry. Robins (1993) argued that project organization prevails in the movie industry as a way to deal with the uncertainty through adaptation and innovation.

Uncertainty and Motion Picture Performance

The distribution of gross box-office receipts characterizes the uncertainty prevailing in the motion picture industry. On average, a movie released during the timeframe of this study grossed a little over 15 million U.S. dollars at the box-office. Figure 1 illustrates the average performance (as measured by gross box-office receipts) of movies released in each year during the time frame of this study. In contrast, the gross box-office receipts for Spider-Man, the best performing movie between 2000 and 2005 and currently the eighth best performing movie overall, were over 400 million U.S. dollars.

This comparison illustrates a key property of motion picture box-office performance and the competitive environment of movie project ventures, which has been the subject of prior academic research (e.g., Ravid, 1999; De Vany & Walls, 1996, 1999, 2002; 2004; De Vany, 2004; Hennig-Thurau, Houston, & Sridhar, 2006). The distribution of box-office revenues does not conform to a standard normal distribution. DeVany and Walls showed that box-office receipts have a distribution with an infinite variance and

heavy tails. The mean of this distribution is dominated by rare blockbuster movies located in the far right tail. According to DeVany and Walls, "there is no typical movie because box office revenues do not converge to an average, they diverge over all scales" (1999: p.314). The authors conclude that these characteristics of the movie industry as it exists today make it especially risky.

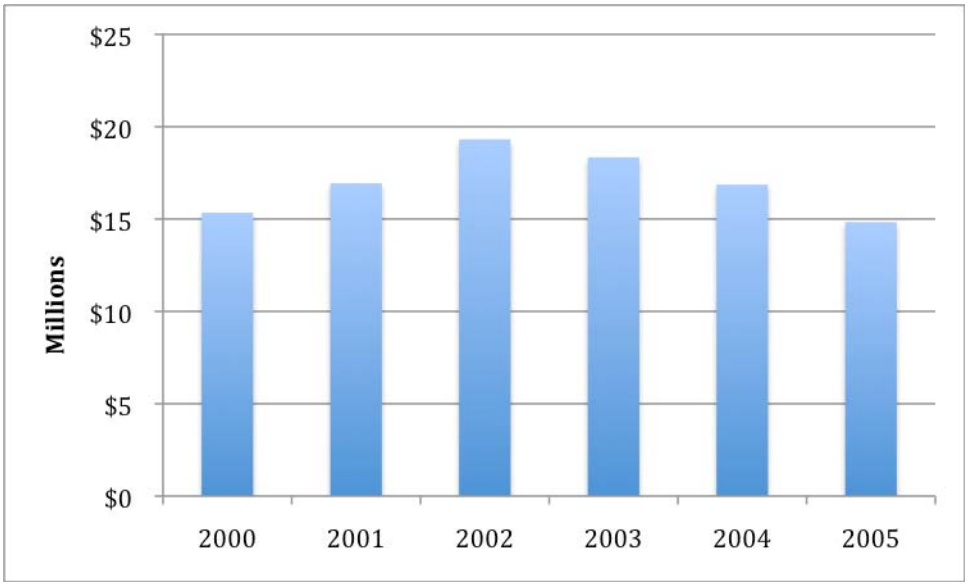

Figure 2: Average Movie Performance Across Time

The characteristics of consumption are an important contributor to the uncertainty in the motion picture industry and research raises doubts about the effectiveness of any efforts designed to mitigate this uncertainty. DeVany and Walls (2004) argue that a bandwagon effect due to the dynamic interaction of moviegoers is an important underlying cause for the uncertainty in the motion picture industry. Movies that start out well at the box-office receive media coverage and become the subject of word-of-mouth advertising. This can create momentum among moviegoers, resulting in high box-office

performance. However, because the process is highly dynamic this outcome is very uncertain.

Research has examined the role of various factors in predicting box office hits (i.e. movies with extremely positive box office performance) but has found no conclusive evidence suggesting reliable key success factors. Two approaches to dealing with uncertainty have endured among industry participants from the era of the studio system: the casting of star actors and the attempt to influence the audience through marketing efforts. Empirical research raises doubts about the effectiveness of both. Ravid (1999) found that the involvement of star actors would seem to increase box office revenues if budget expenditures are not taken into account. The author's study found that any big budget investment increased box-office revenues. Hennig-Thurau et al. (2006) showed that movie quality influenced box office revenues both in the short- and long-term, whereas marketing efforts primarily influence early box office revenues. Having done various studies on box-office performance in the movie industry, DeVandy and Walls (1999) concluded that neither star actors nor marketing efforts cause hit movies. The authors showed, for example, that movies with star actors are still highly risky. These movies have higher revenue expectations, but an infinite variance. Specifically, DeVandy and Walls argued that the proliferation of information (through media coverage and word-of-mouth) during the timeframe in which the movie is screened "can evolve along so many paths that it is impossible to attribute the success of a movie to individual causal factors" (1999: p. 314). Some movie industry insiders share DeVandy and Walls view. Commenting on the factors creating a box-office hit movie, novelist and screenwriter

William Goldman (1983) wrote in his well-known book “Adventures in the Screen Trade", “Nobody Knows Anything.”

Motion Picture Production – Working Within and Across Projects

Film projects are commercial ventures, focused on the development of new entertainment products that entail a series of creative decisions with implications both for the artistic as well as the commercial appeal of the final outcome. Key features of the network organization in the motion picture industry enable the dynamic formation of projects and the work within them.

The changes in the motion picture industry outlined above have changed project venture objectives and the role of the director. Over the course of the latter half of the 20th century film production has moved away from the mere translation of movie scripts into visual presentations that marked the early period. Contemporary film directors enjoy creative liberty that enables some of them to establish their unique visual style in the execution of a movie project. Film directors have substantial control of the artistic and dramatic aspects of transforming a movie script into an audio-visual end product (Buckland, 2003).

A motion picture is created in three phases: preproduction, production, and postproduction (U.S. Department of Labor, 2001). Preproduction, the planning phase, includes budgeting, casting, identifying the right location for the filming of movie sequences, set and costume design and construction, and scheduling. The actual making of the film takes lace in the production phase. Feature film production can easily involve over a hundred people. During the postproduction phase the film is shaped into its final form in editing rooms and recording studios.

Organization and Management of Projects in the Motion Picture Industry

The professional culture and norms of the motion picture industry facilitates the collaboration of key contributors such as directors, actors, cinematographers, and editors during movie projects through routines, role definitions, and conventions that are applicable industry-wide. The industry culture also influences the organizational behavior and career development of contributors (Jones, 2001).

Movie projects can involve up to several hundred contributors in various roles. The roles of the most essential contributors and the focus of their work can be described generally for all kinds of movie projects (U.S. Department of Labor, 2001). Some contributors work in all three phases of a movie project. Producers look for ideas that they believe can be turned into lucrative film projects or television shows. They do so by viewing many films, reading manuscripts, and establishing and maintain contacts with literary agents and publishers. Producers provide or find financing for the production of a movie. Directors interpret the script and develop its thematic and visual images for the film. They also are involved in every stage of production. Directors may supervise hundreds of people, from screenwriters to costume, lighting, and set designers. First and foremost, directors are in charge of all technical and artistic aspects of a movie project. Their responsibilities include: conducting auditions and rehearsals as well as approving filming locations, scenery, costumes, choreography, and music. Directors manage the entire cast and crew during shooting. To be successful directors must know how to hire the right people and create effective teams. In organizing the production, directors work with mid-level managers who oversee different aspects of movie project ventures:

assistant directors (or first and second assistants) help directors handle the transportation of equipment, arrange for food and accommodations, and hire extras (i.e. performers who appear in the film but have no text).

Some contributors are only involved in certain phases of movie production. Actors and actresses only contribute during the production phase. They act out the roles provided by the movie's script according to the direction provided by the director. Only a small number of actors and actresses achieve a high level of recognition in the motion picture industry. Many are cast in supporting roles or as extras. Some of the technical contributors are also only involved during the production phase of the project: cinematographers, camera operators, and gaffers. These contributors work together to capture the scenes in the script on film. Cinematographers work closely with the director to compose the film shots to reflect the mood and image the director wishes to create. Cinematographers do not usually operate the camera; instead, they plan and coordinate the actual filming. Camera operators typically perform the actual shooting of the movie's sequences. Movie editors become involved during the postproduction phase of a project. After a film is shot and processed, they study footage, select the best shots, and assemble them in the most effective way. Editors are guided by the director's intention in creating dramatic continuity and the right pace for the desired mood.

No two movie projects are the same, but important basic coordinating mechanisms are shared across movie projects. The fundamental industry-wide routines and conventions for the coordination of the various roles performed by project participants in movie production are stable and do not have to be recreated for each project (Faulkner, 1987). As a consequence, movie projects can assemble a cast and crew

of previously unacquainted contributors to collaborate for the production of single movie (Becker, 1982; Goodman & Goodman, 1972; 1976). After a project concludes the project team disbands and the contributors move on to become part of a different project team designed to produce another, potentially very different type of movie. Some individuals may specialize in contributing to certain types of projects (e.g., a cameraman may specialize on filming high-paced and very dynamic sequences in action movies), but the basic similarities across projects allow them to potentially contribute to any type of movie project.

Industry-wide performance feedback mechanisms, including movie credits and word-of-mouth can motivate contributors and can influence their careers (Jones, 2001). The contribution of key cast and crewmembers of each project is documented through the credits at the end of each movie. Inferences based on the relative performance of projects an individual has been associated with are a well-accepted fact of the industry and have led to the aphorism "You're only as good as your last credit". Apart from the commercial success of a movie, craft-based evaluations and peer evaluations can provide additional information influencing the career prospects of individuals in the project network organization of the motion picture industry. The outcomes of the work of some contributors are readily observable in the final product. The craft-based aspects of the director's work (e.g., the continuity of the sequences, arrangement of the set, etc), for example, can be evaluated based on the final movie regardless of the movie's audience appeal and box-office performance. The evaluation of other industry participants based on prior collaborations (both cast and crewmembers) can provide additional information for the evaluation of an individual. An actor cast for a new project may, for example,

recommend a certain director based on a good collaborative experience in a past project. The feedback mechanisms that are a part of the project network organization in the motion picture industry make the reputation of industry participants especially important for their career development. Prior research provides some support for the relevance of feedback mechanisms in the motion picture industry. Schwab's (2007) study of the studio system era showed that the association with a successful movie project improved the future employment opportunities of key contributor. Anecdotal evidence based on an interview with an industry participant (Morris, 2007) underlined the importance of the feedback mechanisms for career development in the motion picture industry.

Knowledge Domains in the Production of Motion Pictures

I propose that genre categories provide a proxy for different types of projects. To test the theory-based conjectures of this dissertation it is important to identify knowledge domains that are relevant in the setting of the study. Even though every film project is designed to produce a unique output, it is initiated and executed against the background of previously created movies. Levenhagen and colleagues' (1994) qualitative study on software entrepreneurs suggests that product categories constitute an important competitive dimension for entrepreneurial behavior in innovation-driven markets. The authors found that product ontologies are important both as cognitive underpinnings of competition with rivals and as means for aiding the interpretation of important stakeholders (e.g. customers) (see also: Porac & Thomas, 1995). The genre of a film represents a key product ontology in the movie industry. The genre of a movie implies a set of movie content characteristics. In addition, deliberate use of genre information in the public discourse and promotion of movies makes it an important competitive

dimension (Neale, 2000). The relevance of genre classification for this study is illustrated by Grant's definition of genre movies:

> "Genre movies are those commercial feature films which, through repetition and variation, tell familiar stories with familiar characters in familiar situations." (c.f. Neale, 2000: page 9).

Qualitative evidence supports the thesis that execution differs between movie projects in different genres. To qualify as relevant knowledge domains, genres have to be relevant for project task execution and designate the need for sets of skills and abilities. The appropriateness of genre as a proxy for knowledge domains for the purpose of this research was probed in an interview with a movie director (Personal communication with Mark Morris, movie director and former faculty member at the University of New Orleans). Related qualitative evidence suggests that basic technical skills of movie directing are easily transferable between genres (which is consistent with the existence of industry-wide coordinating routines and conventions as described above), but specific skills tend to be genre specific.

This dissertation focuses on projects from a limited set of distinct genre categories to reduce the probability that the similarity between projects classified as different types of projects is higher than expected based on the preliminary research. The distinct genre categories selected for this study represent the actual production of the U.S. motion picture industry well. Movie projects in the following genres were included in the sampling frame of this study: Action/Adventure, Crime/Thriller, Comedy, Drama, and Horror. A description of each genre is provided in appendix A. Together the market share of the genres considered in this study for the timeframe between 1995 and 2008 is over

90 percent (source: www.the-numbers.com). The average project performance (as measured by total box-office receipts) differs significantly between the genres, as illustrated by figure 2. Action/adventure movies perform best at the box-office on average, followed by comedies and horror movies.

Empirical Research in the Motion Picture Industry

The empirical setting of this dissertation provides a unique opportunity to study the relationship between the dimensions of entrepreneurial experience and the learning outcomes identified in prior research. The U.S. motion picture industry has been the focus of prior empirical research on entrepreneurship and organizational behavior (e.g., Mezias & Mezias, 2000; Mezias & Kuperman, 2001; Perretti & Negro, 2006, 2007; Schwab, 2007; Schwab & Miner, 2008).

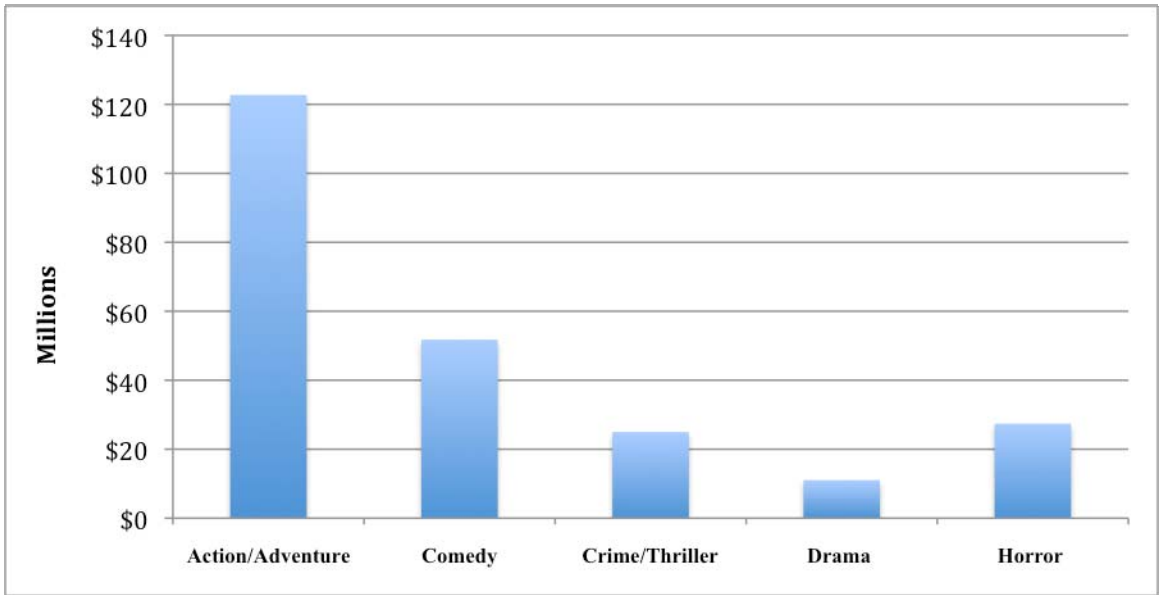

Figure 3: Average Movie Performance in Each Genre (1995-2008)

The setting of this study provides the rare opportunity to obtain data for different organizational outcomes as well as across a wide range of these outcomes. Prior research on entrepreneurial learning was limited to measuring venture outcomes based on self-report data or focused on survival as a venture performance outcome. The U.S. motion picture industry is well documented. The three venture outcomes considered in this study (i.e. number of execution errors, novelty of project outputs, and box-office performance) are documented in independent and distinct sources. Studies on entrepreneurship are often prone to sample selection bias. The sampling frame of most, if not all, studies, especially those studies on entrepreneurial learning, often includes only ventures that have had some success and are profitable. The sources used in this study provide data on movie projects that have not been profitable. Hence, the range of venture outcomes is likely to be broader for this dissertation compared to many studies on entrepreneurial ventures. This does not eliminate the potential for sample selection bias completely, but it mitigates the problem and the associated risks for the internal validity of this study.

CHAPTER 5: METHODOLOGY

The data collection approach and the statistical analyses used in this dissertation were tested through a pilot study. Appendix A documents the approach and conclusions of this pilot study. I used data from the Internet Movie Database (IMDb), Box-Office Mojo, and the U.S. Department of Labor, as well as information from the New York Times to construct the database for this study. Table 2 provides an overview of the variables used in the statistical analyses and their data sources.

Table 2: Data Sources

Data Source	Variables
IMDb	▪ Execution Errors ▪ Depth ▪ Breadth ▪ Total Experience ▪ Genre Control ▪ Budget ▪ Cast Size ▪ Star Power
Box-office Mojo	▪ Project Performance ▪ Prior Director Performance,
New York Times Reviews	▪ Novelty
U.S. Department of Labor	▪ Inflation-adjustment Factor for Project Performance

The main data source for this study is generally considered to be reliable among organizational researchers and offers features that enabled the sampling and data collection approach used in this study. Studies based on data collected from the IMDb have been published in leading management and sociology journals (Schwab, 2007; Schwab & Miner, 2008; Zuckerman, Kim, & von Rittmann, 2003) and the database is

considered reliable information source for studies on the movie industry (Zuckerman et al., 2003). Especially valuable for the approach of this study, the IMDb website offers sophisticated search functions and detailed project histories by individual that allow identifying movie characteristics and director's prior movie experience. The search function by year, genre, and country of production, for example, was used to construct the sampling frame and to select the final sample. Detailed list of contributors, hyper-linked web sites featuring project information by category, and detailed project histories by individual director provided the data for some of the dependent and independent variables.

To enable statistical inference tests (Cook & Campell, 1979), I created a random sample. First, I compiled a list of directors for all the movies released during the timeframe 2000 to 2005. I eliminated all double or triple entries to create a list of all the directors that released a movie during the timeframe of the study. I sampled the directors for my study from this list, using a systematic sampling approach with a random starting point. Subsequently, I used the director's name to identify the movie project that was included in the sample. Movie project ventures were the sampling unit for this study.

To detect the effects outlined by my hypotheses, it is important to construct a sample large enough to ensure that the power of the statistical analysis is adequate. Cohen (1992) recommends a minimum sample size of 138 observations for a multiple regression analysis with 15 predictor variables, a medium effect size, and an α-level of 0.05, to have a power of .80. As I expected my models to contain 24 independent variables (including dummy control variables for year and quarter of release in some models), I initially collected a sample comprising information about 210 movies. The

high sample size was chosen to avoid having to recollect data if data for individual variables would not be available. Power analysis to determine sample size requirements suggests that for a multiple regression analysis with 24 predictor variables, a medium effect size, and a α-level of 0.05, one needs a minimum sample size of 169 for the statistical analysis to have a power of .80 (Cohen, 1988).

The sample for this study was collected after a sampling frame had been established in a preliminary step. To establish the sampling frame for this dissertation, I compiled a list of all U.S. movies and their corresponding directors released between January 1, 2000 and December 31, 2005. This study considers only U.S. movie project ventures to avoid any confounding effects due to the national context in which these movie projects were undertaken and to avoid any challenges due to data availability. Furthermore, I only included movie projects that were classified into one of the following genres: Action/Adventure, Crime/Thriller, Comedy, Drama, and Horror (see Appendix C for a description of the genres considered in this study). These genres each pose somewhat different challenges for directors. In line with a review of the empirical setting this dissertation used genre as a proxy to classify movie projects of the same and different type (to derive the key independent variables of this study). Movies with cross-genre classifications (e.g., Action-Comedy) were removed from the sampling frame. Removing double entries from the list of directors and cross-genre projects provided a list of all directors that had released a movie in the respective genres during the timeframe of my study. This list constituted the sampling frame for my study. From this list I selected 210 movie directors through systematic random sampling. In the next step I identified the movie project that the directors had released during the 2000 to 2005 timeframe. If a

director had released two or more movies during this timeframe I selected the first movie released after January 1, 2000. With the list of movie project names I was then able to access the relevant data sources and collect the data for my study. Table 3 provides an overview of the total number of movies released during each year between 2000 and 2005 (source: www.the-numbers.com). In total 3102 movies were released during this time period. However, because the sampling unit of this study was the project not the director and because this study focused on the five genres outlined above, the resulting sampling frame was smaller than the total number of movies released between 2000 and 2005. Projects for this study were sampled from a total of approximately 2000 projects.

Table 3: Total Number of Movie Projects During The Timeframe of The Study

Year	Number of Movie Projects
2000	502
2001	477
2002	473
2003	493
2004	563
2005	594

Data collection revealed the unsystematic lack of some information, which reduced the final sample of this study. Data collection from the relevant sources revealed that data for some of the variables was not available for the movie projects in the sample. Whenever possible the data was obtained from alternative sources. Eight movie reviews had to be obtained from other sources than the New York Times (i.e. the Los Angeles Times, Variety, and the Chicago Tribune). I compared the reviews and the coding of novelty based on these reviews against the overall sample. There was no significant

difference between the overall sample and the eight reviews obtained from alternative sources. Eleven movies had to be dropped from the overall sample, because data on one or more than one of the dependent variables was neither available from the sources outlined above nor alternative sources. These dropped movie projects were either independent productions with very limited screenings or the produced movie was immediately released on DVD, instead of being shown in movie theaters. 199 movies remained in the sample after the data collection for the novelty variable. The unavailability of data for some of the independent and/or control variables (mainly budget and box-office receipts of the director's previous movie project) reduced the size of the final sample used for data analysis to 148. I compared the 62 excluded movies to the final sample. No significant differences were found between the two sub-samples. Furthermore, the data collection did not suggest that the missing data was systematically related to the type of movie project, the specific director, or any other feature relevant to this study. The following section describes the collected variables and their data sources.

Dependent Variables

The number of project **execution errors** for each movie project was determined based on a project-specific error list published by IMDb. This error listing reports "goofs," industry jargon for errors that occurred during film production visible in the released film. The most obvious goofs involve situations in which a piece of equipment or a member of the crew is visible in the final version of the movie. Goofs also occur when the visual image and the audio of the movie are not properly aligned. More subtle, but equally relevant, goofs include mistakes undermining the realism of movie scenes and errors disrupting the continuity of the final version of the film. Factual mistakes

occur when objects or accessories are visible in the movie that could not exist in the time or context in which the movie is set. The visibility of a billboard ad with an Internet address during Ridley Scott's 2007 movie 'American Gangster', set in the 1970s, is an example of such a factual mistake. A scene during Alfred Hitchcock's 1960 movie 'Psycho', when a private investigator is repeatedly stabbed with a knife, illustrates an error undermining the continuity of a film. The viewer sees the knife being raised after each stab, but the blade is never bloody. This study only considered goofs that have a direct and marked impact on the quality of the final movie. Goofs such as anachronisms (e.g., using a well known quote by someone who was not yet born during the time in which the movie is set), which can be attributed to the creative freedom of the director, were not considered. Table 4 provides a list of the goofs that were considered along with illustrative examples for each type of goof.

The goofs considered in this study, like errors in the arrangement of a scene, can lower the entertainment value of a movie. Even more important, in the professional community of movie makers these goofs may be perceived as the result of a lack of craft-based expertise of the director. For example, a good director would have recognized that equipment was visible during a shot and would have ordered another shot. The close attention of the movie industry to such craft-based errors makes them important for the directors' professional reputation and their future employment opportunities (Jones, 2001). Thus, they represent a highly relevant project outcome dimension far beyond their impact on the entertainment value of a released movie.

The execution error variable is based on the number of goofs reported by the IMDb. IMDb reports individual goofs for released movies with a brief description of the

goof. For the purpose of this study, I counted the number of relevant goofs reported for each of the movies included in the sample.

Table 4: List of Execution Errors with Illustrative Examples

Type of Execution Error	Illustrative Example
Continuity	**Sahara (2005)**: When on the yacht and Al gets a beer; it has a plain red label. In the next shot it's a Budweiser, then it changes back to the red label.
Revealing Mistake	**Alexander (2004)**: The tattoo on Colin Farrell's right arm and shoulder appears in a few shots.
Crew or equipment visible	**Pearl Harbor (2001)**: As Dorie Miller sets down the tray of dishes you can see the hand of a crewmember holding the remote control for the Steadicam.
Audio/visual unsynchronized	**Legally Blonde (2001)**: When Emmet is driving Elle back from the spa, his lips aren't moving as he talks.
Factual Errors	**Master and Commander: The Far Side of the World (2003):** When the Surprise, while disguised as a whaling ship, is being chased by the Acheron, the smoke from the Surprise is trailing behind her. That would only be possible if the wind was coming from dead ahead, which is impossible in a sailing vessel.

The **novelty of the project outcome** was rated on a scale ranging from 1 (i.e. low degree of novelty -- a remake that is closely aligned with the original) to 5 (i.e. high degree of novelty in several aspects of the movie) based on the evaluation of the released movie by movie critics published in the New York Times (or alternative sources for a few movies for which NY Times reviews were not available). Film critics directly

comment on the novelty of a movie, both in terms of craft-based as well as aesthetic dimensions.

The novelty of a movie was scored in relation to the previously existing body of work in a specific genre. Each movie is unique in its own right. However, the degree of novelty of any two movies may differ markedly. One movie may reenact the very same story previously produced by a different director with a different cast and crew (i.e. a remake). The other movie may tell a story that has never been told before from a point of view that has never been illustrated before. For the credibility and reliability of the measure for novelty it was important to establish and use a valid criterion that differentiates between such movies and which also accommodates degrees of novelty that would fall in-between the examples described here. Remakes recreate a previously released movie while sequels do not recreate the same movie but deliberately exploit the same characters and other features to align themselves with prior movies under the same franchise (e.g., the James Bond series). Thus, remakes and sequels can be considered low in novelty by virtue of their nature. However, distinguishing between degrees of novelty for movies that are not remakes or sequels requires an additional criterion. An evaluation of the movie reviews for the pilot study preceding this dissertation provided a suitable solution. Movie reviews frequently set the reviewed movie in relation to previously released movies in the same genre. An example from A.O. Scott's (2004) review of the movie 'The Perfect Score' illustrates this. Scott wrote, "a semi-snide allusion is made to "The Breakfast Club," John Hughes's melodrama of suburban detention-hall bonding, and "The Perfect Score" similarly assembles a collection of familiar types." The movie 'The Breakfast Club' is a well-known humorous movie

released in 1985 about the experience of five high school students who have to spend a Saturday at school as a punishment for various offenses. Based on this feature of movie reviews, the assessment of movies in relation to prior movies in the same genre was used to score movies that were not remakes or sequels on their degree of novelty.

Two individuals reviewed and coded the movie critique's reviews for the first 50 movies independently, based on initial criteria developed through the pilot study. The initial agreement between the scores for both coders was 84 percent. Based on the reviews that were scored differently, the two coders reviewed and revised the initial coding guidelines. The first 50 reviews were then again coded based on the revised coding guidelines (see Appendix C for a description of the coding criteria). The scores for both coders were consistent after this second round. The remaining reviews for the movies in the sample were then coded by one of the coders. The second individual coded a random sample of 50 of the remaining movies. The two scores for this subsample were equal in all but three cases. After additional discussion of the coding guidelines, the two coders agreed on the scores for these reviews.

The **project performance** measure was constructed as a logged variable based on the gross box office receipts for each of the movies in the sample. Box office information was obtained from Box Office Mojo - an online movie publication and box office reporting service (www.boxofficemojo.com). To control for the effect of inflation during the timeframe of analysis, I used the consumer price index provided by the Bureau of Labor Statistics to account for inflation during the time frame of this study. I converted all box-office receipts for the movies released in 2001 to 2005 into year 2000-equivalent dollar figures.

Theoretical considerations suggested the application of the log-transformation to the box-office revenues. According to Hair et al. (1998) variables may be transformed for theoretical or empirical reasons. I performed the log-transformation because I expected depth of experience to have a relative rather than an absolute effect on box-office receipts. More depth of experience, for example, should lead to increased box-office performance as hypothesized by H1c. However, I assume that the absolute box-office performance increase attributable to an increase in depth of experience should be higher in absolute dollar terms for projects with high box-office performance compared to projects with low box-office performance. It is customary to account for the nonlinear effect that this implies by using the log-transformation of the dependent variable.

Independent Variables

In line with the discussion in chapter four, I used the genre classifications of movie projects to distinguish between the same and different types of projects. Appendix A presents a description for each of the five different genres considered in this study: Action/Adventure, Crime/Thriller, Comedy, Drama, and Horror. The Internet Movie Database provides a primary as well as secondary (and sometimes even tertiary) movie classification. A analytical review of a sub-sample of movie projects confirmed that IMDb's primary genre classification reliably captured the main character of the movie projects. The primary genre classification was then used to compute depth and breadth of experience. **Depth of experience** was operationalized as the number of prior movies directed by the same director that have the same primary genre classification as the focal movie. A movie director's prior projects can be identified using IMDb. For the director of an Action/Adventure movie, for example, I counted the number of Action/Adventure

movies this director had done over the course of his or her career prior to the focal movie that is included in the sample (or alternatively within the last five or ten years prior to the focal movie for the variables that were used to test the time-sensitivity of the effects). **Breadth of experience** was operationalized based on the number of different genre classifications of the prior movies directed by the same director using the same genre classifications outlined above. For the director of an Action/Adventure movie, for example, I counted the number of other movie genres in which the director had worked prior to the movie included in the sample.

Control Variables

To control for extraneous effects, I control for presence of star actors, the budget of the movie project, accumulated overall prior experience of the director, prior performance of the director, size of the cast for the focal movie, as well as prior the director's prior collaborative experience with key project contributors in all statistical analyses.

The analyses control for the **presence of star actors** because their presence may change the dynamics of movie projects in ways that could affect my analyses. Star actors are among the few recognized assets in the movie industry (Pomerantz, 2007). More experienced directors may have easier access to top talent and directors may be motivated to achieve a high quality in project execution to increase their attractiveness for future collaborations with a star actor. Apart from that, star actors are often type-cast (i.e. used for certain stereotypical roles and storylines), limiting the degree of novelty that a project can achieve (Zuckerman, Kim, Ukanawa, & von Rittman, 2003). Although the effect of star actor participation on the performance of a movie was questioned by academic

research, there is a widely held belief in the movie industry that such a relationship actually exists (Porter & Fabrikant, 2006). I considered two options to control for the effect of star power. I collected data on the number of Oscars won and number of Oscar nominations received for the main actors and I collected star ratings provided by IMDb. IMDb provides information on the Oscars nominations and Oscar wins for each actor included in the database. The Oscars variable was compiled as the simple count of Oscar nominations and wins for the four main actors of a focal movie included in the database. The IMDb also provides popularity ratings for actors for the entire timeframe of my analysis. The star power measure was calculated as the average rating for the four main characters during the year prior to the movie. Of the two star measures, only the star power measure was significantly related to the outcome variables. Conceptual considerations suggest that the popularity ratings are better suited for the purpose of my study. Many actors that can draw large audiences have never received an Oscar or an Oscar nomination (e.g., Jennifer Lopez, Adam Sandler, and Jim Carey), Thus, I used the star power measure to test my hypotheses.

The total number of previous movies directed by the same director captured any effect related to the director's **accumulated overall experience**. I decided to control for the overall experience of a director, because I wanted to parse out the effect of specific dimensions of experience (i.e. depth and breadth,) from the overall effect of accumulated project experience.

I obtained data on the ***budget*** of each of the movies in the sample as well as on the **prior performance of the director** (i.e. box-office receipts of the director's last movie) from Box Office Mojo. Higher budgets indicate more elaborate productions that may

affect the rate of errors during execution and the ability of directors to experiment with novel ideas. At the same time more elaborate movie projects may increase the attractiveness to the audience and thus increase project success. There is some quantitative (Ravid, 1999) as well as anecdotal evidence (Pomerantz, 2009) suggesting that movies with bigger budgets perform better. Therefore, I control for the budget of the focal movie in all statistical models to account for the potential of associated effects. Experienced directors may have easier access to higher levels of project financing and therefore be able to undertake more elaborate projects. Prior performance of the director may also affect the novelty and/or commercial success of the movie project. Directors that undertake the next movie after experiencing commercial success at the box-office may enjoy more freedom to experiment with novel ideas and/or the box-office performance of that next movie may be fueled by the earlier success of the director rather than the qualities of the movie itself. For the analysis the budget and the prior performance variable will be logged.

A variable capturing the **size of the cast** for the focal movie controlled for any effect the size of the production may have on project outcomes. This measure complements the budget variable and controls for related effects. A higher number of cast members, for example, can be more difficult for the director to manage, potentially making execution errors more likely. On the other hand, movie projects with a higher number of cast members can enable more monumental productions that entice more moviegoers and thereby increase box-office performance.

Prior joint collaborative experience was measured by the number of prior projects a focal director had done together with the cinematographer or editor of the focal

project. Both these types of project participants work closely with the director during a project venture (intense interaction), which created the opportunity for them to develop coordinating practices during prior joint collaborations. Because this dissertation focuses on the effect of the director's prior venture experience, I controlled for the potential effect of prior collaborations with key project contributors.

CHAPTER 6: RESULTS

Table 5 presents the means, standard deviation, and bi-variate Pearson's correlations of all variables in the study. The data provides insights about the empirical setting as well as preliminary evidence with regard to the relationships hypothesized in chapter three.

Movies in the sample are on average moderately novel (M = 3.03, SD = .90). The average number of goofs per movie is 12.51. However, the number of goofs per movie varies substantially among the movies in the sample (SD = 11.51), with some movies containing no goofs while some movies have as many as 56 goofs. From a methodological perspective, the empirical distribution of the execution errors variable suggests a degree of over-dispersion that needs to be accounted for in the testing of the hypotheses. This issue will be discussed below. Movies in the sample have on average generated $51 million in revenues. While the worst performing movie generated only $1,650 in box-office revenue, the best performing movie generated $292 million in revenue. The distribution of box-office revenue in the sample underscores the argument made at the end of chapter 4. The sample includes failures (i.e. movie project ventures for which the box-office receipts do not cover the costs of executing the venture) as well as extraordinary successes (i.e. movie project ventures that returned a multiple of their costs at the box-office) Financial performance clearly does not follow a normal distribution, as histogram 1 (see appendix D) illustrates. Half of the movies in the sample return $3 million or less at the box-office. The implications for my analysis will be discussed below.

Overall, the directors included in the sample have directed an average of about 9 movies (M = 8.90, SD = 9.32) prior to the movie project for which the outcome data was collected. The directors in the sample have, on average, directed fewer than three movie projects (M = 2.91, SD = 4.31) within the same genre as the focal movie project (i.e. depth). On average, the same directors have had even less experience across genres. The directors in the sample directed movies in fewer than two other genres (M = 1.86, SD = 1.39) prior to the focal project (i.e. breadth). A specialization of movie directors is apparent and it seems to be the longevity of a director's career that facilitates the acquisition of breadth of experience. When only the last ten years prior to the release of the focal movie are considered (Depth10), the directors in the sample have on average about 40 percent less experience in the focal genre (i.e. the genre of the focal movie project). When only the last five years prior to the release of the focal movie are considered (depthto5), the directors in the sample have on average about 65 percent less experience in the focal genre. The reduction of breadth of experience when only considering a restricted timeframe prior to the focal movie is less severe but still considerable. Breadth of experience is reduced by approximately 25 percent and 50 percent when one considers only a ten or five-year time period respectively prior to the focal movie project.

Prior collaborations with the same cinematographer or editor are relatively rare in the sample, even though some pairs have collaborated with each other quite frequently. On average, the directors included in the sample have fewer than one previous collaboration with the same cinematographer (M = .7286, SD = 1.64) or the same editor (M = .9346, SD = 2.34).

A number of observations regarding the correlations between several variables are noteworthy. The correlations between most of the independent variables are of small or medium size – except for the various measures of knowledge depth and breadth. However, the high correlation between the different breadth variables is not a concern because they will not be included in the same models for the statistical analyses. The same is true for the high correlation between different measures for knowledge depth. The relatively high correlations of the multiplicative interaction term (Depth x Breadth) with the two main variables of depth and breadth with the two main effect variables used to construct it (i.e. depth: $r = .73$, $p < .05$; breadth: $r=.60$, $p < .05$) suggest the use of hierarchical regression analysis for the investigation of interaction effects as a protection against multicollinearity.

Comparisons of Project Outcomes Across Time and Genres

There are considerable differences in project outcomes between genres and across years. This section reviews and discusses the most significant findings in this regard as well as the meaningful explanations that could explain these findings. Due to the empirical findings as well as conceptual considerations, all analyses control for differences between the genre and release year of the movies produced by the movie project ventures included in the sample.

Execution Errors

The differences in the average number of execution errors per project between genres provide some support for using genre as a proxy to distinguish between different types of projects. Figure 2 allows a comparison of the average number of execution errors per

Table 5: Means, Standard Deviations, And Zero Order Correlations

	Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	15	16	17	18	19	20
1	Novelty	3.03	0.87	1.00																	
2	Goofs	12.51	11.51	-0.19	1.00																
3	Box-office (log)	16.48	2.49	-0.21	0.56	1.00															
4	Depth	2.91	4.31	-0.02	-0.08	0.07	1.00														
5	Depth (10y)	1.84	2.58	-0.04	-0.05	0.05	0.87	1.00													
6	Depth (5y)	1.03	1.51	-0.04	-0.02	0.08	0.74	0.90	1.00												
7	Breadth	1.86	1.39	0.05	0.04	0.14	0.17	0.06	0.02	1.00											
8	Breadth (10y)	1.41	1.05	0.01	0.05	0.08	-0.01	-0.02	0.02	0.77	1.00										
9	Breadth (5y)	0.89	0.80	0.11	0.08	0.02	-0.05	-0.04	-0.04	0.60	0.76	1.00									
10	Depth x Breadth	6.41	11.40	0.04	-0.01	0.13	0.73	0.52	0.44	0.60	0.33	0.24	1.00								
11	Collaboration (Camera)	0.73	1.65	0.06	-0.06	0.01	0.04	0.01	-0.01	0.32	0.21	0.19	0.20	1.00							
12	Collaboration (Editor)	0.93	2.34	0.08	0.10	0.13	0.18	0.11	0.08	0.39	0.27	0.30	0.43	0.29	1.00						
15	Total Experience	8.90	9.32	-0.07	0.13	0.20	0.56	0.41	0.32	0.60	0.36	0.19	0.63	0.35	0.34	1.00					
16	Budget (log)	3.53	1.03	-0.22	0.40	0.52	-0.04	-0.08	-0.02	0.32	0.30	0.23	0.12	0.19	0.16	0.23	1.00				
17	Prior Box-office (log)	12.33	7.27	-0.12	0.20	0.44	0.16	0.08	0.08	0.22	0.10	0.02	0.20	0.15	0.17	0.20	0.33	1.00			
18	Star Power	8.97	1.74	0.20	-0.37	-0.45	0.03	0.01	-0.01	-0.09	-0.13	-0.04	0.00	0.07	-0.01	-0.07	-0.37	-0.25	1.00		
19	Cast Size	57.65	34.32	-0.03	0.23	0.28	0.07	0.01	0.03	0.01	0.01	0.00	0.13	0.08	0.09	0.06	0.16	0.15	-0.19	1.00	
20	Actor Oscars	1.73	2.84	0.09	-0.04	0.13	-0.01	-0.06	-0.03	0.16	0.11	0.07	0.06	0.12	0.09	0.02	0.17	0.27	-0.19	0.09	1.00

****** = significant at $p<0.01$; ***** = significant at $p<0.05$; **+** = significant at $p<0.10$

project across genres. The trend in the data in conjunction with the characteristics of the genres considered in this dissertation suggests a potential cause of execution errors. Projects in the action/adventure genre, on average, produce approximately twice as many execution errors as projects in any of the other four genres. Producing movies that contain very dynamic and high-speed sequences is a key characteristic of the action/adventure genre (e.g., car chases, physical altercations, explosions, etc.). Action/adventure movies frequently employ special effects to increase the impact of such dynamic sequences (e.g. pyrotechnic materials, stunt crews, computer animation, etc). Dramas on the other hand focus on the psychological and emotional struggles of the main characters; highly dynamic or high-speed sequences are less common because they are typically not needed to convey this struggle to the audience of the movie. Bringing too much attention to the environment of the character(s) may even distract the audience's focus from the main characters and their struggles. Projects producing dramas on average result in the fewest execution errors. Horror movies and to a lesser degree comedies often derive some of their appeal from dynamic sequences. Horror productions rely on some of the same techniques used by the action/adventure genre to increase the impact of certain movie sequences (e.g., stunt crews, elaborate make-up and other props, computer animation, etc). Movies in the crime/thriller genre are typically characterized by suspense. Other movies in this genre emphasize drama in the context of crime. These movies may incorporate very dynamic or high paced sequences, but typically do not.

In sum, the findings illustrated by figure 2 and the potential underlying reasons for the trend in the average number of execution errors per project between genres provide some support for the uses of genre as a proxy for different types of movie projects. Due to these differences the

statistical analyses for this study included genre dummy variables to control for the effect of genre on any of the project outcome variables.

The average number of execution errors per project in each year is similar. A comparison of the average number of execution errors per project across time did not indicate a meaningful difference between the years considered in this study. Hence the corresponding graph is not presented here.

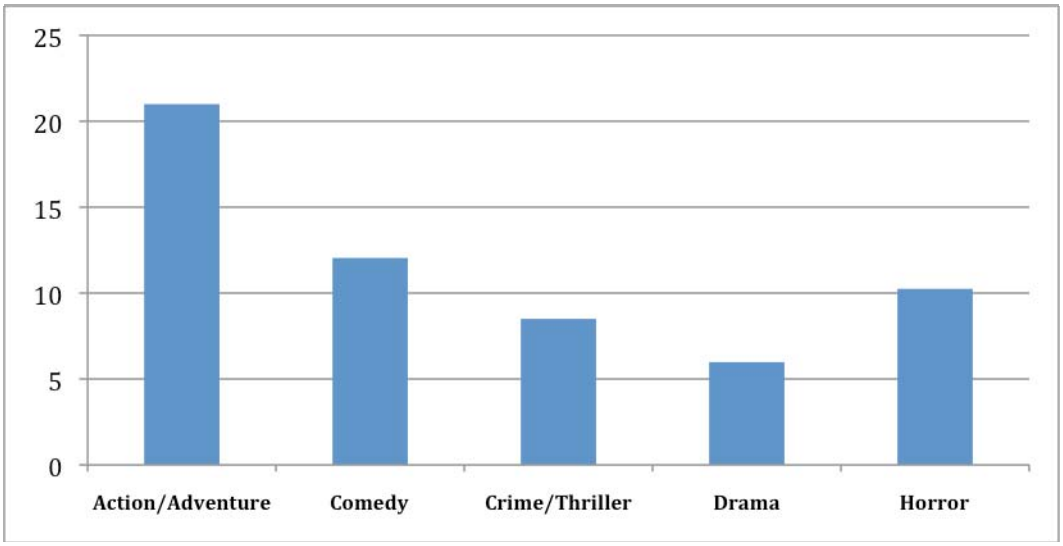

Figure 4: Average number of Execution Errors per Genre (Sample)

Project Outcome Novelty.

The average level of project outcome novelty in each genre is fairly similar, as figure 5 illustrates. Figure 6 illustrates the average level of project outcome novelty in each year. The low average level of project outcome novelty in 2002 is somewhat surprising. To control for systematic differences in outcome novelty across genres and across time control variables for both were included in all statistical analyses of this dissertation.

Project Performance

The average project performance for each genre in the sample (measured by box-office receipts in millions of U.S. dollars), illustrated by figure 7, closely resembles the corresponding chart for the movie industry reported in chapter four. Action/adventure movies have the highest box-office performance, followed by comedies. Among the movies in the sample, horror movies performed less well than crime/thriller movies and dramas. The opposite was the case for the population of project ventures in the industry between 1995 and 2008.

The average project performance in each year for the movies in the sample is somewhat more heterogeneous than the average performance in the industry overall. However, the movie projects released in 2002 had the highest average performance in the sample as well. Figure 8 presents the comparison of average project performance across the years included in the study.

Overall, the distributions of the dependent variables in the sample of this study indicate no anomalies. In some respects the average of project ventures in the sample closely resemble the corresponding average in the population of movie project ventures for the respective timeframe.

Hypotheses Testing

Testing the hypotheses outlined in chapter three requires testing separate models for each of the three dependent variables (i.e. number of execution errors, novelty, and box-office performance). The subsequent sections document the corresponding analyses by dependent variable as well as the steps taken to determine the correct specification of the statistical models used for hypotheses testing.

Avoidance of Execution Errors (H1a, H2a, H3a, H3b)

Number of execution errors is a count variable (see Appendix D for a graph of the sample

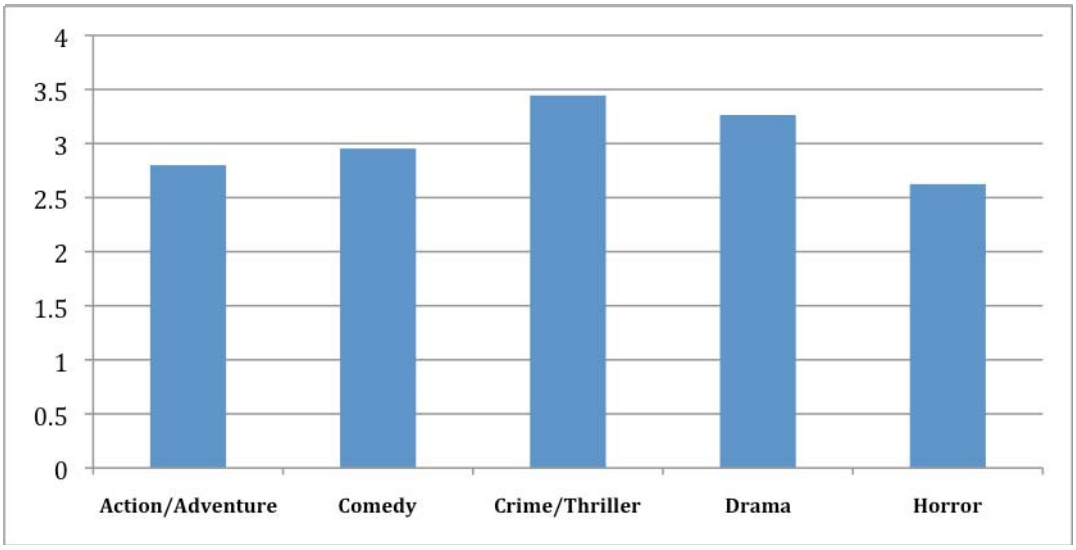

Figure 5: Average Level of Project Outcome Novelty per Genre (Sample)

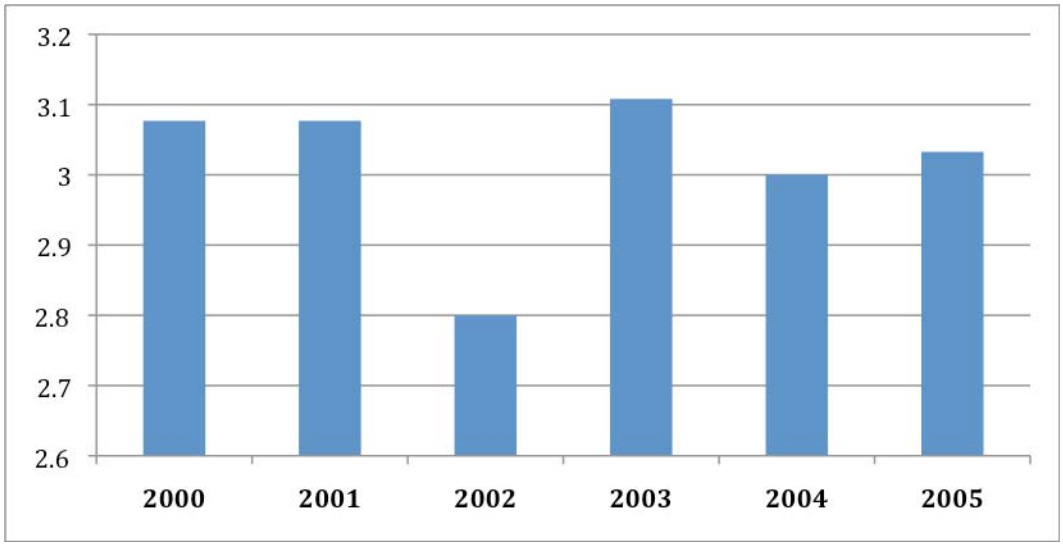

Figure 6: Average Level of Project Outcome Novelty per Year (Sample)

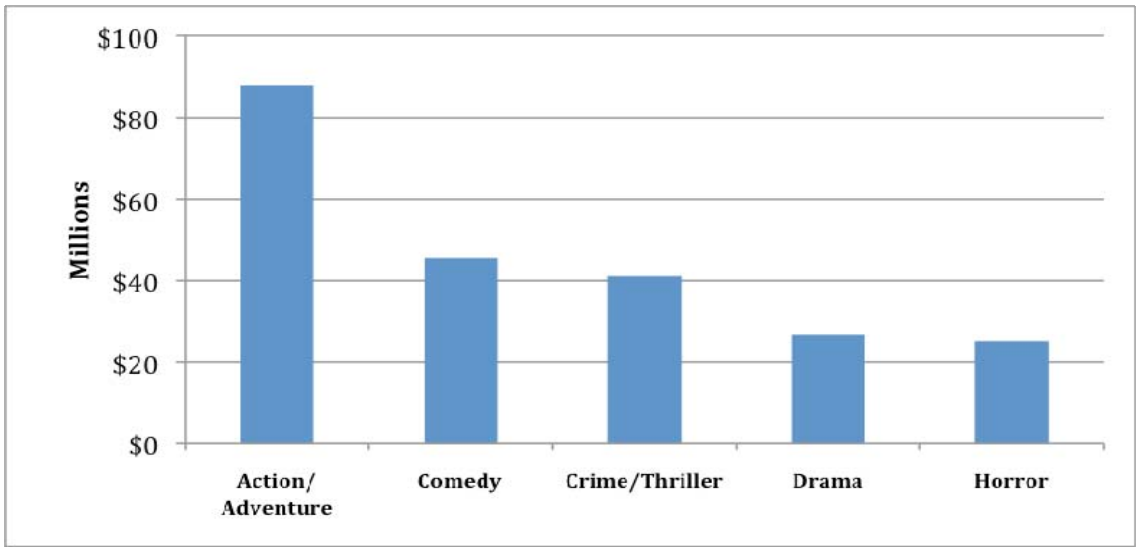

Figure 7: Average Project Performance per Genre (Sample)

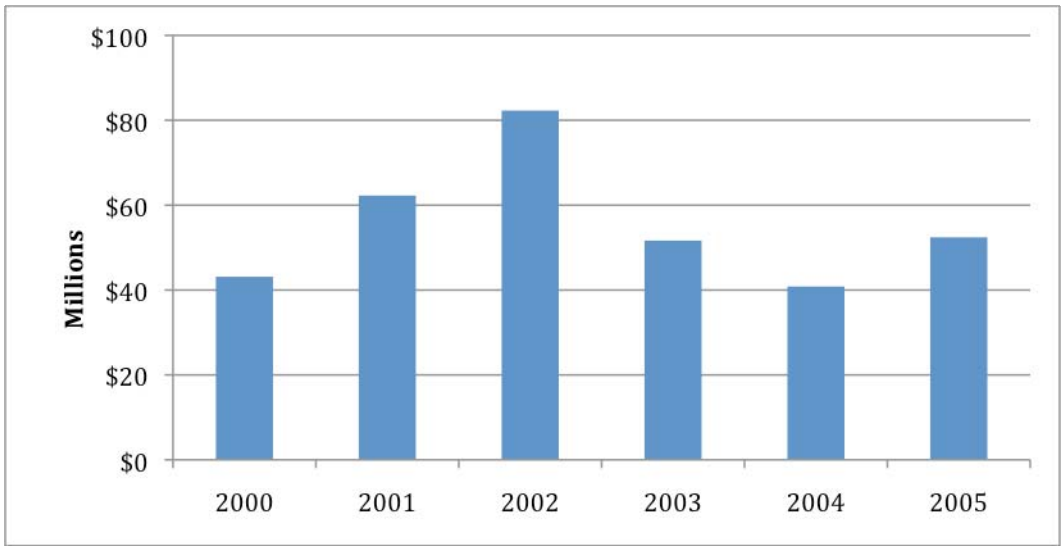

Figure 8: Average Project Performance per Year (Sample)

distribution of this variable). Poisson regression is commonly used to test models involving count data. However, the Poisson distribution assumes that the mean and variance of the variable are the same. Descriptive statistics for the number of execution errors indicate the potential of overdispersion (mean = 12.512; STD = 11.505). Negative binomial regression accommodates overdispersed count data. I examined overdispersion for the baseline model using

a likelihood ratio test of the overdispersion parameter alpha. The alpha parameter is zero if the negative binomial distribution is equivalent to a Poisson distribution. For the collected data, the alpha parameter is significantly different from zero (Chi-square = 434.24; $p \leq 0.001$), indicating that negative binomial regression is more appropriate for testing the hypotheses with the sample data.

Negative binomial regression allows for the use of robust standard errors to mitigate the effect of heteroscedasticity. However, STATA does not provide the opportunity to test for model improvement using a likelihood-ratio test if the models are specified with robust standard errors. Due to this limitation, I initially performed a hierarchical regression analysis without robust standard errors to test for model improvement. I then tested the same models using robust standard errors. Table 6 reports the results for the models with robust standard errors and reports the result for the likelihood-ratio chi-square test comparing the models without robust standard errors in the last line.

H1a hypothesized that an entrepreneur's depth of work with the same type of projects decreases the number of execution errors. Table 6 reports the results of the corresponding analysis. Model 1 constitutes the baseline model, including total experience to control for the general level of experience that a director has accumulated prior to the focal project as well as the two variables capturing the director's prior experience with the cinematographer and editor. Model 2 adds the independent variables capturing specific dimensions of the director's prior experience. Adding the depth and breadth variable to the baseline model does not improve model fit significantly (likelihood-ratio chi-square = 2.440; $p > .10$). I ran additional models to test the robustness of this finding and to test for a potential curvilinear effect of any of the two key independent variables. These additional analyses indicated a potential curvilinear effect of depth

of experience. Model 3 presents the results for the analysis that has the squared term for depth added to the specification tested by model 2. The results for other additional analyses are provided in appendix E. The model with depth-squared added has a significantly better fit than the baseline model (likelihood-ratio chi-square = 8.270; $p < .05$). The coefficient for the depth-squared term is negative and significant ($b = -.337$; $p < 0.05$) and the main effect for depth is positive and not significant ($b = .052$; $p = .123$). The results of the analysis indicate a curvilinear effect of depth on execution errors. A concave downward curve describes this relationship (Aiken and West, 1991).

To evaluate the curvilinear effect of depth of experience on number or execution errors, I calculated regression coefficients for specific relevant values of the depth variable. In my sample, depth of experience had a mean of 2.91, a standard deviation of 4.31 and a range from 0 to 31. Approximately 90 percent of the directors in the sample have a depth of experience ranging from zero to seven. I estimated changes in the number of execution errors for marginal changes of depth of experience. Equation (1) represents the regression equation for model 2b in table 5. Equation (2) is the derivative of equation (1) for marginal changes in depth of experience.

(1) Execution Errors = $b_0 + b_1$ (Breadth) + b_2 (Depth) + b_3 (Depth-Squared) + Controls + ε

(2) $[\partial$ (Execution Errors) / ∂ (Depth)$]$ = b_2 (Depth) + b_3 (Depth-Squared)
= .052 (Depth) - .337 (Depth-Squared)

I performed the conditional analysis using the lincom-command in STATA. This procedure holds the other variables in the model constant at their sample mean when evaluating the marginal effects. The coefficients for these levels of depth of experience are presented below.

Standard errors are reported in parentheses and the level of significance is indicated based on the t-test for the simple slope.

[∂ (Execution Errors) / ∂ (Depth of Experience)	Depth = 1] =	-0.285 **	(0.107)
[∂ (Execution Errors) / ∂ (Depth of Experience)	Depth = 2] =	-1.245 *	(0.485)
[∂ (Execution Errors) / ∂ (Depth of Experience)	Depth = 3] =	-2.882 *	(1.136)
[∂ (Execution Errors) / ∂ (Depth of Experience)	Depth = 4] =	-5.195 *	(2.059)
[∂ (Execution Errors) / ∂ (Depth of Experience)	Depth = 5] =	-8.183 *	(3.254)
[∂ (Execution Errors) / ∂ (Depth of Experience)	Depth = 6] =	-11.847 *	(4.722)
[∂ (Execution Errors) / ∂ (Depth of Experience)	Depth = 7] =	-16.187 *	(6.462)

In addition to testing the coefficients at these levels of depth of experience, I also tested whether the changes between the coefficients were statistically significant. The differences between the coefficients are all significant at the $p \leq .05$ level -- indicating that more depth of experience tends to have an increasingly stronger positive effect on error avoidance across the range of depth of experience captured in this sample. These results indicate that gaining more experience with the same type of project ventures decreases execution errors (support for H2b). The negative effect is stronger for higher levels than for lower levels of depth of experience.

H2a hypothesized that an entrepreneur's breadth of experience with different types of projects increases the number of execution errors. Model 3 indicates that breadth of experience had not significant effect on the number of execution errors ($b = -.015$; $p > .10$). Alternative model specifications, including specifications testing a curvilinear relationship between breadth and execution errors, supported the robustness of this finding.

H3a hypothesizes that a director's breadth of experience strengthens the positive effect of depth of experience on error avoidance (i.e. decreases the number of execution errors). The alternative hypothesis H3b states that a director's breadth of experience weakens the positive effect of depth of experience on the avoidance of execution errors. Model 4 adds the interaction of depth and breadth as well as the interaction between depth-squared and breadth to test the

joint effect. The curvilinear effect of depth of experience requires that both the interaction effect of depth and breadth as well as the interaction of depth-squared with breadth are included in the model to test for the interaction of depth and breadth of experience. Adding the interaction effects does not improve model fit (likelihood-ratio chi-square = 2.54; $p > .10$).

The results for execution errors as the dependent variable only support H1a. However, the relationship between depth of experience and execution error is more complex than the linear effect implied by the formulation of the hypothesis. The implications of this finding are discussed in chapter 7.

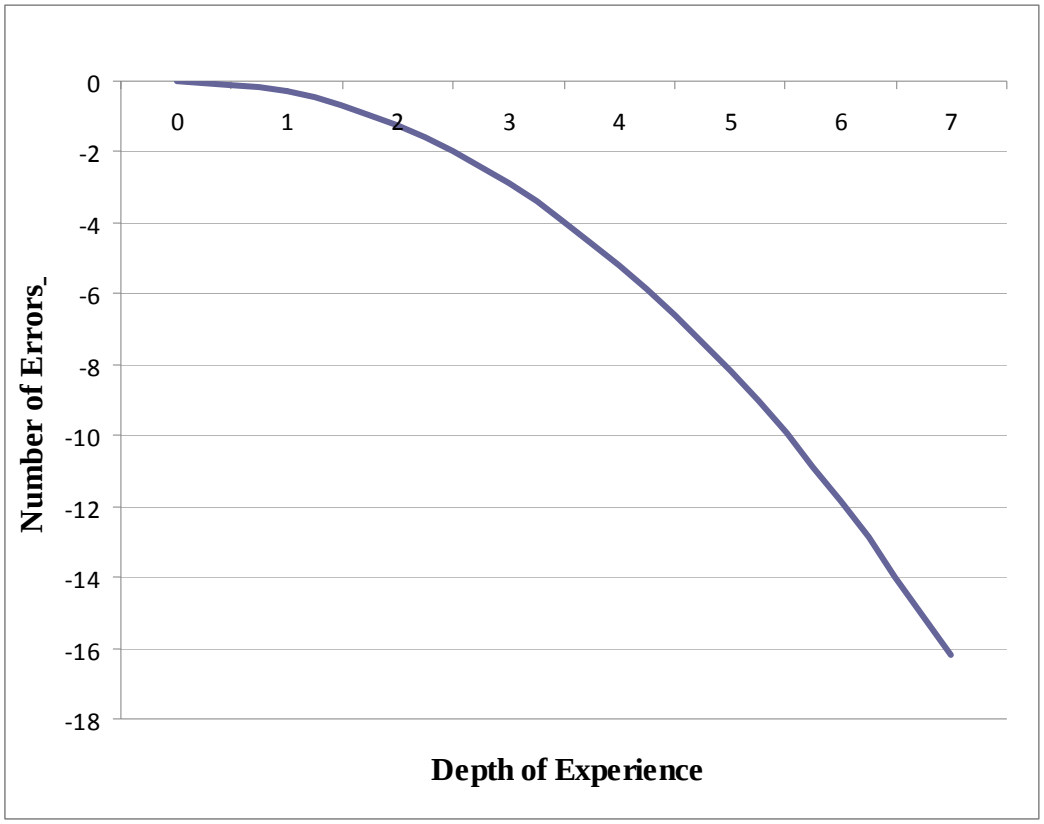

Figure 9: Marginal Effect of Depth of Experience on Execution Errors

Table 6: Negative Binomial Regression of Director Experience on Execution Errors[a]

Variables	Model 1			Model 2			Model 3			Model 4		
Budget (log)	0.155	*	(0.071)	0.162	*	(0.071)	0.181	**	(0.068)	0.171	*	(0.067)
Cast Size	0.003	*	(0.001)	0.003	*	(0.001)	0.003	†	(0.001)	0.002	†	(0.001)
Prior Performance (log)	-0.005		(0.009)	-0.002		(0.008)	0.001		(0.009)	0.004		(0.009)
Star Power	-0.041		(0.050)	-0.039		(0.050)	-0.042		(0.049)	-0.060		(0.052)
Year Dummy Variables	Yes			Yes			Yes			Yes		
Genre Dummy Variables	Yes			Yes			Yes			Yes		
Total Experience	0.002		(0.005)	0.011		(0.008)	0.006		(0.008)	-0.012		(0.010)
Experience with Cinematographer	-0.104	**	(0.038)	-0.111	**	(0.035)	-0.101	**	(0.033)	-0.105	**	(0.034)
Experience with Editor	0.033		(0.023)	0.040	†	(0.023)	0.046	*	(0.023)	0.031		(0.023)
Depth				-0.021		(0.016)	0.052		(0.034)	0.062		(0.167)
Breadth				-0.060		(0.058)	-0.015		(0.059)	-0.151		(0.113)
Depth-Squared							-0.337	*	(0.136)	-0.502	**	(0.188)
Depth x Breadth										0.009		(0.022)
Depth-Squared x Breadth										0.096		(0.091)
Constant	1.398	*	(0.659)	1.431	*	(0.655)	1.665	*	(0.649)	2.026	*	(0.682)
Log pseudo-likelihood	-512.129			-510.910			-507.993			-506.722		
		**			**			**			**	
Wald chi-square	106.050	*		113.090	*		132.450	*		134.86	*	
Likelihood-ratio chi-square[b]				2.44			8.27	*		2.54		

[a] Robust standard errors are in parentheses; n = 148

[b] Test for model improvement based on model specifications without robust standard errors

† p < .10; * p < .05; ** p < 0.01; *** p < 0.001

Novelty (H1b, H2b, H4a, H4b)

Inspection of the sample distribution of the novelty variable suggests that it is reasonably normally distributed (see Appendix D for a graph of the sample distribution of this variable). I performed additional analyses to examine whether the assumptions of ordinary least-squares (OLS) regression are met (i.e. linearity, homoscedascticity, independence of errors, and normality). Analyses performed based on the residuals of the regression including all control variables and independent variables suggest a moderate deviation from normality. Prior research has shown that OLS regression is relatively robust against moderate violations of the underlying assumptions (Certo & Semadeni, 2006). However, the research has also shown that heteroscedasticity can lead to biased results with OLS regression. Using regression analysis with robust standard errors mitigates this problem (White, 1980; Huber, 1967). Consequently, the models for testing the hypotheses focused on the effects of depth and breadth of experience on the novelty of movie projects were investigated using OLS regression with robust standard errors. The analyses were performed using hierarchical regression analysis to control for the effect of multicollinearity and to assess the explanatory power of the different independent variables.

H1b hypothesized that an entrepreneur's depth of venture experience with the same type of projects decreases the novelty of project outcomes. Table 7 reports the results of the corresponding analysis. Model 1 constitutes the baseline model, including total experience to control for the general level of experience that a director has accumulated prior to the focal project as well as the two variables capturing the director's prior experience with the cinematographer and editor. Model 2 adds the independent variables capturing specific

dimensions of the director's prior experience. Depth of experience (b = .008; p = .508) has no significant effect on novelty.

H2b hypothesized that an entrepreneur's breadth of experience with different types of projects increases the novelty of project outcomes. Breadth of experience has the expected positive effect on novelty (b = .168; p = .0.004). Adding the experience variables improves model fit marginally significant (ΔR^2 =.034; $F_{(2,128)}$ = 2.782; $p \leq 0.065$).

Given the curvilinear relationship between depth of experience and execution errors, I tested for a potential curvilinear relationship between the dimensions of experience and novelty. These additional tests did not indicate any support for a curvilinear relationship between depth or breadth and novelty. The results for relevant additional analyses are provided in appendix E. Model 3 reports the analysis that includes the squared term for depth. Adding the squared term does not improve the fit of the model significantly (ΔR^2 =.005; $F_{(1,127)}$ = 0.817; $p > 0.10$).

H4a hypothesized that a director's depth of experience strengthens the positive effect of breadth of experience on novelty. The alternative hypothesis H4b states that a director's depth of experience weakens the positive effect of breadth of experience on novelty. Model 4 adds the interaction of depth and breadth to test the joint effect. Adding the interaction effect does not improve model fit significantly (ΔR^2 =.001; $F_{(1,127)}$ = 0.162; $p > 0.10$).

In summary, the analyses provide only support for one of the hypotheses regarding novelty of project outcomes. The results of table 7 support only H2b, which predicted a significant positive effect of breadth of experience on the novelty of project outcomes. The implications of this finding are discussed in chapter seven.

Project Performance (H1c, H2c, H5a, H5b)

The logged box-office performance variable shows normal distribution tendencies (see

Table 7: OLS Regression of Director Experience on Novelty

Variables	Model 1			Model 2			Model 3			Model 4		
Budget (log)	-0.225	*	(0.089)	-0.256	**	(0.088)	-0.250	**	(0.086)	-0.254	**	(0.088)
Cast Size	0.001		(0.002)	0.001		(0.002)	0.001		(0.002)	0.001		(0.002)
Prior Performance (log)	-0.008		(0.009)	-0.013		(0.009)	-0.011		(0.009)	-0.014		(0.009)
Star Power	0.040		(0.056)	0.055		(0.056)	0.056		(0.055)	0.059		(0.056)
Year Dummy Variables	Yes			Yes			Yes			Yes		
Genre Dummy Variables	Yes			Yes			Yes			Yes		
Total Experience	0.005		(0.005)	-0.020	**	(0.006)	-0.022	**	(0.007)	-0.020	**	(0.007)
Cinematographer Experience	0.048		(0.036)	0.049		(0.035)	0.053		(0.035)	0.049		(0.035)
Editor Experience	0.057	**	(0.016)	0.044	*	(0.018)	0.048	*	(0.019)	0.048	*	(0.020)
Depth				0.008		(0.012)	0.040		(0.031)	0.016		(0.020)
Breadth				0.168	**	(0.058)	0.181	**	(0.060)	0.189	**	(0.071)
Depth-Squared							-0.147		(0.160)			
Depth x Breadth										-0.004		(0.008)
Constant	3.632	***	(0.787)	3.394	***	(0.780)	3.490	***	(0.798)	3.323	***	(0.802)
F-statistic	3.31	***		4.13	***		3.87	***		4.18	***	
R^2	0.178			0.212	***		0.217			0.213		
ΔR^2				0.034			0.005			0.001		
F-statistic (added variables)				2.782	†		0.817			0.162		

[a] Robust standard errors are in parentheses; n = 148

† p < .10; * p < .05; ** p < 0.01; *** p < 0.001

Appendix D for a graph of the sample distribution of this variable). Thus, I used OLS regression with robust standard errors (which accommodates moderate deviations from normality) to test the models with box-office performance as the dependent variable.

H1c hypothesized that an entrepreneur's depth of work experience with the same type of project increases project performance. Table 8 reports the results of the corresponding analysis. Model 1 constitutes the baseline model. Model 2 adds the independent variables capturing specific dimensions of the director's prior experience. Adding the depth and breadth variables does not improve the fit of the model ($\Delta R^2 = .005$; $F_{(2,129)} = 0.598$; $p = .551$). To follow up I tested additional model specifications with squared terms for depth and breadth. Adding breadth-squared did not improve model fit significantly, but adding depth-squared improved model fit significantly. Model 2b reports the results for the model including depth-squared. The results for relevant additional analyses are provided in appendix E. Adding depth-squared to the model marginally improved model fit ($\Delta R^2 = .017$; $F_{(2,129)} = 3.621$; $p = .059$). The coefficient for the depth-squared term is negative and marginally significant ($b = -.460$; $p = 0.070$) and the main effect for depth is positive and not significant ($b = .073$; $p =. 269$).

To evaluate the curvilinear effect of depth of experience on number or execution errors, I calculated regression coefficients for specific relevant values of the depth variable. In my sample, depth of experience had a mean of 2.91, a standard deviation of 4.31 and a range from 0 to 31. Approximately 90 percent of the directors in the sample have a depth of experience ranging from zero to seven. I estimated changes in project box-office performance for marginal changes of depth of experience. Equation (1) represents the regression equation for model 2b in table 7. Equation (2) is the derivative of equation (1) for marginal changes in depth of experience.

(1) Project Performance = $b_0 + b_1$ (Breadth) + b_2 (Depth) + b_3 (Depth-Squared) + Controls + ε

(2) [∂ (Project Performance) / ∂ (Depth)] = b_2 (Depth) + b_3 (Depth-Squared)
= .073 (Depth) - .460 (Depth-Squared)

I performed the conditional analysis using the lincom-command in STATA. This procedure holds the other variables in the model constant at their sample mean when evaluating the marginal effects. The coefficients for these levels of depth of experience are presented below. Standard errors are reported in parentheses and the level of significance is indicated based on the t-test for the simple slope.

[∂ (Project Performance) / ∂ (Depth of Experience)	Depth = 1] =	-0.387 *	(0.196)
[∂ (Project Performance) / ∂ (Depth of Experience)	Depth = 2] =	-1.696 †	(0.893)
[∂ (Project Performance) / ∂ (Depth of Experience)	Depth = 3] =	-3.926 †	(2.095)
[∂ (Project Performance) / ∂ (Depth of Experience)	Depth = 4] =	-7.077 †	(3.800)
[∂ (Project Performance) / ∂ (Depth of Experience)	Depth = 5] =	-11.149 †	(6.010)
[∂ (Project Performance) / ∂ (Depth of Experience)	Depth = 6] =	-16.143 †	(8.724)
[∂ (Project Performance) / ∂ (Depth of Experience)	Depth = 7] =	-22.058 †	(11.942)

In addition to testing the coefficients at these levels of depth of experience, I also tested whether the changes between the coefficients were statistically significant. These differences were all significant at the $p \leq .10$ level. To test the robustness of the results I performed additional analyses with the absolute value of the projects' box-office performance as the dependent variable. The analyses showed marginal effects for all relevant values of depth of experience that are consistent in direction with the reported results, but given the less appropriate non-logged dependent variable only one of the estimated regression coefficients is marginally significant (Depth = 1; b=0.000000155; p = .088). These results indicate that gaining more experience with the same type of project ventures did not improve project performance (reject H5a). To the contrary, more depth of experience tends to have a negative effect across reasonable values of depth, but only one of these effects is significant at the $p<.05$ level and the corresponding effect

on performance is close to zero. Thus, the results for the conditional analysis do not provide conclusive support for H5b.

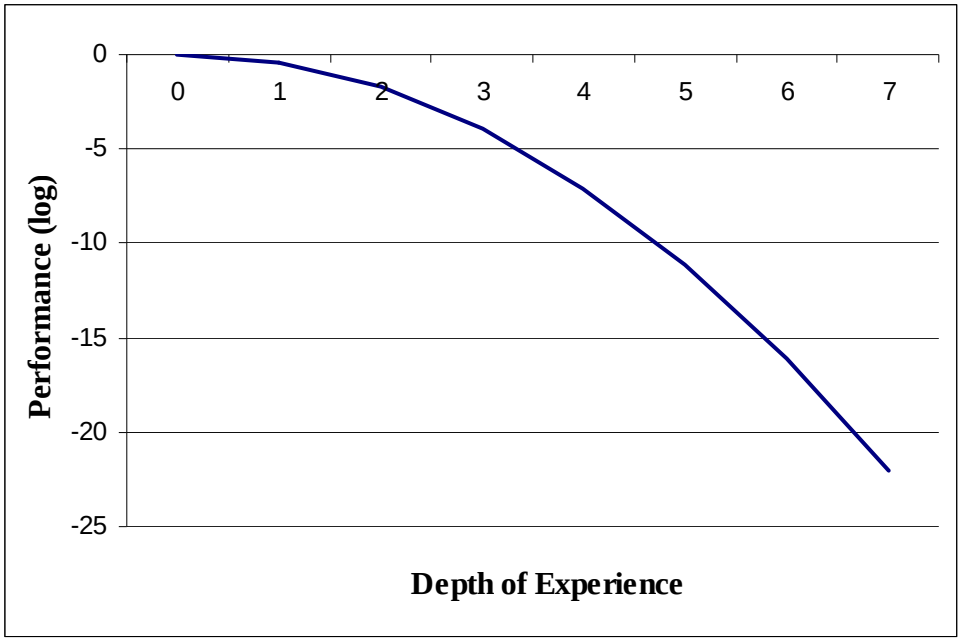

Figure 10: Marginal Effect of Depth of Experience on Project Performance

H2c hypothesized that an entrepreneur's breadth of experience across knowledge domains increases the project performance as well. I interpreted the result for the test of this hypothesis based on model 2b. The coefficient for breadth is negative and not significant (b = -.044; p = 0.613) indicating no support for H2c.

H5a hypothesized that a director's depth of experience strengthens the positive effect of breadth of experience on project performance. The alternative hypothesis H5b stated that a director's depth of experience has no effect on the relationship between breadth of experience and project performance. Model 4 adds the interaction of depth and breadth as well as the interaction effect of depth-squared and breadth to test the joint effect. Adding the interaction

effects does not improve model fit significantly ($\Delta R2 = .003$; $F(2,126) = 0.317$; $p = .728$). Thus, this finding does not provide support for the hypotheses of a substitutional interaction effect of depth and breadth of experience (H5b).

The analyses presented here provide no support for any of the hypotheses regarding project performance. The results of the conditional analysis for the relationship between depth of experience and project performance suggest a relationship that is contrary to the one hypothesized by H1c. However, additional analyses suggest that this finding has to be interpreted with caution. The implications of the findings regarding project performance are discussed in chapter seven.

Table 8: OLS Regression of Director Experience on Box-Office Performance

Variables	Model 1			Model 2a			Model 2b			Model 3		
Budget (log)	0.584	**	(0.203)	0.595	**	(0.204)	0.612	**	(0.198)	0.607	**	(0.200)
Cast Size	0.003		(0.002)	0.003		(0.002)	0.002		(0.002)	0.002		(0.003)
Prior Performance (log)	0.019		(0.017)	0.023		(0.017)	0.029	†	(0.017)	0.032	†	(0.018)
Star Power	-0.027		(0.109)	-0.026		(0.113)	-0.023		(0.111)	-0.031		(0.119)
Year Dummy Variables	Yes			Yes			Yes			Yes		
Genre Dummy Variables	Yes			Yes			Yes			Yes		
Total Experience	0.005		(0.009)	0.018	*	(0.008)	0.013		(0.009)	0.018		(0.011)
Cinematographer Experience	-0.122	*	(0.058)	-0.130	*	(0.055)	-0.116	*	(0.058)	-0.122	*	(0.056)
Editor Experience	0.044	†	(0.026)	0.051	†	(0.026)	0.062	*	(0.024)	0.062	*	(0.027)
Depth				-0.025		(0.032)	0.073		(0.065)	0.123		(0.102)
Breadth				-0.084		(0.079)	-0.044		(0.086)	-0.161		(0.170)
Depth-Squared							-0.460	†	(0.252)	-0.682	†	(0.382)
Depth x Breadth										-0.039		(0.048)
Depth-Squared x Breadth										0.153		(0.177)
Constant	13.648	***	(1.323)	13.711	***	(1.352)	14.011	***	(1.258)	14.184	***	(1.384)
F-statistic	4.91	***		4.91	***		4.68	***		4.53	***	
R^2	0.380			0.385			0.402			0.405		
ΔR^2				0.005			0.017			0.003		
F-Statistic (added variables)				0.598			3.621	†		0.317		

[a] Robust standard errors are in parentheses; n = 148

† p < .10; * p < .05; ** p < 0.01; *** p < 0.001

CHAPTER 7: DISCUSSION AND CONCLUSION

The findings of this dissertation provide important insights for research on entrepreneurial learning and the micro-foundations of organizational learning. Prior research, especially on entrepreneurial learning (e.g., Kolvereid & Bullvag, 1993; Westhead et al., 2003) has exclusively focused on overall entrepreneurial experience. The results of this study focusing on execution errors, project outcome novelty, and project performance as the dependent variables suggest that this focus may be misleading. In the analyses focusing on execution errors and project performance as the dependent variables the overall experience variable is consistently non-significant. In those analyses modeling the effect of the independent variables on project outcome novelty, overall experience of the movie director has a consistently negative effect. Instead of the widely assumed effect of overall entrepreneurial experience, this study finds that the sub-dimensions of prior venture experience examined here (i.e. depth and breadth of experience) affect some but not all project outcomes independently of overall experience and independent of each other. The empirical test of the hypotheses developed in this dissertation provides initial insights and a foundation for future research on entrepreneurial learning.

Effect of Sub-Dimensions of Prior Venture Experience

The findings of this dissertation also contribute to the organizational learning literature. The relevance of depth and breadth of experience has been acknowledged in the organizational learning literature. However, related research as not yet systematically investigated the effect of these sub-dimensions of experience. The findings of this study suggest that explicit attention to the sub-dimensions of experience is important when

research investigates the role of experience for learning processes and outcomes. This dissertation also highlights the relevance of individual-level learning processes for organizational learning.

Depth and breadth, sub-dimension of an entrepreneurs' prior venture experience, have an independent and differential effect on project outcomes. Moreover, the nature of the effect of depth and breadth of prior venture experience differs with regard to different project outcomes. Somewhat surprising, the effects of depth and breadth of prior venture experience do not seem to interact with each other. Depth of an entrepreneur's prior venture experience within a specific domain has a negative but more complex relationship with execution errors than proposed by the respective hypothesis. Depth of prior venture experience seems to have negative effect on project performance. This is contrary to the hypothesized effect. Breadth of experience is positively related to the novelty of movie project outcomes, but has no relationship with execution errors or the financial performance of movie project ventures. The implications of these findings for our understanding of organizational learning in general and entrepreneurial learning in particular are discussed next.

Depth of Experience

Depth of experience aids in the avoidance of execution errors. The results for the test of H1a are in line with the hypothesized effect, but the relationship between depth of experience and execution errors is curvilinear instead of linear, as implied in H1a. This finding corresponds to the findings of prior research on learning curve effects in various other settings (Argote, 1999; Yelle, 1979). The characteristic non-linear positive relationship between accumulated experience and performance measures is what inspired

the term ‘learning curve.’ The generally accepted explanation is that the task-related information provided by accumulated experience with the same or similar tasks becomes increasingly redundant. The typical learning curve describing the relationship between accumulated execution experience and performance outcomes eventually plateaus so that additional experience beyond a certain point does not lead to performance improvements.

Minniti and Bygrave (2001) proposed that entrepreneurs learn to select the most appropriate course of action through the repeated execution of ventures. The authors argue that entrepreneurs learn from both successes and failures as they choose actions and observe and evaluate the resulting outcomes. My findings provide initial empirical support for the model of entrepreneurial learning proposed by Minniti and Bygrave, but also suggest an important contingency factor as well as a more complex effect of entrepreneurial learning. The findings of this study suggest that prior venture experience benefits the avoidance of execution errors in subsequent entrepreneurial activity if an entrepreneur has accumulated experience with previous ventures that are similar to the current endeavor. Entrepreneurs in the sample did not benefit from accumulated prior experience with project ventures that were different from their current venture. In this study the effect of prior experience with the same type of project ventures aided in the avoidance of execution errors; however, the effect diminished with increasing levels of accumulated experience with the same type of project ventures. Repetition of similar entrepreneurial activities provides additional information about the link between chosen actions and the resulting outcomes, but the amount of new information decreases with each repetition. Future research on entrepreneurial learning should account for the degree of similarity between entrepreneurial ventures executed by the same entrepreneur and

should explicitly consider the possibility of a diminishing effect of accumulated prior venture experience.

The results do not provide support for a negative relationship between depth of prior venture experience and the novelty of venture outcomes. I have argued that competency traps and a restricted scope of opportunity recognition would the underlying factors of the negative relationship. This argument is consistent with prior research on organizational learning and with Minnity and Bygrave's (2001) model of entrepreneurial learning. It is possible that competency traps are less likely in a dynamic project-network context compared to other business environments researched in studies on learning-by-doing. The dynamic combination and re-combination of project inputs in this setting may function as an antidote that prevents too narrow specializations among movie directors. In this manner the organizational and institutional context of the project ventures examined here may also allow directors to keep an eye open for a broad variety of opportunities. Unfortunately, the research design of this study does not permit me to explore in more detail how depth of experience affects the opportunity recognition of movie directors. It is equally plausible that their depth of experience allows them to push the envelope of the genre in which they have the most experience. To investigate this future research in the same setting could focus more specifically on the innovation potential of movie directors and examine whether the innovations they create are systematically related to their knowledge base developed from prior experience. The lack of support for the negative effect of depth of prior venture experience in this study's setting does not rule out the possibility of such an effect in other contexts. Future studies

in other settings may help us understand whether the learning context can reduce the probability of competency traps.

Superstitious learning can cause the negative nonlinear effect of depth of experience on project performance, but the results of the statistical analyses suggest caution with regard to interpreting the relationship. My review of the organizational learning literature highlighted that prior experience can lead to positive learning effects, but does not always. Hypotheses H1c was based on the premise that accumulated experience in the same knowledge domain would increase the probability of positive learning effects and benefit the opportunity recognition process. The underlying assumption was that repeated experience in the same knowledge domain provides increasingly reliable information that can be used to improve future performance and reduce the number of execution errors. The empirical test of the hypotheses suggests the opposite. In the sample, depth of prior venture experience had a negative curvilinear relationship with the financial performance of project ventures. The organizational learning literature offers a potential explanation for the observed effect. The directors in the sample may engage in superstitious learning (Levitt & March, 1988: p. 325).

Superstitious learning may cause incorrect inferences about cause-effect relationships in the execution of projects and may lead to incorrect inferences about profitable opportunities. First documented by Skinner (1948), superstitious learning has been investigated in the psychology literature. Superstitious learning occurs when individuals mistake an accidental relationship between an action and a desired outcome for a causal relationship. The incorrect inference motivates the repetition of the same action to obtain the desired outcome, even though no causal relationship exists between

the two. This mechanism underlying superstitious learning has been supported by several studies on humans (Catania & Cutts, 1963; Ono, 1987; Rudski, Lischer, & Alert, 1999; Wright, 1962). Due to the well-documented human limitations regarding statistical inferences (Kahneman & Tversky, 1982), the probability of superstitious learning is higher in situations characterized by a high degree of causal ambiguity and uncertainty. The context of project venture may be especially conducive for superstitious learning. Projects are by definition very dynamic organizational forms and the production of non-routine products along with the dynamic nature of contracting in the motion picture industry (Jones, 2001) makes every project a unique combination of objectives, individuals, skill sets, resources and contextual conditions. Thus, movie projects are high in causal ambiguity. Likewise, the competitive environment of movie project ventures is highly uncertain and the causes of high box-office performance are ambiguous (DeVany & Walls, 1999; DeVany, 2004), even though popular accounts often suggest otherwise (e.g., Pomerantz, 2007). As a consequence, learning-by-doing with positive effects on project performance may be more challenging and the probability for superstitious learning may be high. I did not collect data that would allow me to directly test for superstitious learning in my sample and the reviewed literature on the motion picture industry does not provide qualitative evidence for superstitious learning in the context from which my sample was drawn. However, superstitious learning is a potential explanation for the finding of this study that can be explored in future research. Additional research on the effect of depth of prior venture experience on project performance is warranted before even a tentative conclusion can be drawn, because the

related effect in the statistical analyses of this study is not strong and it is not supported in tests with alternative model specifications.

Breadth of Experience

Diversity in the experience-base of entrepreneurs in the sample of this study increased the probability that they engaged in the production of novel venture outcomes. The results of my analysis provide support for the positive relationship between breadth of experience and the novelty of project venture outcomes as proposed by H2b. This result is consistent with the findings of prior research on the role of individual and team diversity in the production of innovative entertainment products (Taylor & Greve, 2006). Experience with different types of ventures may benefit the creativity of entrepreneurs and may increase their willingness to pursue opportunities associated with novel ideas. The present study cannot directly confirm enhanced creativity and motivation to pursue innovation as the underlying causes for the observed effect. However, prior research in organizational learning and entrepreneurship suggest this explanation and the present study supports the notion that breadth of experience matters, independent of overall experience.

In this study breadth of experience has no effect on the avoidance of errors during the execution of ventures (H2a) or the overall performance of ventures (H2c). The results for H2a in conjunction to the previously discussed finding for H1a (i.e. curvilinear negative effect of depth on execution errors) indicate that entrepreneurs in the setting of this study learn from the repeated execution of the same type of ventures but not from the repeated execution of different types of ventures. Superstitious learning does not seem to pose a problem when entrepreneurs in the sample accumulated experience with different

types of ventures. It is possible that attention to the differences between different types of projects safeguarded entrepreneurs in the sample against drawing inferences that have a high probability of being incorrect due to the causal ambiguity prevailing in the project ventures. Entrepreneurs in the sample may not have expected that the same actions to which they attributed their success in one type of project venture would result in the same outcome if applied during the execution of a different type of project venture.

The motivation of H2c suggests two possible causes for the lack of a relationship between breadth of experience and project performance: non-redundant information is less valuable for project performance than expected or considerable integration challenges undermine the positive effect of non-redundant information. Prior research suggests the latter explanation. Taylor and Greve (2006) found that diverse product development groups faced considerable challenges when trying to integrate information from their diverse knowledge bases. Individual with a diverse knowledge base due to breadth of experience fared better but also faced integration challenges. The entrepreneurs in this study may have experienced difficulties when they tried to harness their diverse experience to improve project performance. The weak or nonexistent support for a relationship of breadth and depth of experience with project performance may also be caused by the characteristics of the empirical setting in which the hypotheses of this dissertation were tested. I will discuss this issue below.

Interaction of Depth and Breadth of Experience

Contrary to the effects hypothesized by H3a/H3b, H4a/H4b and H5a/H5b this study finds no support for an interactive effect of the depth and breadth of experience on any of the project outcomes. This finding is somewhat surprising, but nevertheless

noteworthy. Further research is needed to understand why the different dimensions of a director's knowledge base do not interact with each other. The lack of support could be a function of the size of the sample used for testing the interaction hypotheses. However, the results of the analyses do not support this interpretation. The related literature suggests that general challenges associated with the detection of interaction effects in multiple regressions may explain the lack of findings in this study (Busemeyer & Jones, 1983; Jaccard & Turrisi, 1990). Organizational studies are prone to measurement error, especially when variables measure the underlying construct indirectly. Measurement error reduces effect size and thereby the variance that an interaction term can explain (Aiken & West, 1991).

The findings of this dissertation should not be interpreted to indicate that depth and breadth do not interact with each other, especially as theoretical considerations strongly suggest that they do. The related findings may be a function of methodological challenges related to the investigation of interaction effects. Future research utilizing a different methodology and/or investigating related effects in more stable empirical settings should test for the interaction of depth and breadth of prior experience.

Implications for Theory

This study contributes to the organizational learning literature by developing and testing a more fine-grained model of learning-by-doing (Haunschild & Miner, 1997; Yelle, 1979). The findings of this study extend earlier research that investigated the role of different dimensions of experience (Beckman & Haunschild, 2002; Haunschild & Sullivan, 2002). The empirical evidence examined here supports the notion that accumulated experience within a specific knowledge domain (i.e. depth of experience)

affects various performance dimensions in a way that is distinct from accumulated experience across various knowledge domains (i.e. breadth of experience). Depth of experience reduced execution errors for the examined project ventures, although the effect diminishes with increasing depth of experience. This finding aligns with prior research on learning curve effects in other settings (Argote, 1999; Yelle, 1979). While the scope of the present research cannot confirm the regularity in performance improvements found by learning curve research, it suggests that the positive relationship between repeated execution and performance holds for the execution of projects whose general nature is quite different from the mass production environment of traditional learning curve research.

Consistent with expectations, experience across different knowledge domains (breadth of experience across genres) increased the propensity of project leaders to experiment with novel ideas or resource combinations. This finding is consistent with prior research in organizational learning that found that the availability of diverse sources of knowledge increases the likelihood of innovation (Taylor & Greve, 2006).

Depth and breadth of accumulated experience may create the exploitation and transformation dimension of absorptive capacity that Zahra & George (2002) discussed. In this study, the exploitative dimension of absorptive capacity seemed to help entrepreneurs integrate knowledge gained from prior experience to avoid execution errors during the execution of subsequent ventures. The transformative dimension of absorptive capacity seemed to aid entrepreneurs in this setting to integrate diverse experiences while creating novel outcomes. At least for the examined setting, the two dimensions of

absorptive capacity seem to have an independent effect on project outcomes. Neither dimension seems to influence the effect of the other.

In addition to the contribution to the overall organizational learning literature, this study contributes to research on organizational learning in project ventures -- an increasingly prevalent but under-researched context. Prior research in this area identified project-governing permanent organizations as an important locus of learning across projects (Grabher, 2004; Schwab & Miner, 2001). The findings of this study suggest another locus of learning across project ventures: project managers that accumulate experience across related and unrelated projects. Future research could examine how learning at these two levels influences project outcomes interactively.

The present study also contributes to the emerging research that investigates the influence of entrepreneurial experience on outcomes of subsequent entrepreneurial ventures (Krueger, 1993; Shane, 2000; Starr & Bygrave, 1992). The findings of this study suggest that the similarity/relatedness of prior entrepreneurial experience can have complex implications for the outcomes of subsequent entrepreneurial ventures. Similar to the project ventures examined in this study, new entrepreneurial ventures in other industries can share important features with other ventures previously undertaken by the executing entrepreneur or they can have features that are quite dissimilar to those exhibited by the ventures undertaken earlier. The findings of this study cast doubt on the unconditional positive relationship between accumulated overall entrepreneurial experience and entrepreneurial performance presumed by prior research on serial entrepreneurs (e.g., Kolvereid & Bullvag, 1993; Westhead et al., 2005; Westhead & Wright, 1998; Ucbasaran et al., 2006; Schollhammer, 1991). Research on the

entrepreneurial implications of prior venture experience needs to pay attention to the dimensions of experience accumulated by a serial entrepreneur.

Research on serial entrepreneurs may also benefit from attention to the research design of this study and consider intermediate venture outcomes in conjunction with the traditional focus on financial performance and firm survival. Undoubtedly, financial fitness and survival will remain the ultimate measures of entrepreneurial performance and success. However, paying attention to more intermediate characteristics of entrepreneurial ventures (e.g. novelty of the business model, avoidance of execution errors, etc.) in academic studies may provide a richer understanding of the entrepreneurship phenomenon than a sole focus on market performance alone. Studying intermediate as well as ultimate outcome variables may also shed light on the contingencies of financial performance and firm survival that are independent of market forces.

Additional Considerations and Opportunities for Future Research

This study is the first to investigate the effects of entrepreneurial learning in a large sample of ventures. The study has primarily focused on the effect of depth and breadth of the entrepreneur's prior venture experience on outcomes at the organizational level. The findings support the merit of this focus. Future research should investigate the relative importance of sub-dimensions of prior venture experience compared to other factors that may shape entrepreneurial activities and outcomes. Likewise, potential interactive effects of experience sub-dimensions with other factors should be considered in future research. The attitudes of entrepreneurs (e.g., their artistic orientation) or their personality traits, for example, may moderate the effect of experience sub-dimensions.

Future research should also account for the influence of other sources of experience. Prior education or training, for example, may moderate the effect of depth and breadth of entrepreneurial experience. Prior research in the entrepreneurship literature and in the literature on top management teams may provide valuable insights for future research on entrepreneurial learning that takes into account individual differences beyond those related to prior venture experiences.

The lack of findings for the relationships regarding project performance as the dependent variable may be related to the nature of the empirical setting. Consistent with prior research on organizational learning and research on serial entrepreneurs, this study has included financial performance as a learning outcome. As outlined in chapter 4, the distribution of box-office revenues makes it very difficult if not impossible to appropriately attribute the performance of a particular movie to any cause. DeVany and Walls (1999) have argued that dynamic bandwagon effects among consumers may influence the box-office performance of motion pictures more so than any characteristics of the movie or the movie's production. Thus, it is possible that the non-findings regarding project venture performance are a function of the empirical setting of this study. Future research in other settings should investigate the effect of depth and breadth of prior experience on financial project performance rather than assume based on the findings of this study that no relationship exists.

Some of the limitations of this research stem from the research design and the empirical context of this study. To test the outlined hypotheses, I collected data from archival sources. I studied academic research as well as other publications on the industry and engaged a practitioner to solicit further insights. However, lack of direct access to the

industry prevented me from collecting direct qualitative evidence to corroborate the causal links asserted in this study. It would be desirable to extend the present study through future research that incorporates direct qualitative evidence. Qualitative evidence could be used to test the plausibility of the causal linkages asserted in this study. Furthermore, qualitative evidence may be helpful in gaining a better understanding of the effects of collaborative experience. The present study's findings partially contradict expectations because the effect for the collaboration experience with two key contributors differs. Clearly, qualitative evidence would help to clarify the influence editors and cinematographers have on the execution and performance of movie projects.

The empirical context of this study was chosen for its way of organizing work (i.e. project-based execution of work) and for the potential for discriminating between domains of experience based on classifications that are used and widely accepted by the individuals working in the empirical context (i.e. genre classifications). Extending this research to other contexts that have less explicit and fewer shared conceptions of important experience domains would be necessary to corroborate the relevance of experience sub-dimensions. Testing related hypotheses with a sample of start-ups initiated by serial entrepreneurs would enable the extension of related insights to the entrepreneurship literature. Relevant experience domains may be identified using qualitative research. Prior research on the effect of relatedness in entrepreneurial ventures may (e.g., Ucbasaran et al., 2006) be a useful point of departure for such efforts.

The results of this study related to the sensitivity of the findings to the time frame for which prior experience was considered were surprising. None of the effects emerged when shorter timeframes of experience (i.e. five and ten years prior to the focal movie)

were considered. Future research is needed to investigate the influence of timing on the effect of experience, especially given the well-established effect of knowledge decay (Argote, 1999; Darr et al., 1995).

It is possible that learning processes are more likely or effective in some knowledge domains rather than others. This study has used the genre classification of project ventures in the motion picture industry to identify and distinguish between knowledge (i.e. experience) domains. Learning curve effects may be more salient in one genre versus another or project ventures in one genre may be more likely to benefit from breadth of venture experience than project ventures in other genres. If these considerations generalize to other settings, future studies may investigate the effect of depth and breadth of prior experience. Future research should investigate whether these sub-dimensions of experience have different effects for ventures in different knowledge domains. A future study in the motion picture setting may, for example, focus on ventures in two different genres and investigate whether the effect of depth and breadth of prior experience differs between the two genres.

Conclusions

This dissertation has developed and tested a model of learning across project ventures that explicates the relationship between the depth and breadth of entrepreneurial experience and three different kinds of project outcomes. The findings of this dissertation contribute to the literature on organizational learning and entrepreneurship.

The results of the empirical tests indicate support for the premise that focusing on overall entrepreneurial experience alone is insufficient and potentially misleading. In the statistical analyses presented in this dissertation, overall experience had no effect or a

negative effect on project venture outcomes. In contrast, depth and breadth of experience had an effect on project outcomes independent of overall experience and independent of each other.

A more nuanced view of experience is important for future research on learning from accumulated experience in general and for future research on entrepreneurial learning in particular. Supplementing the focus on overall experience with attention to depth and breadth of experience can improve our understanding of entrepreneurial learning and potentially our understanding of learning processes at various other levels of analysis as well. Studying the effects of sub-dimensions of prior experience on learning outcomes poses conceptual as well as methodological challenges. Prior research, as well as this study, suggests that depth and breadth of experience are relevant sub-dimensions of experience. However, further conceptual work on the identification and classification of experience sub-dimensions could improve our understanding in this area. To research the effect of experience sub-dimensions empirically it is necessary to identify relevant knowledge domains. The findings of this study provided support for the choice of knowledge domains selected based on prior research on the empirical context. It may be more challenging and may require exploratory qualitative research to identify relevant knowledge domains in other settings.

In summary, this dissertation extends prior research on organizational learning and entrepreneurial learning by explicitly testing the effect of depth and breadth of experience on learning outcomes. This study also extends organizational learning research by explicitly modeling the cross-level effect of individual learning on organizational outcomes. In addition, this dissertation examines learning processes in

project ventures - an under-researched but increasingly prevalent organizational context. The insights provided by this dissertation provide a foundation for future research on organizational learning and entrepreneurship.

REFERENCES

Abrahamson, E., & Fairchild, G. 1999. Management fashion: Lifecycles, triggers, and collective learning processes. *Administration Science Quarterly,* 44*:* 708-740.

Adams, J. L. 1974. *Conceptual blockbusting*. San Francisco, W. H. Freeman & Company.

Aiken, L. S., & West, S. G. 1991. *Multiple Regression: Testing and Interpreting Interactions*, London: Sage Publications.

Aldrich, H. 1990. Using an ecological perspective to study organizational founding rates. *Entrepreneurship Theory and Practice* 14(3): 7-24.

Alsos, G. A. & Kolvereid, L. 1998. The Business Gestation Process of Novice, Serial, and Parallel Business Founders. *Entrepreneurship: Theory & Practice* 22(4): 101-114.

Amabile, T. 1998. How to kill creativity. *Harvard Business Review*. 76: 76-87.

Amabile, T. M. 1983. The social psychology of creativity: a componential conceptualization. *Journal of Personality and Social Psychology*. 45: 357-377.

Amabile, T. M. 1996. *Creativity in Context*. Boulder, Colorado: Westview Press.

Amit, R., Glosten, L., & Muller, E.. 1993. Challenges to theory development in entrepreneurship research. *Journal of Management Studies* 30: 815-834.

Ardichvili, A., Cardozo, R, and Ray, S. 2003. A theory of entrepreneurial opportunity identification and development. *Journal of Business Venturing* 18: 105-124.

Argote, L. 1999. *Organizational Learning: Creating, retaining, and transferring knowledge.*. Boston, Kluwer Academic.

Baker, T., Miner, A.S., Eesley, D.T., 2003. Improvising firms: bricolage, account giving and improvisational competencies in the founding process. *Research Policy* 32: 255-276.

Becker, H. S. 1982. *Art Worlds*. Berkeley, University of California Press.

Beckman, C. M., & Haunschild, P. R 2002. Network Learning: The Effects of Partners' Heterogeneity of Experience on Corporate Acquisitions. *Administrative Science Quarterly* 47(1): 92-124.

Bergh, D. D., Lim, E. N. 2008. "Learning How to Restructure: Absorptive Capacity and Improvisational Views of Restructuring Actions and Performance. *Strategic Management Journal*, 29: 593-616.

Berliner, P. F. 1994. *Thinking in Jazz: The Infinite Art of Improvisation*. Chicago, IL, University of Chicago.

Birley, S., & Westhead, P. 1993. A comparison of new businesses established by 'Novice' and 'Habitual' founders in Great Britain. *International Small Business Journal* 12(1): 38-60.

Brown, S. L., & Eisenhardt, K. M. 1995. Product development: past research, present findings, and future directions. *Academy of Management Review* 20(2): 343-378.

Buckland, W. 2003. *Film Studies*. London, Hodder Education.

Busemeyer, J.R., L. Jones. 1983. Analysis of multiplicative combination rules when causal variables are measured with error. *Psychological Bulletin*, 93 549-562.

Busenitz, L. W. 1996. Research on entrepreneurial alertness. *Journal of Small Business Management*, 34(4): 35-44.

Busenitz, L. W., & Barney, J. B. 1997. Differences Between Entrepreneurs and Managers in Large Organizations: Biases and Heuristics in Strategic Decision Making. *Journal of Business Venturing*, 12(1): 9-30.

Casson, M. (1982). *The Entrepreneur: An Economic Theory*. Oxford, Martin Robertson

Catania, A. C., & Cutts, D. 1963. Experimental Control of Superstitious Responding in Humans. *Journal of Experimental Analysis of Behavior*, 6: 203-208.

Certo, S. T., & Semadeni, M. 2006. Strategy Research and Panel Data: Evidence and Implications. *Journal of Management*, 32(3): 449-471.

Chandler, G. N., & Jansen, E. 1992. The founder's self-assessed competence and venture performance. *Journal of Business Venturing*, 7: 223-236.

Christensen, C. 1997. *The innovator's dilemma: When new technologies cause great firms to fail*. Cambridge, MA, Harvard Business School Press.

Christopherson, S., & Storper, M. (1989). The Effects of Flexible Specialization on Industrial Politics and the Labor Market: The Motion Picture Industry. *Industrial and Labor Relations Review*, 42(3): 331-347.

Clark, K., & Fujimoto, T. 1989. Lead Time in Automobile Product Development: Explaining the Japanese Advantage. *Journal of Engineering and Technology Management*, 6: 25-58.

Cliff, J. E., Jennings, P. D., & Greenwood, R. 2006. New to the game and questioning the rules: The experiences and beliefs of founders who start imitative versus innovative firms. *Journal of Business Venturing*, 21(5): 633-663.

Cohen, J. 1988. *Statistical Power Analysis for the Behavioral Sciences*, (2nd ed.) Hillsdale, NJ: Erlbaum.

Cohen, J. 1992. A Power Primer. *Psychological Bulletin*, 112: 1155-159.

Cohen, W. M., & Levinthal, D. A. 1990. Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, 35(1): 128-152.

Cohen, W. M., & Levinthal, D. A. 2000. Absorptive Capacity: A New Perspective on Learning and Innovation. In R. L. Cross and S. B. Israelit (Eds.), *Strategic Learning in a Knowledge Economy: Individual, Collective, and Organizational Learning Process*, Butterworth-Heinemann: 39-68.

Colombo, M. G., & Grilli, L. 2005. Founders' human capital and the growth of new technology-based firms: A competence-based view. *Research Policy*, 34(6): 795-816.

Cook, T. D., & Campell, D. T. 1979. *Quasi Experimentation: Design and Analytical Issues for Field Settings*. Chicago, Rand McNally.

Cooper, R. G., & Kleinschmidt, E. J. 1986. An Investigation Into the New Product Process: Steps, Deficiencies, and Impact. *Journal of Product Innovation Management*, 3: 71-85.

Cooper, R. G., & Kleinschmidt, E. J. 1987. New products: What separates winners from losers? *Journal of Product Innovation Management*, 10: 169-184.

Cope, J. 2005. Toward a Dynamic Learning Perspective of Entrepreneurship. *Entrepreneurship: Theory & Practice*, 29(4): 373-397.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16: 297-334.

Crossan, M. M., Lane, H. W., and White, R.E. 1999. An organizational learning framework: From intuition to institution. *Academy of Management Review*, 24(3): 522-537.

Cyert, R. M., & March, J.G. 1963. *A Behavioral Theory of the Firm*. Englewood Cliffs, Prentice-Hall.

Darr, E. D., L. Argote, & Epple, D. 1995. The Acquisition, Transfer, and Depreciation of Knowledge in Service Organizations: Productivity in Franchises. *Management Science*, 41(11): 1750-1763.

Davies, A., & Hobday, M. 2005. *The business of projects: Managing innovation in complex products and systems*. New York, Cambridge University Press.

de Bono, E. 1968. *New think: The use of lateral thinking in the generation of new ideas*. New York, Basic Books.

deClercq, D., & Arenius, P. 2006. The Role of Knowledge in Business Start-up Activity. *International Small Business Journal*, 24(4): 339-358.

De Vany, A. S. 2004. *Hollywood Economics: How Extreme Uncertainty Shapes the Film Industry*, New York: Routledge.

De Vany, A. S., & Walls, W. D. 1996. Bose-Einstein Dynamics and Adaptive Contracting in the Motion Picture Industry. *Economic Journal*, 106: 1493-1514.

De Vany, A. S., & Walls, W. D. 1999. Uncertainty in the Movie Industry: Does Star Power Reduce the Terror of the Box Office? *Journal of Cultural Economics*, 23(4): 285-318.

De Vany, A. S., & Walls, W. D. 2002. Does Hollywood make too many R-rated Movies?: Risk, Stochastic Dominance, and the Illusion of Expectation. *Journal of Business*, 75(3): 425-451.

De Vany, A. S., & Walls, W. D. 2004. Motion Picture Profit, the Stable Paretian Hypothesis, and the Curse of the Superstar. *Journal of Economic Dynamics and Control*, 28(6): 1035-1057.

Denrell, J. 2003. Vicarious learning, undersampling of failure, and the myth of management. *Organization Science*, 14(3): 227-243.

Dew, N., Velamuri, S. R. , & Venkataraman, S. 2004. Dispersed knowledge and an entrepreneurial theory of the firm. *Journal of Business Venturing*, 19(5): 659-679.

Drazin, R., M. A. Glynn, M.A., Kazanjian, R.K. 1999. Multilevel Theorizing About Creativity in Organizations: A Sensemaking Perspective. *Academy of Management Review*, 24: 286-307.

Dutta, D. K., & Crossan, M. M. 2005. The Nature of Entrepreneurial Opportunities: Understanding the Process Using the 4I Organizational Learning Framework. *Entrepreneurship: Theory & Practice*, 29(4): 425-449.

Dutton, J. M., & Thomas, H. 1984. Treating progress functions as a managerial opportunity. *Academy of Management Review*, 9: 235-247.

Eccles, R. G. 1981. The Quasifirm in the Construction Industry. *Journal of Economic Behavior and Organization*, 2: 335-357.

Eckhardt, J. T., & Shane, S. A. (2003. Opportunities and Entrepreneurship. *Journal of Management*, 29(3): 333-349.

Eisenhardt, K. M., & Tabrizi, B. N. 1995. Accelerating adaptive processes: Product innovation in the global computer industry. *Administrative Science Quarterly*, 40: 84-110.

Ekstedt, E., Lundin, R.A., Soederholm, A., & Wirdenius, H. 1999. *Neo-institutional Organising: Renewal by Action and Knowledge in a Project-intensive Economy*. London: Routledge.

Eliashberg, J., Elberse, A., Leenders, M. 2006. The Motion Picture Industry: Critical Issues in Practice, Current Research, and New Research Directions. *Marketing Science,* 25(6): 638-661.

Endres, A., & Woods, C. 2006. Modern Theories of Entrepreneurial Behavior: A Comparison and Appraisal. *Small Business Economics*, 26(2): 189-202.

Faulkner, R., & Anderson, A. 1987. Short-term projects and emergent careers: Evidence from Hollywood. *American Journal of Sociology*, 92(4): 879-909.

Fiet, J. O. 2007. A Prescriptive Analysis of Search and Discovery. *Journal of Management Studies*, 44(4): 592-611.

Fiol, C. M. 1983. Organizational Learning. *Academy of Management Review*, 10(4): 803-813.

Fiol, C. M. 1995. Thought Worlds Colliding: The Role of Contradiction in Corporate Innovation Processes. *Entrepreneurship: Theory & Practice*, 19(3): 71-90.

Fiske, S. T., & Taylor, S. E. 1991. *Social Cognition*. New York: McGraw-Hill.

Ford, C. M. 1996. A theory of individual creative action in multiple social domains. *Academy of Management Review*,. 21: 1112-1142.

Gaglio, C. M. 1997. Opportunity identification: Review, critique, and suggested research. In *Advances in Entrepreneurship, Firm Emergence and Growth*, Greenwich, CT: JAI Press.

Gaglio, C. M. & Katz, J. A. 2001. The psychological basis of opportunity identification: Entrepreneurial alertness. *Journal of Small Business Economics*, 16: 95-111.

Gartner, W. B. 1985. A Conceptual Framework for Describing the Phenomenon of New Venture Creation. *Academy of Management Review*, 10(4): 696-706.

Gartner, W. B., Bird, B. J., & Starr, J.A. 1992. Acting As If: Differentiating Entrepreneurial From Organizational Behavior. *Entrepreneurship: Theory & Practice*, 16(3): 13-31.

Gentner, D., Holyoak, K. J., Kokinov, B.N. 2001.*The Analogical Mind: Perspectives From Cognitive Science*. Cambridge, MA: MIT Press.

Gilad, B. 1984. Entrepreneurship: The issue of creativity in the market place. *Journal of Creative Behavior*, 18(3): 151-161.

Gimeno, J., Folta, T. B., Cooper, A., & Woo, C. 1997. Survival of the Fittest? Entrepreneurial Human Capital and the Persistence of Underperforming Firms. *Administrative Science Quarterly*, 42(4): 750-783.

Goldman, W. 1989. *Adventures in the Screen Trade: A Personal View of Hollywood and Screenwriting*. New York: Grand Central Publishing

Goodman, P. L., & Goodman, R. A. 1972. Theater as a Temporary System. *California Management Review*, 15(2): 103-108.

Goodman, R. A. & Goodman, P. L. 1976. Some Management Issues in Temporary Systems: A Study of the Professional Development and Manpower - the Theater Case. *Administration Science Quarterly*, 21(3): 494-500.

Gordon, W. J. 1961. *Synectics*. New York: Harper and Row.

Grabher, G. 2004. Temporary architectures of learning: Knowledge governance in project ecologies. *Organization Studies*, 25(9): 1491-1514.

Granovetter, M. S. 1982. The strength of weak ties: A network theory revisited. In P. V. Marsden and N. Lin (Eds.), *Social Structure and Network Analysis B2 - Social Structure and Network Analysis*.. Beverly Hills, CA, Sage: 105-130.

Green, S. B. 1991. How Many Subjects Does It Take To Do A Regression Analysis. *Multivariate Behavioral Research*, 26(3): 499.

Greve, H. R. 1998. Performance, Aspirations and Risky Organizational Change. *Administrative Science Quarterly*, 43(1): 58-86.

Greve, H. R. 2003. *Organizational Learning from Performance Feedback: A Behavioral Perspective on Innovation and Change*, Cambridge: Cambridge University Press.

Guilford, J. P. (1950). Creativity. *American Psychologist*, 5: 444-454.

Guth, W. D., & Ginsberg, A. 1990. Corporate entrepreneurship. *Strategic Management Journal*, 11: 5-15.

Haas, M. R., & Hansen, M. T. 2005. When using knowledge can hurt performance: The value of organizational capabilities in a management consulting company. *Strategic Management Journal*, 26(1): 1-24.

Hair, J. F., Tatham, R. L., Anderson, R.E., Black, W. C. 1998. *Multivariate Data Analysis* (5th edition). Prentice Hall

Hansen, M. T. 1999. The Search-Transfer Problem: The Role of Weak Ties in Sharing Knowledge across Organization Subunits. *Administrative Science Quarterly*, 44(1): 82.

Hansen, M. T. 2002. Knowledge Networks: Explaining Effective Knowledge Sharing in Multiunit Companies. *Organization Science*, 13(3): 232-248.

Harlow, H. F. 1949. The Formation of Learning Sets. *Psychological Review*, 56: 51-65.

Harlow, H. F. 1959. *Learning Set and Error Factor Theory. Psychology: A Study of a Science*. New York: MacGraw-Hill: 492-537.

Hatch, M. J. 1998. Jazz as a metaphor for organizing in the 21th century. *Organization Science*, 9: 556-557.

Haunschild, P. R., & Miner, A. S. 1997. Modes of interorganizational imitation: the effects of outcome salience and uncertainty. *Administrative Science Quarterly*, 42: 472-500.

Haunschild, P. R., & Sullivan, B. N. 2002. Learning from Complexity: Effects of Prior Accidents and Incidents on Airlines' Learning. *Administrative Science Quarterly*, 47(4): 609.

Hayek, F. 1945. The use of knowledge in society. *American Economic Review*, 35(4): 519-530.

Henning-Thurau, T., Houston, M. B., Sridhar, S. 2006. Can Good Marketing Carry a Bad Product? Evidence from the Motion Picture Industry. *Marketing Letters*, 17: 205-219.

Hill, R. C., & Levenhagen, M. 1995. Metaphors and mental models: sense making and sensegiving in innovative and entrepreneurial activities. *Journal of Management*, 21: 1057-1074.

Hirsch, P. M. 1972. Processing Fads and Fashions: An Organization-Set Analysis of Cultural Industry Systems. *American Journal of Sociology*, 77: 639-659.

Hitt, M. A., Ireland, D. R., Camp, S.M., Sexton, D.L. 2001. Strategic entrepreneurship: entrepreneurial strategies for wealth creation. *Strategic Management Journal*, 22(6-7): 479-491.

Hobday, M. 2000. The project-based organisation: An ideal from for managing complex products and systems? *Research Policy*, 29 871-893.

Huber, G. 1991. Organizational learning: The contributing processes and the literature. *Organization Science*, 2(88-115).

Huber, P. J. 1967. The Behavior of Maximum Likelihood Estimates under Nonstandard Conditions. Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability, Berkeley.

Hunt, M., Ogden, T., Neale, M.A. 2003. Who is really sharing? Effects of social and expert status on knowledge exchange within groups. *Management Science*, 49: 464-477.

Hutchins, E. 1991. Organizing work by adaptation. *Organization Science*, 2: 14-39.

Imai, K., Nonaka, I., Takeuchi, H. 1985. Managing the New Product Development Process: How Japanese Companies Learn and Unlearn. In K. B. Clark and R. H.,*The Uneasy Alliance*. Hayes. Boston, MA: Harvard Business School Press.

Ingram, P., &.Baum, J. A 1997. Opportunity and constraint: Organizations' learning from the operating and competitive experience of industries. *Strategic Management Journal*, 18: 75-98.

Itami, H. 1987. *Mobilizing invisible assets*. Cambridge, MA: Harvard University Press.

Jaccard, J., R. Turrisi, C.W. 1990. *Interaction effects in multiple regression*. Newbury Park, CA: Sage Publications.

Janis, I. L. 1972. *Victims of Groupthink*. Boston: Houghton Mifflin Company.

Jones, C. 2001. Careers in Project Networks: The Case of the Film Industry. In M. B. Arthur and D. M. Rousseau, *The Boundaryless Career: A New Employment Principle for a New Organizational Era*.Oxford University Press: 58-75.

Jones, C. 2001. Coevolution of entrepreneurial careers, institutional rules and competitive dynamics in American film, 1895-1920. *Organization Studies*, 22: 911-944.

Jones, C., Hesterly, W. S., Borgatti, S.P. 1997. A general theory of network governance: Exchange conditions and social mechanisms. *Academy of Management Review*, 22 911-945.

Joskow, P. L., & Rozanski, G. A. 1979. The effects of learning by doing on nuclear plant operating reliability. *Review of Economics and Statistics*, 61: 161-168.

Kahneman, D., Slovic, P., Tversky, A. 1982. *Judgement Under Uncertainty: Heuristics and Biases*. Cambridge: Cambridge University Press.

Kaish, S., & Gilad, B. 1991. Characteristics of opportunities search of entrepreneurs versus executives: Sources, interests, and general alertness. *Journal of Business Venturing*, 6: 45-61.

Kamoche, K., & Cunha, M. P. 2001. Minimal structures: From jazz improvisation to product innovation. *Organization Studies*, 22(5): 733-764.

Kelsey, S. F., Mullin, S. M., Detre, K.M., Mitchell, M.J. 1984. Effect of investigator experience on percutaneous transluminal coronary angioplasty. *American Journal of Cardiology*, 53: 56C-64C.

Kim, L. 1995. Absorptive capacity and industrial growth: A conceptual framework and Korea's experience. In B. Koo and D. Perkins (Eds.), *Social capabilities and long-term economic growth*.. London: St. Martin's Press: 266-287.

Kim, L. 1997. The dynamics of Samsung's technological learning in semiconductors. *California Management Review*, 39(3): 86-100.

Kim, L. 1998. Crisis construction and organizational learning: Capability building in catching-up at Hyundai Motor. *Organization Science*, 9: 506-521.

Kirtzner, I. M. 1997. Entrepreneurial discovery and the competitive market process: an Austrian approach. *Journal of Economic Literature*, 35: 60-85.

Kirzner, I. 1973. *Competition and Entrepreneurship*. Chicago, IL.: University of Chicago Press.

Kirzner, I. 1997. Entrepreneurial discovery and the competitive market process: An Austrian approach. *Journal of Economic Literature*, 35: 60-85.

Knight, F. H. 1921. *Risk, Uncertainty, and Profit*. New York: Kelley & Millman.

Koestler, A. 1964. *The act of creation*. New York: Macmillan.

Kolvereid, L. & Bullvag, E. 1993. Novices versus experienced business founders: An exploratory investigation. In S. Birley and I. C. MacMillan (Eds.), *Entrepreneurship research: Global perspectives*. Amsterdam, The Netherlands: Elsevier: 275-285.

Krueger, N. 1993. The Impact of Prior Entrepreneurial Exposure on Perceptions of New Venture Feasibility and Desirability. *Entrepreneurship: Theory & Practice*, 18(1): 5-21.

Kunda, Z., Miller, D., Claire, T. 1990. Combining social concepts: The role of causal reasoning. *Cognitive Science*, 14(4): 551-577.

Lampel, J., Lant, T. K., Shamsie, J. 2000. Balancing Act: Learning from Organizing Practices in Cultural Industries. *Organization Science*, 11(3): 263.

Lane, P. J. & Lubatkin, M. 1998. Relative absorptive capacity and interorganizational learning. *Strategic Management Journal*, 19(5): 461.

Lane, P. J., Salk, J. E. Lyles, M.A. 2001. Absorptive Capacity and Performance in International Joint Ventures. *Strategic Management Journal*, 22: 1139-1161.

Lant, T. K. 1992. Aspiration level updating: An empirical exploration. *Management Science*, 38: 623-644.

Levenhagen, M., Porac, J. F., Thomas, H. 1994. Managing strategic evolution in fast-paced technological environments: the case of software development in 'Silicon Prairie'. *Journal of Strategic Change*, 3(5): 287-303.

Levinthal, D. A., & March, J. G. 1993. The myopia of learning. *Strategic Management Journal*, 14(8): 95-112.

Levitt, B., & March, J. G. 1988. Organizational learning. *Annual Review of Sociology*, 14: 319-340.

Lewis, K., Lange, D., Gillis, L. 2005. Transactive memory systems, learning and learning transfer. *Organization Science*, 16(6): 581-598.

Liang, D. W., Moreland, R., Argote, L. 1995. Group versus individual training and group performance: The mediating role of transactive memory. *Personality Social Psychology Bulletin*, 21: 384-393.

Lofstrom, S. M. 2000. Absorptive capacity in strategic alliances: Investigating the effects of individual's social and human capital on inter-firm learning. *Paper presented at the Organization Science Winter Conference*. Keystone, CO.

Lui, X., & White, R. E. 1997. The relative contribution of foreign technology and domestic inputs to innovation in Chinese manufacturing industries. *Technovation*, 17: 119-125.

Lumpkin, G. T., & Lichtenstein, B. B. 2005. The role of organizational learning in the opportunity recognition process. *Entrepreneurship: Theory & Practice*, 29(4): 451-472.

MacMillan, I. C. 1986. To really learn about entrepreneurship, let's study habitual entrepreneurs. *Journal of Business Venturing*, 1(3): 241-243.

March, J. G. 1991. Exploration and Exploitation in organizational learning. *Organization Science*, 2(1): 71-87.

March, J. G., 1999. Population-level learning and industry change. In A. S. Miner and P. Anderson, *Advances in strategic management*. Stamford, CN: JAI Press. XI-XIII.

March, J. G., Sproull, S., Tamuz, M. 1991. Learning from samples of one or fewer. *Organization Science*, 2(1): 1-13.

Mascitelli, R. 2000. From experience: harnessing tacit knowledge to achieve breakthrough innovation. *Journal of Product Innovation Management,* 17: 179-193.

Mazur, J. E. & Hastie, R. 1978. Learning as accumulation: A reexamination of the learning curve. *Psychological Bulletin*, 85: 1256-1274.

McGrath, R. 1999. Falling Forward: Real options reasoning and entrepreneurial failure. *Academy of Management Review*, 24(1): 13-30.

McGrath, R., & MacMillan, I. C. 2000. *The entrepreneurial mindset.* Cambridge, MA: Harvard Business School Press.

Mezias, J. M., and Mezias, S. J. 2000. Resource Partitioning, the Founding of Specialist Firms, and Innovation: The American Feature Film Industry, 1912-1929. *Organization Science*, 11(3): 306.

Mezias, S. J., & Kuperman, J. C. 2001. The community dynamics of entrepreneurship: The birth of the American Film Industry, 1895-1929. *Journal of Business Venturing*, 16(3): 209.

Miles, R. E., & Snow, C. 1986. Organizations: New Concepts for New Forms. *California Management Review*, 28: 62-73.

Miller, D., & Shamsie, J. 1996. The resource-based view of the firm in two environments: The Hollywood film studios from 1936 to 1965. *Academy of Management Journal*, 39(3): 519-543.

Miner, A. S., Bassoff, P, Moorman, C. 2001. Organizational Improvisation and Learning: A Field Study. *Administrative Science Quarterly*, 46: 304-337.

Miner, A. S., Haunschild, P. Schwab, A. 2003. Experience and convergence: Curiosities and speculations. *Industrial and Corporate Change*, 12(4): 789-813.

Miner, A. S. & P. R. Haunschild 1995. Population level learning. In L. L. Cummings and B. M. Staw (Eds.), *Research in Organizational Behavior* 17: 115-166. Greenwich, CT: JAI Press.

Minkler, A. 1993. Knowledge and internal organization. *Journal of Economic Behavior and Organization*, 21: 17-30.

Minniti, M., & Bygrave, W. 1999. The Microfoundations of Entrepreneurship. *Entrepreneurship: Theory & Practice*, 23(4): 41-52.

Minniti, M., & Bygrave W. 2001. A Dynamic Model of Entrepreneurial Learning. *Entrepreneurship: Theory & Practice*, 25(3): 5.

Moorman, C., & Miner, A. S. 1997. The impact of organizational memory on new product performance and creativity. *Journal of Marketing Research*, 34: 91-106.

Moorman, C., & Miner, A. S. 1998. The convergence of planning and execution: Improvisation in new product development. *Journal of Marketing*, 62: 1-20.

Moorman, C., & Miner, A. S. 1998. Organizational improvisation and organizational memory. *Academy of Management Review*, 23(4): 698-723.

Morris, M. 2007. Personal Communication. Baton Rouge, Louisiana.

Moul, C. 2001. Evidence of qualitative learning-by-doing from the advent of the 'talkie'. *Journal of Industrial Economics*, 49(1): 97-109.

Mumford, M. D., & Gustafson, S. B. 1988. Creativity syndrome: Integration, application, and innovation. *Psychological Bulletin*, 103: 27-43.

Nass, C. 1994. Knowledge and skills: Which do administrators learn from experience. *Organization Science*, 5: 38-50.

Neale, S. 2000. *Genre and Hollywood*. New York: Routledge.

Nicholls-Nixon, C. L., Cooper, A. C., Woo, C.Y. 2000. Strategic experimentation: Understanding change and performance in new ventures. *Journal of Business Venturing*, 15(5-6): 493-521.

Norton, W. I., & Moore, W. T. 2006. The Influence of Entrepreneurial Risk Assessment on Venture Launch or Growth Decisions. *Small Business Economics*, 26(3): 215-226.

Ono, K. 1987. Superstitious Behavior in Humans. *Journal of Experimental Analysis of Behavior*, 47: 261-271.

Parnes, S. J., & Noller, R. B. 1972. Applied creativity: The creative studies project. Part II: Results of the two-year program. *Journal of Creative Behavior*, 6: 164-186.

Pennings, J. M., Barkema, H., Douma, S. 1994. Organizational learning and diversification. *Academy of Management Journal*, 37: 608-640.

Perretti, F., & Negro, G. 2006. Filling empty seats: How status and organizational hierarchies affect exploration versus exploitation in team design. *Academy of Management Journal,* 49(4): 759-777.

Perretti, F. & Negro, G. 2007. Mixing genres and matching people: a study in innovation and team composition in Hollywood. *Journal of Organizational Behavior*, 28: 563-586.

Pirolli, P. L., & Anderson, J. R. 1985. The Role of Learning from Examples in the Acquisition of Recursive Programming Skills. *Canadian Journal of Psychology*, 39(2): 240-272.

Politis, D. 2005. The Process of entrepreneurial learning: A conceptual framework. *Entrepreneurship: Theory & Practice*, 29 (4): 399-424.

Pomerantz, D. 2009. Hollywood's Dark Night. *Forbes*, Vol. 183, Issue 3: p. 92-96.

Pomerantz, D. 2007. Special Report: Ultimate Star Payback. *Forbes.com*, available online at: http://www.forbes.com/2007/08/03/celebrities-hollywood-movies-biz-cz_dp_0806starpayback_print.html. Retrieved on 01/16/2009.

Porac, J. F., & Thomas, H. 1995. Rivalry and the Industry Model of Scottish Knitwear Producers. *Administrative Science Quarterly*, 40(2): 203-227.

Porac, J. F., Ventresca, M. J., Mishina, Y. 2002. Interorganizational Cognition and Interpretation. In J. A. Baum (Ed.) *Companion to Organizations*. New York: Blackwell Publishers.

Porter, E., & Fabrikant G. 2006. A big star may not a profitable movie make. *New York Times*, August 28. New York.

Powell, W. W. 1990. Neither Market Nor Hierarchy: Network Forms of Organization. *Research in Organizational Behavior*, 12: 295-336.

Ravasi, D., & Turati, C. 2005. Exploring entrepreneurial learning: a comparative study of technology development projects. *Journal of Business Venturing*, 20(1): 137-164.

Ravid, S. A. 1999. Information, Blockbusters, and Stars: A Study of the Film Industry. *Journal of Business*, 72(4): 463-492.

Reich, R. 1991. *The Work of Nations: Preparing Ourselves for 21st Century Capitalism*. New York: Random House, Inc.

Reuber, A. R., & Fischer, E. 1999. Understanding The Consequences of Founders' Experience. *Journal of Small Business Management*, 37(2): 30-45.

Robins, J. A. 1993. Organization as Strategy: Restructuring Production in the Film Industry. *Strategic Management Journal*, 14: 103-118.

Rogoff, E. G., Lee, M., Suh, D. 2004. "Who Done it?" Attributions by Entrepreneurs and Experts of the Factors that Cause and Impede Small Business Success. *Journal of Small Business Management*, 42(4): 364-375.

Rosenkopf, L. & Nerkar, A. 2001. Beyond local search: Boundary spanning, exploration and impact in the optical disk industry. *Strategic Management Journal*, 22(287-306).

Rudski, J. M., Lischner, M. I., Albert, L.M. 1999. Superstitious Rule Generation is Affected by Probability and Type of Outcome. *Psychological Record*, 49: 245-260.

Saraswat, S. P., & Gorgone, J. T. 1990. Organizational learning curve in software installation: An empirical investigation. *Information and Management*, 19: 53-59.

Saxenian, A. 1990. Regional Networks and the Resurgence of Silicon Valley. *California Management Review*, 33(1): 89-112.

Schilling, M. A., & Steensma, H. K. 2001. The Use of Modular Organizational Forms: An Industry-Level Analysis. *Academy of Management Journal*, 44(6): 1149-1168.

Schollhammer, H. 1991. Incidence and Determinants of Multiple Entrepreneurship. In *Frontiers of Entrepreneurship Research*. Wellesley, MA: Babson College.

Schumpeter, J. 1934. Theory of Economic Development. Cambridge, MA.: Harvard University Press.

Schwab, A. 2000. Management practices for project collaborations: The performance impact of the shadow of the future and psychological contracts in the U.S. movie industry 1931-1940. *Paper presented at the Academy of Management Conference in Toronto, Canada.*

Schwab, A. 2006. Short-term project collaborations: Flexibility implications for organizational learning and opportunistic behavior. *Paper presented at the European Group for Organization Studies (EGOS) in Bergen, Norway*.

Schwab, A. 2007. Incremental Organizational Learning from Multilevel Information Sources: Evidence for Cross-Level Interactions. *Organization Science*, 18(2): 233-251.

Schwab, A., & Miner, A. S. 2008. Learning in Hybrid-Project Systems: The Effects of Project Performance on Repeated Collaboration. *Academy of Management Journal*, 51(6): 1117-1149.

Scott, A. O. 2004. Film Review: To Brown or Cornell, On the Wings of a Heist. *The New York Times*. New York.

Shane, S. 2000. Prior Knowledge and the Discovery of Entrepreneurial Opportunities. Organization Science, 11(4): 448.

Shane, S., & Venkataraman, S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1): 217-226.

Shepherd, D. A., & DeTienne, D. R. 2005. Prior Knowledge, Potential Financial Reward, and Opportunity Identification. *Entrepreneurship: Theory & Practice*, 29(1): 91-112.

Simonin, B. 1997. The Importance of Collaborative Know-How: An Empirical Test of the Learning Organization. *Academy of Management Journal*, 40(5): 1150-1174.

Simonton, D. K. 1984. Artistic creativity and interpersonal relationships across and within generations. *Journal of Personality and Social Psychology*, 46: 1273-1286.

Simonton, D. K. 1999. *Origins of Genius*. New York: Oxford University Press.

Skinner, B. F. 1948. Superstition in Pigeons. *Journal of Experimental Psychology*, 38: 168-172.

Smith, K. A., & DeGreorio, D. D. 2002. Bisociation, discovery, and entrepreneurial action. In M. Hitt, D. Ireland, M. Camp and M. Sexton (Eds.), *Strategic entrepreneurship: Creating an integrated mindset*. Oxford, U.K.: Blackwell.

Starr, J. A., & Bygrave, W. D. 1992. The Second Time Around. The Outcomes, Assets and Liabilities of Prior Start-up Experience. In S. Birley, I. C. MacMillan and S. Subramony (Eds.), *International Perspectives on Entrepreneurship Research*, 340-363. Amsterdam: Elsevier Science.

Stinchcombe, A. L. 1965. Social structure and organizations. *Handbook of Organizations*.: 142-193. Chicago, IL: Rand McNally.

Storper, M. 1989. The Transition to Flexible Specialisation in the US Film Industry: External Economies, the Division of Labor, and the Crossing of Industrial Divides. *Cambridge Journal of Economics*, 13: 273-305.

Sydow, J., Lindkvist, L., & DeFillippi, R. 2004. Project-based organizations, embeddedness and repositories of knowledge: Editorial. *Organization Studies*, 25(9): 1475-1489.

Sydow, J., & Staber, U. 2000. The Institutional Embeddedness of Project Networks: The Case of Content Production in German Television. *Regional Studies*, 36(3): 215-227.

Szulanski, G. 1996. Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal*, 17: 27-43.

Taylor, A., & Greve, H. R. 2006. Superman or the Fantastic Four? Knowledge combination and experience in innovative teams. *Academy of Management Journal*, 49(4): 723-740.

Thurstone, L. L. 1919. The learning curve equation. *Psychological Monographs*, 26: 1-51.

Ucbasaran, D., Alsos, G.A., Westhead, P., Wright, M.. 2006. *Habitual Entrepreneurs*. Cheltenham, UK: Edward Elgar Publishing.

Ucbasaran, D., Wright, M., Wright, M. 2003. A longitudinal study of habitual entrepreneurs: starters and acquirers. *Entrepreneurship & Regional Development*, 15(3): 207-228.

Unsworth, K. 2001. Unpacking creativity. *Academy of Management Review*, 26: 289-297.

U.S. Department of Labor. 2001. National Industry-Specific Occupational Employment and Wage Estimates SIC 78 - Motion Pictures. http://www.bls.gov/oes/2001/oesi2_78.htm, Retrieved 11/02/2007.

U.S. Bureau of Labor Statistics. (2008) Consumer Price Index Database. http://www.bls.gov/CPI/, Retrieved 11/25/2008.

Uzumeri, M., & Nembhard, D. 1998. A population of learners: A new way to measure organizational learning. *Journal of Operations Management*, 16: 515-528.

Van de Ven, A. H., & Polley, D. 1992. Learning While Innovating. *Organization Science*, 3(1): 92-116.

Van Wijk, R., R. Van den Bosch, F.A., Volberda, H.W. 2001. The impact of knowledge depth and breadth of absorbed knowledge on levels of exploration and exploitation. *Paper presented at the Academy of Management Conference in Washington, DC.*

Venkataraman, S. 1997. The distinctive domain of entrepreneurship research: An editor's perspective. In J. Katz and R. Brockhaus (Eds.), *Advances in entrepreneurship, firm emergence, and growth*, 3: 119-138. Greenwich, CT: JAI Press.

Von Hippel, E. 1994. "Sticky Information" and the Locus of Problem Solving: Implications for Innovation. *Management Science*, 40(4): 429-439.

Ward, T. B. 2004. Cognition, creativity, and entrepreneurship. *Journal of Business Venturing*, 19(2): 173-188.

Weick, K. E. 1993. The collapse of sensemaking in organizations: The Mann Gulch disaster. *Administrative Science Quarterly*, 38: 628-652.

Weick, K. E. 1998. Improvisation as a mindset for organizational analysis. *Organization Science*, 9: 543-555.

Westhead, P., Ucbasaran, D., Wright, M. 2005. Decisions, Actions, and Performance: Novice, Serial and Portfolio Entrepreneurs Differ? *Journal of Small Business Management*, 43(4): 393-417.

Westhead, P., & Wright, M. 1998. Novice, portfolio and serial founders: are they different? *Journal of Business Venturing*, 13(3): 173-204.

White, H. 1980. A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity. *Econometrica*, 48: 817-830.

Winslow, E. K., & Solomon, G. T. 1987. Entrepreneurs are more than non-conformists: They are mildly sociopathic. *Journal of Creative Behavior*, 21(3): 202-213.

Woodman, R. W. 1993. Toward a theory of organizational creativity. *Academy of Management Review*, 18: 293-321.

Wright, J. C. 1962. Consistency and Complexity of Response Sequences as a Function of Scheduled and Noncontingent Reward. *Journal of Experimental Psychology*, 63: 601-609.

Wright, M., Robbie, K., Ennew, C.. 1997. Serial Entrepreneurs. *British Journal of Management*, 8: 251-268.

Yelle, L. E. 1979. The learning curve: Historical review and comprehensive survey. *Decision Sciences,* 10: 302-328.

Zahra, S. A. 1993. New Product Innovation in Established Companies: Associations with Industry and Strategy Variables. *Entrepreneurship: Theory & Practice*, 18(2): 47-69.

Zahra, S. A., & George, G. 2002. Absorptive Capacity: A review, reconceptualization, and extension. *Academy of Management Review*, 27(2): 185-203.

Zuckerman, E. W., Kim, T., & von Rittmann, J. 2003. Robust Identities or Nonentities? Typecasting in the Feature-Film Labor Market. *American Journal of Sociology, 108*(5): 1018-1074.

APPENDIX A: PILOT STUDY

To demonstrate the feasibility and to improve the empirical research design of the study for the defense of the dissertation proposal, I collected a pilot sample (n=16) and conducted preliminary empirical tests of the theory-based main-effect hypotheses regarding depth and breadth of experience. The results of the pilot study are presented in this appendix.

Descriptive Statistics

Dependent variables**.** The number of *project execution errors* (mean=18.10; S.D.=16.48) for each movie project was determined based on a project-specific error list published by the IMDb. *Novelty of project outcomes* was rated based on the evaluation of the released movie by movie critics published in the New York Times (mean=2.90; S.D.=1.15). Using box office information from Box Office Mojo, *project performance* (mean=16.91; S.D.=2.85) was constructed as a logged variable based on the gross box-office receipts for each of the movies in the sample.

Independent Variables. Consistent with discussion of movie genres above *depth of experience* was operationalized as the number of prior movies directed by the same director that have the same genre classification as the focal movie (mean=3.98; S.D.=3.08). A movie director's prior projects were identified using IMDb. I use genre classification for each film as a proxy for different knowledge domains and distinguish between seven different genres each posing different challenges for directors: Action/Adventure, Crime/Thriller, Comedy, Drama, Horror, War, and Western. *Breadth of experience* was operationalized based on the number of different genre classifications

of the prior movies directed by the same director (mean=3.30; S.D.=1.13) using the same genre classifications outlined above. *Prior joint collaborative experience* measures the amount of prior projects a focal director has previously done together with the cinematographer (mean=1.00; S.D.=1.62) or editor (mean=1.70; S.D.=2.47) of the focal project. Both these types of project participants work closely with the director during a project venture (intense interaction), which created the opportunity for them to develop coordination practices during prior joint collaborations.

Control Variables. Information about the *number of Oscars won* (mean=0.53; S.D.=0.70) and *number of Oscar nominations* received (mean=1.89; S.D.=2.38) for the main actors was obtained from IMDb. The total number of previous movies directed by the same director (mean=6.80; S.D.=3.94) was used to capture the effect of *accumulated prior overall experience.* Data on the *budget* of each of the movies in the sample was obtained from Box Office Mojo. For the analysis the budget variable was logged (mean=17.69; S.D.=0.87).

Analyses

Execution errors are a count variable, but showed only limited overdispersion ($\alpha = 0.03$; $\chi^2 = 2.50$; $p = 0.057$). Thus, I used a Poisson regression model to test related hypotheses. The distribution of the other two dependent variables showed normal tendencies. Thus, I used robust OLS regression to test the corresponding hypotheses. Due to the sample-size limitations of my pilot sample, I limited the number of control variables in the models. One-tailed significance test were used to test the directional hypotheses.

Means, standard deviations, and correlation coefficients for the variables are reported in Table 9. The models for the three dependent variables are presented in Table 10 through 12. Most correlations are small, but substantial correlations between depth and overall accumulated experience (r=0.6663) as well as breadth of experience and overall accumulated experience (r=0.4520) suggest hierarchical regression analysis to account for multicollinearity concerns.

Accumulated Overall Experience. Tables 10 to 12 present the results for each of the dependent variables: execution errors, novelty of project outcomes, and project performance respectively. In all cases, Model 1 represents the baseline model containing the control variables. Model 2 adds a director's number of prior movies, which accounts for his or her overall accumulated experience. This variable has no significant effect in any of the models, consistent with my theoretical arguments that learning effects are contingent on the type of the accumulated experience.

Error Avoidance. I hypothesized that depth of experience decreases craft-based errors (H1a) and breadth of experience increases their occurrence (H2a). The results, displayed in Table 10 show that adding the depth and breadth variables in Model 3 significantly improved model fit (log likelihood change = 7.207; $p<.001$). Depth of experience had the hypothesized negative effect on the number of execution errors ($b= 0.073$; $p<0.05$; one-tailed), and breadth of experience the hypothesized positive effect ($b= 0.284$; $p<0.001$; one-tailed). Thus, the findings of the pilot study provide support for both H1a and H2a.

Table A-1: Means, Standard Deviations, and Zero-Order Correlations for the Pilot Sample

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10
1 Craft-based errors	18.10	16.47										
2 Innovativeness	2.90	1.15	-0.287									
3 Gross (log)	16.91	2.85	0.496	-0.524								
4 Depth	3.97	3.08	0.034	-0.100	0.361							
5 Breadth	3.30	1.12	-0.001	-0.016	0.043	0.569						
6 Budget (log)	17.68	0.86	0.463	-0.173	0.455	0.259	0.111					
7 Oscars (Actors)	0.52	0.69	-0.394	0.070	0.140	-0.042	0.360	0.246				
8 Oscar Nominations (Actors)	1.89	2.37	-0.123	0.118	0.046	0.330	0.116	0.044	0.404			
9 Accumulated Experience	6.80	3.94	0.077	-0.033	0.365	0.666	0.452	0.342	0.091	0.372		
10 Camera Experience	1.00	1.62	0.007	0.028	0.454	-0.184	0.057	-0.027	0.168	0.256	-0.246	
11 Editor Experience	1.70	2.47	0.442	-0.287	0.250	0.036	-0.098	0.215	-0.231	0.070	-0.038	0.091

Table A-2: Poisson Regression of Craft-Based Errors on Director Experience

Variables	Model 1			Model 2			Model 3			Model 4		
Constant	-8.097	***	(1.406)	-8.248	***	(1.440)	-8.811	***	(1.439)	-7.612	***	(1.622)
Budget (log)	0.648	***	(0.078)	0.660	***	(0.082)	-0.654	***	(0.081)	-0.621	***	(0.095)
Oscars (Actors)	-0.854	***	(0.110)	-0.850	***	(0.110)	-1.039	***	(0.123)	-0.804	***	(0.124)
Oscar Nominations (Actors)	-0.038		(0.030)	-0.038		(0.030)	0.049		(0.036)	-0.046		(0.034)
Total Experience				-0.008		(0.016)	-0.012		(0.019)	-0.005		(0.019)
Depth							-0.073	*	(0.032)			
Breadth							0.284	***	(0.074)			
Camera Experience										-0.032		(0.057)
Editor Experience										0.025		(0.024)
Log-Likelihood	-62,025			-61,906			-54,699			-61.318		
Δ Log-Likelihood				0.119			7,207	***		0.588		
LR Chi-square	137.84	***		138.08	***		152.49	***		139.25		
Pseudo R^2	0.5263			0.5272			0.5823			0.5317		

Significance test (one-tailed): + p<.10; * p<.05; ** p<.01; *** p<.001; Note: Standard Errors in Parentheses

Table A-3: OLS Regression of Innovativeness on Director Experience

Variables	Model 1	Model 2	Model 3	Model 4

Constant	7.811	(5.533)	7.517	(5.981)	6.137	(5.798)	8.325	(7.222)
Budget (log)	-0.309	(0.309)	-0.288	(0.337)	0.200	(0.305)	-0.326	(0.429)
Oscars (Actors)	0.476	(0.315)	0.466	(0.317)	0.335	(0.616)	0.580	(0.412)
Oscar Nominations (Actors)	0.063	(0.091)	-0.072	(0.106)	0.128	(0.123)	0.109	(0.146)
Accumulated Experience			-0.013	(0.053)	0.046	(0.067)	-0.031	(0.083)
Depth of Experience					-0.186	(0.114)		
Breadth of Experience					0.027	(0.371)		
Director-Camera Experience							-0.197	(0.195)
Director-Editor Experience							0.035	(0.094)
R^2	0.222		0.225		0.394		0.314	
Delta R^2			0.003		0.169		-0.08	
Wald Test (model)	2.20		1.74		1.92		0.78	
Wald Test (added variables)			0.06		1.46		0.52	

Significance test (one-tailed): + p<.10; * p<.05; ** p<.01; *** p<.001; Note: robust standard errors in parentheses

Table A-4: OLS Regression of Project Performance on Director Experience

Variables	**Model 1**			**Model 2**			**Model 3**			**Model 4**		
Constant	-1.90		(5.780)	0.501		(5.980)	5.055		(5.209)	0.626		(5.474)
Budget (log)	1.066	**	(0.338)	1.017	*	(0.356)	0.823	*	(0.303)	1.044	*	(0.328)
Oscars (Actors)	-1.214	+	(0.309)	-1.190	+	(0.621)	0.544		(0.411)	-1.071	**	(0.286)
Oscar Nominations (Actors)	-0.115		(0.172)	-0.135		(0.158)	-0.274	+	(0.149)	-0.020		(0.104)
Accumulated Experience				0.031		(0.075)	0.014		(0.091)	-0.029		(0.059)
Depth of Experience							0.245		(0.139)			
Breadth of Experience							-0.630		(0.423)			
Director-Camera Experience										-0.463	*	(0.156)
Director-Editor Experience										-0.007		(0.086)
R^2	0.608			0.612			0.735			0.813		
Delta R^2				0.004			0.123			0.078		
Wald Test (model)	3.38	+		2.37			2.83	+		6.11	**	
Wald Test (added variables)				0.17			1.57			4.60	*	

Significance test (one-tailed): + p<.10; * p<.05; ** p<.01; *** p<.001; Note: robust standard errors in parentheses

Model 4 indicates that the addition of prior joint collaboration experience of the director with the same cinematographer or the same editor did not significantly improve model fit (log likelihood change = 0.119; p>.10; one-tailed). Neither joint collaborations with the same cinematographer (b= -0.032; p>0.10) nor with the same editor (b= 0.025; p>0.10) has a significant effect on the number of craft-based errors.

Novelty of Project Outcomes I hypothesized that depth of experience decreases novelty of project outcomes (H1b) and breadth of experience increases innovativeness of projects (H2b). Table 3 contains the results of the corresponding analysis. Adding the depth and breadth variables in Model 3 did not improve model fit significantly (R^2 change = 0.169; p>.10). The coefficient for both depth (b= -1.64; p=0.068; one-tailed) and breadth of experience (b= 0.027; p=0.472; one-tailed) are in the expected direction, but only the effect of knowledge depth is marginally significant. The results based on the data from the pilot sample only support the negative effect of knowledge depth on innovativeness (H1b).

Model 4 in Table 11 indicates that the addition of prior joint collaboration experience of the director with the same cinematographer or the same editor did not significantly improve model fit (R^2 change = -0.08; p>0.10) for the models with novelty as the dependent variable. Prior collaborations with the same cinematographer has the expected negative effect, but is not significant (b= -0.197; p>0.10). Prior collaborative experience with the same editor has an unexpected positive effect on novelty, but this effect is also not significant (b= 0.035; p=0.10; one-tailed).

Project Performance. I hypothesized that depth of experience increases project performance (H1c) and breadth of experience decreases project performance (H2c).

Table 11 contains the results of the corresponding analysis. Adding the depth and breadth variables in Model 3 did not improve model fit significantly (R^2 change = 0.123; p>.10). Depth of experience has the expected positive effect on project performance (b= 0.245; p=0.056; one-tailed), and breadth of experience has the expected negative effect on project performance (b= -0.630; p=0.086; one-tailed). Both effects, however, are only marginally significant. Thus, there is only weak support for H1c and H2c.

Model 4 in Table 12 presents the results for the addition of the variables capturing prior joint collaboration experience of the director with the same cinematographer and the same editor. Adding these variables significantly improves model fit (R^2 change = 0.201; p<0.05) for the model with performance as the dependent variable. Prior collaborations with the same cinematographer have an unexpected significant negative effect on project performance (b= -0.463; p>0.01; one-tailed). Prior collaborative experience with the same editor has no significant effect on performance (b= -0.007; p<0.10; one-tailed). The analysis based on the pilot sample data indicated that prior collaborative experience with the same cinematographer decreases project performance.

Conclusions from the Pilot Study

The pilot study demonstrated the feasibility of the proposed study. Furthermore, the consistency and robustness of the results based on the preliminary analyses are encouraging. The pilot study provided an opportunity to confirm the availability of data sources and to develop coding criteria for the variable that is designed to capture the novelty of project venture outcomes.

APPENDIX B: PRIOR JOINT COLLABORATIVE EXPERIENCE

At the beginning of this dissertation project I considered to investigate the effect of prior collaborative experience along with the dissertations main focus on depth and breadth of prior venture experience. However, the pilot study and preliminary analysis for the final sample of the main study indicated diverging effects for prior collaborative experience of the directors with the cinematographer and editor of the focal project ventures. The existing literature on the empirical setting does not provide a potential explanation for those diverging effects. Thus, I decided together with the dissertation co-chairs to focus my study on the effects of depth and breadth of prior entrepreneurial experience. Because of the potential effect of collaboration routines suggested by the literature, all analyses for the dissertation included variables controlling for prior collaborations between the director and the cinematographer and editor. The hypotheses regarding the effect of prior collaborative experience are presented in this appendix and the corresponding results are discussed.

Hypotheses regarding the effect of collaborative experience

Prior project venture research indicates the importance of coordinating the activities of project participants as a main organizational challenge (Argote, 1999; Jones, Hesterly, & Borgatti, 1997; Simonin, 1997). Prior joint experience can help project participants to develop processes for directing, evaluating, and enforcing the actions of others during collaborative efforts (Minkler, 1993). Such management and control-related issues have important implications for the outcome of and the learning taking place in

project ventures. Benefits from prior joint collaborative experience can arise from superior coordinating routines between the entrepreneur and key project participants. In the group literature, research on transactive memory has demonstrated that project team members can develop effective and efficient coordination routines through repeated collaboration (Argote, 1999; Liang, Moreland, & Argote, 1995). Once entrepreneurs have developed coordinating routines with individuals responsible for sub-tasks during the execution of a project venture, these coordinating routines can then also be transferred to other similar projects (Lewis et al., 2005). Simonin (1997), for example, showed that collaborative know-how built from prior collaborative experience helps firms realize greater benefits from collaborations - but his study cautions that prior collaborative experience does not automatically and fully translate into subsequent performance improvements. These findings are consistent with insights from Miller and Shamsie's (1996) organizational-level learning research in the movie industry. The authors found collaborative skills to be very important in the unpredictable competitive context of the post-television movie industry (1951-1965). They showed superior returns for projects consisting of participants that had the chance to nurture their collaborative skills during a history of prior production projects. Schwab and Miner (2001) also report the contingency of performance-feedback learning on prior collaborations between the same project participants.

Avoidance of Execution Errors

Based on the notion that prior joint collaborative experience can increase the effectiveness of collaborative efforts, I expect a positive effect on the avoidance of project execution errors. I focus here on prior joint collaborative experience of the

individuals in charge of project execution with other key project participants. I formally propose:

> **H3a: Prior joint collaborative experience of the entrepreneur with key project participants reduces errors during project execution.**

Novelty of Project Outcomes

Novel elements in project ventures may arise from ad-hoc solutions to unfamiliar challenges arising within the collaboration, or may arise from ideas generated through information sharing and joint problem solving of the key individuals involved in a project venture. Collaborative routines can aid project participants with the effective execution of a project in general. However, learning research indicates that repeated execution of routines can give rise to competency traps that inhibit behavior outside of pre-existing behavioral patterns (Levitt & March, 1988; March, 1991). Moreover, research on improvisation learning has shown that prior experience decreases the likelihood of improvisation, a form of learning associated with innovation (Moorman & Miner, 1997, 1998). Thus, I expect that increasing levels of prior joint collaborative experience among key project participants will reduce the likelihood of their experimenting with novel solutions.

Familiarity among project participants can also increase the likelihood of groupthink (Janis, 1972) and decrease the sharing of unique knowledge and ideas (Hunt, Ogden, & Neale, 2003). Thus, prior joint experience can reduce the propensity of project collaborators to share ideas and solutions that are inconsistent with those of the project leader. Consequently, I expect prior joint collaborative experience to have a negative effect on the innovativeness of a new venture. Formally I hypothesize:

H3b: Prior joint collaborative experience of the entrepreneur with key project participants reduces the novelty of project outcomes.

Project Performance

As mentioned above, the general literature on project collaboration has shown that prior joint collaborative experience can benefit subsequent performance (e.g., Jones et al., 1997; Pennings, Barkema, & Douma, 1994). A history of repeated interactions can enable collaborators to build skills for integrating and coordinating their experience (Itami, 1987; Miller & Shamsie, 1996). The resulting enhanced coordination capabilities have been linked to overall project performance benefits (Argote, 1999; Liang et al., 1995). I suggest that project venture performance will benefit when the individuals driving project execution have had the chance to develop integration and coordination routines during other, prior project ventures with key other project contributors. Hence, I posit that prior joint collaborative experience has a positive effect on project venture performance.

H3c: Prior joint collaborative experience of the entrepreneur with key project participants enhances project performance.

APPENDIX C: CODING OF VARIABLES

Movie Novelty Coding Scale
The criteria illustrated in the following table have been used to code the review of movie critics for the novelty variable.

Table C-1: Coding Criteria for Project Outcome Novelty

Score	Classification Criteria
1	New Story, pushing the envelope in the genre
2	New story, strong parallels to previous films in the same genre
3	Sequel, loosely linked to the prior installment, moderately strong novelty elements
4	Sequel, minimal degree of novelty; Remake with new interpretation
5	Remake, closely aligned with the original

Genre Descriptions*

Action films have tremendous impact, continuous high energy, lots of physical stunts and activity, all designed for pure audience escapism with the action sequences at the core of the film. Action films and adventure films have tremendous cross-over potential as film genres. **Adventure** films are exciting stories, with new experiences or exotic locales. Adventure films are very similar to the action film genre, in that they are designed to provide an action-filled, energetic experience for the film viewer. Rather than the predominant emphasis on violence and fighting that is found in action films, however, the viewer of adventure films can live vicariously through the travels, conquests, explorations, creation of empires, struggles and situations that confront the main characters, actual historical figures or protagonists.

Crime/Thriller films are developed around the sinister actions of criminals or gangsters. Crime stories in this genre often highlight the life of a crime figure or a crime's victim(s). Or they glorify the rise and fall of a particular criminal(s), gang, bank robber, murderer or lawbreakers in personal power struggles or conflict with law and order figures, an underling or competitive colleague, or a rival gang. Suspense is a key feature of Thrillers. Movies in this genre typically focus on criminal activities and their consequences.

Comedy films are designed to elicit laughter from the audience. Comedies are light-hearted dramas, crafted to amuse, entertain, and provoke enjoyment. The comedy genre humorously exaggerates the situation, the language, action, and characters. Comedies observe the deficiencies, foibles, and frustrations of life, providing merriment and a momentary escape from day-to-day life. They usually have happy endings, although the humor may have a serious or pessimistic side.

Drama films are serious presentations or stories with settings or life situations that portray realistic characters in conflict with either themselves, others, or forces of nature. A dramatic film shows us human beings at their best, their worst, and everything in-between. Each of the types of subject-matter themes have various kinds of dramatic plots. Dramatic films are probably the largest film genre because they include a broad spectrum of films.

Horror films are designed to frighten and to invoke our hidden worst fears, often in a terrifying, shocking finale, while captivating and entertaining us at the same time in a cathartic experience. Horror films feature a wide range of styles, from the earliest silent Nosferatu classic, to today's CGI monsters and deranged humans. They are often combined with science fiction when the menace or monster is related to a corruption of technology, or when Earth is threatened by aliens. The fantasy and supernatural film genres are not usually synonymous with the horror genre.

* Descriptions based on: http://www.filmsite.org

APPENDIX D: DISTRIBUTION OF THE DEPENDENT VARIABLES

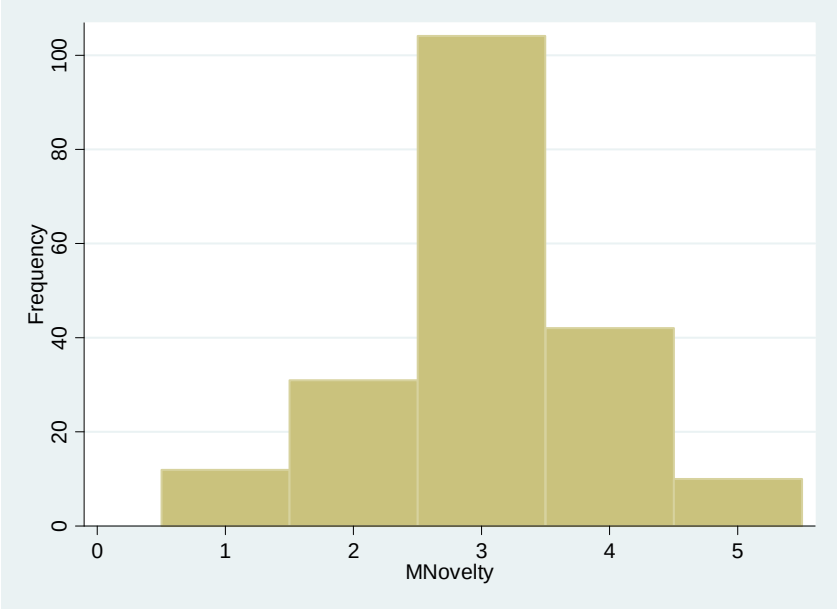

Figure 11: Distribution of Novelty

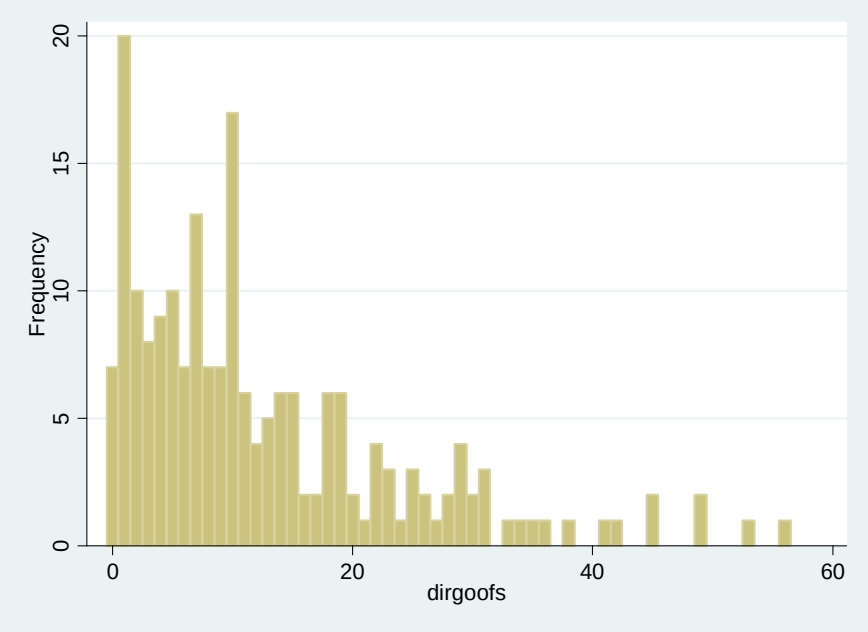

Figure 12: Distribution of Execution Errors

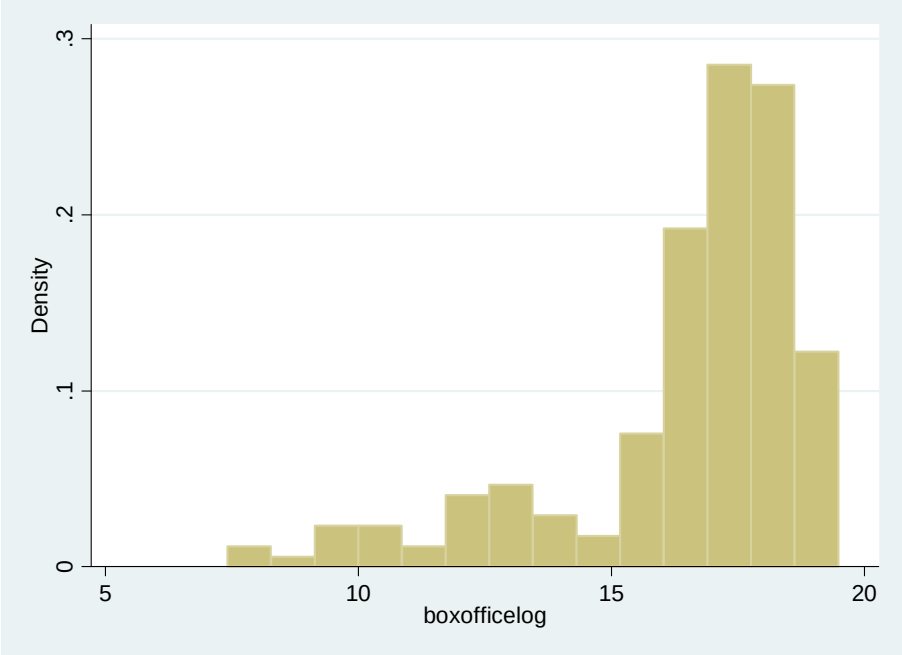

Figure 13: Distribution of Box-Office Receipts (log)

APPENDIX E: SUPPLEMENTARY ANALYSES

Table E-1: Negative Binomial Regression of Director Experience on Execution Errors

Variables	Model 0			Model 1			Model 2c			Model 2d		
Budget (log)	0.152	*	(0.076)	0.155	*	(0.071)	0.149	*	(0.074)	0.165	*	(0.075)
Cast Size	0.002		(0.001)	0.003	*	(0.001)	0.003	†	(0.001)	0.003		(0.001)
Prior Performance (log)	-0.007		(0.008)	-0.005		(0.008)	-0.003		(0.008)	0.004		(0.008)
Star Power	-0.050		(0.042)	-0.041		(0.041)	-0.034		(0.042)	-0.045		(0.041)
Year Dummy Variables	Yes			Yes			Yes			Yes		
Genre Dummy Variables	Yes			Yes			Yes			Yes		
Total Experience	0.000		(0.005)	0.002	*	(0.005)	0.006		(0.007)	-0.103		(0.038)
Experience with Cinematographer				-0.104		(0.038)	-0.111	**	(0.039)	-0.103	**	(0.038)
Experience with Editor				0.033		(0.024)	0.036		(0.024)	0.036		(0.024)
Depth							-0.018		(0.015)			
Breadth										-0.047		(0.058)
Depth-Squared												
Breadth-Squared												
Depth x Breadth												
Depth-Squared x Breadth												
Constant	1.537	*	(0.605)	1.398	*	(0.595)	1.360	*	(0.593)	1.460	*	(0.597)
Log-pseudolikelihood	-515.677	***		-512.129	***		-511.428	***		-511.800	***	
Pseudo-R^2	0.055			0.062			0.063			0.062		
Δ Pseudo-R^2				0.007			0.001			0.000		
Likelihood-ratio chi-square[b]				7.100	*		1.400			0.660		
P-value				0.028			0.236			0.417		

[a] Robust standard errors are in parentheses; n = 148 † p < .10; * p < .05; ** p < 0.01; *** p < 0.001

[b] Test for model improvement based on model specifications without robust standard errors

Table E-2: Negative Binomial Regression of Director Experience on Execution Errors

Variables	Model 2a			Model 2b			Model 2e			Model 2f		
Budget (log)	0.162	*	(0.075)	0.181	*	(0.074)	0.164	*	(0.075)	0.183	*	(0.074)
Cast Size	0.003		(0.001)	0.003	†	(0.001)	0.003	†	(0.001)	0.003	†	(0.001)
Prior Performance (log)	-0.002		(0.008)	0.001		(0.008)	-0.002		(0.008)	0.001		(0.008)
Star Power	-0.039		(0.042)	-0.042		(0.041)	-0.042		(0.042)	-0.045		(0.041)
Year Dummy Variables	Yes			Yes			Yes			Yes		
Genre Dummy Variables	Yes			Yes			Yes			Yes		
Total Experience	0.011		(0.009)	0.006		(0.009)	0.010		(0.009)	0.004	*	(0.009)
Cinematographer Experience	-0.111	**	(0.039)	-0.101	**	(0.039)	-0.106	**	(0.040)	-0.097	*	(0.039)
Editor Experience	0.040	†	(0.024)	0.046	†	(0.024)	0.033		(0.027)	0.040	**	(0.027)
Depth	-0.021		(0.015)	0.052		(0.034)	-0.019		(0.016)	0.054		(0.034)
Breadth	-0.060		(0.059)	-0.015		(0.060)	-0.125		(0.136)	-0.074		(0.134)
Depth-Squared				-0.337	*	(0.139)				-0.336	*	(0.139)
Breadth-Squared							0.013		(0.025)	0.012		(0.024)
Depth x Breadth												
Depth-Squared x Breadth												
Constant	1.431	*	(0.594)	1.665	**	(0.590)	1.515	*	(0.615)	1.739	**	(0.608)
Log-pseudolikelihood	-510.910	***		-507.993	***		-510.770	***		-507.871	**	
Pseudo-R^2	0.064			0.069			0.064			0.070		
Δ Pseudo-R^2				0.005			0.000			0.024		
Likelihood-ratio chi-squrare[b]				5.840	*		0.280			6.080	*	
P-value				0.015			0.596			0.047		

[a] Robust standard errors are in parentheses; n = 148; † p < .10; * p < .05; ** p < 0.01; *** p < 0.001

[b] Test for model improvement based on model specifications without robust standard errors

Table E-3: Negative Binomial Regression of Director Experience on Execution Errors

Variables	Model 2b			Model 2g			Model 2h			Model 2i		
Budget (log)	0.181	*	(0.074)	0.183	*	(0.076)	0.184	*	(0.075)	0.174	**	(0.066)
Cast Size	0.003	†	(0.001)	0.003	†	(0.001)	0.002	†	(0.001)	0.002		(0.001)
Prior Performance (log)	0.001		(0.008)	0.001		(0.008)	0.000		(0.008)	0.003		(0.009)
Star Power	-0.042		(0.041)	-0.042		(0.041)	-0.052		(0.042)	-0.073		(0.047)
Year Dummy Variables	Yes			Yes			Yes			Yes		
Genre Dummy Variables	Yes			Yes			Yes			Yes		
Total Experience	0.006		(0.009)	0.006		(0.009)	0.007		(0.009)	0.014		(0.011)
Cinematographer Experience	-0.101	**	(0.039)	-0.102	**	(0.039)	-0.107	**	(0.039)	-0.113	**	(0.032)
Editor Experience	0.046	†	(0.024)	0.046	†	(0.024)	0.043	†	(0.024)	0.026		(0.024)
Depth	0.052		(0.034)	0.052		(0.034)	0.052		(0.034)	0.067		(0.045)
Breadth	-0.015		(0.060)	-0.016		(0.061)	-0.018		(0.061)	-0.174		(0.114)
Depth-Squared	-0.337	*	(0.139)	-0.337	*	(0.139)	-0.324	*	(0.138)	-0.516	**	(0.186)
Depth x Breadth										-0.014		(0.022)
Depth-Squared x Breadth										0.117		(0.089)
Novelty				0.005	**	(0.067)	-0.360		(0.299)	-0.398		(0.316)
Novelty-Squared							-0.067		(0.052)	0.073		(0.059)
Constant	1.665	**	(0.590)	1.665	**	(0.590)	2.223	**	(0.779)	2.665	**	(0.806)
Log-pseudolikelihood	-507.993	***		-507.989	***		-507.197	***		-505.693	***	
Pseudo-R^2	0.069			0.069			0.071			0.074		
Δ Pseudo-R^2				0.017			0.002			0.003		
Likelihood-ratio chi-square[b]				0.010			1.590			3.010		
P-value				0.933			0.451			0.222		

[a] Robust standard errors are in parentheses; n = 148; † p < .10; * p < .05; ** p < 0.01; *** p < 0.001

[b] Test for model improvement based on model specifications without robust standard errors

Table E-4: OLS Regression of Director Experience on Novelty

Variables	Model 0			Model 1			Model 2b			Model 2d		
Budget (log)	-0.219	*	(0.090)	-0.225	*	(0.089)	-0.224	*	(0.090)	-0.257	**	(0.088)
Castsize	0.002		(0.002)	0.001		(0.002)	0.001		(0.002)	0.001		(0.002)
Prior Performance (log)	-0.004		(0.009)	-0.008		(0.009)	0.008		(0.009)	-0.013		(0.009)
Star Power	0.047		(0.057)	0.040		(0.056)	0.040		(0.058)	0.058		(0.054)
Year Dummy Variables	Yes			Yes			Yes			Yes		
Genre Dummy Variables	Yes			Yes			Yes			Yes		
Total Experience	0.002		(0.006)	-0.005	*	(0.005)	-0.005		(0.006)	-0.017	**	(0.006)
Cinematographer Experience				0.048		(0.036)	0.048		(0.036)	0.046		(0.035)
Editor Experience				0.057	**	(0.016)	0.057	**	(0.016)	0.045	**	(0.018)
Depth							0.001		(0.012)			
Breadth										0.164	**	(0.058)
Depth-Squared												
Breadth-Squared												
Depth x Breadth												
Depth-Squared x Breadth												
Constant	3.453	***	(0.778)	3.632	***	(0.787)	3.636	***	(0.792)	3.380	***	(0.772)
F-statistic	1.83	***		3.31	***		3.11	***		4.05	**	
R^2	0.142			0.178			0.178			0.211		
ΔR^2				0.036			0.000			0.033		
F-test (added variables)				2.846	†		-			5.395	*	
P-value F-test				0.061			-			0.021		

[a] Robust standard errors are in parentheses; n = 148

† p < .10; * p < .05; ** p < 0.01; *** p < 0.001

Table E-5: OLS Regression of Director Experience on Novelty

Variables	Model 2a			Model 3a			Model 3b			Model 3c		
Budget (log)	-0.256	**	(0.088)	-0.250	**	(0.086)	-0.256	**	(0.090)	-0.250	**	(0.087)
Cast Size	0.001		(0.002)	0.001		(0.002)	0.001		(0.002)	0.001		(0.002)
Prior Performance (log)	-0.013		(0.009)	-0.011		(0.009)	-0.013		(0.009)	-0.011	+	(0.009)
Star Power	0.055		(0.056)	0.056		(0.055)	0.055		(0.056)	0.056		(0.056)
Year Dummy Variables	Yes			Yes			Yes			Yes		
Genre Dummy Variables	Yes			Yes			Yes			Yes		
Total Experience	-0.020	**	(0.006)	-0.022	**	(0.007)	-0.020	**	(0.007)	-0.022	**	(0.007)
Cinematographer Experience	0.049		(0.035)	0.048		(0.019)	0.045		(0.022)	0.054		(0.035)
Editor Experience	0.044	*	(0.018)	0.048	*	(0.019)	0.049	†	(0.036)	0.047	*	(0.023)
Depth	0.008		(0.012)	0.040		(0.031)	0.008		(0.013)	0.040		(0.030)
Breadth	0.168	**	(0.058)	0.181	**	(0.060)	0.171		(0.146)	0.175		(0.148)
Depth-Squared				-0.147		(0.160)				-0.147		(0.158)
Breadth-Squared							0.000		(0.027)	0.001		(0.026)
Constant	3.394	***	(0.780)	3.490	***	(0.787)	3.390	***	(0.790)	3.499	***	(0.808)
F-statistic	4.13	***		3.87	***		4.15	***		3.85	***	
R^2	0.212			0.217			0.212			0.217		
ΔR^2				0.005			0.000			0.000		
F-test (added variables)				0.810			-			-		
P-value F-test				0.369			-			-		

[a] Robust standard errors are in parentheses; n = 148

† p < .10; * p < .05; ** p < 0.01; *** p < 0.001

Table E-6: OLS Regression of Director Experience on Novelty

Variables	Model 2b			Model 2g			Model 2h			Model 2i		
Budget (log)	0.612	**	(0.198)	0.615	**	(0.206)	0.616	**	(0.203)	0.613	**	(0.203)
Cast Size	0.002		(0.002)	0.002		(0.002)	0.002		(0.002)	0.002		(0.003)
Prior Performance (log)	0.029		(0.017)	0.029	†	(0.017)	0.027		(0.018)	0.031		(0.019)
Star Power	-0.023		(0.111)	-0.024		(0.110)	-0.011		(0.113)	-0.041		(0.115)
Year Dummy Variables	Yes			Yes			Yes			Yes		
Genre Dummy Variables	Yes			Yes			Yes			Yes		
Total Experience	0.013		(0.009)	0.013		(0.010)	0.015	**	(0.010)	0.022	†	(0.012)
Cinematographer Experience	-0.116	*	(0.058)	-0.117	†	(0.060)	-0.121	**	(0.062)	-0.129	*	(0.060)
Editor Experience	0.062		(0.024)	0.062	*	(0.025)	0.054	*	(0.026)	0.052	†	(0.028)
Depth	0.073		(0.065)	0.072		(0.066)	0.068		(0.066)	0.127		(0.103)
Breadth	-0.044		(0.086)	-0.045		(0.089)	-0.049		(0.088)	-0.204		(0.178)
Depth-Squared	-0.460		(0.252)	-0.459	†	(0.254)	-0.429		(0.258)	-0.704	†	(0.388)
Breadth-Squared												
Depth x Breadth										-0.047		(0.050)
Depth-Squared x Breadth										-0.047		(0.050)
Novelty				0.010		(0.115)	-0.781		(0.485)	-0.808		(0.496)
Novelty-Squared							0.139		(0.085)	0.147	†	(0.088)
Constant	13.711	***	(1.352)	13.973	***	(1.456)	15.051	***	(1.613)	15.290	***	(1.729)
F-statistic	4.91	***		4.42	***		4.27	***		4.24	***	
R^2	0.385			0.402			0.412			0.415		
ΔR^2				0.017			0.027			0.003		
F-test (added variables)				3.581	†		2.125			0.315		
P-value F-test				0.060			0.147			0.730		

[a] Robust standard errors are in parentheses; n = 148

† p < .10; * p < .05; ** p < 0.01; *** p < 0.001

Table E-7: OLS Regression of Director Experience on Box-Office Performance

Variables	Model 0			Model 1			Model 2c			Model 2d		
Budget (log)	0.567	**	(0.202)	0.584	**	(0.203)	0.580	**	(0.204)	0.598	**	(0.202)
Cast Size	0.003		(0.002)	0.003		(0.002)	0.003		(0.002)	0.003		(0.002)
Prior Performance (log)	0.016		(0.016)	0.019		(0.017)	0.020		(0.016)	0.021		(0.017)
Star Power	-0.044		(0.106)	-0.027		(0.109)	-0.018		(0.111)	-0.035		(0.111)
Year Dummy Variables	Yes			Yes			Yes			Yes		
Genre Dummy Variables	Yes			Yes			Yes			Yes		
Total Experience	0.001		(0.009)	0.005	*	(0.009)	0.011	†	(0.006)	0.010		(0.011)
Cinematographer Experience				-0.122		(0.026)	-0.129	*	(0.057)	-0.121	*	(0.056)
Editor Experience				0.044		(0.026)	0.045	†	(0.026)	0.049		(0.026)
Depth							-0.022		(0.033)			
Breadth										-0.070		(0.085)
Constant	13.893	***	(1.304)	13.648	***	(1.323)	13.590	***	(1.326)	13.757	***	(1.354)
F-statistic	4.70	***		4.91	***		5.00	***		4.63	**	
R^2	0.361			0.380			0.382			0.382		
ΔR^2				0.019			0.021			0.021		
F- test (added variables)				1.986			0.417			0.417		
P-value F-test (added Variables)				0.141			0.519			0.519		

[a] Robust standard errors are in parentheses; n = 148

† p < .10; * p < .05; ** p < 0.01; *** p < 0.001

Table E-8: OLS Regression of Director Experience on Box-Office Performance

Variables	Model 2a			Model 2b			Model 2e			Model 2f		
Budget (log)	0.595	**	(0.202)	0.612	**	(0.198)	0.584	**	(0.196)	0.601	**	(0.191)
Cast Size	0.003		(0.002)	0.002		(0.002)	0.003		(0.002)	0.003		(0.002)
Prior Performance (log)	0.023		(0.017)	0.029		(0.017)	0.025		(0.017)	0.031	†	(0.017)
Star Power	-0.026		(0.113)	-0.023		(0.111)	-0.011		(0.113)	-0.010		(0.112)
Year Dummy Variables	Yes			Yes			Yes			Yes		
Genre Dummy Variables	Yes			Yes			Yes			Yes		
Total Experience	0.018		(0.008)	0.013		(0.009)	0.025	**	(0.007)	0.019	*	(0.008)
Cinematographer Experience	-0.130	*	(0.055)	-0.116	*	(0.058)	-0.147	**	(0.054)	-0.132	*	(0.057)
Editor Experience	0.051	†	(0.026)	0.062		(0.024)	0.078	*	(0.032)	0.086	**	(0.031)
Depth	-0.025		(0.032)	0.073		(0.065)	-0.033		(0.033)	0.061		(0.063)
Breadth	-0.084		(0.079)	-0.044		(0.086)	0.218		(0.245)	0.229		(0.241)
Depth-Squared				-0.460		(0.252)				-0.440	*	(0.063)
Breadth-Squared							-0.063		(0.042)	-0.057		(0.039)
Constant	13.711	***	(1.352)	14.011	***	(1.258)	13.290	***	(1.424)	13.615	***	(1.324)
F-statistic	4.91	***		4.68	***		4.96	***		4.68	**	
R^2	0.385			0.402			0.394			0.409		
ΔR^2				0.017			0.009			0.024		
F- test (added variables)				3.621	†		1.886			2.558		
P-value F-test (added Variables)				0.059			0.172			0.081		

[a] Robust standard errors are in parentheses; n = 148

† p < .10; * p < .05; ** p < 0.01; *** p < 0.001

Table E-9: OLS Regression of Director Experience on Box-Office Performance

Variables	Model 2b			Model 2g			Model 2h			Model 2i		
Budget (log)	0.612	**	(0.198)	0.615	**	(0.206)	0.616	**	(0.203)	0.613	**	(0.203)
Cast Size	0.002		(0.002)	0.002		(0.002)	0.002		(0.002)	0.002		(0.003)
Prior Performance (log)	0.029		(0.017)	0.029	†	(0.017)	0.027		(0.018)	0.031		(0.019)
Star Power	-0.023		(0.111)	-0.024		(0.110)	-0.011		(0.113)	-0.041		(0.115)
Year Dummy Variables	Yes			Yes			Yes			Yes		
Genre Dummy Variables	Yes			Yes			Yes			Yes		
Total Experience	0.013		(0.009)	0.013		(0.010)	0.015	**	(0.010)	0.022	†	(0.012)
Cinematographer Experience	-0.116	*	(0.058)	-0.117	†	(0.060)	-0.121	**	(0.062)	-0.129	*	(0.060)
Editor Experience	0.062		(0.024)	0.062	*	(0.025)	0.054	*	(0.026)	0.052	†	(0.028)
Depth	0.073		(0.065)	0.072		(0.066)	0.068		(0.066)	0.127		(0.103)
Breadth	-0.044		(0.086)	-0.045		(0.089)	-0.049		(0.088)	-0.204		(0.178)
Depth-Squared	-0.460		(0.252)	-0.459	†	(0.254)	-0.429		(0.258)	-0.704	†	(0.388)
Depth x Breadth										-0.047		(0.050)
Depth-Squared x Breadth										-0.047		(0.050)
Novelty				0.010		(0.115)	-0.781		(0.485)	-0.808		(0.496)
Novelty-Squared							0.139		(0.085)	0.147	†	(0.088)
Constant	13.711	***	(1.352)	13.973	***	(1.456)	15.051	***	(1.613)	15.290	***	(1.729)
F-statistic	4.91	***		4.42	***		4.27	***		4.24	***	
R^2	0.385			0.402			0.412			0.415		
ΔR^2				0.017			0.027			0.003		
F- test (added variables)				3.610	†		2.892	†		0.317		
P-value F-test (added Variables)				0.059			0.059			0.728		

[a] Robust standard errors are in parentheses; n = 148; † p < .10; * p < .05; ** p < 0.01; *** p < 0.001

Table E-10: OLS Regression of Director Experience on Box-Office Performance

Variables	Model 2b			Model 2g			Model 2h			Model 2i		
Budget (log)	0.612	**	(0.198)	0.524	*	(0.208)	0.528	*	(0.206)	0.504	**	(0.192)
Cast Size	0.002		(0.002)	0.001		(0.002)	0.001		(0.002)	0.000		(0.002)
Prior Performance (log)	0.029		(0.017)	0.028	†	(0.016)	0.026	†	(0.016)	0.029	†	(0.016)
Star Power	-0.023		(0.111)	0.014		(0.093)	0.010		(0.094)	0.034		(0.081)
Year Dummy Variables	Yes			Yes			Yes			Yes		
Genre Dummy Variables	Yes			Yes			Yes			Yes		
Total Experience	0.013		(0.009)	0.004		(0.013)	0.006		(0.014)	0.019		(0.012)
Cinematographer Experience	-0.116	*	(0.058)	-0.063		(0.066)	-0.067		(0.067)	-0.051		(0.065)
Editor Experience	0.062		(0.024)	0.030		(0.034)	0.026		(0.035)	0.045		(0.028)
Depth	0.073		(0.065)	0.051		(0.060)	0.049		(0.060)	0.021		(0.049)
Breadth	-0.044		(0.086)	-0.015		(0.091)	-0.018		(0.090)	-0.067		(0.090)
Depth-Squared	-0.460		(0.252)	-0.279		(0.241)	-0.265		(0.244)	-0.186		(0.226)
Novelty				0.023		(0.112)	0.496		(0.448)	-0.668		(0.435)
Execution Errors				0.043	***	(0.009)	0.042	***	(0.009)	0.151	***	(0.034)
Novelty-Squared							0.091		(0.076)	0.118		(0.077)
Execution Errors-Squared										-0.002	***	(0.000)
Constant	13.711	***	(1.352)	13.590	***	(1.341)	14.307		(1.534)	13.917	***	(1.396)
F-statistic	4.91	***		4.42	***		4.20	***		6.60	***	
R^2	0.385			0.476			0.480			0.553		
ΔR^2				0.091			0.004			0.073		
F- test (added variables)				10.854	***		0.961			20.25	***	
P-value F-test (added Variables)				0.000			0.328			<0.000		

[a] Robust standard errors are in parentheses; n = 147

† p < .10; * p < .05; ** p < 0.01; *** p < 0.001

VITA

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