Aligning Family Human Capital and Innovation Strategy in Family Firms

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Abstract

Research suggests that families control the majority of firms in most economies. The number of family firms, the many people they impact, and their differences from other types of firms make them an important economic institution to study. In such a large population of firms there is the potential for variation in behaviors and performance that stymies general theories about "family firms." Recent reviews of the family business literature suggest the investigation of factors that moderate and mediate the influence of family-control on a firm.

The questions addressed in this study are: Does the human capital of family employees influence organizational innovation in small family firms, and if so, how?

Primary survey data was collected from a single respondent in 94 small family firms on: the number of family employees, their levels of education and years of experience working outside the family firm, their role in identifying and leading the firm's "most-important" innovation activities (championing innovation), and the level of innovation in the small family firm. The results of this small, exploratory study should be interpreted carefully, but human capital and the championing of innovation do appear to moderate and partially-mediate family employees' influence on organizational innovation. Significant relationships were found between lower levels of family human capital and less organizational innovation. However, higher levels of family human capital were associated with both less and more organizational innovation, resulting in insignificant relationships. The directions of the relationships are consistent with an alignment of the family human capital resources and levels of organizational innovation and evidence of strong family influence in all firms.

The contributions of this study are to: 1) support the value of pursuing mediators and moderators of family influence; 2) the holistic operationalization and measurement of family influence, in the championing construct, that accounted for all family employees; 3) the measured influence of family human capital on the family firm. In conclusion, more questions about family human capital are raised than answered, but further investigation appears to be warranted by the results of this study.

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Chapter 1: overview of the dissertation

Introduction

Family firms may be the most common type of firm in the world (Gedajlovic, Carney, Chrisman, & Kellermanns, 2012; La Porta, Lopez-de-Silanes, & Shleifer, 1999; Schleifer & Vishny, 1986). The ubiquity of family firms has led researchers to question both the nature of family firms and the determinants of their performance (Schulze & Gedajlovic, 2010). Recent reviews of the family business literature suggest the powerful influence of family on firms has unpredictable and unexplainable consequences (O'Boyle Jr., Pollack, & Rutherford, 2012; Singal & Singal, 2011). Gedajlovic et al. (2012) compare the family business research to a phase of human adolescence suggesting a period of transition and promise that remains undefined.

Family business researchers are asking fundamental questions: What is a family firm and does it perform differently than non-family firms (Chrisman, Chua, Pearson, & Barnett, 2012; Chrisman, Chua, & Sharma, 2005)? What factors might mediate or moderate the relationships between family firm behavior and performance (Carney, Gedajlovic, Heugens, Van Essen, & Van Oosterhout, 2011; Gedajlovic et al., 2012)? Does family member involvement in the firm help or hinder firm performance (O'Boyle Jr. et al., 2012; Sciascia & Mazzola, 2008; Stewart & Hitt, 2012)? And, why are some family firms more innovative than others (De Massis, Frattini, & Lichtenthaler, 2012; Eddleston, Kellermanns, & Sarathy, 2008; König, Kammerlander, & Enders, 2012)?

This array of open questions may stem from the term "family firm" applying to a wide variety of firms with diverse behavioral and performance characteristics (Chrisman et al., 2012; Chua, Chrisman, Steier, & Rau, 2012). This heterogeneity may stymie efforts to develop a general theory applicable to family firms that may be important for distinguishing between family and non-family businesses (Chrisman et al., 2005; Chua, Chrisman, & Sharma, 1999). Researchers suggest three fundamental and related issues that need to be addressed to advance understanding of family firms: the definition of the family firm (Astrachan, Klein, & Smyrnios, 2002; Chua et al., 1999; O'Boyle Jr. et al., 2012), performance objectives and measurement in family firms (Chrisman, Chua, & Litz, 2003; Chrisman et al., 2012; Le Breton-Miller & Miller, 2006; O'Boyle Jr. et al., 2012), and market conditions that might affect family firm behavior and performance (Carney, 1998; Carney et al., 2011; Gedajlovic et al., 2012; Miller, Le Breton-Miller, & Lester, 2012).

Purpose of this dissertation

The purpose of this research is to increase understanding of family firms from a human capital perspective. Human capital refers to the productive value of individuals' knowledge, skills, and abilities that is primarily acquired through education and experience (Becker, 1962).[1] One of the paramount roles of families is to foster the development of family members' human capital (Becker, 1991; Coleman, 1988). The family's powerful influence on human life may spill-over and affect a firm where

[1] Becker (1962) also included health as a factor contributing to human productivity, but health is not addressed in this study.

multiple family members have interests (cf. Becker, 1991, p. 19). There may be differences between the impact of family and non-family employees on the family firm that can be examined from a human capital perspective (Dawson, 2012; Gedajlovic & Carney, 2010; Lee, Lim, & Lim, 2003; Verbeke & Kano, 2012). A review of relevant literature and an empirical study were performed to gain insight into mechanisms by which family human capital might affect family firms.

In the effort to uncover unique aspects of family influence, few researchers have delved into the particular characteristics of family employees in the firm (Danes, Lee, Stafford, & Heck, 2008; Dawson, 2012; Stewart & Hitt, 2012). The human capital of family employees may be overlooked in the family business literature because of its limited "quantity and ability" (Sirmon & Hitt, 2003, p. 342), which is exacerbated in larger family firms that incorporate more non-family resources (Carney, 1998; Gomez-Mejia, Haynes, Nunez-Nickel, Jacobsen, & Moyano-Fuentes, 2007). Sciascia and Mazzola (2008) suggest that the positive influences of family employment may be off-set by negative ones that diminish the overall impact of family employees on the firm. Given the difficulties in establishing clear differences between family and non-family firms that impact firm performance (Chrisman et al., 2005; Chua et al., 2012), even small differences associated with family human capital may be worthy of greater attention.

Framing of the research questions

Innovation was chosen as the comparison variable by which to consider variation in levels of family human capital between family firms. Innovation is a process and outcome that is driven by human capital and is a primary means of addressing market opportunities and challenges that determine firm performance (Crossan & Apaydin, 2010; Grant, 1996; Subramaniam & Youndt, 2005). A firm's level of innovation is the degree to which it improves upon, or introduces new processes, products and services (Crossan & Apaydin, 2010; Schumpeter, 1934). Innovation-level reflects a firm's efforts to position its resources in its market environment (Hrebiniak & Joyce, 1985). Firms may pursue smaller incremental innovations that build upon their existing resources, or pursue larger, transformative innovations that require new resource combinations (Christensen, 1997; Tushman & Anderson, 1986). There is little empirical evidence of a relationship between family human capital and innovation in family firms (De Massis et al., 2012).

In this dissertation a family firm is identified by the full- or part-time employment of family members in a firm owned by one or more of the family members (Chua et al., 1999). Family firms may be affected by the strong, enduring relationships between family employees that lead to preferential contracting arrangements; this tendency is referred to as "particularism" (Arregle, Hitt, Sirmon, & Very, 2007; Carney, 2005; Gomez-Mejia, Nunez-Nickel, & Gutierrez, 2001; Schulze, Lubatkin, & Dino, 2003). Particularism may increase the small family firm's dependence on the human capital of family employees and impact innovation in family firms (Carney, 1998, 2005; Sirmon & Hitt, 2003). Family employees' influence on organizational innovation may be mediated by

identifying innovation opportunities and leading their implementation, which is called championing innovation (Howell, Shea, & Higgins, 2005). The impact of depending on family employees may be moderated by their human capital. To address the larger issue of the means and extent of family human capital's influence on organizational innovation, six research questions are posed.

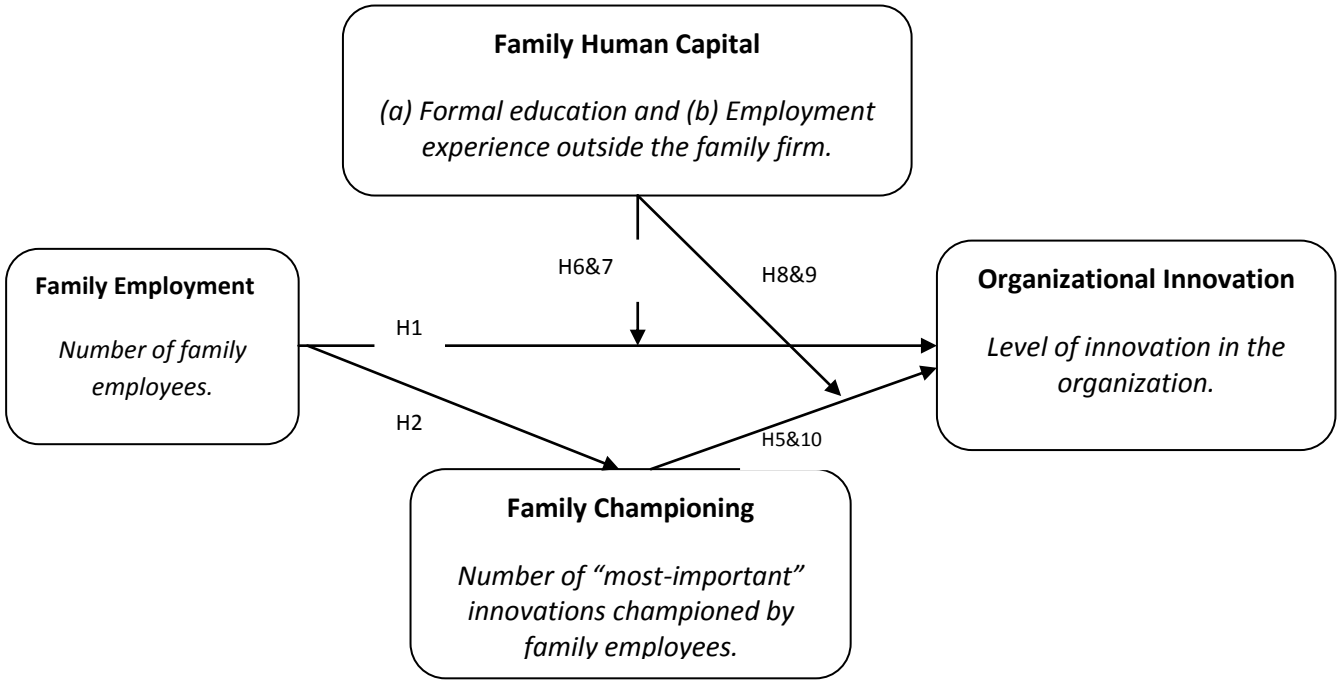
Research Questions:

1. *Does increased family employment or family championing increase levels of organizational innovation in small family firms?*
2. *Do family employees champion more "most-important" innovations than non-family employees?*
3. *Do the "most-important" innovations championed by family employees receive more organizational support than those championed by non-family employees?*
4. *Does education and experience positively moderate the effect of family employment on organizational innovation in small family firms?*
5. *Does education and experience positively moderate the effect of family championing on organizational innovation in the small family firm?*
6. *Does family championing of innovation activities partially mediate family employment's influence on organizational innovation?*

Theoretic model

These research questions are conceived at the organizational level and refer to total levels of family employment, family human capital, family championing, and innovation in the family firm. Research questions one and four through six refer to causal relationships between family-employment, family-championing, family-human capital, and organizational innovation and are addressed by hypotheses one, two, and five through ten in figure 1/1 below. The second and third research questions refer to a comparison between family and non-family employees addressed by hypotheses three and four and are not depicted in the theoretical model. The relationship between family and non-family employees is important (Barnett & Kellermanns, 2006) and is controlled for in statistical tests to isolate the effects of family human capital on the firm.

Figure 1/1, Moderating and Mediating Family Influence on Organizational Innovation



Ten hypotheses were developed based on the review of the literature found in Chapter Two and the proposition of alignment between family human capital and organizational innovation explained in Chapter Three. While particularism may manifest itself in increased family employee influence, it is also expected that family human capital will be used purposefully and judiciously in the family firm. Family firms with less/more family human capital resources will pursue less/more innovation. This positive relationship between family human capital and innovation may be present because family firms that misallocate their family human capital in the firm may be underrepresented in the population (Danes et al., 2008; Danes, Stafford, Haynes, & Amarapurkar, 2009). The ten hypotheses are formulated to triangulate on family human capital's influence in the family firm.

Hypothesis one: Family employment will have a positive relationship with organizational innovation.

Hypothesis two: Family employment will have a positive relationship with family championing.

Hypothesis three: Family employees will champion more "most-important" innovations than non-family employees.

Hypothesis four: Family firms will invest more organizational resources in innovation activities championed by family employees than those championed by non-family employees.

Hypothesis five: Family championing will have a positive relationship with organizational innovation.

Hypothesis six: Education level will positively moderate the relationship between family employment and organizational innovation.

Hypothesis seven: Education level will positively moderate the relationship between family championing and organizational innovation.

Hypothesis eight: Employment experience outside the family firm will positively moderate the relationship between family employment and organizational innovation.

Hypothesis nine: Employment experience outside the family firm will positively moderate the relationship between family championing and organizational innovation.

Hypothesis ten: Family championing will partially mediate family employment's influence on organizational innovation.

Methodology and limitations

The survey method was selected for making inferences to a representative population of family firms. Collecting data on human capital and innovation in small family firms is difficult; collecting random samples from this population is nearly impossible, and secondary data is not available (Beck, Janssens, Debruyne, & Lommelen, 2011; Chua et al., 1999). A short survey was e-mailed to over 7,000 firms, and 94 complete responses met the criteria of having two family members, at least one non-family employee, and fewer than 250 employees in total. An important feature of the research is the collection

of human capital and championing data on ***all*** family employees in the firm, not just the founder or successor. While qualitative studies suggest that family human capital is an important issue (ex. Gersick, Davis, Hampton, & Lansberg, 1997; Hoy & Sharma, 2010), quantitative studies of the human capital of all family employees in the firm were found to be absent in the family business literature (Dawson, 2012; Stewart & Hitt, 2012).

The findings in this study may be interpreted as exploratory. The sample is very small compared with population estimates, the sample firms may be representative of more rural economies, and data was collected from a single respondent using a single survey instrument. However, no statistical problems were found in the data. Although the sampling techniques and use of a single response are common compromises in this research setting, inferences and conclusions should be contingent upon corroborating studies.

Findings

Four of the ten hypotheses were either supported or partially supported by the data in this study and contribute to the understanding of family human capital in small family firms. While the hypotheses were not supported as written, statistically meaningful results were found that provide substantial insights for addressing the research questions. Five case studies were conducted to aid in the interpretation of the findings.

In accordance with recent meta-analyses of the family business literature (O'Boyle Jr. et al., 2012; Singal & Singal, 2011), the influence of family employees and champions is insignificantly related with organizational innovation. However, by dominating championing activities in both less- and more-innovative family firms, family influence appears quite strong. Increased numbers of less-educated family employees and champions (no degrees from post-secondary institutions) were associated with less-innovative family firms. However, increased number of more-educated family employees and champions were associated with both less- and more-innovative family firms, producing an insignificant relationship. Similarly, the number of less-experienced family employees (less than three-years experience working outside the family firm) were associated with less-innovative family firms, but the number of more-experienced family employees (more than three-years experience working outside the family firm) was insignificant. Statistically speaking, family championing innovation could not be said to partially mediate the relationship between family employment and organizational innovation, but this finding is suspect in light of the other findings. Family championing and family human capital may help explain the effects of family influence on small family firms.

Potential significance of this study

This study shows promise in the study of mediators and moderators of family influence, in accounting for the potential influence of all family employees, and in the moderating influence of family human capital on organizational innovation. These three

approaches may further the understanding of small family firms. The outsized role of family employees in championing innovations provides a link between family-specific resources and firm behaviors suggested by a resource-based view of the family firm (Danes et al., 2009; Habbershon & Williams, 1999; Sirmon & Hitt, 2003). A human capital perspective may offer different insights into family firms than the more common measures of ownership, control, or self-identification (Chua et al., 1999). Support is found for the proposition that family human capital levels may be associated with family firm behaviors and performance (Carney, 1998; Danes et al., 2009; Habbershon, Williams, & MacMillan, 2003).

A human capital perspective on family employment provides practical insights for family firm managers who may be concerned about the effects of family employment on firm performance and the well-being of family members. As family situations and market conditions change, families may regularly evaluate the merits of family employment based on family members' and firm's needs (Aldrich & Cliff, 2003; García-Álvarez & López-Sintas, 2001). While the selection of family members to lead the family firm has received much attention, the employment of additional family members may benefit from more scrutiny. The "extent and nature of family involvement" may be the distinguishing feature of the family firm (Le Breton-Miller & Miller, 2009, p. 1171). This dissertation examines family influence from a human capital perspective.

Definitions

There are few areas of agreement in the family business literature (Chua et al., 1999), so the terms used in this dissertation are defined below in table 1/1. The definitions used are intended to apply most accurately to small family firms. While small family firms may not be the only type of family firm, they may be the type most impacted by family human capital and represent a strong form of the family firm, where the influence of the family on the firm is particularly strong .

Table 1/1 Definition of Terms

Construct	Definitions
Small family firm	A firm where the controlling owner(s) employ two or more family members and less than 250 total employees (Chua et al., 1999).
Particularistic contracting	The preferential treatment of family employees compared to non-family employees in a family firm (Carney, 2005).
Family employee	A genetic or legal relative of a controlling owner that works full- or part-time in the family firm (Schulze, Lubatkin, Dino, & Buchholtz, 2001).
Family employment	The number of full- or part-time family members employed in the small family firm.
Non-family employees	Non-family members employed in the firm.
Human capital	The productive value of individuals that accompanies an individual's knowledge, skills, and abilities that is primarily acquired through education and experience (Becker, 1962; Coff, 1997).
Family human capital	The productive value of genetic or legal relatives employed in the family firm (Danes et al., 2009; Sirmon & Hitt, 2003).
Education	Education in formal, degree-granting institutions. Highest degree obtained is the focus in this dissertation.
Experience	Employment experience. Employment outside the family firm is the focus in this dissertation.
Champion of innovation	An individual that identifies, defends, and leads innovation activities (Burgelman, 1983a; Howell & Boies, 2004).
Family Championing	The number of "most-important" innovations championed by family employees
Innovation activities	Actions taken in the process of adapting an existing or adopting a new process, product, or organizational structure (Schumpeter, 1934). These are activities specific to a single innovation.
Most Import	The three innovation activities that have had the most impact on the

Innovations	organization in the last 18 months.
Organizational innovation	An organizational-level measure of the total innovation activities in the organization over a given period of time (Damanpour, 1991; Kimberly & Evanisko, 1981).

Chapter 2: literature review and core concepts

Introduction

In this review of the literature, the concepts of human capital and innovation are discussed before each is considered in the context of the family firm. Although the general management literature finds a positive relationship between human capital and innovation (Nonaka, 1994), the effect of family human capital on innovation has not received much scholarly attention (De Massis et al., 2012). Neither is there abundant research on the human capital of family employees (Dawson, 2012) or innovation in family firms (De Massis et al., 2012) independent of each other. The human capital of family members and innovation are important issues to families that own firm, balancing these two concerns may be a fundamental aspect of family business management (Lansberg, 1983).

Human productivity

Human capital is the productive value derived from individual knowledge, skills, abilities (Becker, 1962). A person's human capital influences his/her productivity and earnings (Blair, 2011). Applying the concept of capital to human productivity has broad-reaching implications for managers. Schultz (1961, p. 1) states that "*…skills and knowledge are a form of capital, that this capital is in substantial part a product of deliberate investment that it has grown at a much faster rate than conventional (nonhuman) capital, and that its growth may well be the most distinctive feature of the economic system."* Individuals,

families, firms, and governments invest in human capital in hopes of spurring innovation and economic advances (Dakhli & De Clercq, 2004). Understanding human capital investment and allocation has become more important to managers as the economy has become more service- and knowledge-driven (Psacharopoulos & Patrinos, 2004; Stiglitz, 2012; Zingales, 2000).

Human capital views of the firm suggest that the knowledge, skills and abilities of employees define a firm's production capabilities and competitive position (Garud, 1997; Grant, 1996; Teece, 2007). Transforming generally available inputs into more valuable products and services requires some firm-specific knowledge embedded in the firm's operations (Barney, 1991; Grant, 1996; Richard R. Nelson & Winter, 1982; Nonaka, 1994; Spender, 1996; Teece, 2007). While firms may engage in a wide variety of productive activities, their competitive advantages may be associated with a few strategically selected competencies (Amit & Schoemaker, 1993; Prahalad & Hamel, 1990). Firm-specific human capital that is difficult to fully codify, understand, or imitate may impede direct competition (Hatch & Dyer, 2004; Miller & Shamsie, 1996). A meta-analysis of 66 studies finds a positive relationship between a variety of measures of human capital and operational and financial indicators of firm performance (Crook, Todd, Combs, Woehr, & Ketchen, 2011).

Competitive markets require firms to update and develop their firm-specific knowledge (Lei, Hitt, & Bettis, 1996) in order to pursue innovation opportunities (Grant, 1996; Schultz, 1975; Shane, 2000; Zingales, 2000). Individual employees work together, learning ways to improve their operations and products, simultaneously renewing

organizational capabilities and outputs (Galunic & Rodan, 1998; Nonaka & Takeuchi, 1995; Popadiuk & Choo, 2006). "So close are the ties between research on knowledge and research on innovation … scholars have seen a blurring of the boundaries between these areas" (Subramaniam & Youndt, 2005). Human capital is central to concepts of dynamic strategy (Porter, 1991), dynamic capabilities (Teece, 2007), and organizational learning (Senge, 1990) that sustain competitive advantage in competitive markets (Jacobson, 1992).

Strategic Human Capital

Acquiring, training, and retaining human capital impacts a firm's innovative possibilities (Subramaniam & Youndt, 2005). Firms may differentiate between "core employees" whose specific human capital drives innovation and "supporting employees" whose general human capital is needed for the delivery of the firm's products (Becker, 1962; Lepak & Snell, 2002; Williamson, 1985). While firm-specific knowledge is generated through training and experiential learning, the infusion of outside, general knowledge from new hires can enrich firm-specific human capital and core organizational competencies (March, 1991). Through hiring, training, and retaining human capital, firms attempt to create a competitive combination of firm specific physical, social, and human capitals (Galunic & Rodan, 1998).

Aligning a firm's human capital and competitive strategy may require different contracting relationships for core and supporting employees (Lepak & Snell, 2002).

Because, a firm has limited control over its human capital (Anand & Galetovic, 2000; Lewin, 2011), firms may link core employees' compensation to firm performance, but pay supporting employees at market rates (Coff, 2011; Lepak & Snell, 2002; Lepak, Takeuchi, & Swart, 2011). The bulk of human capital research focuses on retaining and motivating employees rather than a strict focus on their abilities (Coff, 1997). Firms may be strategic in maintaining and developing specific-human capital in alignment with their competitive strategy (Lepak & Snell, 1999).

Human Capital in Family Firms

Having briefly reviewed the general concepts of human capital in organizations, the family firm context is now considered. In this dissertation, family human capital refers to the productive value of genetic or legal relatives employed in the family firm (Becker, 1962; Danes et al., 2009). The human capital of family employees may provide the family firm with strategically unique resources (Danes et al., 2008; Dawson, 2012; Sirmon & Hitt, 2003). Following the citations from the above papers, articles with insights on family human capital were selected for review. Table 2/1 identifies the articles, methodologies, propositions or findings, and their primary focus.

Table 2/1, Selected Insights on Family Employment and Family Human Capital

Reference by date order	Context	Propositions or Findings	Primary Focus on Human Capital
(Sciascia, Mazzola, & Chirico, 2013)	Quantitative	Family firms are not affected by the number of family managers, are positively affected by non-family managers, and have an inverted U relationship with the number of generations involved in management.	Diversity of family human capital in the management of family firms.
(Stewart & Hitt, 2012)	Literature Review	Family employment may be dependent on 6 factors: the firm's environment, family characteristics, business characteristics, managerial approach, performance outcomes, and stakeholder considerations.	The value of family human capital is context-specific.
(Dawson, 2012)	Theoretical	Family firms will have superior alignment of interests in static and dynamic environments.	Effects of interest alignment on family human capital.
(Verbeke & Kano, 2012)	Theoretical	Family resource restraints can be overcome with increased family size, family member education, and the involvement of non-family members.	Integration of non-family human capital.
(Memili, Chrisman, Chua, Chang, & Kellermanns, 2011)	Theoretical	Production efficiencies will be greater in family than non-family firms when firm-specific human capital is difficult to replace.	Specific and unique family human capital.
(Sardeshmukh & Corbett, 2011)	Quantitative	Family successors' firm specific knowledge facilitates opportunity exploitation, while general human capital facilitates opportunity recognition.	General and specific human capital of family successors.
(Gedajlovic & Carney, 2010)	Theoretical	Family members' tacit knowledge confers competitive advantage is specific to the family but applies generally to the families business interests.	Tacit, family-specific human capital.

(Danes et al., 2009)	Quantitative	The number of family employees is positively related to sales growth and owner perceptions of success.	Family human, social, and financial capital in the family firm.
(Le Breton-Miller & Miller, 2009)	Theoretical	Family executives' special knowledge may insulate them from inefficient family influences.	Family human capital and efficiency in the family firm.
(Chirico, 2008)	Case Study	Human capital accumulation through family member education and experience and integration of non-family employees is facilitated by positive family relations, commitment to the firm, and feeling of shared ownership.	Alignment of interest, family human capital, and integration of non-family human capital.
(Chirico & Salvato, 2008)	Theoretical	Knowledge sharing between family employees enhances firm capabilities and is influenced by increased social capital, decreased conflict, and perceived need for knowledge.	Alignment of interests and investment in family human capital transfer.
(Barnett & Kellermanns, 2006)	Theoretical	Family employment may affect and human resource policies may affect non-family employee perceptions of fairness.	Human resource policies impact on non-family employees.
(Pérez-González, 2006)	Quantitative	Family successors underperform non-family successors, except when they attended selective schools.	Quality of family human capital.
(Sirmon & Hitt, 2003)	Theoretical	Family human capital is a limited source of tacit knowledge that has positive and negative impacts in the family firm.	Family human capital as a resource.
(Lee et al., 2003)	Theoretical	Family human capital is favored unless when family employees are significantly under-qualified or the firm is sufficiently institutionalized to make use of trusted non-family employees.	Alignment of interests and the human capital of family and non-family members.
(Cabrera-Suárez, De Saá-Pérez, & García-Almeida, 2001)	Theoretical	Transfer of tacit knowledge to family successor is dependent upon interpersonal relationships and the quality of successor's educational and experiential training.	Alignment of interests and family human capital transfer.

The literature reviewed in this table provides a wide array of theoretical and empirical insights into family human capital. There is considerable focus on firm-specific and tacit knowledge, knowledge sharing, alignment of interests, and the integration of non-family human capital. However, the formal education of successors has also been found to effect family firms (Pérez-González, 2006; Sardeshmukh & Corbett, 2011) and experience working outside the family firm is recommended by consultants and researchers (Hoy & Sharma, 2010). These human capital variables appear to vary in family firms and may result in heterogeneous family human capital behaviors (Stewart & Hitt, 2012). The employment of family members may engender particularism and a unique human capital context in family firms. The implications of particularism for family human capital are discussed below.

General and Specific Human Capital in Family Firms

The literature suggests that non-family employees provide some advantages over family employees (Dyer, 1989; Pérez-González, 2006). Family human capital may be limited compared with abundant and varied abilities of non-family human capital (Pérez-González, 2006; Sirmon & Hitt, 2003). The fundamental human capital proposition is that increased human knowledge, skills, and abilities lead to increased productivity (Crook et al., 2011; Dakhli & De Clercq, 2004). If "more is better," then the pool of non-family members available in the labor market would greatly exceed the depth and diversity of abilities offered in any family (Dunn, 1995). A firm could source human

capital that meets its specific innovation needs in the labor market more easily than in the family (Perez-Gonzalez, 2006). Accordingly, family firms may maximize competitiveness by utilizing non-family employees for core organizational functions (Dyer, 1989; Verbeke & Kano, 2012).

However, compared to non-family employees, family employees may have an advantage in their potential to accumulate firm-specific knowledge (Gedajlovic & Carney, 2010). Organizational knowledge can be complex and requires substantial investment in training and shared understandings to create efficiencies (cf. Grant, 1996; Nahapiet & Ghoshal, 1998; Nonaka, 1994; Verbeke & Kano, 2012). Considering the importance of firm-specific knowledge to competitive advantage (Becker, 1962; Crook et al., 2011), family employees may be in an enviable, not disadvantaged position vis-avis non family employees (cf. Chirico & Salvato, 2008; Lee et al., 2003; Sardeshmukh & Corbett, 2011). There are compelling arguments for both the advantages and disadvantages of family human capital use the family firm, which may be strategically justified in different contexts (Stewart & Hitt, 2012).

Human Capital Development in Family Firms

Investment in human capital is interpreted very broadly and includes any activities that increase the productive value of the individual, such as waiting for a better job (Becker, 1962). One of the most enduring human capital insights is that firms lack the incentive to invest in employees' human capital if the employees can easily switch

employers (Becker, 1962; Coff, 2011). Managers have more difficulty assessing the value of investments in human capital than they do in physical capital (Coff, 2011). Employees who demonstrate the ability to acquire firm-specific knowledge may be able to bargain for increased compensation and usurp the returns on human capital investment (Groysberg, Lee, & Nanda, 2008). The returns to investment in human capital are difficult to control, and may limit firm investment in human capital.

Families, however, are keenly interested in investing in the human capital of family members (Becker, 1991; Coleman, 1988). Family members are encouraged to learn "unique family techniques and know-how" (Carter-III & Justis, 2009, p. 111) as well as to expand their horizons through higher education and employment in other firms (Hoy & Sharma, 2010). Relationships between family employees may facilitate the transfer of knowledge (Dyck, Mauws, Starke, & Mischke, 2002) through less formal means of knowledge transfer (Fiegener, Brown, Prince, & File, 1994), including mentoring/coaching (Handler, 1990), providing part-time or summer work experiences (Barach, Gantisky, Carson, & Doochin, 1988), and talking positively about the business at home (Handler, 1990). While firms may tend to resist investments in human capital, family firms may invest in the human capital of family members but not necessarily in non-family members.

Contracting with Family and Non-family Employees

The alignment of interests between family members may lead to preferential contracting, particular to family members (Carney, 2005; Gomez-Mejia et al., 2001). Aligned interests is the dominant theme of the family business literature, which is attested to in the agency (Schulze et al., 2001), social capital (Arregle et al., 2007; Pearson, Carr, & Shaw, 2008), transaction costs (Gedajlovic & Carney, 2010; Memili et al., 2011; Verbeke & Kano, 2012), and resource-based (Danes et al., 2009; Habbershon & Williams, 1999; Sirmon & Hitt, 2003) views of the family firm. Family human capital, unlike non-family human capital, is dually situated in familial and business contexts (Aldrich & Cliff, 2003; Dawson, 2012; Le Breton-Miller & Miller, 2009), not the purely market-driven context envisioned by much of human capital theory (Blaug, 1976). Particularism associated with family relationships may imbue family human capital with asset-specificity and core-employee status (Gedajlovic & Carney, 2010; Verbeke & Kano, 2012).

Particularistic contracting arrangements between family employees, may have positive and/or negative impacts on family and non-family employees and the family firm (Sirmon & Hitt, 2003). The alignment of interests may increase family employees' effort, which increases the value of their human capital (Dawson, 2012), or it may also lead to negative behaviors that are associated with entrenchment and opportunism that decreases the value of their human capital (Schulze et al., 2003). Family relationships may enable underperforming family employees to remain employed in the firm (Kellermanns, Eddleston, & Zellweger, 2012), which may negatively affect non-family-employee

efforts (Barnett & Kellermanns, 2006; Lansberg, 1983). Lee et al. (2003) make an economic case for favoring family employees, but the constraints on the family firm's strategy may be unaccounted for in their assessment (Carney, 1998). The complexity of employing family members has received considerable attention (Barnett & Kellermanns, 2006; Lansberg, 1983; Verbeke & Kano, 2012). For better or for worse, particularistic contracting in family firms may result in human capital issues that are not found in non-family firms.

The first part of the literature review stressed the important of human capital to firm behavior and performance and then reviewed the literature for differences between family and non-family human capital that may distinguish family from non-family firms. The impact of family human capital on innovation in small family firms is now considered below.

Innovation in Organizations

Innovation is defined as the introduction of valuable new products, methods of production, markets, sources of supply, and forms of organization (Schumpeter, 1934). Innovation is a common activity that potentially impacts every aspect of a firm's operations (Crossan & Apaydin, 2010; Damanpour, 1991). Innovation is an important part of new product development (S. L. Brown & Eisenhardt, 1995), corporate venturing (Burgelman, 1983b), and organizational restructuring (Birkinshaw, Hamel, & Mol, 2008). Firms coordinate a variety of innovation activities (Damanpour, 1991) that

position the firm strategically and impact their performance (Chakravarthy, 1982; Hitt, Bierman, Shimizu, & Kochhar, 2001).

One of the most studied aspects of innovation, and am important issue for managers, is the magnitude of change that an innovation brings (Christensen, 1997; König et al., 2012; Marvel & Lumpkin, 2007). Less disruptive innovations may be easier for the organization to manage (Tushman & Anderson, 1986) and more compatible with consumers' current preferences (Rogers, 1995). Conversely, more radical innovations may be more difficult to administer and less easily adopted by consumers. An organization may simultaneously pursue many smaller innovations, fewer larger innovations, or some combination thereof. It may be necessary for firms to align their human capital with their intentions toward lesser or greater levels of organizational organization (Lei et al., 1996; Subramaniam & Youndt, 2005).

Innovation is an important firm outcome by which to evaluate the human capital of family employees (Cohen & Levinthal, 1990; Haber & Reichel, 2007; Marvel & Lumpkin, 2007; Richard R Nelson & Phelps, 1966; Schultz, 1975, 1980; Ucbasaran, Westhead, & Wright, 2009).

Innovation in Family Firms

Innovation in family firms has received relatively little theoretical or empirical attention (De Massis et al., 2012; Eddleston et al., 2008; König et al., 2012). Family firms may avoid innovation that requires extra-familial resources (Morris, 1998) whose use might come with infringements on family ownership and control (Gomez-Mejia, Cruz, Berrone, & De Castro, 2011). Conversely, innovation in family firms might be

advantaged by streamlined decision processes (Carney, 2005), resource transfer and transformation efficiencies (Danes et al., 2009; Habbershon et al., 2003), and the willingness to sacrifice current for future gains (Miller & Le Breton-Miller, 2006). There is evidence that innovation can improve (Franz W. Kellermanns, Kimberly A. Eddleston, Ravi Sarathy, & Fram Murphy, 2010) or harm family firm performance (Naldi, Nordqvist, Sjobberg, & Wiklund, 2007).

The only review of research on innovation in family firms was published on-line in December, 2012. The focus of De Massis et al. (2012) on technological innovation in larger family firms. Six of the 23 articles they review pertain to smaller firms, of which three overlap with the articles selected for review below. The authors report a mixed relationship between family control and innovation, and synthesize a model of technological innovation in family firms. The identification of eleven gaps for future study by De Massis et al. (2012) indicates the nascence of research on innovation in family firms. This dissertation loosely addresses four of those eleven gaps.

Eleven empirical articles were selected from the family business literature that included measures of innovation in small family firms. They are described in Table 2/2 below. Because patent counts and R&D budgets are deemed inappropriate measures of innovation in smaller firms (Acs & Audretsch, 1988), studies that focus on entrepreneurial orientation (Miller, 1983) in family firms were used to provide a direct measure of innovation activity. Bibliographies of appropriate articles were reviewed for additional references.

Table 2/2 Selected Articles on Organizational Innovation in Small Family Firms

Articles in Date Order	Causal Variables – Family Specific Variables in Bold.	Effects on innovation
(Zahra, Hayton, & Salvato, 2004)	Moderate individualism Increased external orientations Increased decentralization More strategic controls Fewer financial controls	+ + + + +
(Zahra, 2005)	CEO tenure **Number of generations** Founder-CEO duality and family ownership are insignificant.	- **+** 0
(J. Craig & Dibrell, 2006)	Concern for the natural environment	+
(J. B. L. Craig & Moores, 2006)	Family firms intention to adapt to their environments. Family firms maturity	+ -
(Kellermanns & Eddleston, 2006)	Strategic planning Perceived technological opportunities Willingness to change **Generational involvement**	+ + + **0**
(Zahra, Neubaum, & Larrañeta, 2007)	Knowledge sharing contributes **Family involvement in the TMT** **Generational involvement in the TMT**	+ **+** **+**
(Bergfeld & Weber, 2008)	**Family members delegate incremental innovation.** **Family members oversee radical innovation.**	**+** **+**
(Eddleston et al., 2008)	**Altruistic relationships** Perceived technological opportunities Strategic planning	**+** + -
(Kellermanns, Eddleston, Barnett, & Pearson, 2008)	**Number of generations involved**	**+**
(Beck et al., 2011)	**Successor generation CEOs** Market orientation	**-** +
(Zahra, 2012)	**Family ownership** **Family cohesion** Breadth and depth of organizational learning R&D spending	**+** **+** + +

The effects of family involvement on organizational innovation

In these eleven articles, 20 different constructs are evaluated for their impact on innovation. Fifteen of these constructs, such as decentralization and strategic planning, are generally relevant to innovation rather than specific to family firms. Only five constructs are specific to family firms and are highlighted: family ownership and cohesion, family member and generational involvement in the top management team, and role in innovation. Three of those fifteen reflect on human capital, in the number of family members, knowledge sharing, and investment in organizational learning. The empirical studies do not directly address the family human capital constructs indentified earlier in this chapter (such as tacitness or specificity) though that was not their intention. These eleven studies suggest that, overall, family firms vary in their levels of innovation, which is corroborated by recent studies (De Massis et al., 2012; König et al., 2012).

The findings that focus on family specific variables provide more useful information for parsing the relationship between family control and innovation (Beck et al., 2011; Bergfeld & Weber, 2008; Eddleston et al., 2008; Kellermanns & Eddleston, 2006; Kellermanns et al., 2008; Zahra, 2005, 2012; Zahra et al., 2007). These family-specific variables (in bold in the table) provide more insight into why some family firms are more innovative than others. While these are only a handful of studies, they seem to point in the direction of narrowing the focus on family-specific variables in order to advance understanding of innovation in family firms (Habbershon et al., 2003).

Inferences from the literature review

The link between human capital and innovation is central to understanding firm behavior and performance (Grant, 1996; Lei et al., 1996; Nonaka & Takeuchi, 1995). In the family firm context, family relationships may affect family employment and firm strategy (Le Breton-Miller & Miller, 2009). Family employees may differ from non-family employees in terms of human capital specificity, human capital sharing and investment, and alignment of interests (Chirico & Salvato, 2008; Dawson, 2012; Gedajlovic & Carney, 2010; Verbeke & Kano, 2012). These differences may produce family firm behaviors not found in non-family firms. Family firm strategy may be impacted by the number of family employees, their level of education, and their use of non-family employees (Sciascia et al., 2013; Verbeke & Kano, 2012). Based on this review of the literature, the following research questions are posed:

Research Questions:

1. *Does increased family employment or family championing increase levels of organizational innovation in small family firms?*
2. *Do family employees champion more "most-important" innovations than non-family employees?*
3. *Do the "most-important" innovations championed by family employees receive more organizational support than those championed by non-family employees?*

4. *Does education and experience positively moderate the effect of family employment on organizational innovation in small family firms?*
5. *Does education and experience positively moderate the effect of family championing on organizational innovation in the small family firm?*
6. *Does family championing of innovation activities partially mediate family employment's influence on organizational innovation?*

Chapter 3: theoretic model and hypotheses

Introduction

This research is a deductive inquiry into the relationships between the human capital of family employees and innovation in family firms. The overlap of social and economic concerns in family firms may complicate their management and may be most acute in the employment of family members (Gomez-Mejia, Cruz, et al., 2011; Lansberg, 1983; Sirmon & Hitt, 2003). Two perspectives about families and firms guide the discussion of hypothesized relationships. First, the human capital of family members is a paramount concern to families and may significantly influence their employment in the firm (Becker, 1991). Therefore, family employees may be given special consideration and treatment in the family firm (Carney, 2005; Gomez-Mejia et al., 2001). Second, family firms must balance socially-oriented family interests with the efficiency requirements of competitive markets (Porter, 1981). While family employees have special status in the firm, the market disciplines family firm behaviors (Miller et al., 2012). Balancing family and firm interests may result in an alignment between the human capital of family employees and the firm's innovation strategy.

The Alignment of family human capital and organizational innovation

Sustainable Family Business Theory posits balancing firm performance with returns to the families' social, human, and financial capital will be more sustainable than

firms that neglect one or the other (Danes et al., 2009). In other words, there must be reciprocity between the family and firm to remain a family firm. The employment of family members impacts family members and the firm (Chua, Chrisman, & Chang, 2004; Vozikis, 2010). Family employment brings opportunity costs for the family member and the firm (Blair, 2011; Blaug, 1976). Over- or under-qualified family employees may reduce family member or firm returns, respectively. Misallocating family human capital or firm resources may lead to family member exit or poor firm performance, either of which might lead to a dissolution of the family firm and an underrepresentation of misallocating family firms in the population. Figure 3/1 depicts a two-by-two matrix that describes the alignment of family human capital with the level of innovation in small family firms and is the basis of the hypothesis development.

Quadrants two and three of the matrix depict the alignment of family human capital and levels of organizational innovation and the efficient allocation of family and firm resources (Chua et al., 2004). In quadrant three, less family human capital may be efficiently allocated in less-innovative family firms (cf. Benner & Tushman, 2003; Gimeno, Folta, Cooper, & Woo, 1997). In quadrant two, firms pursuing higher levels of innovation may require higher levels of family human capital capable of renewing organizational competencies (Benner & Tushman, 2003; cf. Cohen & Levinthal, 1990; Crook et al., 2011; Galunic & Rodan, 1998). Quadrants two and three align family human capital with innovation levels and may successfully satisfy the needs of family employees and the firm. These firms may be the most sustainable family firms and therefore most prevalent in the population.

Quadrants one and four describe the misalignment of family human capital with innovation strategy and the possible misallocation of family and/or firm resources. In quadrant four, lower levels of family human capital in a more innovative family firm may require the efficient integration of non-family human capital (Dyer, 1989; Verbeke & Kano, 2012). Low human capital family employees in an innovative family firm may be learning the family trade, free-riding, and/or working in less influential positions. In this situation, increased reliance on non-family employees may threaten family control over the firm (Gomez-Mejia, Hoskisson, Makri, Sirmon, & Campbell, 2011). In quadrant one, high levels of family human capital in a less innovative family firm may indicate family intentions to increase organizational innovation and align the firm's level of innovation with the family's human capital and shift to quadrant two. However, in some less-innovative family firms, high general human capital families may be wasting their family human capital or using firm resources to pursue investment opportunities outside the firm (Carney, 1998).

Figure 3/1, Family Human Capital and Innovation Levels in Small Family Firms

Family Firm Configurations	**Less-innovative Family Firms**	**More-innovative Family Firms**
Higher Family Human Capital	**1) Mis-alignment –** Intentions to increase innovation, diversification, or misallocation of family human capital.	**2) High-alignment –** Efficient family human capital allocation.
Lower Family Human Capital	**3) Low-alignment –** Efficient family human capital allocation.	**4) Mis-alignment-** Intention to develop family human capital, free-riding, and or unfavorable employment of family members.

(Based on Carney, 1998; Danes et al., 2008; Lepak & Snell, 2002)

Family firms in quadrants one and four misallocate family and/or firm resources and are subject to threats to their viability that would diminish their presence in the population (Danes et al., 2009). To summarize the theoretical framework from above that drives the discussion of the ten hypotheses, a proposition regarding the influence of family human capital is stated formally:

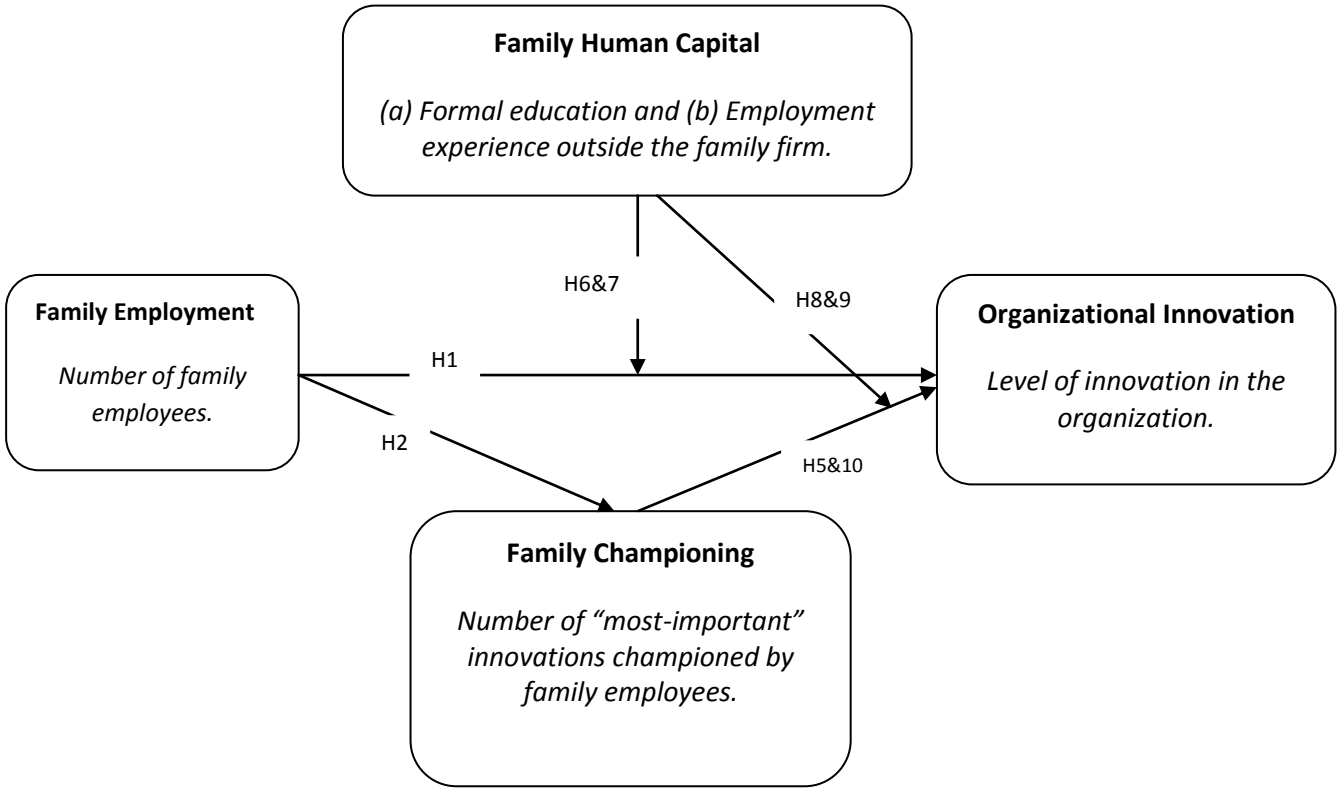
> ***Small family firms will exhibit an alignment of family human capital and organizational innovation levels based on the efficient allocation of family human capital (Carney, 1998; Danes et al., 2009).***

Theoretic Model of Family Human Capital and Organizational Innovation

The Alignment of family human capital and organizational innovation levels would produce a positive relationship between the two constructs. Human capital may moderate the effects of family employment and championing on organizational innovation. Diagram 1/1 is repeated below and depicts the relationships between constructs. Hypotheses one examines the relationship between family employment and organizational innovation. Hypothesis two relates the number of family employees to the number of family champions. Hypotheses three and four, not depicted in the model, compare family to non-family employees and the presence of particularistic contracting. Hypotheses five probes the relationship between family championing and organizational innovation. Hypotheses six through nine address the moderating effects of formal

education and experience working outside the family firm on the relationships between family employment, family championing, and organizational innovation. Hypothesis ten tests the mediating effect of championing between family employment and organizational innovation.

Figure 1/1, Moderating and Mediating Family Influence on Organizational Innovation



Hypotheses

Family employment may bring strong enduring, strong relationship into a firm that can be a valuable resource (Arregle et al., 2007; Pearson et al., 2008). Family members may be a source of physical, social, intellectual, and moral human capital resources that can be

used to further firm objectives (Aldrich & Cliff, 2003; Hoy & Sharma, 2010 ; Rogoff & Heck, 2003). Family employees' altruistic desire to help their family which may reduce agency costs that come with monitoring and incentivizing non-family members (Schulze et al., 2003). Family members may bring human capital resources and shared family interests that are may contribute to organizational innovation.

Younger family members may encourage the family leader to innovate and position the firm for future growth and prosperity (Kellermanns & Eddleston, 2006). Family employees and the firm may make innovative accommodations for one another that might not be expected with non-family employees (Argyris, 1957; Schulze et al., 2003). To accommodate additional family employees, the firm may create a new position or even enter new ventures (Barach et al., 1988), which are considered administrative or management innovations (Hamel, 2006). Thus, increased family member employment can be a resource as well as an incentive for innovation.

Hypothesis one: Family employment will have a positive relationship with organizational innovation.

Family members who join the family firm may be considered "core" employees by virtue of their stake in the firm's success (Schulze et al., 2003). This alignment of interests (cf. Dawson, 2012), may result in expanded influence in the organization and increased involvement in championing of "most-important" innovations. While they may be driven by the desire to help the family, successful championing is also a way to add

value to family resources and earn identity as a valuable member of the family business (cf. Milton, 2008).The more family members that are employed in the firm, the greater will be the chances that family employees champion more of the "most-important" innovations.

Hypothesis two: Family employment will have a positive relationship with family championing.

Family champions of innovation assume personal, familial, and firm risks in championing innovations that alter firm resources and shape the competitive posture of the firm (cf. Burgelman, 1983a). While non-family employees may possess the human capital to contribute to organizational innovation, they do not have the powerful, added interests in helping their own family (Astrachan & Kolenko, 1994; Dawson, 2012; Pérez-González, 2006). The long, trusting family relations are beneficial when confronting risky, unknowable situations associated with innovation (Chirico & Salvato, 2008; Nahapiet & Ghoshal, 1998; Ouchi, 1980). Families may have better knowledge of family employees' abilities to champion innovation relative to non-family employees (Gedajlovic & Carney, 2010; Lee et al., 2003). The uncertainties surrounding innovation activities may make selecting family-championed ideas an efficient alternative to an "objective" selection process (Ouchi, 1980). This is the idea behind champions, that influence and shared interests facilitate innovation activities (Burgelman, 1983a, 1983b). Particularistic contracting in the small family firm may increase the role of family employees in championing innovation.

Hypothesis three: Family employees will champion more "most-important" innovations than non-family employees.

The trust and altruism in family relations may increase the authority and responsibility given to family employees to allocate resources under uncertain conditions (Ouchi, 1980; Schulze et al., 2003). Deep knowledge of, and trust in, the family member may speed resource-allocation decisions (Carney, 2005; Chirico & Salvato, 2008). Family champions may receive more organizational resources faster, thereby increasing the scale of family-championed innovations compared with those of non-family members (Carney, 2005).

Hypothesis four: Family firms will invest more organizational resources in innovation activities championed by family employees than those championed by non-family employees.

Taken together, hypotheses two through four suggest that family members may play a large role in championing innovation and have a greater impact on organizational innovation than non-family members. The uncertainties surrounding innovation activities may make selecting family-championed ideas an efficient alternative to an "objective" selection process (Ouchi, 1980). This is precisely the idea behind championing; that influence and shared interests facilitate decision making in the organizational innovation process (Burgelman, 1983a). The potential benefits for family champions and the firm, the increased level of support, and the goal of wealth generation may provide family

champions with the opportunity to have a significant, positive impact on organizational innovation.

Hypothesis five: Family championing will have a positive relationship with organizational innovation.

Hypotheses two through five suggest that family employees may have considerable influence on the small family firm through the championing of important innovation activities. The following four hypotheses account for the moderating effects of family human capital on the small family firm.

High human capital family employees with more education and broader experience will be more likely to work in and contribute to more innovative family firms (Amabile, 1983; Card, 1999; Crook et al., 2011; Schultz, 1980; Ward, 2004). Increased human capital may stimulate family members' desire to work in an organization where they can use their skills to advantage (Casper, 2007). Pérez-González (2006) finds that family successors with prestigious educations were associated with better firm performance than less prestigiously educated successors. Conversely, low human capital family employees may be aligned with less-innovative family firms (Gimeno et al., 1997). Barring other influences, more-educated family employees would have a more positive impact on organizational innovation (Richard R Nelson & Phelps, 1966; Schultz, 1980). Increased levels of education may increase family employee's ability to effectively support or champion innovation activities in the family firm.

Hypothesis six: Education level will positively moderate the relationship between family employment and organizational innovation in small family firms.

Hypothesis seven: Education level will positively moderate the relationship between family championing and organizational innovation in small family firms.

Experience is an important factor in individual contribution to innovation (J. S. Brown & Duguid, 1991; Sardeshmukh & Corbett, 2011; Shane, 2000). A mixture of specific and general experience may be necessary for innovation (Cohen & Levinthal, 1990; March, 1991; Marvel & Lumpkin, 2007; Sardeshmukh & Corbett, 2011). In family business research it has been suggested that family employees may benefit from working experience outside the family firm (Hoy & Sharma, 2010 ; Sardeshmukh & Corbett, 2011). Through these experiences family employees may be exposed to a greater breadth of perspectives and situations that expand an individual's self confidence (Hoy & Sharma, 2010) and creative potential (Baron, 2006). Outside working experiences may enable family employees to make better contributions to the family firm and possible contribute more to innovation. Increased levels of outside work experience of family employees may enhance family employee's ability to effectively support or champion innovation activities in the family firm.

Hypothesis eight: Employment experience outside the family firm will positively moderate the relationship between family employment and organizational innovation in small family firms.

Hypothesis nine: Employment experience outside the family firm will positively moderate the relationship between family championing and organizational innovation in small family firms.

Family employees may influence organizational innovation indirectly in supportive roles or directly by championing innovation activities. A family employee might handle routine activities so that another organizational member could champion an innovation, providing advice and emotional support as needed. Thus, championing is only one means of mediating the relationship between family employment and organizational innovation, which is considered partial mediation (James, Mulaik, & Brett, 2006). Family employees may contribute to innovation and influence family firm strategy through supporting and/or championing roles. Family championing will explain part of the relationship between family employment and organizational innovation.

Hypothesis ten: Family championing will partially mediate family employment's influence on organizational innovation.

Conclusion

This chapter has explored the proposition that small family firms may align family human capital and organizational innovation levels. A set of direct, mediated, and moderated relationships were discussed to gain insights into the effects of family human capital on organizational innovation. Insights from the human capital, innovation, and family business literatures were used to develop testable hypotheses that are most relevant in small family firms.

Chapter 4: research design

Introduction

This chapter describes the research design and assessment of the data collected. The research design focuses on making a contribution to the family business research given the resource constraints and the challenge of empirical observation in this specific context (Huff, 2008). The sample of firms is assessed for its representation of the target population, relevance to the relationships under consideration (Davidsson, 2005), and for the validity and reliability of the measures (Pedhazur & Schmelkin, 1991).

Research Design

Previous case studies provide criterion-validity to a relationship between family-member characteristics and roles in the firm and the performance of the firm (ex. Gersick et al., 1997; Hoy & Sharma, 2010 ; Rosenblatt, De Mik, Anderson, & Johnson, 1985). My intention is to examine these relationships in a larger number of firms using uniform measurements in order to make inferences about the population of family firms (Davidsson, 2005). The exploratory nature of this research project garnered limited institutional resources, which came from a single $5,000 grant from the Family Owned Business Institute (FOBI) in 2010.[2]

[2] The Family Owned Business Institute selected the project "Human Capital Impacts on Innovation in Entrepreneurial Family Firms" (Gottschall, Dawson, and Sharma, 2010) for a $5,000 research stipend.

There is no single repository of data that reflects the population of small, private, family firms, which necessitates primary data collection and makes random sampling prohibitively difficult and expensive (Beck et al., 2011; Chua et al., 1999). Based on budget restraints, a desire to collect data representative of the population, and an anticipated response rate of 14% reported by Dillman (2000), it was decided to collect survey data from family firms.

The FOBI research grant was used to purchase a book, Qualtrics online surveying software, an e-mail address database from E-mail-list.com, and research assistance in gathering contact information and loading it into the software. E-mail-delivered surveys were used to reduce costs per response (Kaplowitz, Hadlock, & Levine, 2004). "E-surveys" offer flexibility, speed/timeliness, technological features, respondent convenience, and data entry and analysis efficiencies (Evans & Mathur, 2005). As of April, 2010, 95% of small businesses with a computer had high speed internet (U.S. Small Business Administration, 2010), so coverage of the population is not restricted by the use of e-mail.

Single-response was chosen over the more cumbersome multiple-response to further increase response rates. The risk of inflated relationships due to affective, acquiesce, or social desirability biases are reduced by the objective nature of some of the variables, such as number of family members, or their less apparent association with organizational innovation, such as family employees' education (Spector, 2006). Precautions in sequencing the related variables further reduce the likelihood of systematic inflation of relationships (Spector, 2006). Following procedures in (cf. Miller, Le Breton-Miller, & Scholnick, 2008; Miller, Lee, Chang, & Le Breton-Miller, 2009), 12

firms, 11.7% of the sample, provided a second response so that inter-rater agreement could be assessed to assess the reliability of the survey instrument. Common method variance is a concern in this sample, which may lead to the exaggerated the statistical strength of relationships in the data.

The survey was designed according to principles and tips from Dillman (2000) and Van Selm and Jankowski (2006) and is presented in its paper form in appendix A. Businesspersons report lengthy surveys as a primary reason for non-response (Tomasevic-Devey, Leiter, & Thompson, 1994). Efforts were made to collect the minimal amount of information to capture the phenomena of interest, and well-established scales and variables were used to ensure the valid and reliable measurement of concepts (Davidsson, 2005). The survey used for data collection was pre-tested ten times. I alternated pre-testing with the owners of five family businesses and five academic colleagues. The pre-testing resulted in a series of improvements that generated a substantially better instrument.

Target Population

Because family sizes are limited[3], the target population of family firms was limited to 250 employees, which accounts for over 98% of all businesses (U.S. Census Bureau, 2008). There are approximately 5.9 million firms with between 1 and 250

[3]Based on an average family size of 3.14 persons (U.S. Census Bureau, 2010), an extended family might include three families or approximately 9.42 members. The influence of family human capital on organizational innovation will presumably diminish as more non-family human capital is employed in the firm.

employees in the United States (U.S. Census Bureau, 2008)[4]. Depending on the definition used, family firms may represent between 35% and 95% of all firms (Shanker & Astrachan, 1996). Many researchers employ broader definitions of family firms that account for almost 90% of all firms (ex. Aldrich & Cliff, 2003; Chang, Chrisman, Chua, & Kellermanns, 2008; Rosenblatt et al., 1985). Using an estimate of 85%, there may be roughly five-million firms that meet the criteria of having less than 250 total employees, self-identify as a family-owned business, and have more than two family members working full- or part-time in the firm.

Sample Data Collection

To increase response rates, the survey was kept short, survey recipients were contacted several times, salient issues were emphasized, researcher affiliations were customized, and a $250 donation to the American Red Cross was used as a respondent reward (Sheehan, 2001). Firms were selected from data-mining Chamber of Commerce web sites, a purchased list of 100,000 email addresses and by contacting my network of friends and family and asking them to contact business owners that they know. Efforts were made to ensure population representation and to reduce researcher-related bias in the collection of data.

Chambers of Commerce in cities with between 25,000 and 125,000 inhabitants were targeted because they sometimes provide membership directories that do not effectively prevent data mining. I collected 918 email addresses from 18 websites.

[4] The U.S. Census Bureau reports that there were 5,911,663 firms employing between 1 and 499 employees. Only 90,386 of these firms had between 100 and 499 firms and 11,663 firms were subtracted to estimate the firms with between 1 and 250 employees.

Enthusiasm for this approach diminished when costs-per-response exceeded estimates tenfold, due to an average response rate (1.4%) that is one-tenth (14%) reported by Dillman (2000). In all, this data collection method generated 71 complete responses, 28% of the total. See table 4/1 for a summary of survey dissemination and response information.

A list of 100,000 business email addresses was purchased from Email-list.com. I selected job titles of *Owners, Presidents*, and *Partners*, which resulted in a list of 6,934 emails. A response rate of .082% produced 57 completed responses, accounting for 22% of the total complete responses.

Finally, I contacted family members and friends, and requested that they fill out the survey and/or pass a survey-link to their business-owner associates. The use of my network of friends and family to reach business owners is based on snowball-sampling techniques (Biernacki & Waldorf, 1981); an example of these communications is presented below in figure 4/1. I collected 132 complete responses from these survey links, which account for 51% of the total. In personal communications, I was able to estimate that this personalized, networking approach resulted in an approximate response rate of 50%. Based on this figure, I estimate that approximately 264 links were disseminated via the snowball technique.

Figure 4/1, Email contact using Snowball Technique

All, Rich Gottschall is a friend of mine, and as per below, he is working on his Ph.D. thesis. If any of you small business owners can complete the 5-7 minute survey on innovation in small and medium sized firms, we would both appreciate it. The survey can be found by clicking this link or copying it into a browser. https://acsurvey.qualtrics.com/SE/?SID=SV_3ltqoKBlePX0rpG

If anyone has any questions or comments, you can contact Rich at gottscrl@plattsburgh.edu

Thanks, and have a nice weekend,

Table 4/1, Survey Dissemination and Response Rates

	Dissemination	Complete Responses	Response %	Response by method
Data mining chamber of commerce Northern NY	400	64	16	24.5%
Data mining chamber of commerce PA+	390	5	1.3%	1.9%
Data mining chamber of commerce CA	128	2	1.5%	0.8%
Networking approach	264*	132	50%*	50.6%
Purchased list	6,934	57	.82%	21.8%
Totals	**8,116**	**261**	**3%**	**100%**
Removed responses				
Self-identified family firm with zero non-family employees	28			
Self-identified family firm with only one family employee	41			
Self-identified non-family firms with zero family members	55			
Incomplete data	43			
Removed responses	169			
Tested Responses in sample		**94**		

* Estimates based on the completed responses and informal inquiries into dissemination.

The overall response rates seem below averages published in similar research studies, and well below Dillman (2000)'s 14%. It may be that researchers typically collect less data during the summer months when small business owners may be taking vacations or experiencing seasonal demand. Also the proliferation of online surveys may have lowered response rates since Dillman (2000)'s study. 94 firms completed the survey and met the criteria of having fewer than 250 total employees, two-or-more family employees working full- or part-time in the firm, and at least one non-family employee. While the number of discarded responses seems high, no efforts were made to target firms that met the criteria for inclusion. Data on 55 non-family firms was also collected in the process.

Out of 241 usable responses, 122 (50.6%) met the criteria of employing at least two family employees full- or part-time. However, I removed 28 (11.6%) of these firms

because they did not employ any non-family members, leaving 94 (39%) firms in the study. I had anticipated that close to 85% of the sample would meet an acceptable definition of a family firm (Chang et al., 2008), especially in the small business arena where family firms might be more prevalent (Shanker & Astrachan, 1996). 69 (28.6% of the usable responses) were not classified as either family or non-family firms.

The rate of response to the e-mailed surveys is generally disappointing. The 60% completion rate reflected a drop-out rate of 30% on the first question; another 10% dropped out throughout the rest of the survey, suggesting that survey length was not a deterrent to completion. While I generally followed established practices to increase response rates, I did try a novel approach in the respondent incentives. Instead of offering the chance of winning a gift such as an I-pod, I offered to make a donation to the Red Cross upon the receipt of 200 responses. A few people responded appreciatively (see example in figure 4/4), but I will try the I-pod next time.

Figure 4/2, E-mail Response to Red Cross Donation Incentive

Dear Richard,

I would be happy to help you with your survey. Your ethical bribe of a donation to the Red Cross is an excellent marketing tool that motivated me to respond. Smart.

Best Regards,

Sample Data Analysis

In the sample of 94 firms, the respondents self-identified as follows: Three blanks and 91 responses, zero nonfamily employees, 76 (84%) owner, co-owner, or partner, 8 (9%) manager, and 7 (8%) family member employee.

The 94 sample firms were tested for their representativeness of the population of small family firms. In the absence of population data on family firms, I compared the sample data to all small firms in the U.S. Census Bureau data, to the 55 non-family firms that responded to my survey, to a study of U.S.-based family firms by Zahra et al. (2004), and to an EU-based study of family firms by Beck et al. (2011).

This sample of 94 family firms had a mean age of 24.04 years, which is not statistically different from the mean age of 24.27 years for non-family firms in the sample, or the mean age of 29.77 years in Beck et al. (2011) (see table 4/2 below). However, this sample is significantly younger than the 31.4-year mean of the Zahra et al. (2004) study and 13.84 years older than an 11.82-year estimated mean of the U.S. Census Bureau data (U.S. Census Bureau, 2010).[5] With family firms representing a large portion of small firms, and no significant differences between family and non-family firms in this sample data, it does not appear that the gap is between family and non-family firms. The difference may be due to non-response bias, the tendency of younger firms not to respond

[5] The U.S. Census Bureau reports 11 age categories from 1 through 26-plus years since founding. I used median figures to average categories and estimated 40 years for the oldest category based on a sensitivity analysis. With five million firms represented, the average was fairly insensitive to changes in the oldest category.

to surveys (cf. Carter, Stearns, Reynolds, & Miller, 1994; Chua et al., 1999). It is noted that this data does not seem to represent younger firms in the larger population.

Table 4/2, Comparison of Mean Firm-Ages

Family firm age	N	Mean	SD	P-value	Interpretation
Sample Family Firms	94	24.04	18.91		
Sample Non-Family Firms	80	24.27	23.69	.9433	No difference
Beck et al. (2011)	111	29.77	26.52	.0814	No difference
Zahra et al. (2004)	218	31.4	26.1	.0141	Difference
U.S. Census Bureau 2010	5Mil.	11.82	NA	NA	12-20-year Gap

The mean number of employees in this sample of 94 family firms is 25.85 employees, which is not statistically different from the sample of 55 non-family firms or the Beck et al. (2011) sample. However, the sample of family firms in the Zahra et al. (2004) study is significantly larger (see table 4/3) and a comparison with the U.S. Census Bureau follows.

Table 4/3, Comparison of Mean Number of Employees

Family firm size	N	Mean	SD	P-value	Interpretation
Sample Family Firms	94	25.93	41.54		
Sample Non-family Firms	80	25.69	43.15	.9703	No difference
Beck et al. (2011)	111	28.55	40.27	.6478	No difference
Zahra et al. (2004)	218	76.10	181.3	.0084	Difference

This distribution of family firm sizes is consistent with a sample of 449 family firms in Spain (Casillas & Moreno, 2010). However, there are significant differences

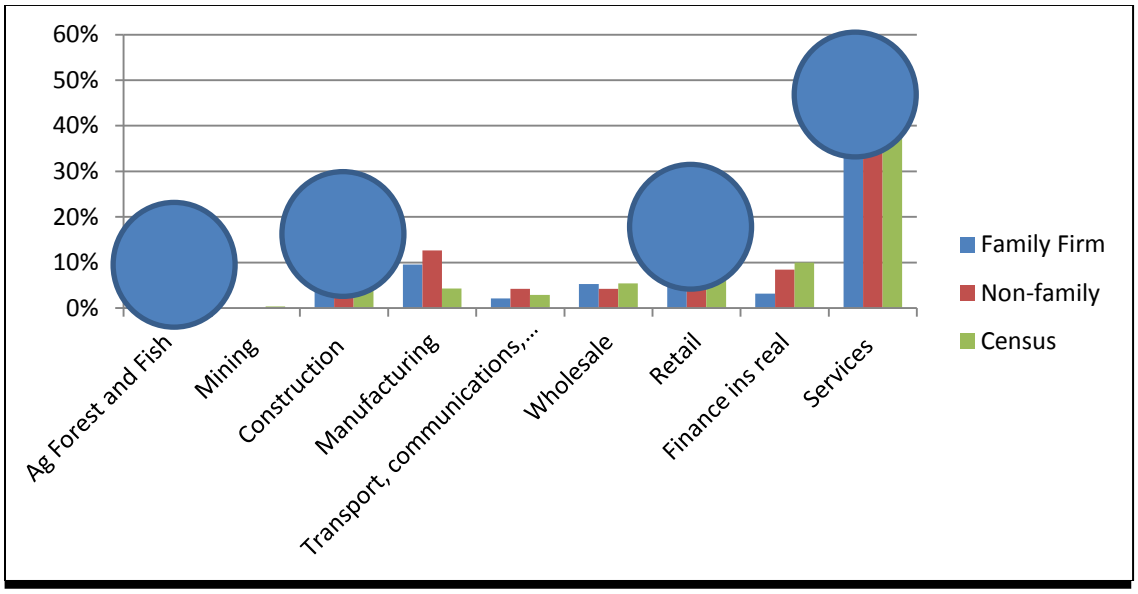
between the sample and the U.S. Census data. The removal of firms with fewer than three employees (the firms must have at least two family and one non-family employees) from the sample exacerbated an underrepresentation of firms with four or fewer employees, and over represents firms with between five and 100 employees. A similar pattern is seen in the sample of non-family firms, though they skew slightly larger in the 20-99 employees category. It seems that the differences in size distributions may be related to non-response bias rather than to a difference between family and non-family firms. While this is a speculation, it is beyond the scope of this research project to attempt to develop parameters for the family firm population.

Table 4/4, Comparison of Number of Employees

Organization size	U.S. Census Data	Sample Family Firms	Differ-ences	Sample Non-Family Firms	Differ-ences
Size 0-4	61%	11%	-50%	31%	-30%
Size 5-9	17%	32%	15%	27%	10%
Size 10-19	10%	24%	14%	13%	3%
Size 20-99	9%	28%	19%	20%	11%
Size 100+	1.5%	5%	4%	9%	7.5%

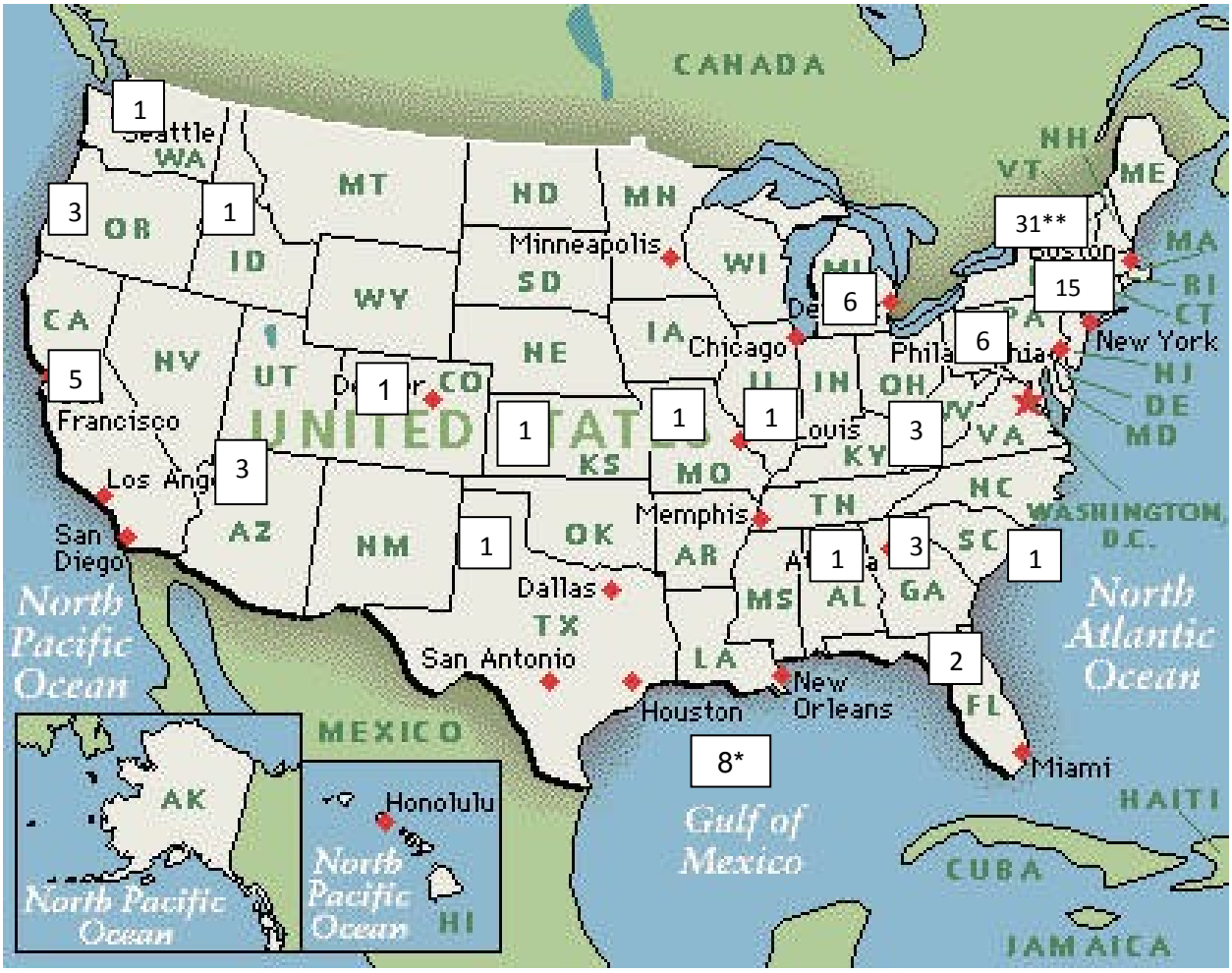
This sample of 94 firms presents a few anomalies in the industry structure when compared to U.S. Census data and data collected for this research 55 on non-family firms. A visual analysis of the data in figure 4/3 shows differences in agricultural, construction, retailing, and service businesses in this sample. These differences are consistent with, and may reflect, more rural/agrarian economies (Porter, Ketels, Miller, & Bryden, 2004).

Figure 4/3, Comparison of industry activity



This sample of 94 family firms is distributed across at least 19 U.S. states, but cannot be further specified because eight respondents failed to provide a complete zip code (see figure 4/3). There is a geographic bias in the region of New York State associated with the researcher's affiliations. At least 33% of the responses come from this one region of upstate N.Y. while at least 67% of responses come from outside this region. These regional differences are analyzed in the next section on non-response bias.

Figure 4/4, Map of U.S.A. with Responses



* Not specified. **Researcher's Affiliated Region

To detect non-response bias, researchers commonly compare earlier responses to later responses under the assumption that late-responders may share characteristics with non-responders. However, the response rate from upstate N.Y. was so much higher than that from other regions (16% compared to less that 1%), that it may better reflect differences between responders and non-responders. Thus, in one test I compare high to low response rates and upstate-N.Y. responses to responses outside of upstate N.Y. The Levene's test revealed largely insignificant differences between the two sets of data on

the firm-level criteria listed in table 4/6 and little evidence of regional or non-response bias. Only the number of family champions with outside employment experience of greater than three years was significantly larger in the Upstate N.Y. region that represents the potential non-respondents. It is difficult to interpret this one anomaly. While there appears to be no statistical bias, the data may be more generalizable to populations of small family firms in the Northeast of the U.S.

Table 4/5, Levene's Independent Samples Test for Geographic and Non-Response Bias

Variables	**F**	**Sig.**	**T**	**df**	**Sig. (2-tailed)**
Organization age	.065	.799	-.873	92	.385
Organization size	.082	.775	-.235	92	.815
Industry	.947	.333	-1.813	92	.073
Org. atmosphere	1.270	.263	.242	92	.809
Industry dynamism	2.043	.156	-.142	92	.887
Number of family employees	3.002	.087	-1.644	92	.104
Number of less-educated family employees	.131	.718	-.171	92	.865
Number of more-educated family employees*	4.643	.034	-1.858	80.2	.067
Number of less-experienced family employees	1.134	.290	-1.872	92	.064
Number of more-experienced family employees*	13.575	.000	.376	90.4	.708
Number of family champions	1.877	.174	1.532	92	.129
Number of less-educated family champions	.153	.697	.147	92	.884
Number of more-educated family champions	1.005	.319	1.343	92	.183
Number of less-experienced family champions	1.776	.186	-1.597	92	.114
Number of more-experienced family champions*	4.441	.038	2.519	92	**.013**
Organizational Innovation	.068	.795	1.621	92	.109

* Levene's test of variance, assumed not equal

Using the data collected from non-family firms, a two other studies of family firms, and the U.S. Census data, I am able to make a few observations about this sample

of family firms. Overall, the analysis reveals that the sample may under-represent younger, smaller, and service-oriented firms. There is an over-representation of firms from upstate-N.Y. and as many as 31 U.S. states may not be represented. A split-sample comparison of upstate-N.Y. versus all the other responses revealed only one significant difference between firms on the variables of interest in this study. The data seems representative of firms with between 5 and 99 employees which represent 37.2 % of the total population of U.S. firms. It seems that younger, smaller firms may be routinely under-represented when primary data is collected on private firms (ex. Beck et al., 2011; Casillas & Moreno, 2010; Zahra et al., 2004).

Operationalization of Constructs

To test the relationships discussed Chapter Three, I selected existing variables from the family business, human capital, and organizational innovation literatures to measure the concepts of interest. It is important to choose variables that accurately represent their intended concepts (Nunnally & Bernstein, 1994); their successful use in previous research helps validate their theoretical overlap (Davidsson, 2005). The measures of human capital, organizational innovation, organizational atmosphere for innovation, and championing of innovation are further tested for their reliability and inter-rater agreement (Nunnally & Bernstein, 1994).

Family and Non-family Employment: The respondent will count the number of family and non-family employees who worked at the firm full- or part-time in the past 18 months. The measure will produce a count of family and non-family employees

employed in the firm (ex. Casillas & Moreno, 2010; Chua et al., 1999; Sciascia & Mazzola, 2008).

Family Human Capital – Education and Experience:

Family human capital has been defined as the productive value of genetic or legal relatives employed in the family firm (Danes et al., 2009; Sirmon & Hitt, 2003). Thus, family human capital can be described as a "compilation construct" (St. John, 2005, p. 203), which describes a "configuration" of family employees' knowledge, skills, and abilities (Klein & Kozlowski, 2000). The level of theory is about the firm's stock of family human capital and its level of organizational innovation, however the data is collected on individual family employees backgrounds, which is referred to as a "bottom-up, cross level approach" and is appropriate for studying human capital in organizations (St. John, 2005, p. 212). As opposed to a shared family firm-specific body of knowledge (Chirico & Salvato, 2008; Gedajlovic & Carney, 2010), this study focuses on the collective human capital resources of family employees, hoping to capture insights relating to family firms with two, three, or more family employees (Chirico, 2008).

Aggregating individual data needs to be done from a sound theoretical perspective (Klein & Kozlowski, 2000). Summing the education and/or experience of family employees presents theoretical and practical complications. For example, three family employees with high school degrees and 36-years of education would have 12.5% more human capital than a two family employees with college degrees and 32 years of total education. This operationalization is numerically clear but theoretically ambiguous.

Practically speaking, the family does not add family employee education by the year, they hire and fire family members. To capture the family human capital in the firm, counts of family employees and their educational and experiential backgrounds were used.

Family human capital - Education: Education is measured by highest degree obtained by each family employee (cf. Bates, 1990; Becker, 1962; Blaug, 1976; Davidsson & Honig, 2003). The choices are: (1) high school, (2) two-year college, (3) four-year college, (4) Master's degree, (5) Ph.D., (6) technical certification (7) did not finish high school, (8) don't know/recall/rejected.[6] At the firm level, the firm's family human capital resources are represented by the number of family employees with each degree.

Family human capital - Experience: Respondents were asked how many years each family employee had worked both inside and outside the family firm. Researchers and consultants suggest that family employees obtain at least three years experience working outside the firm to gain perspective on a non-family work environment and enhance their productivity in the family firm (Hoy & Sharma, 2010). At the firm level, the firm's family human capital resources are represented by the number of family employees with more or less than three-years outside experience.

Family and Non-family Champion of Innovation: After subjectively identifying what the respondent believes to be one of the three "most-important" innovations, the respondent will then be asked: "Who, in your organization, was responsible for identifying and leading the adoption of this innovation?" Respondents could identify

[6] A few other survey questions probed family human capital for exploratory research that is not directly related to the research questions posed in this dissertation.

specific family employees or the option for non-family members. This method of identifying champions is reported as "a highly reliable and valid technique" (Howell & Higgins, 1990, p. 326). This measure will result in a variable ranging from 0/3 to 3/3 for family and non-family champions per firm.

Innovation

Subjective measures of innovation are supported by the high correlation between three objective and subjective measures (Dess & Robinson Jr, 1984). However, in an effort to assess retrospective rationalization and common methods variance, three measures of the concept will be taken (Campbell & Fiske, 1959): (1) a six item scale, (2) identification of up to three of the most significant innovations, and (3) comparison to other firms in the same industry.

Introduction of Newness to the Organization: The primary measure of organizational innovation uses a scale developed by Johannessen, Olsen, and Lumpkin (2001) that measures respondents' perceptions of the level of adoption of: (1) new products, (2) new services, (3) new methods of production, (4) opening new markets, (5) new sources of supply, and (6) new ways of organizing.[7] Respondents ranked each of the types of innovation on a five-point Likert scale from "Not active" to "Extremely active." These six measures converge to produce a single measure of innovation based on the characteristic of introducing "newness" to the organization (Johannessen et al., 2001), and reflect an encompassing measure the family firm's total level of innovation over the last 18 months.

[7] To this scale, I added a seventh item adopted or updated technologies for an unrelated research project.

"Most-important" Innovation: The second measure of innovation describes the resource intensity of up to three "most-important" innovation adoptions. The importance of innovations is measured relative to the firm's slack resources (Bessen, 2002; George, 2005) based on a five-point scale used by (Gopalakrishnan & Bierly, 2001). After identifying a "most-important" innovation, the respondent is prompted to reveal the "estimated use of discretionary financial and managerial resources to implement the innovation," and can answer on a scale from "insignificant use of resources" to "very high use of resources." The firm's commitment of resources to the three "most-important" innovations is used to compare resource commitments to family and non-family champions and also serves as a secondary measure of overall organizational innovation.

Industry comparison: The third measure of innovation is the respondent's perception of the firm's level of innovation compared to other firms in the same industry. The response scale ranged from "much less innovative" to "much more innovative." This quick question is used to triangulate, with the other measures of organizational innovation.

To better measure the relationships between family human capital and organizational innovation, I controlled for the age and size of the organization as well as the industry and the organizational climate for innovation.

Organization size: Organizational size is related to innovation by economies of scale and the ability to spread the costs of innovation over a greater resource base (Chrisman et al., 2003). As the organization grows in its number of employees, it is also possible that the influence of family human capital diminishes proportionately, so organizational size will

be measured by summing the number of family and non-family employees (Eddleston et al., 2008).

Organization age: As firms mature, structural inertia may limit organizational innovation (Hannan & Freeman, 1984). The age of the organization is calculated by subtracting the founding date of the firm from the year 2012 (Autio, Sapienza, & Almeida, 2000).

Organizational climate for innovation: Innovation is affected by organizational context such as culture, resources, and reward systems (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Kimberly & Evanisko, 1981). I developed a four-item scale to measure organizational atmosphere for innovation based on the seven-item-scale of Madjar, Oldham, and Pratt (2002). I translated "my supervisor discusses with me my work-related ideas in order to improve them" as: (1) "Organizational members regularly discuss work-related ideas in order to improve them." Similarly, I have adapted their other measures as: (2) "Organizational members are supportive of ideas about improving tasks," (3) "Organizational members provide useful feedback about ideas concerning the workplace,' (4) "Organization members are supportive of a person even when they introduce an unpopular idea or solution at work." Respondents rated the statements on a five-point scale from "strongly disagree" to "strongly agree."

Industry Dynamism and Industry Classification: A firm's market environment affects its level of innovation (Drazin, Glynn, & Kazanjian, 1999; Kimberly & Evanisko, 1981). Zahra et al. (2004) assess the environment with a single, self-reported item, identifying the industry as "high tech" or "low tech." Eddleston et al. (2008) use four self-reported measures concerning the abundance of innovation opportunities in the firm's industry. I

used one item, “How important is innovation to performance in your industry?” with a five-point scale ranging from “not important” to “very important.” Respondents also identified their industry using the two-digit standard industrial classification that begins with: (1) agriculture, (2) mining, (3) construction, (4) manufacturing, (5) transportation, (6) wholesale, (7) retail, (8) finance, and (9) services. Public administration was omitted from the sample.

Analysis of Construct Measures

The measure of family human capital was analyzed for inter-rater reliability and bivariate correlations with organizational innovation. The organizational-innovation and organizational-atmosphere-for-innovation variables were subjected to validity and reliability tests. The single-item identification of champions of innovation was tested for inter-rater reliability (Miller et al., 2009). All variables in the study were analyzed for bivariate collinearity that might interfere with statistical analysis (Kleinbaum, Kupper, & Nizam, 2008).

Family Human Capital - Education

The educational data for family employees is presented below in table 4/8. The bivariate correlation between education levels and organizational innovation suggests that some levels of education were significant while others were not. The data was grouped into “less-educated” and “more-educated” categories to provide greater statistical power to, and aid in interpreting the findings (Pedhazur & Schmelkin, 1991). The cut-off between less- and more-education was found between those who have and have not obtained a degree after completing high school. This split is borne out in this sample as

well as in national statistics. In 2010, 87.1% of Americans 25 and over had obtained high school degrees and while 57% attend some college, only 36.7% of Americans will obtain a degree from a post-secondary educational institution.

58 family employees had high school degrees or less, 205 had associates, technical degrees or higher, and zero respondents were unable to recall the highest degrees of education for family members. The 58 less-educated family employees represent 22% of family employees and were employed in only 36 (38.35%) of the sample family firms. In this sample, the 78% of the family employees had post-secondary degrees, which more than doubles the national rate of 36.7%. The two-group classification provided significant bivariate relationships with innovation that are negative in the case less-educated family employees (β -.362; α .000) and positive in the case of more-educated family employees (β .212; α .020).

Table 4/6, Education Levels and Bivariate Correlations with Organizational Innovation

Level of Human Capital (Education)	Sum	Mean	Cor-relation	Sig.
High School	54	.57	-.367	.000
Associates Degree (2-Yr. college)	32	.34	.098	.173
Bachelors Degree (4-Yr. college)	133	1.41	.093	.187
Masters Degree	22	.23	-.017	.434
Doctoral Degree	12	.13	.068	.257
Technical Degree	6	.06	.166	.055
Did not finish high School	4	.04	.013	.451
Unknown level of education	0			
Less-educated family employees	**58**	**.61**	**-.362**	**.000**
More-educated family employees	**205**	**2.19**	**.212**	**.020**

The inter-rater reliability of the human capital measurement was assessed in 12 firms according to the procedures used by (Miller et al., 2008; Miller et al., 2009). In nine of the 12 firms (75%), respondents provided identical answers for the number and educational level of family employees. Two of the 12 (19%) differed on the number of family employees and only one pair had equal numbers of employees but different selections for education. Inter-rater reliability of 75% is above the 70% threshold. In the ten firms that identified the same number of family employees, there was 100% agreement between raters in differentiating between less- and more-educated family employees.

Family Human Capital – Experience

The experience data from the sample is presented below in table 4/8. The data was collected in a manner that allowed for multiple manipulations of the data and triangulation on the construct of interest (Campbell & Fiske, 1959). By analyzing the bivariate correlations between experience working inside and outside the family firm, the approach of using three-years outside experience was supported. The total experience of all family employees working in the firm had an insignificant relationship (β -.057; α .292) with organizational innovation. There was a significant negative relationship (β -.174; α .047) with increasing experience inside the family firm and a marginally significant positive relationship (β .15; α .015) with experience working outside the family firm, which is corroborated with a highly significant negative relationship (β -.219; α .017) between the ratio of experience working inside the family firm to total

working experience. Thus, the decision to focus on a family employees attainment of outside working experience as a prerequisite for making contributions to innovation seems justifiable and is borne out in the negative relationship (β -.198; α .028) between the number of family employees with less than three-years experience working outside the firm and the marginally significant, positive relationship between those with more than three-years experience and organizational innovation (β .109; α .147).

Table 4/7, Experience Levels and Bivariate Correlations with Organizational Innovation

Experience Construct	MEAN	Correlation	Significance
Total working experience of family employees in years	66.9	-.057	.292
Total experience of family employees working in the family firm in years	39.2	-.174	.047
Total experience of family employees working outside the family firm in years	27.7	.150	.074
Ratio of family employees experience working in the family firm to total working experience	59%	-.219	.017
Number of family employees with less than 3-years working outside the family firm	1.05	-.198	.028
Number of family employees with more than 3-years working outside the family firm	1.76	.109	.147

The inter-rater reliability of the experience measurement was assessed in 12 firms according to the procedures used by (Miller et al., 2008; Miller et al., 2009). Due to a problem with the on-line surveying software (Qualtrics), many respondents were not able to see the experience questions on their computer screens. This problem was also reflected in the sample of firms used for testing inter-rater reliability of the instrument. Four of the 12 firms did not complete the experience questions, which is consistent with the loss of data from the entire sample for missing experience. In the eight remaining

firms, the outside experience was analyzed for discrepancies between the respondents on whether the family employee had worked more or less than three-years outside the family firm. Agreement between respondents was found for 16 out of the 21 family employees (76%), which exceeds the 70% threshold. However, in the five instances where respondents disagreed on the outside experience of family employees, one of the respondents entered no data in their years of outside experience. These discrepancies appear to be consistent omissions of data rather than differences in judgment or recall. Responses with omitted experience data were not included in the sample of 94 family firms, so the reliability of the measure may be higher than 76%.

Organizational innovation

The first step in assessing the reliability of the organizational innovation scale was to examine the ratio of variance in individual scale items to their composite score, using Cronbach's alpha to ensure that the items are measuring a single construct (Pedhazur & Schmelkin, 1991, p. 90). Alpha scores of .7 or higher generally represent a sufficient level o f reliability (Nunnally, 1978, p. 245). The six items in the scale produced a .788 ratio of internal to composite variability that indicates acceptable reliability. This result was not reported by Johannessen et al. (2001).

Table 4/8, Cronbach's Alpha for Organization Innovation

Scale	N	Items	Alpha	Alpha Standardized
Organizational Innovation	94	6	.785	.788

Next, I assessed the reliability of the organizational innovation scale by testing inter-rater agreement in 11 firms as one of the paired responses was incomplete. The respondents' ratings on the five-point scale could yield differences in opinions ranging from zero to four. Inter-rater agreement was defined as zero to one point of difference on the Likert scale, whereas disagreement would be reflected in two, three, or four points of difference (ex. Miller et al., 2008; Miller et al., 2009). Between the 12 pairs of raters and 72 points of reference, there were zero four-point and only one three-point difference. Inter-rater reliability was well above the 70% threshold on five of six items, and only slightly below in the sixth.

Table 4/9, Inter-rater Agreement on Organizational Innovation Items

Items	**Complete agreement**	**Complete and near agreement**	**Convergent validity at complete or near agreement**
New products	5/12	10/12	83%
New services	7/12	11/12	92%
New production methods	8/12	10/12	83%
New markets	5/12	8/12	67%
New supplies	4/12	10/12	83%
New organization	5/12	11/12	92%

The organizational innovation scale was designed by Johannessen et al. (2001), who reported single-factor solution in their principal components analysis of the six-item scale. Following Johannessen et al. (2001), an eigenvalue of one was used as the cutoff for components to be analyzed; items with loadings above .5 were retained in a factor, were analyzed for discriminant validity against loading on other factors (not to exceed

.4), and were deemed to have sufficient internal consistency by virtue of their Cronbach's alpha scores in excess of the .7 threshold. Varimax rotation was used to provide maximal data reduction and ease of interpretation. The findings closely approximate Johannessen et al. (2001) and are supportive of a single factor underlying these six types of innovation.

Table 4/10, Comparison of Principal Components Analyses

	This study		**Johannessen et al. (2001)**	
Item	Components	Communality	Components	Communality
New products	.687	.472	.77	.59
New services	.751	.564	.73	.53
New methods	.573	.329	.72	.52
New markets	.790	.624	.70	.49
New suppliers	.677	.459	.59	.34
New organization	.677	.459	.64	.41

This single factor is the only factor with an eigenvalue higher than 1, and explains 48.4% of the variance in the six items. While factor one is dominant, the 48.4% average variance explained suggests that, in-concert, other factors could outweigh factor one. This seems like an accurate depiction of a complex and multilevel phenomenon such as innovation (Kimberly & Evanisko, 1981). As the dependent variable, the organizational innovation factor score was tested for normality using measures of skew, kurtosis, and the Kolmogorov-Smirnov test and for univariate outliers using the outlier labeling rule (Hoaglin & Iglewicz, 1987), which are reported in table 4/20. The skew of -0.19 and kurtosis of -0.39 both indicate normality of the distribution of errors and is confirmed by the .24 significance of the Kolmogorov-Smirnov test. Zero cases exceeded the upper or lower limits of the univariate outliers test.

Two other measures of organizational innovation were collected that provide triangulation on the primary measure of organizational innovation (Campbell & Fiske, 1959). A single item measure comparing the respondent firm to others in the industry and the organizational resources spent on the three "most-important" innovations are used to assess the six-item scale. The bivariate correlations between the six-item scale, the industry comparison, and the resources expended for the three "most-important" innovations are significant at the .05 and .01 levels.

Table 4/11, Bivariate Correlations Between Three Measures of Organizational Innovation

	Ind. comp	Total org. resources	Org. Innovation
Industry comparison	1		
Total organizational resources	.321**	1	
Organizational innovation	.290**	.350**	1

** Correlation is significant at the 0.01 level (2-tailed).

I performed a principal component analysis on these three measures of innovation. The three measures loaded on a single factor associated with organizational innovation. The underlying factor for organizational innovation explains 99% of the variance in total resources for innovation and corroborates the view that organizational innovation is indicative of resource-based organizational strategy. In conclusion, the six-item scale seems a valid and reliable measure of a firm's level of innovation and theoretically supports my view of innovation being relevant to the firm's resource strategies.

Table 4/12, Principal Components Analysis of Three Measures of Organizational Innovation

	Components	Communality
Industry comparison	.340	.116
Total organizational resources	.999	.999
Organization innovation factor	.383	.147

Organizational Atmosphere

I assessed the organizational atmosphere for innovation scale using Cronbach's alpha to ensure the internal consistency of the four items (Pedhazur & Schmelkin, 1991, p. 90). The standardized Cronbach's alpha of .839 suggests that the measure is reliable (Nunnally, 1978, p. 245).

Table 4/13, Cronbach's Alpha for Organization Atmosphere

Scale	N	Items	Alpha	Alpha Standardized
Organizational atmosphere	94	4	.832	.839

The inter-rater agreement for the organizational-atmosphere-for-innovation scale was assessed in 11 firms because one of the paired responses had incomplete data for organizational atmosphere. The respondents' ratings on the five-point scale could yield differences in opinions ranging from zero to four. Agreement was defined as zero to one point of difference on the Likert scale, whereas disagreement would be reflected in two, three, or four points of difference (Miller et al., 2008; Miller et al., 2009). Between the eleven pairs of raters and 44 points of reference, there were zero four-point and only one three-point difference. Inter-rater agreement of 91-100% was well above the 70% threshold for all four items.

Table 4/14, Inter-rater Agreement for Organizational Atmosphere for Innovation Items

Items	Complete agreement	Near agreement	Complete or near agreement
Organizational members regularly discuss work-related ideas in order to improve them.	6/11	10/11	91%
Organizational members are supportive of ideas about improving tasks.	5/11	10/11	91%
Organizational members provide useful feedback about ideas concerning the workplace.	7/11	11/11	100%
Organizational members are supportive of a person even when they introduce an unpopular idea or solution at work.	6/11	10/11	91%

The principal components analysis of the organizational-atmosphere-for-innovation items revealed a single-factor solution that (rescaled) loaded evenly on all four items, extracting an average variance of 67.21%. In conclusion, this four-item scale exceeds accepted standards of construct validity and reliability.

Table 4/15, Principal Components Analyses of Organizational Atmosphere for Innovation

Items	Components	Communality
Organizational members regularly discuss work-related ideas in order to improve them.	.819	.671
Organizational members are supportive of ideas about improving tasks.	.840	.706
Organizational members provide useful feedback about ideas concerning the workplace.	.842	.709
Organizational members are supportive of a person even when they introduce an unpopular idea or solution at work.	.776	.603

Champions of Innovation

This is a complex measure that links the firm's "most-important" innovations to their champions. Respondents first identify a "most-important" innovation and then identify a specific family member or non-specific non-family member as its champion. A firm could have between zero and three "most-important" innovations championed by either family or non-family employees. Complete agreement is when both raters counted the same number of family and non-family champions in the firm. Differences in opinion range from zero to three. From 11-paired responses (the same pair omitted data on these items) and 66 data points, one non-family and 62 family champions were identified. There was agreement between raters on the champion of 23 out of 32 most-important innovations for a 72% inter-rater agreement that exceeds the 70% threshold. In one paired response, one respondent identified two "most-important" innovations when his/her pair identified three; measurement error was in the identification of innovations not the champion. Removing that data point, the reliability of the champion measure improves to 74%. Errors in measuring the importance of innovations appear to lower agreement on this score.

Remaining variables

The remaining variables are single item measures that are less subject to bias and can be fairly accurately measured by firm managers (Dess & Robinson Jr, 1984). The variables were assessed for bivariate collinearity between independent variables that might have

adverse effects on regression modeling. Table 4/16 shows the number of observations, bivariate correlations, and significance levels for each variable. A number of significant relationships are identified. However, none of the relationships exceed the bivariate correlation-threshold of .9 that might indicate a collinearity problem (Kleinbaum et al., 2008). Tests of normality and outliers are reported in table 4/17. As reported earlier, the dependent variable had no issues with normality or outliers. While skew and normality are not an issue for independent variables, a few outliers were detected using the outlier labeling rule (Hoaglin & Iglewicz, 1987). Outliers were Winsorized by assigning the highest non-outlier score to all outliers (Tukey, 1962). The regression models were tested with the Winsorized variables and while some of the test statistics changed, the results did not affect any of the hypotheses and it was decided to focus on the unaltered data for this study. The bivariate correlation matrix and regression models with the Winsorized data are presented in appendix B. Overall, the data appears suitable to use in multivariate linear regression analysis. Further tests will be done on individual models.

Conclusion

The data collection methods and execution have some weaknesses that affect statistical and theoretical inference making that may be addressed in future studies. The sample size of 94 is small compared to the general population of family firms in the USA. To generalize about family employees, championing, and human capital, more and larger studies are needed. The relationships were examined broadly and a more thorough explanation of some of these complex phenomena may be warranted. Using multiple respondents may detect any common methods variance, especially with regard to the identification of champions. The 18-month window is on

the shorter end of windows in the innovation literature, different timeframes, including longitudinal studies, may provide interesting insights. The lack of population data presents challenges in making inferences and it may be helpful for if family business researchers reported simple statistics like firm age, firm size, industry, etc. so that population parameters might be better assessed. Before making inferences to the population of small family firms, these methodological weaknesses should be considered.

Table 4/16 Abbreviated Operationalization of Variables

1	Firm age	Number of years since founding.
2	Firm size (employees)	Number of employees.
3	Atmosphere for innovation factor score	Four-item, five-point scale measuring organizational atmosphere.
4	Industry classification	Two-digit standard industrial classification.
5	Industry dynamism	Single item, five-point scale.
6	Family employment	Number of family members employed in the firm.
7	Non-family employment	Number of non-family members employed in the firm.
8	Less-educated family employees	The number of family employees who have not obtained any degrees higher than high school.
9	More-educated family employees	The number of family employees who have obtained degrees from institutions above the high school level.
10	Family employees with less than 3-years outside working experience	The number of family employees with less than three-years experience working outside the family firm.
11	Family employees with more than 3-years outside working experience	The number of family employees with more than three-years experience working outside the family firm.
12	Family champions	The number of family champions of the firms three most-important innovations.
13	Non-family champions	The Number of non-family champions of the firms three most-important innovations.
14	Less-educated family champions	The number of less-educated family champions of the firms three most-important innovations.
15	More-educated family champions	The number of more-educated family champions of the firms three most-important innovations.
16	Less-experienced family champions	The number of less-experienced family champions of the firms three most-important innovations.
17	More-experienced family champions	The number of more-experienced family champions of the firms three most-important innovations.
18	Organizational resources used for the three most-important innovations	Single item, five-point scale rating the resources used for the firms “most-important” innovations.
19	Organizational Innovation Factor Score	Six item, five-point scales rating the organizations’ level of innovation.

Table 4/17, Pearson, two-tail, Bivariate Correlation table

#	Variables	Mean	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Firm age	24.04	1																	
2	Firm size (employees)	25.93	.277**	1																
3	Industry classification	6.63	-.103	-.011	1															
4	Atmosphere for innovation factor score	.00	-.135	-.067	.196	1														
5	Industry Dynamism	4.23	.076	-.012	.064	.014	1													
6	Non-family employees	23.12	.273**	1.000**	-.011	-.067	-.011	1												
7	Family employees	2.81	.194	.321**	-.017	-.038	-.014	.295**	1											
8	Less-educated family employees	.61	.074	.036	-.066	-.239*	-.202	.020	.562**	1										
9	More-educated family employees	2.19	.144	.339**	.035	.200	.168	.325**	.602**	-.318**	1									
10	Less-experienced family employees	1.05	.346**	.186	-.058	-.177	.016	.170	.606**	.551**	.161	1								
11	More-experienced family employees	1.76	-.182	.142	.048	.160	-.033	.131	.412**	-.010	.481**	-.476**	1							
12	Non-family champions	.37	.072	.355**	.224*	-.068	.103	.358**	.008	.025	-.010	.104	-.110	1						
13	Family champions	2.19	-.203*	-.155	-.178	.222*	-.028	-.158	.047	-.041	.115	-.192	.271**	-.631**	1					
14	Less-educated family champions	.24	-.070	-.035	-.156	-.135	-.072	-.040	.177	.480**	-.253*	.245*	-.085	-.130	.181	1				
15	More-educated family champions	1.95	-.150	-.125	-.078	.283**	.014	-.125	-.056	-.309**	.251*	-.317**	.301**	-.516**	.831**	-.396**	1			
16	Less-experienced family champions	.60	.123	.031	-.044	-.102	.075	.031	.017	.036	-.008	.456**	-.503**	-.094	.133	.161	.033	1		
17	More-experienced family champions	1.61	-.241*	-.149	-.124	.245*	-.068	-.151	.027	-.054	.096	-.475**	.574**	-.444**	.706**	.028	.643**	-.604**	1	
18	Total resources used for "most-important" innovations	7.71	-.046	.228*	.030	.278**	.162	.227*	.075	-.179	.281**	-.076	.170	.092	.517**	-.002	.484**	.121	.325**	1
19	Organizational Innovation	.00	-.044	.004	-.119	.301**	.316**	.007	-.107	-.362**	.212*	-.198	.109	.006	.143	-.280**	.292**	.051	.062	.350**

* Significance .05, ** Significance .01

Table 4/18, Normality and Outliers in the Data

#		N	Skew	Kurtosis	Kolomogorov Smirnov	Low Quartile	High Quartile	g	Low limit	Upper limit	Outliers
1	Firm age	94	1.15	1.36	0	9	32	50.6	-42	82.6	1
2	Firm size (employees)	94	3.59	13.58	0	6	30	52.8	-47	82.8	5
3	Industry classification	94	-0.63	-0.99	0	4	9	11	-7	20	NA
4	Atmosphere for innovation factor score	94	-0.48	0.92	0	-0.6	0.75	2.87	-3.4	3.62	0
5	Industry Dynamism	94	-1.32	2.449	0	4	5	2.2	1.8	7.2	0
6	Nonfamily employees	94	3.6	13.5	0	4	26	48.4	-44	74.4	5
7	Family employees	94	1.75	2.72	0	2	3	2.2	-0.2	5.2	6
8	Less-educated family employees	94	2.4	7	0	0	1	2.2	-2.2	3.2	3
9	More-educated family employees	94	1.01	2.83	0	2	3	2.2	-0.2	5.2	2
10	Less-experienced family employees	94	1.37	2.11	0	0	2	4.4	-4.4	6.4	0
11	More –experienced family employees	94	0.11	0.013	0	1	2	2.2	-1.2	4.2	1
12	Nonfamily champions	94	2.11	3.83	0	0	0	0	0	0	9
13	Family champions	94	-0.89	-0.54	0	1	3	4.4	-3.4	7.4	0
14	Less-educated family champions	94	2.89	8.604	0	0	0	0	0	0	5
15	More-educated family champions	94	-0.5	-1.15	0	1	3	4.4	-3.4	7.4	0
16	Less-experienced family champions	94	1.45	1.165	0	0	1	2.2	-2.2	3.2	0
17	More-experienced family champions	94	-0.15	-1.66	0	0	3	6.6	-6.6	9.6	0
18	Total resources used for “most-important” innovations	94	-0.24	-0.55	0.09	5	10	11	-6	21	0
19	Organizational Innovation	94	-0.19	-0.39	0.24	-0.5	0.79	2.9	-3.4	3.69	0

Chapter 5: statistical tests and results

Introduction

This chapter describes the results of the statistical tests of the ten hypothesized relationships discussed in chapter three. The data gathered from 94 family firms with at least two family employees and one non-family employee was found to be suitable for statistical analysis, and the measures of variables are statistically reliable and are widely used as valid representations of their concepts. The primary means of testing relationships between family employees and the family firm are multiple regression analysis, and t-tests. An independent samples t-test comparison of less- and more-innovative family firms was performed to evaluate the alignment of family human capital. The regression models are presented in table 5/1 and the independent samples t-tests in table 5/2. Five case studies were then conducted to provide qualitative insights into the findings in the survey data.

T-tests are used to compare differences between the means of variables in hypotheses three and four. Based on the number of observations and standard deviation, it can be judged, within a confidence interval, whether the groups of variables have similar or dissimilar means (Kleinbaum et al., 2008). Multiple regression models allow for the examination of covariation between multiple independent variables and a single dependent variable (Kleinbaum et al., 2008). Previous research was used to ensure that important factors affecting innovation were not omitted, leaving the models

underspecified. After running the full, theory-based model, extraneous variables were identified in the stepwise entrance of variable into the regression model (Kleinbaum et al., 2008). Once the model was settled on, assessment of multi-collinearity tolerances greater than .2 and variance inflation factors (VIF) less that 10 (O'Brien, 2007) confirmed that the effects of each independent variable on the dependent variable were interpretable. Serial correlation was tested using the Durbin Watson statistic, heteroskadacity was tested using the Breusch-Pagan statistic, and multivariate outliers were tested using Cook's distance. All of the regression models were free of serial correlation, heteroskadacity, and multivariate outliers and the test statistics are reported in table 5/1.

The exploratory nature of this research, the smaller sample and effect sizes, related research, and interpretation of the descriptive data (Pedhazur & Schmelkin, 1991), a significance level of .10 was used to reduce the omission of meaningful relationships (Davidsson, 2005). However, few results fell between the .05 and .10 alpha levels. In any case, the results should be interpreted cautiously. Assessing the statistical significance of relationships is complex and is not the same as assessing the substantive meaning of the relationships (Zilak & McCloskey, 2013). The independent-sample t-tests were used to provide a secondary statistical view of the relationships and helps in the interpretation of the data. All significance levels are reported so that researchers may evaluate the data themselves. In table 5/1, the control variables and hypothesized insignificant relationships are reported with two-tailed Pearson correlation coefficient, and in cases where a positive or a negative relationship was expected, the one-tailed correlation coefficients are reported.

Hypothesis testing

Control Variables

The control variables were tested for their relationship with organizational innovation in the first model. Organizational age and size, a scale measure of atmosphere for innovation, the industry classification, and a scale measure of industry dynamism were regressed against organizational innovation. The model of control variables explained 48.2% (AR^2 .189; αF .000) of the variance in organizational innovation. However, organization age and size had insignificant effects on organizational innovation (β -.058; α .278 and β .044; α .327 respectively), were omitted from the stepped-regression model, and were removed from further statistical analysis. Although the non-family variables were consistently insignificant, they were kept in the models for theoretical purposes. This sample of firms exhibit strong sensitivities to market dynamism, which may overshadow other factors in terms of organizational innovation (Hrebiniak & Joyce, 1985; Porter, 1981).

Hypotheses Testing

Hypothesis one, that there will be a positive relationship between the number of family employees and organizational innovation, is not supported. In this sample, the number of family employees has an insignificant negative effect on organizational innovation (β -.113; α .127), as reported in model one, table 5/1. Increased family

employments' relationship with less-innovative family firms may indicate fewer barriers to family employment. The insignificant relationship conforms with findings that family involvement is not consistently associated with either positive or negative organizational-level outcomes (O'Boyle Jr. et al., 2012; Singal & Singal, 2011) or exclusively with more or less innovation in the family firm (ex. Casillas & Moreno, 2010; Franz W. Kellermanns, Kimberly A. Eddleston, Ravi Sarathy, & Fran Murphy, 2010). The finding is consistent with the family business literature and suggest that this sample is suitable for testing moderating and mediating effects (cf. Chua et al., 2012; Gedajlovic et al., 2012).

Hypothesis two, of a positive relationship between the number of family employees and the number of MII's championed by family employees, is not supported. Model two in table 5/1 reports a positive relationship (β.127) at a significance level of .112, which slightly exceeds the 90% confidence-level. The insignificance of this relationship seems counterintuitive and may reflect the restricted range of variability in measuring only three of the firms' innovations, as well as the lower statistical power of smaller sample sizes. An insignificant interpretation of this relationship will affect hypothesis ten, that family championing partially mediates family employment's influence on organizational innovation. This finding requires further scrutiny because of the face validity of the relationship as the variables have been operationalized.

Hypothesis three, that family employees will champion a disproportionately larger number of most-important innovations than non-family members, is supported. The mean number of "most-important" innovations championed by family employees of (χ2.19; s 1.091) is statistically larger than the mean of "most-important" innovations championed by non-family employees (χ.37; s .748) at the .000 level. In each firm, champions of innovation were identified for up to three of the firms' most-important innovations. Firms reported an average of 2.56 most-important innovations, 85.5% of which were championed by family employees.

The overwhelming influence of family employees in championing the "most-important" innovation activities suggests that family employees have a major impact on innovation and is supportive of a positive relationship between family involvement and entrepreneurship in family firms (cf. Aldrich & Cliff, 2003; Rogoff & Heck, 2003). Family employees championed more innovations even though the average number of non-family employees outnumber family employees 23.1 to 2.81, or 8.2 times. It appears that small family firms are not prone to delegate important functions to non-family employees, as is suggested by the "professionalization" approach (Dyer, 1989; Stewart & Hitt, 2012; Verbeke & Kano, 2012), which may limit organizational innovation (Carney, 1998).

Hypothesis four, that family employees' championing activities will receive greater organizational support than non-family champions, is not supported. Organizational resources were allocated to family and non-family employees at a

statistically equivalent level (P .831) at the 95% confidence level, (χ 3.05; s .842) and (χ 3.02; s 1.075) respectively. Reduced agency and transaction costs associated with family employees (Memili et al., 2011; Schulze et al., 2003) did not lead to increased investment in family-championed innovations. While there is apparent particularism in the selection of champions evident in hypothesis three, non-family employees are equally supported once selected, which may be indicative of the economic nature of the innovation process.

Hypothesis five's prediction that the number of most-important innovations championed by family employees would be positively related to levels of organizational innovation, is not supported. Model three, in table 5/1 explains 48.9% (AR^2 .195; αF .000) of the variance in organizational innovation, which is a .07% increase over the control model. An insignificant relationship between family championing and organizational innovation was found (β .118; α .172). Family champions were not provided additional organizational support (see discussion of hypothesis four), which was expected to influence their impact on organizational innovation. Similar to hypothesis one, the insignificant relationship is consistent with other finding and the need for moderators to help explain the influence of family on the firm.

Hypothesis six, that increased education of family employees will have a positive effect on organizational innovation, is partially supported. Model four, in table 5/1, explains 53.9% (AR^2 .241; αF .000) of the variance in organizational innovation, which is a 5.7% increase in explained variance compared to the control model. There is a significant negative relationship (β -.245; α .007) between the less-educated family employees and organizational innovation. However, the relationship between the number

of more-educated family employees and organizational innovation is insignificant (β.035; α .369). In the step-regression (S-model four) the non-family employment and more-educated family employees were omitted, which slightly increased the strength of the relationship between less-educated family employees and organizational innovation (β -.254; α .004). The employment of less-educated family employees in less-innovative family firms was anticipated and does materially differentiate less- and more-educated family employees. However, more-educated family employees are employed in both more- and less-innovative firms and the hypothesis is only partially supported.

Hypothesis seven, that there will be a positive relationship between the education of family champions and organizational innovation, is partially supported. Model five in table 5/1 explains 55.6% of the variance in organizational innovation (AR^2 .251; α .000), which is a 7.1% increase over the control model. The full model suggested significant negative relationships between the number of less-educated family champions and organizational innovation (β -.167; α .064) and a significant positive relationship between more-educated family champions and organizational innovation (β .189; α .074). The number of non-family champions had an insignificant relationship with organizational innovation. These results suggest full support for the hypothesis at a 90% confidence level. However, more-educated family champions were omitted from the stepped-regression model (S-model five), which suggests that the positive relationship was not powerful enough to add sufficient additional explanation of variance in organizational innovation. In the reduced model, the relationship between less-educated family champions and organizational innovation became stronger (β -.253; α .003). Akin to the

findings relating to employment, less-educated family champions are active in less-innovative family firms, while more-educated family champions are active in both less- and more-innovative family firms.

These findings regarding the education levels of family employees and champions in hypotheses six and seven support the view that family human capital is a limiting resource for the family firm (Carney, 1998; Sirmon & Hitt, 2003) and that the education of family employees may alleviate that constraint (Verbeke & Kano, 2012). Contrary to views that under qualified family employees might be employed in family firms (Berrone, Cruz, & Gomez-Mejia, 2012; Sciascia & Mazzola, 2008), less-educated family employees and champions were not prevalent in more-innovative family firms, while more-educated family employees and champions were active in less-innovative family firms.

Hypothesis eight, that there will be a positive relationship between the number of more-experienced family employees and organizational innovation, is partially supported. Model six, in table 5/1, explains 50.7% (AR^2 .206; α .000) of the variance in organizational innovation, which is a 2.5% increase over the control model. The full model produced a significant negative relationship (β -.177; α .056) between the number of less-experienced family employees and organizational innovation, and an insignificant relationship between more-experienced family employees and organizational innovation (β .458; α .458). The stepped regression model (S-model six) omitted the number of more-experienced family employees and increased the significance of the negative relationship between less-experienced family employees and organizational innovation (β

-.161; α .043). Echoing the results of the education hypotheses, the relationship between family employees experience outside the family firm and organizational innovation is significant only when family employees do not have more than three-years of outside experience, providing only partial support for hypothesis eight.

Hypothesis nine, that there will be a positive relationship between the experience of family champions and organizational innovation, is not supported. Model seven in table 5/1 explains 48.9% (AR^2 .186; αf .000) of the variance in organizational innovation, which is a .07% increase over the control model. The full model suggested insignificant relationships between the number of family champions with less than three-years outside experience (β .124; α .21) and family champions with more than three years outside experience (β .16; α .174). Three-years outside experience of family champions does not appear to have a strong effect on organizational innovation.

Experience working outside the family firm may provide family employees with skills that help them support innovation activities but not lead them. The three-year criterion of experience working outside the family firm suggested by some consultants appears to have some benefits but does not necessarily impact championing activities.

Hypothesis ten, that championing of "most-important" innovation activities partially mediates the influence of family employment on organizational innovation, is not supported. The suspect, insignificant statistical relationship between family employment and family championing from hypothesis two precludes mediation. However, proceeding with the Barron and Kenny procedure with the understanding that

the positive relationship between family employment and family championing has an α-value of .112, then the relationship between less-educated family employees and organizational innovation can be tested for mediation (Barron & Kenny, 1986). In model eight in table 5/1, the introduction of the mediating variable - less-educated family champions - both provides a significant positive relationship with organizational innovation (α .051), and reduces the significance of the relationship between less-educated family employees and organizational innovation from α.004 to α .055, which would indicate partial, not full mediation. Due to insignificant relationships, the mediating effects of championing could not be tested with more-educated or more-experienced family employees. This study was not able to find statistical support for hypothesis ten although there are other indications in the data that suggest the relationship exists.

Independent-Samples T-test of Differences Between Less- and More-Innovative Family Firms

The significance of the relationships in the regression analyses are open for interpretation (Zilak & McCloskey, 2013) so the data was analyzed using an independent-samples t-test to compare differences between the 47 less- and 47 more-innovative family firms. The results of the independent-samples t-test are consistent with the regression analysis, but provides descriptive data that aids in the interpretation of the results.

While some of the human capital differences between less- and more-innovative family firms were not statistically significant, the directions of the relationships were consistent with the proposition of alignment. In figure 5/1 the direction of all of the relationships is supportive of alignment, as all quadrant-one (Q1) means are less than quadrant-two (Q2) means, and all quadrant-three (Q3) means are larger than quadrant-four (Q4) means. For example, there are more less-educated family members working in less-innovative family firms (.89 > .32), and more more-educated family members working in more-innovative family firms (2.34>2.04). The statistically significant increases in less-educated and less-experienced family employees, and less-educated family champions in less-innovative firms, suggest alignment of low human capital family employees with less organizational innovation.

While the significance levels are lower in the case of higher-human capital family firms, the directions are still consistent with alignment. If it is true that a greater number of more-educated family employees in more-innovative family firms than in less-innovative family firms, the α-value of .175, suggests that 17.5% of the time the hypothesis making this claim might be rejected. That the mean number of more-educated family champions in more-innovative firms is significantly larger than in less-innovative firms (α .072) is more supportive of a relationship between higher family human capital and more organizational innovation. The relationships are consistently in the direction of alignment.

Figure 5/1, Human Capital and Innovation Levels in Small Family Firms

	Variables	Less-innovative Family Firms (N=47)	More-innovative Family Firms (N=47)	Two-tail sig.
Higher Family Human Capital		**Q1**	**Q2**	
	More-educated family employees	2.04	2.34	.175
	More-experienced family employee	1.64	1.87	.307
	More-educated family champion	1.74	2.15	*.072*
	More-experienced family champion	1.53	1.68	.573
Lower Family Human Capital		**Q3**	**Q4**	
	Less-educated family employees	.89	.32	*.006*
	Less-experienced family employee	1.3	.81	*.061*
	Less-educated family champion	.38	.11	*.029*
	Less-experienced family champion	.62	.57	.819

In innovative firms, less-educated family employees champion an average of .11 "most-important" innovations (MII), while more-educated family employees champion 2.15 MII's. In innovative family firms, more-educated family employees champion nearly 20 times the MII's of less-educated family members and more-educated family employees out-number less-educated ones seven-to-one. While there is heavy evidence of particularism in the selection of champions, the family clearly differentiates between family employees based on their human capital levels. Table 5/1 presents a ratio of high- to low-human capital family members in less- and more-innovative family firms. In more-innovative family firms, the ratio of high to low human capital family employees is 3.19:1and 4.27:1 for family champions. There is a 1.83:1 and 1.19:1 ratio of more-

experienced family employees and family champions, respectively, in more-innovative family firms.

Table 5/1, Family Human Capital Ratios In Less- and More-Innovative Firms

Human capital ratios	Less-innovative	More-innovative	Family human capital ratio, more- to less-innovative family firms
Ratio of more- to less-educated family employees	2.29:1	7.31:1	3.19:1
Ratio of more- to less-experienced family employees	1.26:1	2.31:1	1.83:1
Ratio of more- to less-educated family champions	4.58:1	19.55:1	4.27:1
Ratio of more- to less-experienced family champions	2.47:1	2.95:1	1.19:1

In-depth Interviews with Five Family Firms

To further aid the interpretation of the sample data and results from the regression analyses and t-tests, in-depth interviews were conducted in five family firms. Interviews provide a richer and more detailed view of the phenomena of interest when compared to the limited number of variables collected in survey data (Langley, 1999). Open ended discussions provide the opportunity for bringing in new insights, exposing emphasis and emotions, and additional influences associated with the phenomenon of interest (Eisenhardt, 1989; Yin, 2010). Family firm leaders were able to speak freely about their family's human capital as well as the family employees' influence on the firm's innovation strategy.

Theoretical sampling was used to select five family businesses to interview. Theoretical sampling involves selecting a sample for theoretical reasons rather than through a random process, so that data can be gathered about the specific phenomena of interest (Eisenhardt, 1989). In this case, family firms were selected based on their representativeness of the quadrants in the two-by-two matrix (figure 3/1) that depicts the alignment of family human capital and organizational innovation strategies in family firms (see figure 5/2 below).

Cases were identified from local media within a three-hour drive of the researcher's office. Articles from local papers and magazines were first used to identify potential firms and then used as a secondary source of data for case analysis. Using the articles, industry information, and company web sites, firms were prequalified for screening phone calls. Screening calls were made until it was determined that a reasonable representative for each of the four quadrants had been identified. The firms' classifications were discussed with representatives of the firm and two of the cases were reclassified during the interview process to adjacent quadrants, so a fifth case was selected so that every quadrant was represented. Two firms were found for quadrant two, and a single representative firm for each of the other three quadrants. The cases are presented below.

The semi-structured interviews were guided by the same research questions that guided the survey development (see pages 29-30). However, the discussion was made

more general and open ended by referring to family members in "core strategic roles" (see Lepak & Snell, 2002) rather than taking the time to identify specific innovations activities and their champions. The interview protocol followed the following format: 1) Discussion of the history of the family firm, starting with its founding and concentrating on family member employment. 2) Discussion of the employees that constitute the strategic core of the firm's human capital. 3) Discussion of family human capital and the firm's human capital strategy. 4) Discussion of the firm's classification in one of the four quadrants. 5) Discussion of the future family human capital and innovation alignment concerning the next generation of family members.

Figure 5/2, Case Study Representatives of Family Human Capital and Organizational Innovation Alignment

	Less-innovative Family Firms	**More-innovative Family Firms**
Higher Family Human Capital	**Firm C1** Insurance agency Third generation One family employee	**Firm C2a** Telecom OEM representative and consulting Second generation Five family employees **Firm C2b** Staffing services Second generation Four family employees
Lower Family Human Capital	**Firm C3** Electrical supply/contractor Third Generation Four family employee	**Firm C4** Telecom and fiber-0ptics infrastructure company Third generation Six family employees

Case 1 – High Family Human Capital and Low Levels of Organizational Innovation

Firm C1 represents quadrant one in the alignment of family human capital and innovation strategies matrix. The firm is an insurance agency, in its third generation of family control, with plans to celebrate its 100th anniversary in 2019. However, at that milestone the owner plans to sell the business to a larger financial institution and cease operations of the family business. When asked about continuing the family legacy, Mr. C1 replied flatly, "no one is going to come back and run this place."

Mr. C1 had worked with his father, who had worked with his father in this successful business. However, it was Mr. C1's mother who had a strong impact on the family and indirectly the firm. She was born in 1908 in a working class family, one of four sisters who all received college degrees. Mr. C1's mother went on to receive a master's degree from Columbia University, which was a rather extraordinary accomplishment at that time. All three of her children received excellent educations. After college, Mr. C1 went on to a very good career at General Electric, his brother went on to law school and is now a professor at Cornell University, and his sister moved out of the area. At mid-career Mr. C decided to return to his small hometown to "return to the area … and work for myself." Mr. C1 worked with his father for a number of years before his father retired and has been the sole family employee for the last 30 years.

The firm may not be considered very innovative compared with other insurance agencies of the current era. The firm has been around for 95 years and it has rented the same office space the entire time, neither moving nor buying the building. The

furnishings and décor are reminiscent of the 50's, featuring tasteful portraits of the family stewards, which all comes together to create an atmosphere of trust and tradition. Some of the firm's current customers have been with the business for its entire 95 years. The firm has no web site. Mr. C1 "loves the business and serving customers" and has done very well at it, but innovation does not to appear to be a primary force behind the business's success.

Mr. C1 plans to sell the business after celebrating 100-years in business, ending the relationship between the family and the firm. This separation may be seen as the culmination of a very long process that began thirty years ago when the number of family employees decreased from two to one. Though there are strong family elements to this firm, at the time of this research the firm would not have met the criteria to be included in the survey data. Mr. C1 had no children himself and thought that "it wasn't a good fit" to encourage his nephew, a recent Swarthmore College graduate, to join the firm. What was a family firm for many years has slowly become less-so, and will soon cease to be. It appears that both the firm and the family will continue on their successful paths, but independently of each other.

Case 2a – High Human Capital and High Levels of Organizational Innovation

Firm C2a is one of two firms representing quadrant two, which is for family firms with higher levels of human capital and innovation. This firm is in the communications technology industry providing "unified communications" and "business continuity," among other services and products, to their clients. The firm is run by the second

generation, with the third generation now taking up important roles in the firm. In its 45th year in business, the firm continues to grow and innovate in a very dynamic industry and "the current generation seems poised to maintain this trajectory [quadrant 2] for another ten years." Even though the third generation is receiving high quality educations and gaining valuable experience, the CEO is not sure what will happen when the second generation exits.

The three children of the founding couple and one of their children constitute the strategic core of this family firm's human capital. Filling the officer positions and titles of CEO/President, VP of Administration, and VP of Operations, the siblings oversee all aspects of the operation with a grandchild of the founders taking a next most influential position in operations. Three of the four family members have a post-secondary degree. Ms. C2a reflects that there is a larger strategic core, but there "is an inner-strategic core [the family] that will be there through thick and thin," the family was critical in sustaining the firm them through a major innovation that coincided with the challenges of the economic downturn in 2007, 2008, and 2009.

The pressure to innovate in this firm is reflected in their approach to human capital strategy. The company's promotional documents include these telling statements: "Armed with an aptitude for identifying emerging technology and industry trends, an intuitive suite of products, services and solutions, a diverse team of experts … [firm C2a] is committed to providing exceptional customer experiences." And, "the company is committed to continuous education, internally and externally, sharing its knowledge and working hand-in-hand with its customers." To develop the firm's human capital capacity, the firm is developing the third generation, bringing in experienced professionals for their

specific skill sets, and ensuring that current employees are receiving training. The firm boasts of 52 technology certifications ranging from Cisco Certified Design Associate (CCDA) to Mitel Communications Director (MCD).

Currently the alignment between family human capital and innovation centers on the three siblings who enact the firm's strategy. The three siblings will be nearing the early edge of retirement in approximately ten years. As a forward thinking family, the firm is working with family business advisors on a variety of issues and is aware of the challenges surrounding succession. Of the six third-generation family members, two are employed in the firm with one on a track toward top management, two are pursuing other careers, and two are in college. Considering their ages, education, and experience the third-generation may be prime for grooming within the time horizon of the second generation's exit. However, the CEO lives the fast pace of their industry and declined to speculate on whether family-firm alignment might extend to the next generation.

Case 2b – High Human Capital and High Levels of Organizational Innovation

Firm C2b is a second example of a more innovative family firm with higher levels of family human capital. While this case is duplicative, removing data would be problematic. The firm specializes in temporary staffing, temp-to-hire, and permanent placement services. The firm is in its 32nd year and is led by the second generation of family members. The family employees include two siblings, an in-law, and one third-generation family employee. The family sees the potential for substantial growth and then the sale of the firm to a larger player in the industry.

The current generation boasts excellent, and complementary, educations and employment experience, such as an MBA from Rutgers and employment with industry leading human resource and financial services firms. Their aggressive growth and exit strategies are a reflection of a potent combination of skills and world-views. The three second generation family members occupy the CEO/President, CFO, and Staffing Director positions. Mr. C3 observes that, "the non-family employees do not participate in the core strategic activities, they seem to be satisfied with doing a good job and going home." A fourth family member recently joined the firm in a non-strategic role, in what Mr. C2b called "a purely nepotistic hire, but [the family member] has the necessary qualification and is a good fit."

Mr. C2b regards innovation as integral to the firm's strategy, "we all [the family] have the mindset if you are not innovating and growing, you are dying." When Mr. C2b joined the family firm, the firm innovated by adding a new service offering to its repertoire. The firm has been creative in developing public private partnerships that provide educational and training programs that prepare a workforce that meets the needs of the area's leading manufacturing firms. The firm was an early and aggressive adopter of both "local-roots" and "social responsibility" corporate identity that resonates in the community.

The family is very entrepreneurial and Mr. C2b recounts his childhood memories of multiple family members starting and running businesses. His sibling has started and operates a secondary business while working full time for the family firm. Although the family has been heavily involved in this firm for over 32 years, the feeling seems to be that an asset should be developed to its fullest potential and exited at the appropriate time

to maximize value. The pride of family ownership and dedication to the business is matched by an entrepreneurial spirit of maximizing value. Mr. C2b's kids are very young and he has no interest in his kids joining the business. While Mr. C2b thought the family would own the firm for another ten years, there seems to be agreement amongst family members that maintaining family ownership is of secondary importance to entrepreneurial value creation.

Case 3 – Low Family Human Capital and Low Levels of Organizational Innovation

Firm C3 represents firms with lower levels of family human capital and less organizational innovation. The 73-year old firm is led by a third generation of three brothers and a sister in-law. This highly successful firm started out in the electrical contracting business but expanded to include industrial electrical supply and an upscale lighting boutique. The three brothers have worked at the firm for 20+ years each and still have years to go before retirement. Regarding the future, Mr. C3 states, "we could be doing this for another 20 years easily. There are quite a few good options moving forward, the land and buildings are gaining in value, but all that is a long way off."

Of six children in the third generation, three siblings do not work for the firm and three sons and one sister in-law have core strategic positions in the firm. Growing up, the three sons worked summers and odd jobs in the firm. One received an associate's degree, the other two attended university for briefer periods of time. The brothers had some outside experience including military service, starting their own electrical

contracting business, and working in non-core positions in the firm. “This is a hands-on business run on experience,” says Mr. C3. The long tenures of family and non-family employees provides the firm with a wealth of experience. However, the fourth generation has been more strongly encouraged to obtain higher education and is not being exposed to the firm in the same manner as the third.

The firm has done very well over the years, but the family is weary of innovation. Mr. C3 says that “15 years ago everyone wanted to get into solar power, those folks aren’t doing very well with that.” He continues, “There are certain areas of this industry, like automation, that are really innovative, but we are set up more as a pipe and wire shop.” The location, business lines, and senior staff remain largely unchanged from when the second generation ran the firm. Mr. C3 looks at the impending retirements of some of the senior staff as an opportunity to hire less expensive people and may consider outsourcing more services in the future.

In firm C3 there is currently alignment between family human capital and firm strategy. The brothers’ human capital is efficiently allocated, “we aren’t getting rich but we are well paid.” The brothers seem satisfied with the business and can envision running the business for another twenty years. However, the involvement of the next generation is more discouraged than encouraged. Mr. C3 states, “If one of the kids wants to get involved, more power to them, but we are not encouraging them.”

Case 4 – Low Family Human Capital and High Levels of Organizational Innovation

Firm C4 represents a family firm with low family human capital in the strategic core and high levels of organizational innovation. The 110 year old telecom and fiber-optic data service provider is led by a 3rd generation entrepreneur who acquired control of the firm 17 years ago. Mr. C4 gained control of the company and began an entrepreneurial expansion and diversification of services that required professionalizing the firm. The growth of the firm and change in its character has been dramatic. Mr. C4 is now planning his exit and is assessing options based on strictly economic criteria. A recent attempt to exit via an employee stock ownership plan (ESOP) was aborted when the valuation fell below expectations.

Three related families own shares of the firm and each has family members employed in the firm. From a consortium of cousins, Mr. C4 was deemed unique in having the managerial and financial resources to take the majority share in the firm and lead it during turbulent times. Mr. C4 attended a four-year college and had 25-plus years of corporate management experience. In the midst of rapid competitive changes, Mr. C4 charted a new course for the firm. "We are in a technical field, we needed specific talents and skills- we needed outside people," stated Mr. C4. At the onset, Mr. C4 described "a difficult transition as family members were replaced in key operational positions." Of the six family members employed in the firm, only one possessed the requisite skill-set to remain in a key strategic position. A strategic shift in the level of innovation altered the human capital requirements of the firm and resulted in the professionalization of the firm.

When Mr. C4 took control of the firm, the industry had just been through a major regulatory reform. The existing firm was used as a platform from which to launch an innovative venture in fiber-optics infrastructure serving an expanded market area. "The investment was large and enabled the firm to sell high-end, high-tech services to a very demanding customer base. The strategy was summarized by the non-family president as a "heavy bet on technology … in order to offer the best services." Mr. C4 is planning his own exit while he continues to push innovation and growth that is "fueled by what [he calls] repeatable winning formulae."

Firm C4 undertook radical organizational innovation led by an entrepreneurial family leader. Although family ownership and employment are still quite high, the process of professionalization may have been the beginning of dissolution of bonds between family and firm. The firm was not well positioned for turbulent times and Mr. C4's entrepreneurial strategy sought to maximize family wealth through profits rather than salaries. Mr. C4's children are very young and although the children are being exposed to the business, the natural conclusion to Mr. C's strategy appears to be selling the firm to the highest bidder.

Analysis and Interpretation of Case Studies

The analysis of the data, including interview notes, articles from the press, and company web sites was conducted in a series of reviews and reflections (Eisenhardt, 1989). The intention in the analysis was to both reconfirm the classification and describe relevant phenomena in each of the four quadrants. Care was taken to not omit any information that was contrary to the firm's classification. In reporting the findings, care is taken to protect

the identities of the firms and any sensitive data. Because the data is so idiosyncratic and personal that people familiar with the firms might recognize them, the secondary sources have not been referenced in this document. The methods used for data collection and analysis have potential for bias that should preclude generalizations to the population and are intended to provide insights into the individual cases and shed light on the survey data and results.

The interviewees were familiar with the concepts of family firm, human capital, strategically core employees, and innovation. The alignment between the current family employees had been thoroughly rationalized and family members easily explained their idiosyncratic career choices. The interaction between family human capital and organizational innovation were natural concerns in all of the firms. However, none of the interviewees offered any overarching rationale for employment of the next generation. There was clear, possibly intentional, detachment from the personal decisions family members might make about joining the firm. There was unanimous concern regarding the next generation's self determination, the interviewees took pains to unshackle the next generation from any sense of obligation to the firm. Only one firm (C4) has taken specific actions to gently expose his children (ages 5 and 9) to the business. Alignment seems to be an idiosyncratic decision process between each individual family member, not a sweeping force between the family and the firm. However, once a family member joins the firm and becomes an employee, the relationship between family human capital and innovation are consistent with the survey data and suggest alignment.

In these five firms there is data supporting alignment between the families' human capital and organizational innovation levels. Where there is fit between the family's

human capital and innovation levels, the respondents anticipate longer spans of family control, where there is misalignment the spans are much shorter. Firms in the aligned quadrants, 2Ca, 2Cb, and 3C, reported anticipated spans of ten, ten, and 20 years respectively, firms 1C and 4C in the misaligned quadrants reported five and zero year anticipated spans on continued family control.

Conclusion

The results presented in this chapter may be interpreted cautiously due to the exploratory nature of the study and the small sample size. Interpreting the data in light of the hypotheses was more difficult than anticipated, and for that reason the independent-samples t-test and five case study analyses were conducted. The ratios of means in Table 5/1, provide useful descriptive data that suggests significant family human capital differences between less and more innovative family firms. Some very strong relationships were identified that provide some evidence of alignment as well as misalignment in the case of higher human capital family members working in less innovative firms. The case study data provides descriptive detail of firms representing each quadrant in the alignment of family human capital and organizational innovation matrix (Figure 3/1).

The hypotheses did not receive very strong support as written, which is some reflection of the state of the literature on family human capital from which the hypotheses were drawn. The relationships are more nuanced than was anticipated. However, the use

of moderators and mediators (education, experience, and championing) in the theoretic model and the data collection methods resulted in a data set and analysis that provided usefully answers to the research questions that were posed and advance our understanding of the relationship between family human capital and organizational innovation in family firms.

Table 5/2, Multivariate Regression Models and Test Statistics

		Control Model		Model 1 Hypo. 1		Model 2 Hypo. 2		Model 3 Hypo. 5		Model 4 Hypo. 6		S-model 4 Hypo. 6		Model 5 Hypo. 7		S-model 5 Hypo. 7		Model 6 Hypo. 8		S-model 6 Hypo. 8		Model 7 Hypo. 9		Model 8 Hypo. 10	
	N	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**
(Constant)			.048		.132		.000		.027		.168		.185		.038		.102		.085		.062		.047		.230
Organization Age	94	-.059	.555																						
Organization Size	94	.043	.654																						
Industry	94	-.211	.031	-.208	.032	-.243	.018	-.207	.039	-.210	.028	-.208	.026	-.230	.018	-.239	.011	-.210	.029	-.210	.027	-.211	.039	-.240	.015
Atmosphere for Innovation	94	.332	.001	.336	.001	.241	.019	.318	.002	.272	.006	.278	.004	.275	.005	.310	.001	.312	.002	.309	.002	.334	.001	.279	.004
Industry Dynamism	94	.330	.001	.323	.001	-.002	.985	.316	.001	.269	.005	.275	.004	.300	.001	.309	.001	.328	.001	.328	.001	.312	.002	.276	.003
Nonfamily Employees	94			.063	.513	-.132	.217	.006	.950	.018	.841			-.001	.995			.060	.532			.006	.950	.013	.892
Family Employees	94			*-.113*	*.127*	*.127*	*.112*																		
Less-educated family employees	94									*-.245*	*.007*	*-.254*	*.004*											-.172	.055
More-educated family employees	94									*.035*	*.369*														
Less-experienced family employees	94																	*-.177*	*.056*	*-.161*	*.043*				
More-experienced family employees	94																	*-.013*	*.458*						
Nonfamily Champions	94							*.117*	*.171*					*.122*	*.168*							*.117*	*.457*	.027	.393
Family Champions	94							*.118*	*.172*																
Less-educated family champions	94	.482												*-.167*	*.065*	*-.253*	*.003*							-.172	.052
More-educated family champions	94													*.189*	*.076*										
Less-experienced family champions	94																					*.124*	*.210*		
More-experienced family champions	94																					*.160*	*.301*		
R - Explained variance	94	.482		.491		.401		.489		.539		.536		.555		.539		.507		.504		.489		.558	
Adjusted R^2	94	.189		.198		.103		.195		.241		.255		.251		.258		.206		.220		.186		.256	
Significance of F statistic	94	.000		.000		.016		.000		.000		.000		.000		.000		.000		.000		.000		.000	
Durbin Watson statistic	94	1.32		1.37		2.29		1.31		1.41		1.42		1.40		1.43		1.41		1.33		1.31		1.44	
Breusch Pagan statistic	94	.305		.328		.283		.165		.410		.387		.112		.183		.525		.383		.277		.178	
Cook's Distance	94	.012		.013		.013		.012		.013		.013		.014		.016		.012		.014		.012		.012	

Shaded cells are omitted variables in the stepped regressions. Single-tailed significance levels are in italics, all others are two-tailed.

Table 5/3, Comparison of family human capital levels between less- and more-innovative family firms

				Levene's Test for Equality of Variances		t-test for Equality of Means		
Variables	**Firm Innovativeness**	**N**	**Mean**	**F**	**Sig.**	**t**	**df**	**Sig. (2-tailed)**
Firm Age	Less-innovative	47	26.13	1.561	.215	1.070	92.0	.288
	More-innovate	47	21.96			1.070	88.3	.288
Firm Size (employees)	Less-innovative	47	29.28	3.016	.086	.780	92.0	.437
	More-innovate	47	22.57			.780	71.2	.438
Industry classification	Less-innovative	47	6.62	.515	.475	-.041	92.0	.967
	More-innovate	47	6.64			-.041	91.8	.967
Atmosphere for innovation factor score	Less-innovative	47	-0.28	.923	.339	-2.817	92.0	.006
	More-innovate	47	0.28			-2.817	91.6	.006
Industry dynamism	Less-innovative	47	3.99	.069	.794	-3.028	92.0	.003
	More-innovate	47	4.48			-3.028	91.1	.003
Non-family employees	Less-innovative	47	26.34	2.794	.098	.757	92.0	.451
	More-innovate	47	19.89			.757	71.7	.451
Family employees	Less-innovative	47	2.94	3.453	.066	1.014	92.0	.313
	More-innovate	47	2.68			1.014	80.2	.314
Less-educated family employees	Less-innovative	47	0.89	5.866	.017	2.836	92.0	.006
	More-innovate	47	0.32			2.836	68.3	.006
More-educated family employees	Less-innovative	47	2.04	.301	.585	-1.368	92.0	.175
	More-innovate	47	2.34			-1.368	81.2	.175
Less-experienced family employees	Less-innovative	47	1.30	8.999	.003	1.902	92.0	.060
	More-innovate	47	0.81			1.902	76.4	.061
More-experienced family employees	Less-innovative	47	1.64	3.459	.066	-1.028	92.0	.307
	More-innovate	47	1.87			-1.028	88.7	.307
Non-family champions	Less-innovative	47	0.34	.637	.427	-.412	92.0	.681
	More-innovate	47	0.40			-.412	90.5	.681
Family champions	Less-innovative	47	2.13	.110	.741	-.605	92.0	.546
	More-innovate	47	2.26			-.605	92.0	.546
Less-educated family champions	Less-innovative	47	0.38	15.760	.000	2.220	92.0	.029
	More-innovate	47	0.11			2.220	80.6	.029
More-educated family champions	Less-innovative	47	1.74	1.105	.296	-1.818	92.0	.072
	More-innovate	47	2.15			-1.818	91.9	.072
Less-experienced family champions	Less-innovative	47	0.62	.896	.346	.229	92.0	.819
	More-innovate	47	0.57			.229	89.5	.819
More-experienced family champions	Less-innovative	47	1.53	.238	.627	-.566	92.0	.573
	More-innovate	47	1.68			-.566	91.8	.573

Table 5/4. Summary of findings

Hypotheses	Relationship	Regression Analysis
1	*Family employment will have a positive relationship with organizational innovation.*	Not Supported
2	*Family employment will have a positive relationship with family championing.*	Not Supported
3	*Family employees will champion more "most-important" innovations than non-family employees.*	Supported
4	*Family firms will invest more organizational resources in innovation activities championed by family employees than those championed by non-family employees.*	Not Supported
5	*Family championing will have a positive relationship with organizational innovation.*	Not supported
6	*Education level will positively moderate the relationship between family employment and organizational innovation in small family firms.*	Partially supported
7	*Education level will positively moderate the relationship between family championing and organizational innovation in small family firms.*	Partially supported
8	*Employment experience outside the family firm will positively moderate the relationship between family employment and organizational innovation in small family firms.*	Partially supported
9	*Employment experience outside the family firm will positively moderate the relationship between family championing and organizational innovation in small family firms.*	Not supported
10	*Family championing will partially mediate family employment's influence on organizational innovation.*	Not supported

Chapter 6: conclusion

Introduction

In this concluding chapter the findings in chapter five are discussed in relation to existing research on family firms. The possible causes and consequences of the relationships, selected implications for future research, and practical considerations for family firms are briefly discussed. Although there are limitations in the study and in this area of the family business literature, broad inferences from the findings are discussed in relation to the dominant views on family firms.

While there is considerable interest in the unique issues facing family businesses, there is little consensus on what constitutes a family firm or how they behave (Chua et al., 2012; Gedajlovic et al., 2012; O'Boyle Jr. et al., 2012; Singal & Singal, 2011). Fundamental questions about family firms remain unanswered. These unresolved issues have led to calls for more attention on mediators and moderators of family influence (Gedajlovic et al., 2012).

This study presented a broad model of family human capital relationships with organizational innovation. Organizational innovation was used as a dependent variable to assess the effects of family employment, championing, and human capital on the small family firm. The ten hypotheses were developed to triangulate on mediating and moderating factors between family employment and organizational innovation. This

study attempted to capture the effects of all of the family employees, not just founders and successors. To the question of the importance of family human capital to the family firm, I tentatively answer that the human capital of family members may influence a broad range of family business issues.

Summary of findings

The insignificant influence of family employees on organizational innovation

The relationship between the number of family employees and organizational innovation was found to be negative (β -.113) and insignificant (α .127). While I had anticipated a positive relationship, this finding is cautiously interpreted as insignificant. Interpreting the negative direction of the relationship from a human capital perspective, a significant negative relationship was found between the number of family employees and the average education of the family employees (β -.349; α .001); meaning that as the number of family employees increases, the average education of family employees falls. This may be evidence of the limitation of family human capital (Carney, 1998; Sirmon & Hitt, 2003; Verbeke & Kano, 2012); a non-linear relationship, where early additions of family human capital have a positive impact, while later additions have a negative impact on organizational innovation; or it may also be that in a less-innovative family firm, the employment of less-educated family members is acceptable and economically efficient (Cassar, 2006; Gimeno et al., 1997). Finally, the weakness of the relationship between

family employment and organizational innovation may indicate the existence of mediating and moderating factors.

Mediating the influence of family employees and champions on organizational innovation

The influence of family championing on organizational innovation was examined in hypotheses two, three, four, nine, and ten. By definition, the championing of "most important" (MII) innovations is an activity that impacts the organization (Burgelman, 1983a; Howell & Boies, 2004). The championing of 85% of the MII's by family members suggests both particularism between family members and considerable family influence on the firm. Championing innovations that shape the resources and competitive posture of the firm, family employees appear "core" in the small family firm's human capital strategy (cf. Lepak & Snell, 2002). Because the championing role is open to all organizational members, the impact of all family employees, not just founders or successors, can be evaluated. In table 6/1, family firm-leaders championed 49% of all MII's, averaging 1.26 per firm, other family members championed 36%, averaging .92 per firm, and nonfamily employees championed 15%, averaging .37 per firm. These averages are statistically different at a p-value of .000. Using a construct that can apply to any employee (championing), the human capital of family employees other than the CEO are shown to have significant influence on organizational innovation in the small family firm.

Table 6/1 – Champions of innovation in small family firms

	Firms N	Total MII championed	Portion of MII	Mean MII/firm	Std. Deviation	Sig. (2-tailed)
Non-family champions	94	35	15%	.37	.748	.000
Other-family champions	94	87	36%	.93	.907	.000
Lead-family champions	94	119	49%	1.27	.894	.000

There appears to be strong evidence of particularism in the championing data, but it was also found in hypothesis four that non-family champions receive equal organizational support. The authority to champion innovation comes with responsibility for stewarding family firm resources and more-educated family employees champion almost twenty times the number of MII's in more-innovative family firms. This provides some indication that particularism is not boundless, family employees may not be given carte blanche to pursue their personal ambitions. One possible consequence of this particularism in championing is to constrain the human resources used in innovation processes (cf. Gomez-Mejia, Hoskisson, et al., 2011). However, this study provides evidence of particularism being tempered by economic concerns in the small family firm.

In hypothesis ten the statistical analysis failed to show support for the mediating function of family championing between family employment and organizational innovation. However, this statistical result should be judged with caution. The marginally insignificant relationship between family employment and family championing may have problems in the restricted range of this study's measure of only three MII's. Championing innovation is, by definition, an activity by which an employee can substantially influence firm resources and behaviors (Burgelman, 1983a) and the family employees' domination

of championing activity provides a vehicle for family influence. This insignificant finding may be indicative of the need to review the restricted range of the family championing variable.

Moderating the influence of family employees on organizational innovation

The relationships between family employment and organizational innovation and championing and organizational innovation were next tested for the moderating effects of education and experience in hypotheses six through nine. As operationalized in this study, the education measures seem to be more telling than the experience measures. Partial support for the hypotheses suggests that differences in some levels of education and experience have significant impact on organizational innovation. Lower levels of human capital in family employees and champions were associated with less innovation, while higher levels of human capital did not ensure increased organizational innovation. Organizational innovation is a multilevel construct subject to many influences (Kimberly & Evanisko, 1981), of which human capital is only one. The significant negative relationship between the number of less-educated family employees and organizational atmosphere for innovation (β -.239; α .02) may indicate that alignment between family human capital and organizational innovation is strategic. The differences between less and more-innovative family firms found in the independent samples t-test also indicate alignment of family human capital and organizational innovation. Human capital shows promise as an important moderator of family influence on performance-related variables

in small family firms. In the five case studies, interviewees were keenly aware of their firms human capital requirements and their family's stock of human capital resources.

Contributions of this study

Significant relationships between the constructs in the theoretic model are useful in answering questions regarding the impact of family human capital on organizational innovation. There are three contributions of this study that I wish to draw attention to: 1) the value of pursuing mediators and moderators of family influence; 2) the holistic operationalization and measurement of family influence that accounted for all family employees; 3) the influence of family human capital. These mediating and moderating relationships help explain some of the mixed and insignificant findings in the family business research (O'Boyle Jr. et al., 2012; Singal & Singal, 2011). The influence of family involvement is a major theoretical problem in the family business literature (Astrachan et al., 2002; Chrisman et al., 2005; Chua et al., 1999; O'Boyle Jr. et al., 2012), and choosing a mediating mechanism that accommodated all family employees is an aggressive attempt at conceptualizing and measuring family influence. The focus on family human capital as an important factor in family firm behavior and performance may have excellent explanatory potential.

Conclusions for practice

From the family's perspective, family human capital is a unique and valuable resource to be allocated with care (Becker, 1991; Coleman, 1988). In addressing the limitations of

family human capital in the family firm context, Verbeke and Kano (2012) suggest three courses of action: increasing family size, educating family employees, and integrating non-family human capital. Of the three options, many researchers appear to favor the practical option of "professionalizing" with non-family employees (Dyer, 1989; Verbeke & Kano, 2012). In this sample, the effects of family size, non-family employees, and non-family champions were insignificant. Stewart and Hitt (2012) note that family firms either ignore some of the advice in the literature to professionalize, and/or having professionalized may no longer be considered family firms. Based on this study, educating family members seems to be a promising avenue for overcoming family human capital constraints. The case studies revealed great concern for the development and allocation of family human capital, while employment in the firm was a matter of fit, not a priority.

If particularism leads family employees to "core" positions such as champions of innovation, then educating family members will impact the firm's strategic human capital resources. Properly managed, it is possible that particularism and the use of family employees has economic advantages (Lee et al., 2003; Schulze et al., 2003). The data in this study suggests that families exhibit particularism that is blended with economic rationale, and that there is already a fair amount of alignment between family human capital and organizational innovation. Alignment of family and firm resources is in accord with much of the advice for family firms to balance their economic and social goals (Lansberg, 1983). Family firms may set specific "rules of entry" that specify education and experience requirements for family members who wish to join the family

firm (Hoy & Sharma, 2010). A long-term strategy for developing family human capital may be a factor in enhancing the sustainability of the family business.

Holding organizational innovation constant, the family's human capital decisions are discussed. In less-innovative family firms, family employees can focus on firm-specific knowledge that can be acquired through family channels with little outside investment. In case 3, the family employees were provided opportunities to gain valuable experience from a young age and may have found continuing education superfluous to their needs. As long as there are limited market disruptions, this strategy may be satisfactory. A garbage company, like Rumpke Consolidated Companies that employed over 75 family members in 2010, may have few human capital restrictions on family employment (Hoy & Sharma, 2010 p. 123). However, some higher-human capital family employees may be encouraged to seek out diversification opportunities and/or explore other careers rather than join the family firm as was seen in case 1 and may be the case for case 3's fourth generation who are not being encouraged to join the firm.

In more-innovative family firms, maintaining higher levels of family human capital may be essential for maintaining control of the firm. At Arbil Safety, the "rules of entry" require experience in another firm before a family member can be employed, and their family-CEO advises other successors to "get an MBA" and "join a support/networking group" (Hoy & Sharma, 2010 p. 76). Family firms provide unique opportunities for developing family members' human capital (Memili et al., 2011; Sanders & Nee, 1996; Sardeshmukh & Corbett, 2011; Scherer, Adams, Carley, & Wiebe,

1989) and the potential for greater family wealth generation when "core" family employees are well prepared for their leadership roles (Pérez-González, 2006) as evidenced in cases 2A and 2B. However, if family human capital is lacking, the professionalization or the sale of the firm may be in the family's best interests as was seen in case 4.

The human capital concept provides a family-first perspective, which may be important for relationships, but is also economic in nature. When difficult but common decisions need to be made, such as passing over a family successor for a non-family employee or giving up on transgenerational ownership in the sale of the business, focusing on the alignment of family human capital and the family firm's needs may be useful. The second-generation owners of Hayes Manufacturing Group sold their firm when they realized they lacked the family resources to grow the business in a rapidly consolidating industry (Hoy & Sharma, 2010 p. 203). A difficult decision was made based on both family and economic criteria.

Limitations of this study

When interpreting the results of this study it is important to reflect upon the limitations of the data collection methods. Some of the challenges regarding data collection in small firms have been mentioned in the earlier sections and deemed acceptable trade-offs for an initial probing of well-established constructs and relationships in the novel context of family firms. What follows is a discussion of the most relevant concerns, not an exhaustive recounting of all of the possible methodology problems associated with

research on small firms. The data collection, sample size, regional bias, model specification, and use of single-respondents limit the scope of inferences that should be made from the findings.

The data were collected without the benefit of techniques that provide a greater likelihood of random selection of respondents. While this does not mean that bias has been introduced into the sample, a step that might help prevent a biased sample was not appropriate (Pedhazur & Schmelkin, 1991). The potential for bias in the sample, may limit inferences to the sample data. The low response rates resulted in sample size of 94, which is miniscule compared to the entire population of approximately five million small firms with less than 250 employees. While there is little consensus on the parameters of the family firm population, it is prudent to limit inferences to firms that closely resemble the sample characteristics rather than a larger population. While no biases were detected in the sample data, the sample is heavily influenced by firms from upstate NY, which is a rural economy. These issues pertaining to the sample data should restrain inferences about the findings to larger populations of family firms. The findings serve to raise questions and point the direction for future research.

The survey was designed limit the duration of response times. A number of relationships were examined using a minimum of data, these important relationships have been examined from a broad perspective and some of the models are underspecified, resulting in lower levels of explained variance than might be desired for a more comprehensive understanding of individual relationships. While the data provides support for the utility of the model, there are opportunities for further explication of the specific relationships it describes.

The measurement of constructs was aided by the use of existing scales and measures found in the relevant literature. However, the identification of champions is a particularly important variable for this study and a difficult concept to measure accurately. Although more thorough measurements would be costly, researchers may be encouraged by this study to look more closely at this construct in family business research.

The use of a single respondent to provide all of the data for analysis presents the problem of common methods variance that may result in inflated correlations (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). This concern for inflated correlations is subject to debate and may not be a problem when steps were taken to mitigate possible biases (Spector, 2006). While statistical analysis revealed no signs of common method bias, the potential for undetected bias may still be a possibility. This weakness in data collection may result in inflated relationships between constructs.

These methodological limitations restrain the generalizability of inferences and reduce confidence in the measurements of constructs and relationships. Researchers should be careful about inferences to the population. Put simply, these findings require replication in additional studies.

Recommendations for future research

The findings presented in this study suggest that family human capital may be a fertile area for future research and that the effort and expense of addressing some of the

methodological issues discussed above may be warranted. This study raises more questions about family human capital than it answers. Relationships were exposed that could not be explored in a single study, in the detail that mirrors the complexities of family and organizational life. Questions regarding the abilities of family members, the roles they play in the organization, which organizational activities align with family human capital strengths and weaknesses, and how family human capital can be leveraged are all interesting avenues to pursue.

There are countless ways to measure the broad constructs of innovation and human capital, and many possible mediators of family influence could be explored that could expand on and replicate or refute these findings. (See Kalaitzidakis, Mamuneas, Savvides, and Stengos (2001) for a discussion on measures of human capital.) A human capital perspective on family influence could be tested on a number of dependent variables, such as sales, employee growth etc. (See Yu, Lumpkin, Sorenson, and Brigham (2012) for a discussion of dependent variables specific to family business research.) As an important antecedent to organizational performance, innovation provides many research opportunities as well. (See Crossan and Apaydin (2010) and Gopalakrishnan and Bierly (1997) for types of innovation that might be interesting to explore.)

In this study, a positive relationship between family employment and organizational innovation was hypothesized based on previous literature concerning the preparation for, and initial employment of, family members (ex. Barach et al., 1988). However the 18-month window in which innovation was studied did not overlap with

family hiring, as the average term of employment for family members was 13.9 years and only 19 of 264 family members had less than two-years of experience in the firm. It might be interesting to examine the influence of family employment on the firm surrounding an entry and/or exit events. What types of innovation might be associated with new family hires? Or more broadly, does the human capital of family members play a role in the entry and exit decisions of family members?

Mediators of family influence is an important concept in the family business literature (Astrachan et al., 2002). While most family business research has focused on the top levels of management, such as founders, successors, board members, and owners (Chua et al., 1999; O'Boyle Jr. et al., 2012), little is known about what roles family members play in the lower echelons of a small family firm (Stewart & Hitt, 2012). Looking at family employees was one way to expand upon the mediators of influence that included the whole family. Continued research on the mediation of influence might differentiate between family members such as spouses, children, parents, or siblings, and explore the different finer-grained means of mediations, such as attendance at board meeting, number of e-mails, or other measures from the networks literature.

Further research on family human capital strategy might include the configuration of family employee roles in the firm, such as one family member overseeing production, while another takes charge of marketing and sales. Family human capital may be deployed strategically in ways that complement each other to maximize family influence

in the firm. For example, the Roberts brothers have grown a "business empire" by combining their "visionaire" and "functionaire" roles and talents (Hoy & Sharma, 2010 p. 100). The division of important roles between family members was seen in the three cases where family human capital and innovation levels were in alignment. Emotional roles may play an important part in organizational culture, with one family member playing good cop while another plays bad cop. Collecting resumes and job descriptions of family employees from family businesses might provide insights into the human capital resources of the entire family, including longitudinal phenomena.

This research did not collect human capital data on non-family employees or champions due to concerns about reducing responses rates if respondents did not have the education and experience information for non-family employees handy. However, it may be useful to look at the human capital of non-family employees in certain roles, such as top management teams. Are there factors that enable family firms to more easily incorporate non-family human capital? Might higher human capital family members be more successful in integrating higher human capital non-family employees? Do family firms invest differentially in the human capital of family and non-family employees? Investments in formal training or education, on-the-job training, exposure to important events, such as board meetings, tradeshows, or conferences where the intent is for the organizational member to gain productive abilities rather than provide resources would be ripe areas for comparison.

The phenomenon of higher-human capital family employees and champions in less-innovative family firms (Q1 in figure 5/1) bears further investigation. The family may have more discretion in the inefficient use of over-qualified rather than under-

qualified family employees. Still, there may be important human capital differences between quadrant-one and quadrant-two family members that were not captured. For example, (Pérez-González, 2006)found performance differences the prestige-levels of colleges attended by family members. Higher human capital family members were found to be working in family firms that innovate less, in less-dynamic environments, and with lower levels of organizational support for innovation. These findings raise the question of whether problems in family firms that are often attributed to under-qualified family employees might be missing problems of under-utilized family human capital. The family firm may retain high human capital family members in anticipation of future events that may necessitate innovation (Bergfeld & Weber, 2008) or to pursue diversification opportunities (Carney, 1998). Further research into the over-qualification of family members and its affect on the family firm might be interesting.

Conclusion

A family human capital perspective may shed light on a broad range of family business issues that remain poorly explained in the family business literature (O'Boyle Jr. et al., 2012). As an exploratory study in a less developed area of research, I would like to close with a subtle point, tentatively made, concerning the degree of importance attributed to the human capital of family employees in the family firm. While human capital is widely acknowledged as a resource for family firms (Danes et al., 2009; Habbershon & Williams, 1999; Sharma, 2008), it is also viewed as a limited resource compared to other organizational resources (Carney, 1998; Sirmon & Hitt, 2003; Verbeke & Kano, 2012). The limitations of human capital are apparent, but this limitation is also

what gives family ties meaning and strength (Adler & Kwon, 2002; Arregle et al., 2007). In addition to being a resource, family human capital is also a *goal* of families (Becker, 1991; Coleman, 1988). Might family human capital be both a means to an end and an end in itself? Family human capitals' influence on the organization may be multifaceted, both a resource and a primary objective. This duality may amplify its affects on the small family firm.

A few descriptions of family governance were selected from a thorough review of the family business literature and corroborated in a list of the top 25-most-influential articles on family business (Chrisman, Kellermanns, Chan, & Liano, 2010). Unique attributes of family controlled firms can be grouped into those focused on altruistic family relationships (Carney, 2005; Gomez-Mejia et al., 2007; Litz, 1995; Schulze et al., 2003), long-term and transgenerational orientations (Chua et al., 1999; Le Breton-Miller & Miller, 2006), and family-based resources (Danes et al., 2009; Habbershon et al., 2003). Family human capital is an important consideration in all of these perspectives.

While altruism can have positive or negative impacts on a family firm (Schulze et al., 2003; Schulze et al., 2001), a traditional view of altruism in the family is the desire to sacrifice for another's gain, to transfer, not waste family resources (Becker, 1991). In this study, the evidence of altruism-fueled particularism in the selection of champions coincides with evidence of economic concerns. The evidence of non-economic altruism associated with family firms (Berrone et al., 2012; Chrisman et al., 2012) may indicate incompetence, imperfect insight, or lesser-of-evils decision-making that are common in

human activity (Hendry, 2002; Simon, 1955). A human capital perspective suggests that altruism should lead to economic behaviors toward family members, if not necessarily for the firm. The family firm may be sustainable so long as family human capital and firm goals are complementary (Danes et al., 2009).

The human capital perspective also provides insights into the long-term orientation of family firms (Le Breton-Miller & Miller, 2006) and their intentions toward transgenerational ownership and wealth generation (Chua et al., 1999; Habbershon et al., 2003). The development of children's human capital is a prime example of the long-term, transgenerational objectives of families (Becker, 1991; Coleman, 1988). Empirical evidence suggests that as few as 23% of family firms survive into a second generation (Gersick et al., 1997). Long-term firm objectives and transgenerational ownership may not be in the best interests of some family firms (Sharma, 2004). A poignant example is that of emigrant families who commonly run businesses so that their children can become professionals (Danes et al., 2008; Wald, 2007). A human capital perspective may help explain when a short-term orientation, professionalizing, or exiting the business are the most beneficial courses of action for the family as was described by case studies 1 and 4.

Family-based resources are captured by the concept of "familiness" or "family capital" that encompasses the financial, social, and human capital of the family (Danes et al., 2009; Habbershon & Williams, 1999). Family social capital may drive the systemic resource flows and transformations at the center of the family resource advantages (Arregle et al., 2007; Pearson et al., 2008), but it is meaningless without complementing

resources (Adler & Kwon, 2002). While researchers recognize the relationship between human and social capital (ex. Sharma, 2008), it may be that human capital better explains important aspects of family firms' behavior and performance.

Research often treats families "as an entity or 'black box' rather than a collection of people and relationships" (Creed, 2000, p. 346). Quantitative research on the demographic, human capital, or kinship relations of individual family members in the firm is limited (cf. Dawson, 2012; Stewart & Hitt, 2012) and often focuses on the family firm leaders, excluding other family members (ex. Jorissen, Laveren, Martens, & Anne-Mie, 2005; Kellermanns et al., 2008). Stewart and Hitt (2012) lament that family data is often "limited to a few questions, such as the leaders' generation and the representation of kin in ownership, management or board positions" used to identify the family firm. The exploration of mediators and moderators suggested by Chua et al. (2012) and Gedajlovic et al. (2012) naturally prompts a finer-grained look inside the family firm. Although family human capital is a limited resource, it may be an overlooked driver of behavior in small and medium sized family firms.

Although so much has been written about human capital and organizational innovation, these concepts have received little attention in the family business literature. Exploratory research such as this warrants an economical approach for guiding future research. A survey asking simple questions of a statistically significant number of firms was deemed an appropriate research strategy for a single study seeking to expose new relationships. While the sample was smaller than hoped, enough statistically significant

relationships were found to suggest the possible roles of championing and human capital as important mediator and moderator of family influence. This study provides grounds supporting further research on family human capital.

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Appendix A, Survey Instrument

Introduction-Informed Consent

INTRODUCTION

Dear Business Owner or Manager,

I am a Lecturer of Marketing and Entrepreneurship at SUNY Plattsburgh working on my Ph.D. at Concordia University in Montreal, Canada. The survey will take less than 10 minutes and in appreciation of participants' time a single donation of $250 will be made to the Red Cross. For further information, you may reach me at gottscrl@plattsburgh.edu. Thank you! Richard Gottschall

This survey asks general questions about your company and about the education and experience of some of the employees. Your identifying data will be kept confidential. No firm-specific data will be published with any identifying details. Your participation is voluntary and you may quit the survey at any time.

I understand that my participation is voluntary and that I can quit at any time, that identifying information will be kept confidential, and that the cumulative responses from many individuals may be published.

☐ I understand the above and wish to participate

☐ I prefer not to participate

DEFINITION OF INNOVATION for this survey: Innovation is any change in the business designed to improve the firm's offerings or business processes. For example, offering a new service, upgrading your accounting software, redesigning your menu, and creating a new position, etc. can be considered innovation.

	NOT IMPORTANT	OF LITTLE IMPORTANCE	IMPORTANT TO SOME BUT NOT ALL FIRMS	IMPORTANT	VERY IMPORTANT
How important is innovation to a firms' performance in your industry?					

Please provide some general information.

WHEN WAS THIS FIRM FOUNDED?

Enter year - YYYY

WHAT IS THE ZIP CODE FOR YOUR BUSINESS?

5-digit zip code

IS YOUR ORGANIZATION CONSIDERED A FAMILY-OWNED BUSINESS?

- [ ] No, not a Family Business
- [ ] Yes, a Family Business with a Founder-CEO
- [ ] Yes, a Family Business with a Successor-CEO
- [ ] Yes, a Family Business with a Non-Family-CEO

WHO IS COMPLETING THIS SURVEY?

- [ ] Owner or Co-Owner
- [ ] Manager
- [ ] Managing Owner/Partner
- [ ] Family Member Employee
- [ ] Non-Family Member Employee

What is the main industry in which your firm operates?

	Agriculture, Forestry and Fishing
	Mining
	Construction
	Manufacturing
	Transportation, Communications, Electric, Gas, Sanitary Services
	Wholesale Trade
	Retail Trade
	Finance, Insurance and Real Estate
	Services
	Public Administration

In the past 18 months, how active has your firm been in:

	NOT ACTIVE OR NOT APPLICABLE	MINIMALLY ACTIVE	MODERATELY ACTIVE	VERY ACTIVE	EXTREMELY ACTIVE
Introducing new products					
Introducing new services					
Introducing new methods of production					
Opening new markets					
Acquiring new sources of supply					
Adopting new ways of organizing or managing					
Added or updated new technology					

What is your organization's creative atmosphere like?

	Strongly disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly agree
Organizational members **regularly discuss work-related ideas** in order to improve them					
Organizational members are **supportive** of ideas about improving tasks					
Organizational members **provide useful feedback** about ideas concerning the workplace					
Organizational members are **supportive of a person** even when they introduce an unpopular idea or solution at work					

Compared to other firms in your industry, what is your firm's level of innovation

	Much less innovative	Less innovative	About the same	More innovative	Much more innovative
Our firm is:					

How many people work in the firm full or part time?

	Enter number
Family members (related to and including an owner)	
Non-Family Members	

Please describe up to three of your firm's most important INNOVATIONS and identify their CHAMPIONS.

* An innovation is any change in the business designed to improve the firm's offerings or business processes.
* A champion is the primary promoter, supporter, and defender of the implementation of the innovation.

	ROLE IN THE FIRM	RELATIONSHIP TO FAMILY MEMBER 1	EDUCATION LEVEL	AREA OF STUDY	WORK EXPERIENCE IN YEARS (ENTER NUMBER)	
					AT FAMILY FIRM	OUTSIDE FAMILY FIRM
Family Member 1	☐ Chief or Co-Executive of the Firm ☐ Department Head ☐ Employee	☐ Self ☐ Spouse ☐ Child ☐ Parent ☐ Sibling ☐ More Distant Relative	☐ High School ☐ 2-Yr College ☐ 4-Yr College ☐ Master's Degree ☐ PhD. ☐ Technical Certification ☐ Did Not Finish High School ☐ Don't Recall/ Know	☐ None/NA ☐ Business ☐ Law ☐ Science ☐ Liberal Arts ☐ Technical ☐ Don't Recall/ Know		

	What type of innovation?	Estimated use of discretionary financial and managerial resources to implement the innovation.	Who is the primary champion of this innovation?
Innovation 1	☐ Products ☐ Services ☐ Methods of Production ☐ Opening New Markets ☐ Sources of Supply ☐ Ways of Organizing ☐ Technology	☐ Insignificant use of resources ☐ Low use of resources ☐ Moderate use of resources ☐ High use of resources ☐ Very High use of resources	☐ Non-Family Member ☐ Family Member 1 ☐ Family Member 2 ☐ Family Member 3 ☐ Family Member 4 ☐ Family Member 5 ☐ Family Member 6
Innovation 2	☐ Products ☐ Services ☐ Methods of Production ☐ Opening New Markets ☐ Sources of Supply ☐ Ways of Organizing ☐ Technology	☐ Insignificant use of resources ☐ Low use of resources ☐ Moderate use of resources ☐ High use of resources ☐ Very High use of resources	☐ Non-Family Member ☐ Family Member 1 ☐ Family Member 2 ☐ Family Member 3 ☐ Family Member 4 ☐ Family Member 5 ☐ Family Member 6
Innovation 3	☐ Products ☐ Services ☐ Methods of Production ☐ Opening New Markets ☐ Sources of Supply ☐ Ways of Organizing ☐ Technology	☐ Insignificant use of resources ☐ Low use of resources ☐ Moderate use of resources ☐ High use of resources ☐ Very High use of resources	☐ Non-Family Member ☐ Family Member 1 ☐ Family Member 2 ☐ Family Member 3 ☐ Family Member 4 ☐ Family Member 5 ☐ Family Member 6

Concerning the eligibility of family members to join the firm: (click all that apply)

☐ There are no formal or specific requirements for family member entry into the firm

☐ Family members must attain a certain level of education before joining the firm

☐ Family members must train in entry level positions in the firm

☐ Family members must have experience working in other firms before joining the family firm

Finally, please answer the following questions about your firm's performance over the last 18 months

	VERY POOR	POOR	SATISFACTORY	GOOD	VERY GOOD	DON'T KNOW OR PREFER NOT TO ANSWER
Sales Level						
Gross Margin						
Profit Margin						

Thanks for taking the Survey <2012>

For questions or problems with this survey, please contact gottscrl@plattsburgh.edu

Appendix B, Outlier Analysis

Table B1, Pearson, 2-Tail, Bivariate Correlation table

#	Variables	Mean	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	***Firm size (employees)***		1																	
2	***Firm age***		.366**	1																
3	Industry Dynamism		.049	.076	1															
4	Atmosphere for innovation factor score		-.061	-.135	.014	1														
5	Industry classification		.045	-.103	.064	.196	1													
6	***Non-family employees***		.998**	.368**	.049	-.061	.049	1												
7	***Family employees***		.306**	.199	.021	-.014	-.016	.261*	1											
8	***Less-educated family employees***		.075	.075	-.166	-.265**	-.113	.046	.507**	1										
9	***More-educated family employees***		.288**	.147	.186	.225*	.047	.267**	.587**	-.367**	1									
10	Less-experienced family employees		.269**	.346**	.016	-.177	-.058	.244*	.580**	.508**	.139	1								
11	***More-experienced family employees***		.022	-.191	-.019	.174	.060	.001	.398**	-.009	.454**	-.495**	1							
12	***Non-family champions***		.402**	.114	.050	-.078	.174	.410**	.009	-.052	.052	.192	-.188	1						
13	Family champions		-.203	-.203*	-.028	.222*	-.178	-.209*	.053	-.025	.116	-.192	.280**	-.571**	1					
14	***Less-educated family champions***		-.044	-.045	-.130	-.161	-.103	-.063	.300**	.592**	-.193	.273**	.029	-.060	.166	1				
15	More-educated family champions		-.141	-.150	.014	.283**	-.078	-.140	-.044	-.325**	.267**	-.317**	.318**	-.474**	.831**	-.343**	1			
16	Less-experienced family champions		.220*	.449**	.109	-.183	-.014	.209*	.245*	.122	.200	.413**	-.192	-.057	.206*	.145	.154	1		
17	More-experienced family champions		-.336**	-.526**	-.112	.319**	-.123	-.331**	-.163	-.121	-.078	-.488**	.371**	-.384**	.583**	.005	.500**	-.675**	1	
18	Total resources used for "most-important" innovations		.209*	-.046	.162	.278**	.030	.208*	.055	-.199	.279**	-.076	.155	.111	.517**	-.064	.484**	.155	.262*	1
19	Organizational Innovation		.014	-.044	.316**	.301**	-.119	.020	-.062	-.354**	.244*	-.198	.112	.015	.143	-.377**	.292**	-.019	.124	.350**

* Significance .05, ** Significance .01

Table B/2, Multivariate Regression Analysis with Outlier Correction

		Control Model		Model 1 Hypo. 1		Model 2 Hypo. 2		Model 3 Hypo. 5		Model 4 Hypo. 6		S-model 4 Hypo. 6		Model 5 Hypo. 7		S-model 5 Hypo. 7		Model 6 Hypo. 8		S-model 6 Hypo. 8		Model 7 Hypo. 9		Model 8 Hypo. 10	
	N	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**	**Beta**	**Sig.**
(Constant)			.049		.115				.024		.164		.189		.057		.156		.086		.062		.024		.209
Firm age	94	-.065	.523																						
Firm size (employees)	94	.052	.608																						
Industry Dynamism	94	-.214	.028	-.210	.030	-.01	.918	-.203	.042	-.220	.019	-.219	.018	-.223	.017	-.227	.013	-.215	.025	-.210	.027	-.202	.045	-.243	.011
Atmosphere for innovation factor score	94	.333	.001	.340	.001	.253	.014	.321	.002	.267	.007	.272	.005	.262	.002	.291	.002	.313	.002	.309	.002	.316	.003	.281	.004
Industry classification	94	.328	.001	.324	.001	-.215	.036	.322	.001	.276	.004	.283	.002	.286	.002	.286	.002	.325	.001	.328	.001	.324	.001	.285	.002
Non-family employees				.057	.560	-.21	.043	.008	.940	.034	.726			-.013	.896			.079	.416			.013	.903	.014	.891
Family employees	94			-.082	.398	.108	.291																		
Less-educated family employees	94									-.248	.008	.260	.004											-.171	.063
More-educated family employees	94									.043	.340														
Less-experienced family employees	94																	-.185	.048	-.161	.044				
More-experienced family employees	94																	-.010	..464						
Non-family champions	94							.123	.318					.130	.125							.123	.322	.034	.739
Family champions	94							.117	.324																
Less-educated family champions	94													-.255	.006	-.316	.001							-.163	.067
More-educated family champions	94													.168	.075										
Less-experienced family champions	94																					.116	.215		
More-experienced family champions	94																					.164	.159		
R - Explained variance	94	.483		.486		.380		.491		.541		.538		.586		.569		.510		.504		.492		.558	
Adjusted R^2	94	.190		.193		.096		.189		.244		.258		.289		.294		.209		.220		.180		.255	
Significance of F statistic	94	.000		.000		.016		.000		.000		.000		.000		.000		.000		.000		.001		.000	