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Preprint

This is the submitted version of a paper published in *Journal of Business Research*.

Citation for the original published paper (version of record):

Pittino, D., Martínez, A B., Chirico, F., Galván, R S. (2018)
Psychological ownership, knowledge sharing and entrepreneurial orientation in family firms: The moderating role of governance heterogeneity.
Journal of Business Research, 84: 312-326
<https://doi.org/10.1016/j.jbusres.2017.08.014>

Access to the published version may require subscription.

N.B. When citing this work, cite the original published paper.

Permanent link to this version:

<http://urn.kb.se/resolve?urn=urn:nbn:se:hj:diva-37382>

**Psychological Ownership, Knowledge Sharing and Entrepreneurial Orientation in
Family Firms: The Moderating Role of Governance Heterogeneity**

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ACCEPTED FOR PUBLICATION IN "JOURNAL OF BUSINESS RESEARCH"

Psychological Ownership, Knowledge Sharing and Entrepreneurial Orientation in Family Firms: The Moderating Role of Governance Heterogeneity

Abstract

Adopting a stewardship perspective and relying on a sample of 93 Spanish family firms, we emphasize the importance of psychological ownership as a primary determinant of entrepreneurial orientation in terms of proactiveness, innovativeness and risk taking. We also suggest that the relationship between psychological ownership and entrepreneurial orientation is mediated by knowledge sharing. Finally, we assess the potential moderating roles of heterogeneous governance conditions in terms of the generation in control, generational involvement and family involvement in the top management team with regard to the relationship between psychological ownership and knowledge sharing. Research and managerial implications are shared in the concluding section.

Keywords: family firms' heterogeneity, entrepreneurial orientation, psychological ownership, knowledge sharing, stewardship.

Psychological Ownership, Knowledge Sharing and Entrepreneurial Orientation in Family Firms: The Moderating Role of Governance Heterogeneity

1. Introduction

To survive and preserve the capacity to create value over time, firms must maintain an appropriate level of entrepreneurial orientation (EO), i.e., an organizational posture that emphasizes entrepreneurial behavior (e.g., Covin & Miles, 1999, Covin & Slevin, 1991; Lumpkin & Dess, 1996; Miller, 1983; Zahra, 1996). This challenge is especially critical for family firms, because they are often reluctant to change and highly committed to the status quo (Beckhard & Dyer, 1983; Gersick, Davis, Hampton & Lansberg, 1997, Kellermanns & Eddleston, 2006).

Many studies have explored the determinants and performance consequences of EO (see, for example, the reviews by Rauch, Wiklund, Lumpkin & Frese, 2009 and Wales, Gupta, & Mousa, 2013), including research in the field of family business (e.g., Casillas, Moreno & Barbero, 2010; Chirico, Sirmon, Sciascia & Mazzola, 2011; Lumpkin, Brigham & Moss, 2010; Naldi, Nordqvist, Shepherd & Wiklund, 2007; Schepers, Voordeckers, Steijvers & Laveren, 2014). In particular, an emerging stream in the family business literature focuses on the specific antecedents of family firms' EO by investigating the influence of various factors, such as family involvement (e.g., Madanoglu, Altinay, & Wang, 2015; Miller & Le Breton-Miller, 2011; Sciascia, Mazzola & Chirico, 2013), organizational culture (e.g., Eddleston, Kellermanns & Zellweger, 2010; Zellweger & Sieger, 2012), and top executive characteristics (e.g., Boling, Pieper, and Covin, 2015; Cruz & Nordqvist, 2012; Kellermanns, Eddleston, Barnett, & Pearson, 2008) on the adoption of entrepreneurial behaviors.

The findings in this promising line of research identify multiple determinants of EO. Among these, psychological ownership (PO) is a relevant factor. PO is the feeling of

possessiveness that ties an individual to a material or immaterial object regardless of the presence of enforceable property rights (Pierce, Kostova & Dirks, 2001). In family firms, PO results in the development of a sense of stewardship toward the organization (e.g., Corbetta & Salvato, 2004; Hernandez, 2012) and has been viewed as a source of entrepreneurial behavior, as it creates the perception of a common purpose and stimulates family members' engagement in value-creating activities (e.g., Chirico, 2008; Eddleston, Kellermanns, & Zellweger, 2010). The analysis of PO as an antecedent of entrepreneurial behavior is important because PO captures the cognitive and affective mechanisms that explain the family attachment to the business, and is therefore tightly linked to the essence of the family firm (Rantanen & Jussila, 2011; Henssen, Voordeckers, Lambrechts, & Koironen, 2014).

While the relationship between PO and EO has been addressed in previous research, the variation of this relationship across heterogeneous family business contexts remains largely unexplored. In this study, we use the stewardship perspective to explore the nuances of the path from PO to EO, and to determine how this path varies across the landscape of family firms. It is crucial to understand how family members' PO in heterogeneous family business contexts translates into organizational-level EO through distinctive social and organizational processes, as this type of analysis contributes to the development of a comprehensive theory of family business and provides managers and consultants with a more realistic picture of heterogeneous patterns of behavior among family firms (e.g., Chrisman, Chua, De Massis, Minola, & Vismara, 2016).

To provide a more nuanced representation of the effects of the family business context on entrepreneurial behaviors (e.g., Naldi et al., 2007), we model the baseline relationship between PO and EO by disentangling the EO construct in its components of proactiveness, innovativeness and risk taking (Covin & Slevin, 1989; Miller, 1983).

Second, we argue that the relationship between PO and EO is mediated by knowledge sharing, i.e., the process that makes individual knowledge available to others within the organization (Davenport & Prusak, 1998). Knowledge sharing represents a manifestation of the stewardship attitude in family firms (Eddleston et al., 2010; Patel & Fiet, 2011) and strengthens firms' ability to pursue entrepreneurial opportunities (e.g., Chirico & Salvato, 2014; Zahra, Neubaum & Larrañeta, 2007).

Furthermore, we recognize that heterogenous governance conditions may influence the path that leads to EO. Previous literature clearly emphasizes the importance of studying heterogeneity among family firms by pointing out that the variance in family firm behaviors is greater than the variance in behaviors between family firms and their non-family counterparts (e.g., Bennesen, Perez-Gonzalez & Wolfenzon, 2010). It has been observed that the key governance conditions, namely, the characteristics of family ownership and control, the involvement of family members in the top management team (TMT) and the participation of later generations (Miller & Le Breton-Miller, 2006), are major sources of family firm's heterogeneity (Chua, Chrisman, Steier, & Rau, 2012; Li & Daspit, 2016), because they are associated with different organizational goals, processes and routines (e.g., Carney, 2005; Le Breton-Miller & Miller, 2006; Li & Daspit, 2016). Accordingly, expanding previous research that links the heterogeneity among family firms with the adoption of entrepreneurial behaviors (e.g., Kellermanns, Eddleston, Barnett & Pearson, 2008; Marchisio, Sciascia, Mazzola, Miles, & Astrachan, 2010), we theorize that the abovementioned governance conditions moderate the relationship between PO and knowledge sharing. The generation in control is expected to weaken the impact of PO on knowledge sharing, whereas the involvement of multiple generations in the company and family involvement in the TMT are expected to strengthen this effect.

Our theoretical arguments are tested on a sample of 93 Spanish family firms. The empirical results support the prediction of a positive relationship between PO and the EO components of innovativeness and proactiveness, as mediated by knowledge sharing. The findings also indicate a negative moderating effect of the family generation in control on the relationship between PO and knowledge sharing and a positive moderating effect of family involvement in the TMT on the same relationship. We observe no significant moderating effect for the involvement of multiple generations.

Drawing on these findings, we offer several contributions. First, we add to the research on the determinants of EO in heterogeneous family business settings. The previous literature has largely addressed the direct impact of diverse family business features on EO outcomes without “opening the black box” of intervening factors (e.g., Boling et al., 2015; Miller & Le Breton-Miller, 2011; Sciascia et al., 2013). Our study investigates whether and how family business heterogeneity in terms of generation in control, generational involvement and family involvement in the TMT has different effects on the path leading to different EO dimensions. In particular, we extend the knowledge on the diversity of behaviors among family firms (e.g., Chua, Chrisman, & Sharma, 1999; De Massis, Kotlar, Chua, & Chrisman, 2014) by illustrating PO’s impacts on organization-level outcomes through the emergence of stewardship behavior via knowledge sharing and the extent to which this path is contingent upon different family involvement factors.

Our study is also one of the first attempts to explicitly link PO to entrepreneurial behavior in the family business setting. Despite their crucial importance in family business, PO has been overlooked as an antecedent of EO in the existing literature (e.g., Chirico & Salvato, 2014; Kellermanns, Dibrell, & Cruz, 2014). Although the socio-emotional wealth perspective has been widely employed as a psychological and cognitive

framework to explain how affective endowments influence family firms' decisions related to entrepreneurship and innovation (e.g., Chrisman & Patel, 2012; Gomez-Mejia, Cruz, Berrone, & de Castro, 2011), we believe that our focus on PO and its subsequent stewardship attitudes can provide a distinctive contribution to further understand the antecedents of family business behavior. Indeed, PO attitudes involve cognitive mechanisms that are at the core of the socioemotional wealth endowment (e.g., Goel, Voordeckers, Van Gils, & van den Heuvel, 2013), and most research on socioemotional wealth does not provide direct assessments of the cognitive processes at the level of family business actors (e.g., Hauck, Suess-Reyes, Beck, Prügl, & Frank, 2016). By focusing on PO as a primary driver of entrepreneurial posture, we contribute to filling this gap and add to the research on PO in family firms (e.g., Bernhard & O'Driscoll, 2011; Henssen, Voordeckers, Lambrechts, & Koiranen, 2014; Rantanen & Jussila, 2011).

Finally, we add to the general literature on EO, because our work is one of the first attempts to explore the connection among PO, knowledge sharing and entrepreneurial behavior at the organizational level. A limited number of studies has previously focused on pairwise relationships among these variables (or similar constructs, e.g., De Clercq & Dimov, 2013; Sieger, Zellweger, & Aquino, 2013; Han, Chiang, & Chang, 2010) without considering their interplay in a model that encompasses all of these constructs.

2. Theoretical background and hypotheses

EO reflects “the organizational processes, methods and styles that firms use to act entrepreneurially” (Lumpkin & Dess, 1996, p. 139). According to the original definition proposed by Miller (1983) and later embraced by Covin and Slevin (1989), EO manifests through the concurrent presence of three dimensions, two of which are behavioral—innovativeness and proactiveness—and one is attitudinal—risk taking. Specifically,

innovativeness is the tendency to support creative processes that may result in new products, services, or technologies; proactiveness reflects attitudes toward the continuous pursuit of new opportunities; and risk taking refers to the willingness to make investments and resource commitments with uncertain returns.

Although EO is an organizational-level construct, it can be considered the result of attitudes and behaviors adopted by individuals in the organization, particularly those adopted by organizational decision makers (e.g., Miller & Friesen, 1982; Miller & Le Breton_Miller, 2011; Simsek, Heavey & Veiga, 2010; Wales, Monsen & McKelvie, 2011). Therefore, family members are central in driving EO in a family firm, as they are the main decision makers in the organization (Chrisman, Chua, Pearson & Barnett, 2012). PO is central in this reasoning because it can be identified as a key antecedent of family members' behavior within the organization. In fact, PO captures the cognitive and affective mechanisms that explain the family attachment to the business and motivate the emergence of pro-organizational actions (e.g., Eddleston & Kellermanns, 2007; Rantanen & Jussila, 2011). Leveraging this argument, we develop our hypotheses in the next sections regarding the following: (1) the baseline relationship between PO and the dimensions of EO, explained through the lenses of stewardship theory; (2) the manner in which that PO translates into EO through the mediating role of knowledge sharing, seen as a manifestation of stewardship attitude; and (3) the roles of family generation in control, generational involvement and family involvement in the TMT in shaping the former relationship.

2.1. A stewardship perspective on the relationship between PO and EO

PO is the psychologically experienced state in which individuals develop possessive feelings toward the organization. In other words, the degree of PO is reflected in the answer to the question "How much do I feel this organization is mine?" (Van Dyne

& Pierce, 2004, p. 443). According to Pierce, Kostova and Dirks (2001), PO comprises three dimensions that correspond to basic human needs: (1) efficacy, (2) self-identity, and (3) belongingness. Efficacy, which responds to the need to feel effective in altering the environment, is enhanced by the sense of possession of tangible or intangible objects. Self-identity is also strengthened by feelings of possession, which is an expression of the self and clarifies who someone is (Dawkins, Tian, Newman, & Martin, 2015). Belongingness corresponds to the desire to have a place, fulfilled by the feeling of possessing a physical or symbolic space (Pierce et al., 2001). In addition, studies have been suggested that PO reflects a sense of responsibility and accountability for the ownership target (Avey, Avolio, Crossland, & Chen, 2009; Dawkins et al., 2015). For example, Parker, Wall, and Jackson (1997) suggested that the individual sense of ownership is expressed by concern and perceived responsibility for the object. According to stewardship theory, PO is essential for the development of pro-organizational attitudes among individuals (Hernandez, 2012).

Stewardship theory, rooted mainly in psychology and sociology (Davis, Schoorman, & Donaldson, 1997), was originally developed to analyze managerial behaviors in contrast with agency theory, rooted in economics (e.g., Eisenhardt, 1985; Jensen & Meckling, 1976). Agency theory describes top managers and corporate decision makers as agents whose preferences tend to diverge from shareholders' interests because both actors seek to maximize their individual utility (Jensen & Meckling, 1976). Stewardship theory, by contrast, depicts top executives not as selfish agents but as stewards who are motivated to act in the best interests of their principals (Donaldson & Davis, 1991) Thus, stewardship theory criticizes the view of humans as rational actors who pursue the maximization of their self-interest and proposes that organizational actors may be motivated by the desire to serve the long-term collective interest of the

organization, not the pursuit of self-serving and short-term opportunistic goals (Davis, Schoorman, & Donaldson, 1997). As explained by Davis and colleagues (1997, p. 24), “Given a choice between self-serving behavior and pro-organizational behavior, a steward's behavior will not depart from the interests of his or her organization”.

Family firms are considered favorable contexts for the development of stewardship attitudes (Corbetta & Salvato, 2004), especially because of the high levels of family members' PO, which increases the sense of responsibility toward the organization (e.g., Chirico, 2008; Eddleston & Kellermanns, 2007; Henssen, Voordeckers, Lambrechts, & Koiranen, 2014). The stewardship culture engendered by PO stimulates the adoption of innovative and proactive behaviors (Corbetta & Salvato, 2004; Eddleston et al., 2010), with the goal of securing the longevity and long-term well-being of the organization (Miller & Le Breton-Miller, 2005). Accordingly, family members tend to proactively explore new innovative opportunities and adopt a forward-looking perspective characterized by the anticipation and pursuit of future marketplace needs (De Massis, Chirico, Kotlar, & Naldi, 2014; Lumpkin & Dess, 2001) that allow their business to survive in the long run (Corbetta & Salvato, 2004; De Massis, Chirico, Kotlar, & Naldi, 2014; Nordqvist et al., 2008).

The PO-related goal of “improving the object of ownership” (Avey et al., 2009) also fosters stewardship behaviors through “the constant and continual interaction of family and business” (Carnes & Ireland, 2013; p. 1408) and the emotional proximity of family members to the organization (Chirico, Salvato, Byrne, Akther & Arriaga Múzquiz, 2017) According to the stewardship perspective, all these factors positively influence family members' intrinsic motivation, self-leadership and perception of empowerment (Davis et al., 1997). These attitudes improve family members' ability to identify and exploit entrepreneurial opportunities and to adopt a long-term view of firms' performance

(Sieger et al., 2013; Spreitzer, 1995; Spreitzer, De Janasz, & Quinn, 1999), thus enhancing the proactive and innovative posture of the business (Eddleston et al., 2010).

Therefore, we argue that family members' PO, by fostering stewardship attitudes and behaviors, promotes the development of the EO dimensions of proactiveness and innovativeness among family firms.

***Hypothesis 1a.** Family members' psychological ownership is positively related to family firms' proactiveness.*

***Hypothesis 1b.** Family members' psychological ownership is positively related to family firms' innovativeness.*

However, PO is also associated with the stewardship motivation to protect the organization (Avey et al., 2009; Hernandez, 2012), and this motivation in family firms can lead to a conservative and risk-averse posture (Huybrechts, Voordeckers, & Lybaert, 2013). The PO dimensions of belongingness and self-identity are important non-economic benefits that family members derive from business ownership (e.g., Carr, Chrisman, Chua, & Steier, 2016), and these benefits have been identified as core components of socioemotional wealth, i.e., the endowment of "affect-related value that a family derives from its controlling position in a particular firm" (Berrone, Cruz, & Gómez-Mejía, 2012; p. 259). Family members are particularly sensitive to the protection of such non-economic endowment (e.g., Chua, Chrisman, & De Massis, 2015), and they tend to avoid venture initiatives with high outcome variance that might pose a threat to their stock of non-financial wealth (Gómez-Mejía et al., 2007). These arguments are supported by previous research on long-lived family firms, in which a family stewardship attitude toward the business is a prominent dimension (Zellweger & Sieger, 2010). The entrepreneurial strategies pursued by such firms are characterized by low levels of performance risk.

Therefore, high levels of PO—which increase the stewardship attitude to protect the object of ownership as a source of identity and belongingness and enhance the sense of responsibility toward the ownership target—induce family firms to avoid high-variance projects and in general, to undertake less risk (Gómez-Mejía, Cruz, Berrone, & De Castro, 2011; Huybrechts et al., 2013).

***Hypothesis 1c.** Family members' psychological ownership is negatively related to family firms' risk taking.*

The previous hypotheses largely echo the findings of previous studies (e.g., Eddleston et al., 2010; Zellweger & Sieger, 2010) and therefore are used as baseline hypotheses to develop our next arguments about the path leading to EO.

2.2 The mediating role of knowledge sharing

The relationship between PO and EO implies the translation of individual perceptions and feelings into an organizational posture. As argued above, this may occur through the establishment of a stewardship culture in the organization that can materialize in different ways within family firms (Eddleston et al., 2010; Miller et al., 2008). One way is the process of knowledge sharing among family members and between family members and other members of the organization (e.g., Patel & Fiet, 2011). Knowledge sharing is defined as the exchange and mutual absorption of knowledge among individuals and groups (Bartol & Srivastava, 2002; Davenport & Prusak, 1998). Family members' PO may foster knowledge sharing, as the associated altruistic spirit and organizational identification enhance the willingness of individuals to disclose information, encourage other people's learning, help one another in problem solving, and endorse and disseminate organizational values and beliefs (e.g., Han, Chiang & Chang, 2010, Peng & Pierce, 2015; Podsakoff, McKenzie, Payne, & Bacharach, 2000; Wang & Noe, 2010). These processes in turn stimulate the emergence of entrepreneurial behaviors at the organizational level (De Clercq & Dimov, 2013; Jaskiewicz, Uhlenbruck, Balkin

& Reay, 2013). This occurs in the following ways: (1) through the conversion of individual knowledge in organizational knowledge by means of the combination and the socialization of expertise among actors (Nonaka, 1994); and (2) the use of such collective knowledge and expertise in the identification and pursuit of new opportunities (e.g., Wiklund & Shepherd, 2003).

In family firms, these dynamics especially involve the exchange of the deep tacit knowledge embedded in the family firm system (e.g., Zahra, Neubaum, & Larrañeta, 2007), which is shared in a long-term system of connections among family and non-family actors (Arregle et al., 2007; Carnes & Ireland, 2013). The result is the firm's increasing ability to identify new ways to recombine and extend its existing capabilities (e.g., Sirmon & Hitt, 2003), thus supporting innovation and proactiveness (Carnes & Ireland, 2013; Sirmon, Hitt, Ireland, & Gilbert, 2011) in responding to market opportunities. Thus, we postulate that knowledge sharing mediates the positive effect of PO on the EO dimensions of proactiveness and innovativeness.

***Hypothesis 2a.** Knowledge sharing mediates the positive effect of family members' psychological ownership on family firms' proactiveness.*

***Hypothesis 2b.** Knowledge sharing mediates the positive effect of family members' psychological ownership on family firms' innovativeness.*

The process of knowledge sharing among actors also involves the sharing of organizational values and beliefs (e.g., Tagliaventi & Mattarelli, 2006). In family firms, this phenomenon is particularly relevant, given the strong sense of community that characterizes these organizations (e.g., Guzzo & Abbott, 1990) and the significant overlap between family and organizational values (Arregle et al., 2007).

We assume that family members' PO fosters the exchange of values as a manifestation of stewardship toward the organization's long-term viability. This exchange involves the PO dimensions of identity, belongingness and responsibility and

reinforces the commitment to non-economic purposes (Chrisman et al., 2012), increasing the willingness to preserve the socioemotional wealth embedded in the family firm (Berrone et al., 2012). This attitude extends to non-family members (Huybrechts et al., 2013) and to the entire system of organizational norms and rules (Arregle et al., 2007), thereby creating a company-level tendency to avoid risky behaviors that could jeopardize the firm's socioemotional endowment and symbolic legacy (Hammond, Pearson, & Holt, 2016).

In summary, PO enhances knowledge sharing, which also involves the combination and socialization of values and beliefs; such an exchange strengthens cohesion around non-economic goals and socioemotional wealth protection, thus reducing risk propensity at the organizational level (Hoskisson, Chirico, Zyung & Gambeta, 2017). This reasoning leads to our next hypothesis:

***Hypothesis 2c.** Knowledge sharing mediates the negative effect of family members' psychological ownership on family firms' risk taking.*

2.3. The moderating effects of generation in control, generational involvement and family involvement in the TMT.

Family companies should not be treated as a homogeneous group (Chrisman, Chua, & Sharma, 2005; Chua, et al., 2012), and in fact, a number of studies have considered the effect of various sources of family business heterogeneity on company-level behaviors and outcomes (e.g., Chirico & Salvato, 2014; Mazzola, Sciascia, & Kellermanns, 2013; Michiels et al., 2013; Miller, Minichilli, & Corbetta, 2013; Miller et al., 2014). The key dimensions of family business governance have been identified as major factors in family firms' heterogeneity (Chua, Chrisman, Steier, & Rau, 2012; Li & Daspit, 2016; Miller & Le Breton – Miller, 2006), as they are associated with different organizational goals, processes and routines (e.g., Carney, 2005; Le Breton-Miller & Miller, 2006; Li & Daspit, 2016).

Therefore, we theorize that the connection between PO and knowledge sharing in the PO-EO path can be stronger or weaker depending on specific governance conditions, namely, the generation managing the firm, the simultaneous involvement of different generations in company management and the involvement of family members in the TMT. We focus on the governance variables that capture intergenerational continuity in family firms given their crucial importance in sustaining EO over time and across family generations (e.g., Chirico & Salvato, 2014; Kellermanns et al., 2008; Kellermanns & Eddleston, 2006; Nordqvist & Zellweger, 2010).

Our basic argument here is that when coordination mechanisms are more informal and less bureaucratic, family members' PO has a stronger effect in promoting a stewardship culture at the organizational level, which is expressed by knowledge sharing practices. In contrast, more formalized structures and more bureaucratic coordination mechanisms create a detachment between family members' personal attitudes and organizational-level routines. Building on previous literature (e.g., Gersick et al., 1999; Dyer, 1988; Rosenkranz & Wulf, 2017; Arregle et al., 2007), in the next sections we argue that later generations in control enhance the adoption of formal coordination mechanisms, weakening the link between family members' PO and stewardship-oriented knowledge sharing, whereas higher generational involvement in the company and higher family involvement in the TMT are both conditions that encourage the adoption of informal coordination mechanisms, strengthening the link between family members' PO and knowledge sharing at the organizational level.

2.3.1. Generation in control

Scholars widely agree that the generation in control, i.e., the family generation that has control over management, is a major factor in heterogeneity among family firms (Bammens, Voordeckers, & Van Gils, 2008; Cruz & Nordqvist, 2010; Gersick, Davis,

Hampton, & Lansberg, 1997; Lansberg, 1999). In particular, research has shown that family firms that proceed across generations in response to increasing organizational complexity and environmental pressure (e.g., Cruz & Nordqvist, 2010) tend to adopt more formalized organizational structures and governance mechanisms (e.g., Beck, Janssens, Debruyne, & Lommelen, 2011; Gersick et al., 1999; Dyer, 1988), thereby reducing the importance of informal and relational governance (Mustakallio, Autio, & Zahra, 2002). This formalization also involves the organizational mechanisms governing the circulation and transfer of knowledge (e.g., Chirico & Salvato, 2014; Stewart & Hitt, 2012), and family members' PO may thus be rendered less salient as a determinant of knowledge sharing.

More specifically, we argue that the effect of PO on knowledge sharing is likely to be stronger in earlier-generation family firms, where relational governance mechanisms are prevalent. These coordination systems are embedded in the social ties and informal relationships among family business members (Mustakallio et al., 2002) and are supported by collective norms, bonding relationships and traditions (e.g., James 1999; Rosenkranz & Wulf, 2017; Uhlaner, Floren, & Geerlings 2007). Under such informal relational mechanisms, knowledge-sharing activity is the direct expression of a stewardship attitude and depends on the personal initiative and internalized values embedded in a stewardship culture. In contrast, with the adoption of more formalized systems that are typical of later-generation firms, organizational rules and standards and impersonal mechanisms reduce the impact of individual attitudes such as PO on the activation of knowledge-sharing behavior. Formally, we propose the following:

Hypothesis 3: *The generation in control negatively moderates the relationship between psychological ownership and knowledge sharing such that the effect of family members' psychological ownership on knowledge sharing is weaker in later-than in earlier-generation family firms.*

2.3.2. Generational involvement and family involvement in the TMT

Generational involvement depicts the simultaneous presence of multiple family generations in company management (Kellermanns & Eddleston, 2006; Ling & Kellermanns, 2010). Previous studies have suggested that the involvement of multiple generations in family firm management contributes to bridging and strengthening family business values over time (e.g., Eddleston & Kellermanns, 2007; Zellweger, Nason, & Nordqvist, 2012), increases the sense of belonging to the family business (Björnberg & Nicholson, 2012), and enhances the members' feeling of being part of a common history, thus promoting awareness and pride of the family's past achievements (Jaskiewicz, Combs, & Rau, 2015). This involvement also reinforces the perception of a strong identity fit between the family and the firm (Zellweger, Nason, Nordqvist, & Brush, 2011) and the personalization of ties between family members and the organization (Sundaramurthy & Kreiner, 2008). Moreover, researchers have highlighted that multigenerational family members jointly involved in management roles endorse collectivism, mutual trust, and altruism (e.g., Arregle et al., 2007; Chirico, Ireland & Sirmon, 2011; Pieper, Klein, & Jaskiewicz 2008; Rosenkranz & Wulf, 2017).

All these features enhance the use of informal and relational coordination mechanisms in the relationships among family members involved in the business (Li, Poppo, & Zhou, 2010; McEvily & Marcus, 2005; Mustakallio et al., 2002). As argued by Arregle et al. (2007), in family firms relationships among organizational actors are shaped on the basis of the relationships among family members. According to the stewardship perspective, if relational and informal mechanisms prevail among family members in the form of trust and relational contracts, the same type of mechanisms will also emerge at the organizational level, promoting a unifying model of behavior among family and non-family actors (e.g., Corbetta & Salvato, 2004).

Similar arguments can be made with respect to family members' involvement in the top management positions compared to non-family managers. In particular, when TMTs are dominated by family members, the level of formalization of organizational mechanisms and routines is generally lower (e.g., Minichilli, Corbetta, & MacMillan, 2010; Rosenkrantz & Wulf, 2017). This may occur not only because there is less need to establish formal procedures to control and evaluate the non-family managers (Songini & Gnan, 2015) but also because a lower presence of non-family managers reduces the likelihood that formal and "professionalized" management processes will be introduced in the family firm (Stewart & Hitt, 2012). Because highly formalized corporate governance structures reduce actors' discretion and perception of empowerment, stewardship behaviors will be encouraged by lower use of formal governance and control mechanisms (Davis et al., 1997)

In summary, the prevalence of relational and informal coordination arising out of higher generational involvement and family involvement in the TMT results in a stronger influence of individual psychological attitudes on the establishment of a stewardship culture and therefore on knowledge-sharing behavior. Therefore, we predict that generational involvement and family involvement in the TMT positively moderate the relationship between PO and knowledge sharing. Formally:

***Hypothesis 4:** Generational involvement positively moderates the relationship between psychological ownership and knowledge sharing such that the effect of family members' psychological ownership on knowledge sharing is stronger in family firms with high generational involvement than in firms with low generational involvement.*

***Hypothesis 5** Family involvement in the TMT positively moderates the relationship between psychological ownership and knowledge sharing such that the effect of family members' psychological ownership on knowledge sharing is stronger in family firms with high family involvement in the TMT than in firms with low family involvement.*

3. Methods

3.1. Data Collection

Primary data were necessary to test our hypotheses. In this study, the population consists of Spanish firms belonging to the network of the Regional Associations of Family Businesses related to the Instituto de la Empresa Familiar (IEF) (Family Business Institute). The IEF is a business organization—specifically, an independent, apolitical, non-profit institution—that does not receive public funds. Since its foundation more than 20 years ago, the IEF has established itself both as an exclusive business platform and as a key intermediary between family businesses and the public administration, aimed at defending the interest of family businesses, identifying corporate governance and management best practices, and securing the education and networking of future generations. Among the IEF's one hundred members are the main companies in the country, the leaders in their areas, with a presence in the main international markets. In total, these companies employ more than one million people around the world. Globally, their turnover represents 17.5% of the Spanish GDP (or 27.5% if we include the Regional Associations of Family Businesses linked to the IEF). The IEF has 16 Regional Associations of Family Business, including 1,100 companies from all sectors that are among the leading companies in their respective regions. Their main objectives as an association are to support and defend the interests of family businesses in each Spanish region and to contribute to their development.

A total of 480 family firms were identified from the Family Business Regional Associations' websites with the help of their directors. Once identified, the family businesses were invited to participate in the study. The respondent was either the family CEO or the family's highest-ranking executive. The information was collected via an online survey, but when email information was unavailable or when the firm requested a printed questionnaire, we sent it by ordinary mail. To guarantee the highest number of

replies, managers were informed of the study in a cover letter stating the purpose and importance of the research and ensuring the respondents' anonymity and confidentiality. In total, 93 questionnaires were returned, yielding a response rate of 19.38%.

This response rate is within the 10-20% range, which represents the average response rate for surveys involving senior management (Menon et al., 1996). Additionally, we compared our sample size to samples used in previous family business research adopting analogous perspectives and an analytical approach, and found that these studies rely on samples that include a similar number of firms as our final dataset (e.g., Cunningham, Seaman, & McGuire, 2016; Kellermanns & Eddleston, 2007; Sardeshmukh, & Corbett, 2011).

A descriptive analysis of the sample shows that most of the respondents (67%) were men, with a scarce presence of female leaders, and 78% had worked at the company for less than 20 years. Ten percent of the studied companies are controlled by the 1st generation, 65.9% by the 2nd generation, 17.6% by the 3rd generation and 6.6% by the 4th or later generation. Most of the firms were founded between 1901 and 1950 (22%) or between 1981 and 1990 (25.3%). In 93.4% of the cases, a family holds 100% ownership. Finally, 5.38% of the firms belong to the primary sector, 37.63% belong to the secondary sector and 56.99% belong to the tertiary sector.

3.2. Measures

The study mainly used validated scales obtained from the literature. Selected scales were modified to make them relevant to the family business context. A pretest assessed the suitability of the wording and format and the extent to which measures represented all facets of the constructs. Except where noted, the constructs were measured by items on a 7-point Likert scale anchored by "strongly disagree" and "strongly agree" (see the Appendix). The following constructs were used.

Dependent and Independent variables:

Psychological Ownership (PO). Following Avey and colleagues (Avey, Avolio, Crossley, & Luthans, 2009; Avey, Wersning, & Palanski, 2012) and according to the original definition by Pierce, Kostova and Dirks (2001), we operationalized PO as a construct which is rooted in individuals' internal motives of self-efficacy, identity and sense of belonging (Pierce, Kostova & Dirks, 2003; Dawkins, Tian, Newman & Martin, 2015). Based on the PO items proposed by Avey et al. (2009), we relied on a scale comprising 5 items that account for family members' feelings of the "ability to affect and control", "self-identity" and "feeling at home". Examples of items capturing the dimensions of responsibility, identity and belongingness, crucial in the conceptualization of Avey and colleagues (2009) are *We identify ourselves with the family firm*, *We really feel that the family firm's problems are ours*, and *The family firm has great personal meaning for us*, respectively (see also the appendix).

We believe that this measure of PO is particularly interesting in our empirical context. Since we target individuals who are also legal owners (unlike the vast majority of research on PO, which focuses on non-owner employees), along with owners belonging to a family firm's association (who therefore are fully aware of being part of a family firm), we believe that the measure proposed by Pierce et al. (2001), centered around "the organization is mine/ours" statements, can be redundant and possibly misleading. According to our stewardship perspective, we instead capture the internal motivations associated with PO as sources of pro-organizational behavior (Avey, et al., 2009; Dawkins, Tian, Newman, & Martin, 2015). The selected items from Avey et al. (2009) have been adapted to a family business context based on Chirico's (2008) qualitative work on PO in family firms. This scale has exhibited high reliability ($\alpha = 0.83$). PO was modeled as a reflective first-order construct.

Knowledge Sharing (KS). This scale consists of five items based on the measurement scale from Bartol et al. (2009). This scale has been adapted to the specific context of family businesses to capture the degree to which business-relevant knowledge is shared among family members and between family members and other members of the organization ($\alpha = 0.93$). Knowledge sharing was modeled as a reflective first-order construct.

Entrepreneurial orientation (EO). EO was measured by following the nine-item scale used in Naldi et al. (2007) and multiple other studies (e.g., Chirico et al., 2011), who adapted the Covin and Slevin (1989) scale. We modeled EO as three reflective first-order constructs: proactiveness (PROAC) ($\alpha = 0.86$), innovativeness (INNO) ($\alpha = 0.77$) and risk taking (RISK) ($\alpha = 0.78$), following the insight from Slevin and Wales (2012: 678), who state that “reflective measurement models are often most appropriate for assessing EO”.

Generation in control (GC). Generation in control was measured with a direct question asking which generation was primarily responsible for managing the business, which is similar to the work of Chirico and Salvato (2014).

Generational involvement (GI). Generational involvement was measured with a direct question asking about the number of generations simultaneously involved in company management.

Family involvement in the top management team (FI TMT). This variable was measured as the percentage of family members in the top management team, which is similar to the work of Sciascia, Mazzola, and Chirico (2013).

Control variables

Four control variables were used in our study, given their potential effect on our dependent variables. We controlled for firm industry, firm size, firm age, and performance. Multiple studies have reported that these variables may determine the abundance of entrepreneurial opportunities (Castro & Roldán, 2015; Chirico & Salvato, 2014; Zahra & Nielsen, 2002; Hernández-Perlines et al., 2016). To control for industry, we differentiated between the primary (agriculture and food), secondary (industry), and tertiary (services) sectors. We operationalized the industry controls through two dummy variables for the secondary and tertiary sectors, taking the primary sector as a comparative base sector (Casillas et al., 2010; Chirico & Salvato, 2014). Firm size was measured by the number of full-time employees, while firm age was measured using the natural log of firm age (Zahra & Nielsen, 2002). Performance ($\alpha = 0.78$) may also influence EO dimensions. For example, when performance declines and firm survival is in jeopardy, the preference for EO fades (Garcés-Galdeano, Larraza-Kintana, García-Olaverri, & Makri, 2016). Performance was measured through four financial measures related to net profit, sales growth, cash flow, and growth in net worth (Naldi et al., 2007). Respondents were asked to rate how their companies performed compared to their competitors during the past three years (1 = much worse - 7 = much better).

3.3. Data analysis and results

We applied variance-based structural equation modeling (SEM) to test the hypotheses (Chin, 2010). SEM enables researchers to statistically examine a series of interrelated dependence relationships between theory-based latent variables and their indicator variables by measuring directly observable indicator variables (Astrachan et al., 2014; Sarsted et al., 2016). Within SEM, the partial least squares (PLS) technique has been used. PLS path modeling can be understood as a full-fledged SEM method that can

handle both factor models and composite models for construct measurement, estimate recursive and non-recursive structural models, and conduct tests of model fit (Henseler et al., 2016). Our sample is relatively small ($n = 93$) and according to Reinartz et al. (2009), PLS should be used when the number of observations is low. This study therefore uses PLS for the analyses. We rely on the SMART-PLS v. 3.2.6 software. Using PLS entails a two-stage approach (Chin, 2010; Roldán & Sanchez-Franco, 2012; Hair et al., 2014). The first step requires the assessment of the measurement model, which allows the relationships between the observable variables and theoretical concepts to be specified. In the second step, the structural model is evaluated in order to test the extent to which the causal relationships specified by the proposed model are consistent with the available data. In short, “stage 1 examines the measurement theory, whereas stage 2 covers the structural theory, which includes determining whether the structural relationships are significant and meaningful and testing hypotheses” (Sarstedt et al., 2014, p. 108). The study uses PROCESS macro 2.16 (Hayes, 2013) for the moderated mediation analysis.

3.3.1. First stage: Measurement model

The measurement model for reflective constructs (in this case, all our constructs are modeled as reflective) is assessed in four steps: individual item reliability, construct reliability, convergent validity, and discriminant validity (Henseler et al., 2016). We begin by assessing the individual item reliability of the measurement model. Individual item reliability is considered adequate when the factor loading of an item on its respective construct is generally greater than 0.7. All standardized loadings (λ) exceeded this threshold (Table 1), apart from one item from the risk construct, which was removed (Naldi et al., 2007). In addition, two PO items had loadings that were weak but close to the threshold; we decide to retain them in order to support the content validity of the scale (Table 1). The reliability of individual items is overall acceptable.

The measures of construct reliability and convergent validity represent measures of internal consistency. Construct reliability enables testing whether the indicators truly measure the constructs. The results in Table 2 indicate that all reflective constructs are reliable, as their composite reliabilities are greater than 0.7. These values are considered “satisfactory to good” because they are between 0.70 and 0.95 (Sarstedt et al., 2014). Furthermore, the most recent developments identify the Dijkstra-Henseler’s rho_A coefficient as the only consistent measure of reliability (Dijkstra & Henseler, 2015). In this case, the variables also meet the requirement of construct reliability, since their rho_A coefficients are above the 0.7 level.

[Insert here Table 1]

To assess convergent validity, which measures the extent to which a construct converges on its indicators by explaining the item variance, we examine the average variance extracted (AVE) measure. AVE values should be greater than 0.50, and all our constructs exceed this value (Table 2). Finally, discriminant validity indicates the extent to which a construct is empirically distinct from other constructs in the path model. To assess discriminant validity, we follow the Fornell-Larcker criterion, in which AVE should be greater than the variance shared between the construct and other constructs in the model. For adequate discriminant validity, the diagonal elements should be significantly greater than the off-diagonal elements in the corresponding rows and columns. This condition is satisfied for each reflective construct in relation to the rest of the variables (Table 2). We also use a recent criterion to assess discriminant validity, the heterotrait-monotrait ratio of correlations (HTMT), which is an estimate of the factor correlation (more precisely, an upper boundary).

[Insert here Table 2]

[Insert here Table 3]

To clearly discriminate between two factors, the HTMT should be significantly less than one (Henseler et al., 2016). Table 3 shows that all variables also achieved discriminant validity following the HTMT criterion. Finally, the cross-loadings were assessed to ensure that no indicator is incorrectly assigned to an incorrect factor (Table 1). Consequently, each construct relates more strongly to its own measures than to others.

To further validate our measurement model, we also addressed common method bias in two ways. First, following Podsakoff, MacKenzie, Lee, and Podsakoff (2003), we analyzed our data with the unmeasured latent factor method approach, which allows all self-reported items to load both on their theoretical constructs and on an uncorrelated method factor. We compared the results of this model with our full factor model, without the latent method factor, and found that the addition of the latent factor does not significantly improve the fit of the measurement model. All factor loadings of the measurement model remain significant, suggesting that common method bias is unlikely to have influenced our study's results. Second, we collected objective secondary data for firm size and industry. The diversity in the data sources further reduces the likelihood of common method bias. As a conclusion of this first round of analyses, the measurement model results are satisfactory. The next stage involves assessing the structural model results to identify patterns in the data relationships.

3.3.2. Second stage: Structural model

The assessment of the structural model involves the analysis of the model's predictive capabilities and of the relationships between the constructs. The structural model was evaluated based on the assessment of collinearity; the algebraic sign, the magnitude and significance of the structural path coefficients; the R^2 values (variance explained); the f^2 effect size; and the Q^2 (cross-validated redundancy) test for predictive relevance (Roldán & Sanchez-Franco, 2012). Bootstrapping was used to generate

standard errors and *t*-statistics, facilitating evaluation of the statistical significance of the path coefficients. Six of the nine hypothesized relationships are significant. The same result was achieved when we applied percentile bootstrapping to generate a 95% confidence interval (Henseler et al., 2016). An interval that does not contain zero means that the structural path coefficient is significantly different from zero, at a confidence level of 95% (Castro & Roldán, 2015), and therefore, the path coefficient is regarded as significant. These results support Hypotheses 1a and 1b, Hypotheses 2a and 2b, Hypothesis 3 and Hypothesis 5. Some of the control variables included in our model (second sector, tertiary sector and age) show negligible and non-significant paths, but the results for performance and size are significant.

To check for collinearity issues, we examined the VIF values of all predictor constructs. All VIF values are below the conventional threshold of 5. Therefore, collinearity among the constructs is not a critical issue in the structural model, and we can continue examining the results. They show that proactiveness and innovation have substantial R^2 values of 0.370 and 0.330, whereas the prediction of knowledge sharing and risk taking is comparably weak ($R^2 = 0.152$ and 0.021). Regarding the effect sizes f^2 for the structural model relationship, PO has a medium effect size of 0.176 on knowledge sharing, a small effect size of 0.053 and 0.043 on proactiveness and innovativeness, and no effect on risk taking (0.000). In addition, knowledge sharing has a medium effect size of 0.161 on innovativeness, a small effect size of 0.140 on proactiveness and no effect on risk taking. Blindfolding was used to evaluate the model with the cross-validated redundancy index (Q^2) for the endogenous variables. Chin (2010) suggested this measure to examine the predictive relevance of a theoretical/structural model. Q^2 values greater than zero imply that the model has predictive relevance. The results summarized in Table

4 confirm that the structural model has satisfactory predictive relevance for all the endogenous constructs except for risk taking.

Finally, we tested the model fit through the standardized root mean square residual (SRMR) as the root mean square discrepancy between the correlations observed and the model-implied correlations (Hu & Bentler, 1999). SRMR may provide an indication of whether the data follow a common factor model (Sarsted et al., 2016). Following Henseler et al. (2016), we determined the SRMR for a composite factor model. This approach provides the exact fit of the composite factor model, thus constituting a confirmatory composite analysis. Our model achieves an SRMR for the composite factor model of 0.072, which indicates an appropriate fit based on the usual cutoff of 0.08 (Hu & Bentler, 1999). Table 4 includes the main parameters obtained for the three models under study in the structural assessment. Model 1 describes the significant total effect of PO on proactiveness ($c_1=0.321^{***}$), innovativeness ($c_2=0.322^{**}$), and risk taking ($c_3=-0.026^{ns}$) while controlling for industry, secondary and tertiary sector, firm age, firm size and performance. Therefore, H1a and H1b are supported, but not H1c.

Model 2 shows how the direct effect of PO on EO dimensions decreases when knowledge sharing is included (proactiveness $c_1'=0.201^*$; innovativeness $c_2'=0.187^*$; risk taking $c_3'=-0.016^{ns}$). Furthermore, paths a_1 (PO-knowledge sharing), b_1 (knowledge sharing-proactiveness) and b_2 (knowledge sharing-innovativeness) are significant. Therefore, the fact that both the significant decrement manifested in the direct effect (c_1' and c_2') and the significance of the regression coefficients (a_1 , b_1 and b_2) suggest the existence of an indirect effect of PO on proactiveness and innovativeness via the mediating role of knowledge sharing (Leal-Rodríguez et al. 2015). However, we cannot suggest the same for risk taking, as either the direct effect (c_3') or the regression coefficient (b_3) is significant.

Nonetheless, the key condition to determine such a mediating effect is to test the significance of $a_1 \times b_1$ (path $PO \rightarrow KS \times$ path $KS \rightarrow PROAC$) and $a_1 \times b_2$ (path $PO \rightarrow KS \times$ path $KS \rightarrow INNO$) (Hernández-Perlines et al., 2016). With this objective, we obtain the values for these indirect effects ($a_1b_1=0.128$; $a_1b_2=0.142$) (Figure 1) from SmartPLS. Both are significant, since CI does not contain zero (Table 5), confirming the mediation effect (H2a and H2b). All situations under the condition that both the direct effect c' and the indirect effect $a \times b$ are significant represent partial mediation. Two types of partial mediation can be distinguished (Nitzl et al., 2016): (1) a positive abc' value indicates the presence of complementary partial mediation; (2) a negative abc' value indicates the presence of competitive partial mediation. Consequently, we can affirm complementary partial mediation, which indicates that a portion of the effect of PO on proactiveness and innovativeness is mediated by knowledge sharing, whereas PO still explains a portion of proactiveness and innovativeness that is independent of knowledge sharing. In addition, to obtain further information about the partial meditation, we calculated the strength of mediation through the variance accounted for (VAF) index (Hair et al, 2014), which determines the size of the indirect effect (ab) in relation to the total effect (c). When the outcome of the VAF is between 20% and 80%, partial mediation can be expected. This occurs when we assess the indirect effect of PO on proactiveness (VAF = 39.88%) and on innovativeness (VAF = 44.10%). Finally, as a robustness check of our mediating results, we followed Baron and Kenny's (1986) multistage methodology to test for mediation. Support for mediation is achieved if "the primary antecedent is statistically related to (1) the dependent variable and (2) the proposed mediator(s), while (3) in a model with both the primary antecedent and the mediator(s) present, only the mediator(s) remain(s) a statistically significant predictor(s) of the dependent variable" (Sirmon et al,

2008: 989). As expected, the results of the OLS analysis were substantially similar to the hypotheses tested through SEM.

[Insert here Table 4]

[Insert here Table 5]

[Insert here Figure 1]

The hypotheses (H3, H4 and H5) of the moderating roles of generation in control, generational involvement and family members in the TMT in the path between PO and knowledge sharing were tested using the orthogonalizing approach. Such an approach ensures that the indicators of the interaction term do not share variance with any of the indicators of the predictor or moderator variable (Henseler and Chin, 2010). As in regression analysis, the predictor (PO) and the moderator variables (generation in control, generational involvement and family involvement in the TMT) are multiplied to obtain the interaction terms. In Table 4, model 3 includes generation in control, generational involvement and family members in the TMT, along with the interaction terms ($PO \times GC = a_2$, $PO \times GI = a_3$ and $PO \times FI \text{ TMT} = a_4$). The results support H3 ($a_2 = -0.181^*$) and H5 ($a_4 = 0.141^*$) but not H4 ($a_3 = 0.072$) (Table 4, model 3) (Figure 1). Moreover, along these lines, the R^2 for this interaction model is compared to the R^2 for the baseline model, which excludes the interaction term. The difference in R^2 indicates the overall effect size f^2 for each interaction effect. The effect size f^2 can be calculated as $f^2 = (R^2_{\text{included}} - R^2_{\text{excluded}}) / (1 - R^2_{\text{included}})$. The overall effect size for a_2 and a_4 achieves an f^2 value of 0.028 and 0.021, which exceed the minimum threshold of 0.02 (Chin et al., 2003). This finding implies additional support for the moderation role of generation in control and family members in the TMT. Therefore, generation in control negatively moderates the link between PO and knowledge sharing. In contrast, having family members in the TMT positively moderates the link between PO and knowledge sharing. However, a_3 achieves

a negligible f^2 value of 0.014, which is far from the required minimum. Consequently, H4 is not supported.

The support for H3 and H5 together with the significant indirect effects (H2a and H2b) generates the emergence of moderated mediations (Hayes, 2013). These results might involve the dependence of the indirect effects on the values of GC and FI TMT, which would act as moderator variables. We have applied the PROCESS macro developed by Hayes (2013) to estimate these conditional indirect effects. Using latent variable scores from SmartPLS as input, PROCESS produces estimates and bias-corrected 95% bootstrap CI for the indirect effects at different values of generation in control and family involvement in TMT as moderating constructs (Leal-Rodríguez, Eldridge, Roldán, Leal-Millán & Ortega-Gutiérrez, 2015).

Table 6 shows that the indirect effects of PO on proactiveness (table 6A.1) and innovativeness (table 6A.2) via generation in control and family involvement in the TMT are consistently positive and decrease as values of generation in control (GC) increase and increase as values of family involvement in the TMT increase. A 95% CI bias-corrected bootstrap for the conditional indirect effects are above zero for the different values of generation in control and family involvement in the TMT (low, medium and large). These indirect impacts are significant in all the scenarios analyzed. Hence, knowledge sharing partially mediates PO's influence on proactiveness and innovation, and these indirect effects decrease with generation in control and increase with family involvement in the TMT.

[Insert here Table 6]

4. Discussion

In this study, we adopt a stewardship perspective to provide a fine-grained description of the path connecting perceptions of family members' PO to organizational-

level EO, disaggregated in its key components and under different conditions of family business governance. Our results suggest that the positive relationship between PO and EO is mediated by knowledge sharing, which is considered a manifestation of family members' stewardship attitude. We also found that family generation in control and family involvement in the top management team play significant moderating roles in the relationship between PO and knowledge sharing. As such, first, our study contributes to the understanding of the path leading to EO, suggesting that knowledge sharing behavior is an important mediator linking family members' PO to the various dimensions of EO. Our supporting result, consistent with the stewardship perspective applied to family firms (Corbetta & Salvato, 2004; Davis et al., 1997), underlines the importance of knowledge sharing as a means to translate family members' cognitive and affective attitudes into organizational-level outcomes (e.g., Björnberg & Nicholson, 2012; Chirico & Salvato, 2014; Cunningham, Seaman, & McGuire, 2016; Woodfield & Husted, 2016).

Our theory and results in relation to the moderating roles of generation in control and generational involvement confirm the idea that accounting for heterogeneity in family business contexts, and especially in governance dimensions, is important to understand family firms' behavior (e.g., Chirico, Sirmon, Sciascia, & Mazzola, 2011; Kellermanns et al., 2008; Sciascia, Mazzola, & Chirico, 2013). Through this analysis, we extend previous research that has identified heterogeneous family business attributes both as direct predictors of entrepreneurial behavior (Kellermanns & Eddleston, 2006; Kellermanns, Eddleston, Sarathy, & Murphy, 2012) and as factors intervening in knowledge dynamics and knowledge sharing (e.g., Cunningham, Seaman, & McGuire, 2016; Zahra et al., 2007). However, we take one additional step further and suggest that heterogeneity in family business governance should be considered in combination with family members' psychological attitude toward the business to effectively predict

outcomes at the organizational level. This argument originates from the findings in support to Hypothesis 3 and Hypothesis 5, which suggest that family members' PO results in stewardship behaviors (knowledge sharing, in our case) only in organizational settings in which less formal coordination mechanisms are likely to prevail—i.e., in earlier generation family firms and in companies with high levels of family involvement in the TMT. Therefore, our results also indicate the relevance of family business heterogeneity as a contingent factor for the establishment of a stewardship culture from family members' attitudes.

Notably, the family generation in control has no direct effect on knowledge-sharing behavior, and the effect emerges only through the interaction with the degree of family members' PO. Accordingly, this result also sheds some light on the often-contradictory empirical findings of studies directly linking family generation in control to entrepreneurial outcomes (e.g., Cruz & Nordqvist, 2012, Casillas et al., 2010; Ling & Kellermans, 2010). In contrast, the hypothesis related to the simultaneous involvement of multiple generations in the business is not supported, and this is probably because whereas generational involvement may strengthen the relationship between individual PO and promotion of knowledge-sharing practices, because of the greater relevance of informal and personalized coordination mechanisms, there is also a counteracting effect arising from the increased conflict potential. Multigenerational family members are indeed exposed to a higher likelihood of affective conflict, which in turn may impede processes of knowledge sharing (e.g., Ensley & Pearson, 2005; Sciascia et al., 2012). It can also be argued that the presence of multiple generations in business increases the complexity of the relationships among actors, leading to a higher adoption of formal coordination mechanisms (e.g., Songini & Gnan, 2015; Songini, Morelli, Gnan, & Vola, 2015), not to higher levels of informality, as we hypothesized.

As a further contribution, the recognition of knowledge sharing as a significant mediator in the PO and EO path corroborates the still-limited evidence of the processes linking PO to organizational outcomes (Avey et al., 2009; Bernhard & O' Driscoll, 2011; De Clercq, Dimov, & Thongpapanl 2013; Peng and Pierce, 2015). However, it is important to note that knowledge sharing only partially mediates the PO-EO relationship. This finding further confirms the importance of looking at the path leading to EO by studying additional intervening mechanisms. For example, Madanoglu et al. (2016) already identified decentralization in decision making as a possible mediator between family involvement and EO. It could also be that the remaining effect is purely due to PO without any other intervening variable, and this explanation would reflect previous findings on emotional and affective factors as “energizing forces” stimulating entrepreneurial outcomes (e.g., Bloemer, Pluymaekers, & Odekerken, 2012; Chirico & Salvato, 2014).

By disaggregating EO in its constitutive dimensions, our study also contributes to the discussion on the distinctive conceptualization of EO in family firms (e.g., Naldi et al., 2007; Zahra, 2005). Although Hypotheses 1c and 2c are not supported by significant results, we still provide important theoretical arguments that the risk-taking component responds to the variation in family business characteristics in a manner that is different from proactiveness and innovativeness. We highlight the distinctive nature of risk taking in family firms' EO (Naldi et al., 2007). Overall, our study underlines the need to adopt a multidimensional view of EO in a family business setting and contributes to the research on stewardship driven entrepreneurial strategies in family firms. Our results seem to corroborate previous research on long-lived family firms in which family stewardship attitude toward the business is a prominent dimension (Zellweger & Sieger, 2010). Our evidence confirms that proactiveness and innovativeness are not necessarily related to

risk taking in terms of performance hazard. Our study also has the potential to inform managers and practitioners. Because PO by family members positively affects the level of proactiveness and innovativeness, practitioners should focus on maintaining family members' feeling of possessiveness toward the company. Family business managers should also be aware that their feeling of possessiveness has direct consequences at the organizational level because it fosters the willingness to disclose information to other members of the organization, encourages problem solving at the company level and promotes a more cohesive organizational culture. Our results also suggest that family business managers should carefully consider the knowledge-sharing process at the organizational level as the basis for developing competitive advantage. However, family business advisors and managers must be conscious that family members' PO feelings might enhance a culture of risk avoidance in the organization, possibly causing inertia and competitive stagnation.

In addition, our results suggest that in later generations, because family firms tend to adopt more formalized organizational structures and governance mechanisms, the translation of family members' personal attitudes and "energy" in organizational level outcomes is less pronounced, potentially depriving the family business of one of its most important resources stemming from "familiness". Family business managers must therefore develop tools to maintain a certain level of "personalization" in the management of the family firm to avoid the negative effects of more formalized systems.

5. Limitations and future research directions

Our study has also a number of limitations, which suggest opportunities for future research. First, our data are cross-sectional. Future studies should focus on panel data to capture the longitudinal dimension of inherently dynamic phenomena. Additionally, we rely on a single respondent for each company, and this method could limit the validity of

our results. Moreover, the research was carried out within a specific inter-firm network (Family Business Associations). Therefore, we must be cautious in generalizing the results. A further major limitation arises from the understanding of causal relationships. Although our study focuses on the “pathway” between PO and EO, the data do not allow us to fully assess the existence of causal relationships. Future studies could address this issue, for example by adopting a qualitative/processual perspective or a longitudinal survey design.

Future studies should explore the dimensions of interest by involving multiple respondents at both the family level and the non-family level, given the relevance of the latter in knowledge sharing processes. Moreover, it would be interesting to explore the effect of various dimensions of family involvement on the PO-KS-EO relationship, employing a comprehensive operationalization of family influence (Astrachan, Klein, & Smyrnios, 2002). In the present study we adopted a stewardship perspective. Opportunities exist for future research to employ other theoretical lenses (e.g., agency view, capability perspective) to expand our understanding of the postulated relationships and related ones. It may also be interesting to introduce objective measures of entrepreneurial outcomes to supplement the subjective assessment of the relevant constructs. Direct measures of the levels of formalization and of the adoption of bureaucratic mechanisms should also be employed, to corroborate our arguments in relation to family firm heterogeneity. Finally, further studies might be carried out with larger samples, with the possibility of including additional control variables, to rule out confounding effects and further improve the robustness of the results.

6. Concluding Remarks

In conclusion, in this study the stewardship perspective serves as the foundation to sharpen our understanding of PO and knowledge sharing as key determinants of EO

and the moderating role of governance heterogeneity. We hope that this research informs, extends, and motivates future work on EO and its antecedents while investigating heterogeneous governance conditions within family-controlled firms.

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Appendix

<i>Variables</i>	<i>Items</i>
Psychological Ownership	PO1. We perceive the firm as part of the family PO2. We dedicate the necessary time to the family firm PO3. We identify ourselves with the family firm PO4. We feel that the family firm's problems are our own PO5. The family firm has great personal meaning for us
Knowledge Sharing	KS1: We share information that can be helpful to the family firm KS2: We keep information flow high to increase organizational effectiveness KS3: We seek helpful information to be shared within the family firm KS4. We share expertise to help resolve the family firm's problems KS5: We collectively offer innovative ideas that can benefit the family firm
Entrepreneurial Orientation	Innovation (INNO) INNO1: Our family firm prefers to strongly emphasize the R&D of the company's products INNO2: Our family firm has introduced new products/services, administrative techniques or technologies over the past 5 years INNO3: The changes in the family firm's products/services, administrative techniques or technologies have been significant Proactiveness (PROAC) PROAC1: Our family firm normally initiates changes upon which our competitors react PROAC2: Our family firm is often the first company to introduce new products/services, administrative techniques or technologies PROAC3: Our family firm normally takes on a competitive-oriented "beat-the-competitor" position Risk taking (RISK) RISK1: Our family firm has a strong tendency to become involved in high-risk projects RISK2: The business environment of the family firm is such that fearless and powerful measures are needed to achieve the company's objectives RISK3: In risky decision-making situations, our family firm normally takes a fearless and aggressive position

Tables and figures

Table 1. Loadings and cross-loadings for the measurement model

	PO	KS	PROAC	INNO	RISK	GC	GI	FI TMT	2°	3°	Age	Perf	Size
PO1	0.68	0.18	0.24	0.15	-0.07	-0.01	0.05	0.15	-0.10	0.04	-0.13	0.05	-0.02
PO2	0.68	0.30	0.25	0.14	-0.01	-0.16	0.03	-0.17	-0.11	0.09	-0.06	0.09	-0.16
PO3	0.84	0.25	0.21	0.15	-0.05	0.03	0.05	0.00	-0.09	0.05	0.06	0.14	-0.08
PO4	0.76	0.20	0.20	0.19	-0.03	-0.02	0.00	0.00	-0.13	0.09	0.04	-0.01	-0.09
PO5	0.86	0.43	0.43	0.43	0.05	-0.01	0.09	-0.08	-0.01	0.00	-0.06	0.26	-0.05
KS1	0.35	0.88	0.36	0.34	-0.04	0.00	0.03	-0.01	0.04	-0.10	0.01	0.12	-0.15
KS2	0.32	0.91	0.28	0.34	-0.12	0.05	-0.03	-0.08	0.11	-0.09	0.05	0.20	-0.25
KS3	0.35	0.85	0.32	0.34	-0.05	0.00	-0.01	-0.10	0.05	-0.06	0.09	0.32	-0.17
KS4	0.31	0.90	0.39	0.34	0.00	0.01	0.08	-0.03	-0.07	0.10	-0.02	0.23	-0.04
KS5	0.36	0.85	0.52	0.50	0.09	0.02	0.06	0.04	-0.02	0.01	0.02	0.14	-0.05
PROAC1	0.40	0.39	0.92	0.45	0.18	0.01	-0.03	-0.08	-0.12	0.11	0.01	0.38	0.12
PROAC2	0.33	0.43	0.90	0.43	0.34	-0.10	0.04	-0.04	-0.20	0.19	-0.14	0.23	0.08
PROAC3	0.27	0.35	0.84	0.36	0.39	-0.03	0.06	-0.09	0.03	0.01	-0.05	0.39	0.13
INNO1	0.23	0.44	0.45	0.81	0.17	0.07	0.00	0.01	0.13	-0.12	0.05	0.26	0.19
INNO2	0.34	0.35	0.35	0.85	0.15	-0.06	0.12	-0.23	0.09	-0.09	-0.02	0.23	0.17
INNO3	0.22	0.27	0.34	0.82	0.15	0.09	0.03	-0.12	0.12	-0.17	0.14	0.20	0.15
RISK1	-0.03	-0.02	0.34	0.20	0.97	0.06	0.17	0.01	-0.03	0.06	-0.03	0.10	0.10
RISK3	0.06	-0.01	0.22	0.12	0.80	0.09	0.08	-0.02	-0.01	0.01	0.04	0.09	0.00
GC	-0.04	0.01	-0.04	0.04	0.07	1.00	0.13	0.04	0.12	-0.16	0.78	0.10	-0.12
GI	0.07	0.04	0.02	0.06	0.16	0.13	1.00	-0.01	-0.06	0.03	0.00	0.03	-0.18
FI TMT	-0.05	-0.04	-0.08	-0.13	0.00	0.04	-0.01	1.00	-0.01	0.04	-0.09	-0.24	-0.21
2°	-0.10	0.02	-0.11	0.14	-0.02	0.12	-0.06	-0.01	1.00	-0.87	0.11	0.15	0.10
3°	0.06	-0.03	0.12	-0.15	0.05	-0.16	0.03	0.04	-0.87	1.00	-0.20	-0.09	-0.07
Age	-0.05	0.03	-0.06	0.06	-0.01	0.78	0.00	-0.09	0.11	-0.20	1.00	0.09	0.01
Perf1	0.11	0.11	0.20	0.20	0.12	0.09	0.03	-0.05	0.19	-0.15	-0.04	0.70	-0.06
Perf2	0.03	0.20	0.31	0.27	0.04	0.08	0.02	-0.05	0.20	-0.18	0.11	0.73	0.18
Perf3	0.17	0.21	0.33	0.19	0.01	0.06	0.01	-0.36	0.03	0.03	0.11	0.83	0.01
Perf4	0.22	0.17	0.30	0.22	0.17	0.08	0.02	-0.27	0.04	0.02	0.09	0.83	0.10
Size	-0.10	-0.14	0.12	0.21	0.08	-0.12	-0.18	-0.21	0.10	-0.07	0.01	0.09	1.00

Bold type shows the loading of the measurement items on the constructs to which they are assigned

Table 2. Construct reliability, convergent validity, and discriminant validity (Fornell-Larcker criterion)

	Mean	SD	CR	rho_A	AVE	1	2	3	4	5	6	7	8	9	10	11	12	13
1. PO	6.27	0.97	0.88	0.93	0.59	0.77												
2. KS	5.94	1.08	0.94	0.94	0.77	0.39	0.88											
3. PROAC	5.29	1.30	0.92	0.87	0.78	0.38	0.44	0.89										
4. INNO	5.94	1.20	0.87	0.78	0.68	0.32	0.44	0.47	0.83									
5. RISK	4.59	1.59	0.89	1.36	0.80	-0.02	-0.01	0.33	0.19	0.89								
6. GC	2.26	0.89	1.00	1.00	1.00	-0.04	0.01	-0.04	0.04	0.07	1.00							
7. GI	1.84	0.45	1.00	1.00	1.00	0.07	0.04	0.02	0.06	0.16	0.13	1.00						
8. FI TMT	70.09	29.38	1.00	1.00	1.00	-0.05	-0.04	-0.08	-0.13	0.00	0.04	-0.01	1.00					
9. Secondary	0.39	0.49	1.00	1.00	1.00	-0.10	0.02	-0.11	0.14	-0.02	0.12	-0.06	-0.01	1.00				
10. Tertiary	0.57	0.50	1.00	1.00	1.00	0.06	-0.03	0.12	-0.15	0.05	-0.16	0.03	0.04	-0.87	1.00			
11. Age	46.72	28.93	1.00	1.00	1.00	-0.05	0.03	-0.06	0.06	-0.01	0.78	-0.00	-0.09	0.11	-0.20	1.00		
12. Perf	5.02	1.24	0.86	0.79	0.60	0.17	0.22	0.37	0.28	0.11	0.10	0.03	-0.24	0.15	-0.09	0.09	0.78	
13. Size	79.14	139.63	1.00	1.00	1.00	-0.10	-0.14	0.12	0.21	0.08	-0.12	-0.18	-0.21	0.10	-0.07	0.01	0.09	1.00

SD: standard deviation; CR: Composite reliability; AVE: Average variance extracted

PO: psychological ownership; KS: knowledge sharing; PROAC: proactiveness; INNO: innovativeness; RISK: risk taking; GC: generation in control; GI: generational involvement; FI TMT: family members in the top management team; Perf: performance.

Diagonal elements (bold) are the square root of the variance shared between the constructs and their measures (average variance extracted). Off-diagonal elements are the correlations among constructs. For discriminant validity, diagonal elements should be larger than off-diagonal elements.

Table 3. Discriminant validity (heterotrait-monotrait ratio (HTMT))

	PO	KS	PROAC	INNO	RISK	GC	GI	FI TMT	2°	3°	Age	Perf	Size
PO													
KS	0.40												
PROAC	0.40	0.48											
INNO	0.34	0.49	0.57										
RISK	0.08	0.07	0.39	0.23									
GC	0.06	0.02	0.06	0.10	0.09								
GI	0.06	0.05	0.05	0.07	0.16	0.13							
FI TMT	0.12	0.06	0.09	0.17	0.02	0.04	0.01						
2°	0.13	0.07	0.15	0.16	0.02	0.12	0.06	0.01					
3°	0.08	0.08	0.12	0.17	0.04	0.16	0.03	0.04	0.87				
Age	0.10	0.05	0.08	0.10	0.05	0.78	0.00	0.09	0.11	0.20			
Perf	0.21	0.26	0.45	0.36	0.13	0.11	0.02	0.27	0.17	0.14	0.12		
Size	0.11	0.16	0.13	0.24	0.07	0.12	0.18	0.21	0.10	0.07	0.01	0.13	

PO: psychological ownership; KS: knowledge sharing; PROAC: proactiveness, INNO: innovativeness; RISK: risk taking; GC: generation in control; GI: generational involvement; FI TMT: family members in the top management team; 2°: secondary industry; 3°: tertiary industry; Perf: performance.

Table 4. Structural model results

Relationships	Model 1	Model 2	Model 3	f^2	Support
	SRMR cfm=0.076	SRMR cfm=0.076	SRMR cfm=0.072		
		$R^2_{KS} = 0.150 / Q^2_{KS} = 0.098$	$R^2_{KS} = 0.211 / Q^2_{KS} = 0.119$		
	$R^2_{PROAC} = 0.286 / Q^2_{PROAC} = 0.179$	$R^2_{PROAC} = 0.370 / Q^2_{PROAC} = 0.245$	$R^2_{PROAC} = 0.368 / Q^2_{PROAC} = 0.243$		
	$R^2_{INNO} = 0.223 / Q^2_{INNO} = 0.108$	$R^2_{INNO} = 0.330 / Q^2_{INNO} = 0.176$	$R^2_{INNO} = 0.328 / Q^2_{INNO} = 0.175$		
	$R^2_{RISK} = 0.021 / Q^2_{RISK} = -0.090$	$R^2_{RISK} = 0.021 / Q^2_{RISK} = -0.091$	$R^2_{RISK} = 0.021 / Q^2_{RISK} = -0.090$		
Secondary industry	-0.060 (0.715) ^{ns} [-0.28; -0.01]	-0.071 (0.758) ^{ns} [-0.29; -0.01]	-0.071 (0.76) ^{ns} [-0.29; -0.01]		
Tertiary industry	-0.038 (0.478) ^{ns} [-0.25; -0.01]	-0.040 (0.510) ^{ns} [-0.25; -0.01]	-0.041 (0.510) ^{ns} [-0.27; -0.01]		
Age	-0.018 (0.342) ^{ns} [-0.18; -0.01]	-0.031 (0.689) ^{ns} [-0.14; -0.01]	-0.031 (0.654) ^{ns} [-0.15; 0.00]		
Performance	0.314 (3.975) ^{***} [0.20; 0.45]	0.246 (3.456) ^{***} [0.17; 0.40]	0.246 (3.450) ^{***} [0.15; 0.39]		
Size	0.201 (2.388) [*] [0.04; 0.31]	0.254 (2.960) ^{**} [0.08; 0.35]	0.254 (3.049) ^{**} [0.09; 0.36]		
H1a: PO-PROAC	(c_1) 0.321 (3.529) ^{***} [0.18; 0.47]	(c_1') 0.201 (1.989) [*] [0.05; 0.38]	0.203 (2.069) [*] [0.04; 0.36]		Yes
H1b: PO-INNO	(c_2) 0.322 (2.546) ^{**} [0.10; 0.53]	(c_2') 0.187 (1.690) [*] [0.02; 0.38]	0.189 (1.674) [*] [0.01; 0.38]		Yes
H1c: PO-RISK	(c_3) -0.026 (0.375) ^{ns} [-0.22; -0.01]	(c_3') -0.016 (0.229) ^{ns} [-0.23; -0.01]	-0.015 (0.201) ^{ns} [-0.24; 0.00]		No
PO-KS= a_1		0.388 (3.952) ^{***} [0.22; 0.56]	0.389 (3.805) ^{***} [0.24; 0.57]		
KS-PROAC= b_1		0.331 (3.319) ^{***} [0.15; 0.47]	0.327 (3.084) ^{**} [0.13; 0.48]		
KS-INNO= b_2		0.366 (3.206) ^{***} [0.19; 0.55]	0.363 (3.151) ^{***} [0.19; 0.55]		
KS-RISK= b_3		-0.021 (0.262) ^{ns} [-0.25; -0.01]	-0.024 (0.287) ^{ns} [-0.27; -0.01]		
GC-KS			0.034 (0.562) ^{ns} [0.01; 0.20]		
GI-KS			0.019 (0.331) ^{ns} [0.01; 0.19]		
FI TMT-KS			-0.015 (0.275) ^{ns} [-0.18; -0.01]		
H3: POxGC-KS=a_2			-0.181 (1.759) [*] [-0.41; -0.09]	0.028	Yes
H4: POxGI-KS=a_3			0.072 (0.810) ^{ns} [0.02; 0.31]	0.006	No
H5: POxFI TMT-KS=a_4			0.141 (1.653) [*] [0.08; 0.39]	0.021	Yes

Table 5. Summary of mediating effect tests

Total effect on EO dimensions (Model 1)			Direct effect on EO dimensions (Model 2)			Indirect effect on EO dimensions (Model 2)				
Path	t		Path	t		Point estimate	t	Percentile bootstrap 95% CI	Sig	VAF
PO-PROAC (c_1)	0.321 ^{***}	3.529	PO-PROAC (c_1')	0.201 [*]	1.989	H2a: a_1b_1 (via KS)				
						PO-KS-PROAC	0.128 ^{**}	2.613	[0.05; 0.21]	Yes 39.88%
PO-INNO (c_2)	0.322 ^{**}	2.546	PO-INNO (c_2')	0.187 [*]	1.690	H2b: a_1b_2 (via KS)				
						PO-KS-INNO	0.142 [*]	2.113	[0.06; 0.27]	Yes 44.10%
PO-RISK (c_3)	-0.026 ^{ns}	0.375	PO-RISK (c_3')	-0.016 ^{ns}	0.229	H2c: a_1b_3 (via KS)				
						PO-KS-RISK	-0.008 ^{ns}	0.214	[-0.11; -0.01]	No 30.77%

Notes (Tables 4 and 5): PO: psychological ownership; EO: entrepreneurial orientation; PROAC: proactiveness; INNO: innovativeness; RISK: risk taking; KS: knowledge sharing; GC: generation in control; GI: generational involvement; FI TMT: family members in the top management team; cfm: composite factor model; CI: confidence intervals. Bootstrapping 95% confidence intervals in square brackets (based on n=500 subsamples); Sig. denotes a significant weight at 0.05; VAF: variance accounted for.

*** p < 0.001; ** p < 0.01; * p < 0.05; ns: not significant

Figure 1. Results of structural model analysis.

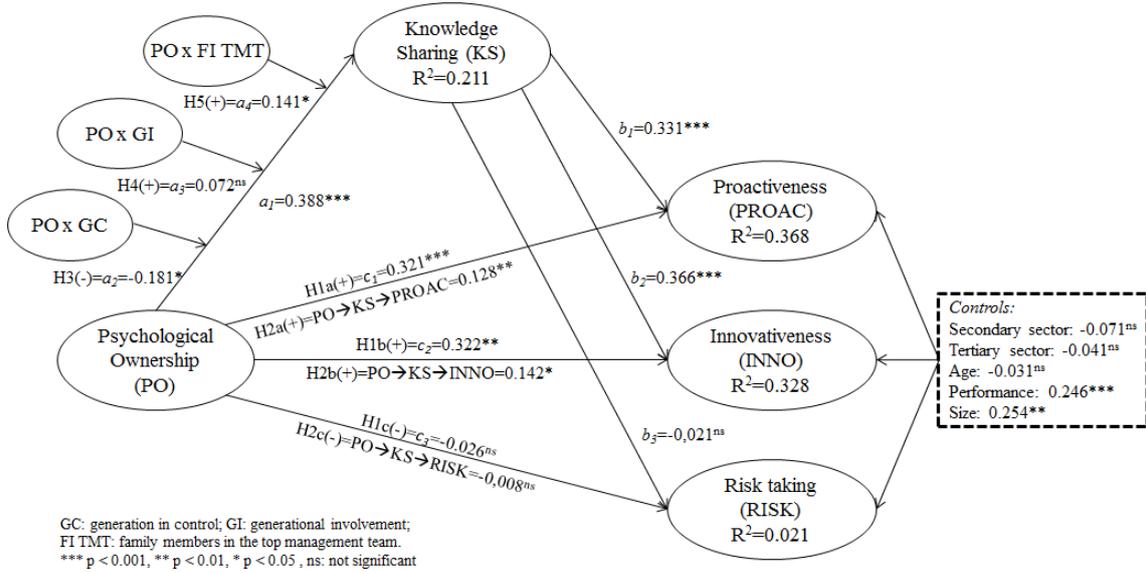


Table 6. Mediating and moderating effects

A.1) Conditional indirect effects of psychological ownership (PO) on proactiveness (PROAC) through knowledge sharing (KS) at values of generation in control (GC) and family members in top management team (FI TMT) as moderators											
Mediator	GC	Indirect Effect	Boot SE	Bias-corrected confidence interval		Mediator	FI TMT	Indirect Effect	Boot SE	Bias-corrected confidence interval	
				Lower	Upper					Lower	Upper
KS	-1.005	0.166	0.086	0.042	0.396	KS	-1.005	0.095	0.065	0.006	0.272
KS	0.000	0.130	0.066	0.039	0.312	KS	0.000	0.126	0.061	0.038	0.289
KS	1.005	0.094	0.073	0.010	0.341	KS	1.005	0.156	0.085	0.044	0.403

A.2) Conditional indirect effects of psychological ownership (PO) on innovativeness (INNO) through knowledge sharing (KS) at values of generation in control (GC) and family members in top management team (FI TMT) as moderators											
Mediator	GC	Indirect Effect	Boot SE	Bias-corrected confidence interval		Mediator	FI TMT	Indirect Effect	Boot SE	Bias-corrected confidence interval	
				Lower	Upper					Lower	Upper
KS	-1.005	0.178	0.101	0.044	0.467	KS	-1.005	0.102	0.063	0.016	0.287
KS	0.000	0.139	0.083	0.036	0.378	KS	0.000	0.134	0.076	0.037	0.351
KS	1.005	0.100	0.088	0.011	0.411	KS	1.005	0.167	0.113	0.032	0.485