

**TURNING AGENTS INTO PSYCHOLOGICAL PRINCIPALS:  
ALIGNING INTERESTS OF NON-OWNERS THROUGH PSYCHOLOGICAL  
OWNERSHIP**

**ABSTRACT**

Principals who delegate tasks to agents face the perennial challenge of overcoming agency problems. We investigate whether feelings of ownership among senior managers in the absence of formal ownership can align agents' interests with those of principals, thus turning agents into psychological principals. Using a moderated mediation model, we find that psychological ownership is positively related to company performance through the mediating effect of individual-level entrepreneurial behaviour. We also find that the effect of psychological ownership on individual-level entrepreneurial behaviour and, ultimately, company performance is weaker for high levels of monitoring compared to low levels. These findings offer important contributions to agency, psychological ownership, and entrepreneurship literatures.

*Keywords: agency theory, interest alignment, psychological ownership, psychological principals*

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## INTRODUCTION

Conventional wisdom tells us that no one cares about a company as much as its owners. Making non-owning agents think and act like owning principals is therefore a perennial challenge for many organizations. The vast literature on agency theory is devoted to analysing this problem (Daily, Dalton & Rajagopalan, 2003; Eisenhardt, 1989; Jensen & Meckling, 1976). Scholars have proposed different approaches to align the interests of owners and non-owners and reduce agency costs. Among these are bonuses, profit sharing, and stock ownership plans (Ang, Cole & Lin, 2000; Dalton, Daily, Certo & Roengpitya, 2003; Eisenhardt, 1989). However, these measures are costly and can crowd out intrinsic motivation (Block & Ornati, 1987; Chrisman, Chua, Kellermanns & Chang, 2007). In addition, owners may be hesitant to implement stock ownership plans because they dilute control rights. Another drawback to these approaches is that their link to actual company performance has not been firmly established (cp. Dalton et al., 2003; Pugh, Oswald & Jahera, 2000; Tosi, Werner, Katz & Gomez-Mejia, 2000). These inconclusive findings call for a fresh look at other factors that might help reduce agency costs.

With regard to stock ownership plans, scholars claim that for behavioural alterations among owners to occur, formal ownership must first induce *feelings of ownership* (Pierce & Furo, 1990; Pierce, Rubinfeld & Morgan, 1991). Presumably, these feelings only develop when ownership plans encompass certain rights associated with ownership, such as the right to obtain information and to exercise influence (Pierce & Furo, 1990). Agency theory implicitly assumes that more formal ownership automatically leads to stronger ownership feelings. Given the mixed findings regarding the performance effect of stock ownership plans, however, this assumption might not be universally valid. Put differently, a model that focuses only on formal aspects of ownership

and neglects its psychological elements is likely to be under-specified. Interestingly, ownership feelings may arise even in the absence of legal ownership (Pierce, Kostova & Dirks, 2001).

We build on these theoretical considerations by applying the concept of *psychological ownership* (Pierce, Kostova & Dirks, 2003), defined as "*the state in which individuals feel as though the target of ownership or a piece of that target is 'theirs'*" (Pierce et al., 2003, p. 86). We hypothesize that it is possible for the interests of agents to be aligned with those of principals in the absence of legal ownership for purely psychological reasons (Eisenhardt, 1989). Building on the notion of psychological ownership as a way to alleviate agency problems, we report (to our knowledge) the first empirical test of the argument that psychological ownership can turn agents into "*psychological principals*" (Pierce et al., 2003, p. 101), resulting in both psychological owners and principals sharing the goal of improving company performance (Chrisman et al., 2007; Dalton et al., 2003; Jensen & Meckling, 1976).

To establish the link between psychological ownership and company performance, we introduce *individual-level entrepreneurial behaviour* as a mediator in this relationship. We chose this variable to test our arguments for several reasons. First, individual-level entrepreneurial behaviour, generally understood as all actions taken by firm members that relate to the discovery and exploitation of entrepreneurial ideas and opportunities (Hornsby, Kuratko, Shepherd & Bott, 2009; Shane & Venkataraman, 2000; Smith & Di Gregorio, 2002), has been shown to be an antecedent of firm-level corporate entrepreneurship (Kuratko, Ireland, Covin & Hornsby, 2005). In turn, corporate entrepreneurship has been confirmed as a predictor of firm performance (Sharma & Chrisman, 1999; Zahra, Jennings & Kuratko, 1999). These established relationships allow us to deduce a theoretically defensible rationale that connects psychological ownership to company performance through individual-level entrepreneurial behaviour. Second, we contend

that within the broader context of entrepreneurship literature and agency theory, there is reason to believe that the behaviours that define entrepreneurial behaviour are likely to differ reliably as a function of whether someone is the owner or non-owner of a company. According to agency theory, an owner's ultimate goal is to improve company performance, thereby increasing the value of his or her ownership stake (Daily et al., 2003; Jensen & Meckling, 1976; McDonald, Khanna & Westphal, 2008). An obvious way to achieve this goal is to engage in individual-level entrepreneurial behaviour (Hornsby et al., 2009; Zahra et al., 1999). Assuming, in line with agency theory, that principals and agents will act in ways that advance their own interests, the former should be more willing to exhibit entrepreneurial behaviour than the latter simply because the economic benefits they derive from it are greater (Jensen & Meckling, 1976). Thus, it seems reasonable to suggest that one way to demonstrate whether psychological ownership can turn agents into psychological principals is to see whether agents with strong ownership feelings are more inclined, compared to those with weak ownership feelings, to exhibit a behaviour that should be observed more frequently from principals than agents.

Demonstrating an empirical relationship between agents' psychological ownership and company performance through entrepreneurial behaviour represents a first indication that ownership feelings in the absence of legal ownership can align the interests of agents and principals. However, we qualify this hypothesis by showing that the effectiveness of psychological ownership to create such alignment depends on the level of monitoring. Research suggests that monitoring through observation and constant evaluation, while being costly, can be an effective way of motivating agents to behave more like principals (Chrisman et al., 2007; Eisenhardt, 1989). Monitoring is an external influence on employee behaviour that operates independently of psychological ownership, but both work in the same direction of motivating

agents to act like principals. If so, and if our arguments related to agency theory and psychological ownership are correct, then the positive effect of psychological ownership on entrepreneurial behaviour and, ultimately, company performance should be stronger when monitoring is low and relatively weaker when monitoring is high. The reason is that high monitoring will have a strong beneficial effect on entrepreneurial behaviour of agents with low psychological ownership; when ownership feelings rise, however, the beneficial effect of high monitoring will be reduced due to interest alignment induced by psychological ownership. Our moderated mediation model (see also Preacher, Rucker & Hayes, 2007) is illustrated in Figure 1.

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We tested our hypotheses using a random sample of 714 non-owning senior managers from Switzerland and Germany. Our findings make three main contributions. *First*, we contribute to the broader agency theory literature by examining whether psychological ownership in the absence of legal ownership aligns the interests of agents and principals, thus establishing psychological ownership as a viable alternative to alleviate agency problems (Daily et al., 2003; Dalton, Hitt, Certo & Dalton, 2007; Eisenhardt, 1989) and suggesting a possible explanation for previous inconclusive findings regarding the effect of managers' stock ownership (Daily et al., 2003; Dalton et al., 2003; Pugh et al., 2000). *Second*, we contribute to the psychological ownership literature, as our study, to the best of our knowledge, is the first to empirically test the claim that psychological ownership can turn agents into psychological principals (Pierce et al., 2003). We also address psychological ownership scholars by proposing and empirically validating a link between ownership feelings and individual-level entrepreneurial behaviour (Avey, Avolio, Crossley & Luthans, 2009; Pierce, O'Driscoll & Coghlan, 2004). *Third*, our

findings contribute to the entrepreneurship literature by demonstrating that individual-level entrepreneurial behaviour is an appropriate indicator whether someone has ownership feelings or not. In addition, we extend existing literature (e.g., Kuratko, 2010; Kuratko et al., 2005) as we confirm a link between individual-level entrepreneurial behaviour and company performance.

## THEORETICAL FOUNDATIONS

### Agency theory

Agency theory has long been a dominant paradigm in organization and management theory (Daily et al., 2003; Eisenhardt, 1989; Wiseman & Gomez-Mejia, 1998). Its building block is the relationship between shareholders (principals) and managers (agents) (Berle & Means, 1932; Werner, Tosi & Gomez-Mejia, 2005), whereby "*the principal(s) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent*" (Jensen & Meckling, 1976, p. 5). This relationship introduces two main challenges to the maximization of organizational performance.

The first cause of so-called agency problems are incongruent interests of principal and agent, induced by individuals' tendency to be opportunistic, self-interested, risk averse, and limited by bounded rationality (Eisenhardt, 1989; Jensen & Meckling, 1976). Agents may diversify excessively, build empires (Tan & Peng, 2003), or adopt a low-risk/low-return strategy for the firm due to their inability to diversify employment risks (Cruz, Gomez-Mejia & Becerra, 2010). This misalignment of interests leads to goal conflicts and, ultimately, to agent behaviour that deviates from principals' desires. Second, agents can hide negative actions from principals due to information asymmetries, which make it difficult and expensive for the principal to verify the agents' actions (Ross, 1973). As a consequence, agents' self-serving behaviour cannot be

prevented by contracting, also because not all possible eventualities can be included in such a contract (Eisenhardt, 1989; Williamson, 1981). Unobservable behaviour may result from moral hazard, with the agent shirking his/her duties or may be induced by adverse selection, where an agent is hired based on misrepresentation of skills (Eisenhardt, 1989).

In light of these challenges, many agency writings have been trying to identify mechanisms to curb managerial mischief that is detrimental to company performance, the principals' ultimate interest (Daily et al., 2003; Jensen & Meckling, 1976; McDonald et al., 2008). To overcome information asymmetries and to detect agent behaviour, principals use monitoring mechanisms such as personal direct observation, regular assessment of short-term output, measuring progress toward long-term goals, consulting subordinates, punishments, and managerial processes (Chrisman et al., 2007). To align the interests of agents and principals, incentive systems such as bonuses, profit sharing, and stock ownership plans can be introduced (Ang et al., 2000; Brown, Sturman & Simmering, 2003; Nyberg, Fulmer, Gerhart & Carpenter, 2010). Agent stock ownership is presumed not only to align interests, but also to curb moral hazard, since agent wealth then co-varies with principal wealth (Dalton et al., 2003; Eisenhardt, 1989; Nyberg et al., 2010). However, stock ownership plans suffer from important disadvantages. Examples are costs incurred by the principal in the form of dividend payments and the need to share increased equity value. In addition, the dilution of ownership rights limits the principals' ability to exercise control (Morck, 1996) and to reap its private financial and non-financial benefits (Gomez-Mejia, Haynes, Nunez-Nickel, Jacobson & Moyano-Fuentes, 2007). Moreover, financial incentives in general may crowd out agents' intrinsic motivation (Block & Ornati, 1987; Osterloh & Frey, 2000), and the relationship between agent stock ownership and company performance is still a matter of debate (Daily et al., 2003; Dalton et al., 2003; Pugh et al., 2000; Tosi et al., 2000).

Agency theory, which is predicated on the idea that interest alignment through formal ownership is the necessary and sufficient condition for behavioural alterations of agents (Alchian & Demsetz, 1972; Fama & Jensen, 1983), suggests that agents who own shares will automatically alter their behaviour and seek to maximize the value of their ownership stake. However, psychology scholars have noted that formal ownership does not automatically produce favourable outcomes. Pierce and Furo (1990) argue that to be effective, stock ownership programs must not only provide the right to own equity, but also the right to obtain information and the right to exercise influence. Only when these rights are granted and perceived as such, a psychological sense of ownership will emerge (Pierce & Furo, 1990). And only when psychological ownership is present, behavioural consequences will occur in the next step (Pierce & Furo, 1990; Pierce et al., 1991). Without ownership feelings, *“it is unlikely that employee-owners will differ from non-owners”* (Pierce & Furo, 1990, p. 37). Ownership feelings, however, may even emerge in the complete absence of formal ownership (Pierce et al., 2003; Pierce et al., 2001). It thus seems reasonable to propose that ownership feelings without formal ownership can produce the same attitudinal and behavioural outcomes as formal ownership. At the same time, they avoid some of the disadvantages associated with agents' stock ownership. Psychological ownership is thus an alternative way of aligning agents' interests with those of principals.

### **Psychological ownership**

Psychological ownership builds on a long history of philosophical and psychological research on the genesis of possessive tendencies in the form that something is *“mine”* (see Etzioni, 1991; Furby, 1978). Research suggests that ownership may fulfil more than the utilitarian or instrumental function that is taken as axiomatic by agency theory (Pierce et al., 2003; Pierce et



al., 2001). Ownership, both legal and psychological, can satisfy three human motives. First, it can nurture feelings of efficacy, since “*to have*” is the ultimate form of control; being in control leads to the perception that one is “*the cause*” and, as such, has altered or is able to alter circumstances (Beggan, 1992). Second, ownership helps people define themselves, express their self-identity to others, and maintain the continuity of the self. As such, one’s actual or perceived possessions can forge identity and maintain self-continuity (Price, Arnould & Folkman Curasi, 2000). Finally, scholars suggest that a sense of place and, hence, the need for territoriality and security, may also be nurtured by ownership (Porteous, 1976).

A critical assumption of psychological ownership is that formal ownership is not necessary for ownership feelings and behavioural alterations to emerge (Pierce et al., 2001). For example, people may perceive a rented apartment as “*theirs*” and act upon this ownership feeling as if they were the legal owner (i.e., by cleaning or performing maintenance). This expectation builds on the premise that possessions can become part of the extended self (Belk, 1988; Dittmar, 1992) even in the absence of enforceable property rights. In contrast, as outlined before, it is also possible that legal owners do not exhibit ownership feelings (Pierce & Furo, 1990).

Due to the sense of possession as its conceptual core, psychological ownership differs from other constructs that might at first glance appear to share the same conceptual space (cp. Pierce et al., 2001; Van Dyne & Pierce, 2004). It asks, “*How much do I feel this organization is mine*” (Van Dyne & Pierce, 2004, p. 443). Organizational commitment asks: “*Why should I maintain my membership in this organization*” (cp. Meyer & Allen, 1997); organizational identification asks, “*Who am I*” (Dutton, Dukerich & Harquail, 1994) or “*How important is my membership in the organization for my identity/sense of self*” (Bergami & Bagozzi, 2000), and job involvement asks, “*How important is the job and job performance to my self-image*” (Lawler & Hall, 1970).

Psychological ownership also differs from stewardship. Stewardship theory assumes that managers value cooperative behaviour per se; that they are intrinsically motivated to act in good faith; and that they behave in the best interest of their organization, subordinating their personal interests (Davis, Schoorman & Donaldson, 1997; Donaldson, 1990). While this may be true sometimes, substantial empirical evidence shows that selfish, opportunistic behaviour of managers is prevalent (Ezzamel, 2005; Judge & Ferris, 1993; Tosi, Gomez-Mejia, Loughry, Werner, Banning, Katz, Harris & Silva, 1999). Psychological ownership basically retains agency theory's assumption of the self-interested manager, whereas the non-economic functions of ownership, such as efficacy, identity, and territoriality, might curtail expropriating behaviour and align the interests of agents and principals (cp. Pierce et al., 2003).

Psychological ownership can be observed across all organizational levels (Floyd & Wooldridge, 1997; Kellermanns, Walter, Lechner & Floyd, 2005) or even as a collective phenomenon (Pierce & Jussila, 2010). Research has documented numerous pro-organizational attitudinal and behavioural consequences of psychological ownership, such as increased affective commitment (Avey et al., 2009; Liu, Wang, Hui & Lee, 2012), extra-role behaviour (Pierce, Van Dyne & Cummings, 1992), organizational citizenship behaviour (Liu et al., 2012; Van Dyne & Pierce, 2004), job satisfaction (O'Driscoll, Pierce & Coghlan, 2006), and reduced workplace deviance (Avey et al., 2009). However, a link to individual-level entrepreneurial behaviour as a potential mechanism through which psychological ownership relates to company performance has not been investigated yet. Even more importantly, the central claim that agents who exhibit high levels of psychological ownership think and act as psychological principals even in the absence of legal ownership also remains empirically untested (see Pierce et al., 2003). To test this claim, relying on individual-level entrepreneurial behaviour seems appropriate, as it is

assumed to be a behavioural tendency that is rather attributed to principals than to agents. Hence, it allows us to evaluate whether agents with strong ownership feelings are more likely to exhibit principal-like behaviour.

### **Entrepreneurial behaviour**

Individual-level entrepreneurial behaviour is defined as the actions of managers that explicitly refer to the discovery and exploitation of unnoticed entrepreneurial opportunities (Kuratko, 2010; Shane & Venkataraman, 2000; Smith & Di Gregorio, 2002). While all managers are jointly responsible for entrepreneurial actions (Burgelman, 1983), individual-level entrepreneurial behaviour can vary across managerial levels (Kuratko et al., 2005). In particular, Hornsby et al. (2009) emphasize the critical role of senior managers, as entrepreneurial ideas and actions are more likely to arise from their activities than from tasks performed at lower managerial levels (Beal, 2000). For example, senior managers explicitly “*identify effective means through which new businesses can be created or existing ones reconfigured*” (Hornsby et al., 2009, p. 236) and scan the environment for opportunities and threats (Kraut, Pedigo, McKenna & Dunnette, 2005). Put differently, senior managers, as part of their jobs, frequently recognize, surface, and generate innovative and entrepreneurial ideas (Burgelman, 1983; Kraut et al., 2005; Shepherd, McMullen & Jennings, 2007) from within and outside the firm (e.g., by observing the market and competition) (see also Nonaka & Takeuchi, 1995). In addition, scholars regard efforts that support others, such as subordinates, in acting entrepreneurially as important element of entrepreneurial behaviour (Kuratko, 2010; Kuratko, Ireland & Hornsby, 2004).

The attributes that scholars have used to define individual-level entrepreneurial behaviour permit us to conceptually distinguish it from related concepts such as improvisation (which also

includes dimensions referring to pressure and persistence, see Hmieleski & Corbett, 2008; Hmieleski & Corbett, 2006) or proactiveness (which tends to neglect the idea generation dimension, see Bateman & Crant, 1993). As entrepreneurial behaviour explicitly refers to behaviour at the individual level, it is also distinct from firm-level entrepreneurship constructs. Corporate entrepreneurship, for instance, refers to firm-level activities “*aimed at creating new businesses in established companies through product and process innovations and market developments*” (Zahra, 1991, p. 262; Zahra et al., 1999). Similarly, entrepreneurial orientation (EO) has been conceptualized in terms of five dimensions that characterize and distinguish key entrepreneurial processes at the firm level and that provide the basis for entrepreneurial decisions and actions (Lumpkin & Dess, 1996; Rauch, Wiklund, Lumpkin & Frese, 2009).

## **HYPOTHESES**

Our theoretical starting point is the implicit assumption of agency theory that higher levels of formal ownership generate higher levels of ownership feelings. While formal ownership can be accompanied by low or non-existing ownership feelings, such feelings may arise even in the absence of formal ownership. To link psychological ownership, individual-level entrepreneurial behaviour, and firm performance, we draw from the basic claim of psychology literature that feelings of ownership have important attitudinal and behavioural effects (Beggan, 1992; Formanek, 1991; Pierce et al., 2003; Porteous, 1976).

More specifically, we propose that psychological ownership toward a company induces the agent’s strong desire to contribute to firm performance due to identity considerations. When agents experience a sense of place, belonging, and personal space regarding their company, they will experience “*mere ownership*” (Beggan, 1992) and develop feelings of attachment and

belonging (Pierce et al., 2003). As a result, the firm as the target of ownership feelings will play such a dominant role in their identity that it will become part of the person's extended self (Belk, 1988; Dittmar, 1992; Pierce et al., 2003). This experience is important because as William James (1890) observed, "*a man's Self is the sum total of all that he can call his [...]. All these things give the same emotions. If they wax and prosper, he feels triumphant; if they dwindle and die, he feels cast down*" (p. 291-292). Similarly, Formanek (1991) argues that the growth of possessions produces a positive and uplifting effect for the owner. Possessions also play a crucial role in social interaction as they communicate the individual's identity to others, which generates recognition and prestige (Dittmar, 1992; McCracken, 1986; Pierce et al., 2003). If a company forms an integral part of its owners' identity, and given that individuals strive to maintain and enhance identity (Korman, 1970; Pierce et al., 2001), then psychological owners should be highly motivated to contribute to strong firm performance, perhaps as much as principals (Chrisman et al., 2007; Jensen & Meckling, 1976; McDonald et al., 2008). We treat company performance in this paper as a multi-faceted construct that includes not only financial aspects, but also other elements such as job creation (Eddleston, Kellermanns & Sarathy, 2008).

Psychological owners can enhance company performance in many ways. Among the correlates of ownership feelings that can affect company performance are extra-role behaviour (Pierce et al., 1992), organizational citizenship behaviour (Liu et al., 2012; Pierce et al., 2004), and lower levels of workplace deviance (Avey et al., 2009). We suggest that individual-level entrepreneurial behaviour is another activity that could represent a mechanism through which psychological ownership can influence company performance and that differs reliably depending on whether someone is the owner or non-owner of a company. Building on the argument that individuals who feel they own an object behave differently than non-owners (Beggan, 1992;

Formanek, 1991; Porteous, 1976), we propose different routes through which ownership feelings of senior managers can motivate them to engage in entrepreneurial behaviour.

One of these routes is when ownership feelings induce a heightened sense of responsibility for the ownership target (Korman, 1970; Pierce et al., 2001). A sense of responsibility should lead managers to invest time and energy, assume greater personal risk (Pierce et al., 2001), promote change (Dirks, Cummings & Pierce, 1996), and engage in socially desirable behaviours (Cummings & Anton, 1990). It seems reasonable to suggest that the investment of time and energy, the assumption of risk, and the promotion of change are reflected in psychological owners who generate ideas and seek to exploit them (Burgelman, 1983; Kuratko, 2010; Smith & Di Gregorio, 2002). Furthermore, because a sense of responsibility induced by ownership feelings also raises awareness for socially desirable behaviour, psychological owners may be more inclined to support others in acting entrepreneurially, which is another attribute of individual-level entrepreneurial behaviour identified in the literature (Kuratko, 2010).

A second route that connects ownership feelings with entrepreneurial behaviour is empowerment. Van Dyne and Pierce (2004) suggest that ownership feelings are related to feelings of empowerment (Spreitzer, 1995), whereby empowered individuals believe they are autonomous and have an impact. This increases the likelihood that those individuals will be creative, innovative, and expect success (Amabile, 1988; Redmond, Mumford & Teach, 1993). Indeed, a link between feelings of empowerment, the initiation of change and innovative behaviour is strongly supported by previous studies (see overview by Spreitzer, 1995). If psychological owners feel empowered, and if empowerment is linked to creativity, innovation, and change stimulation, then there should be a positive link between psychological ownership and individual-level entrepreneurial behaviour, which is essentially about discovering and

exploiting innovative ideas and opportunities (Burgelman, 1983; Kuratko, 2010; Smith & Di Gregorio, 2002).

The third route through which ownership feelings can drive entrepreneurial behaviour is the need for efficacy and control. Individuals have an inherent need for efficacy and seek to produce desired outcomes (White, 1959). This desire to satisfy this need propels them to explore and manipulate their environment (Pierce et al., 2003). Psychological owners tend to feel they have some control over the firm (Pierce et al., 2003; White, 1959), which can lead them to believe that they are entitled to have a voice in decisions that impact the ownership target (Pierce et al., 1991). We argue that enhanced perceptions of control can influence them to try to alter activities and processes in a company, which enhances perceptions of self-efficacy (Beggan, 1992; White, 1959). To exercise and demonstrate control over the firm to oneself and to others (Dirks et al., 1996) and to nurture individual self-efficacy, senior managers who experience psychological ownership may engage in entrepreneurial behaviour. Generating new ideas, identifying and exploiting entrepreneurial opportunities, as well as helping others in such attempts, is likely to fundamentally change key aspects of the company, such as markets served, product range, production processes, and technologies applied. Such changes signal control and ability to act, ultimately strengthening perceptions of self-efficacy. Indeed, the positive link between self-efficacy and entrepreneurial action has been well documented (Chen, Greene & Crick, 1998; Zhao, Hills & Seibert, 2005).

Finally, we draw on the traditional agency theory argument whereby legal ownership enhances the proclivity to invest in innovation and to act in novel ways (Cho, 1998; Hill & Snell, 1989). For legal ownership to generate these effects, however, ownership feelings must first evolve (Pierce & Furo, 1990; Pierce et al., 1991). Following our theoretical reasoning, we expect

the same effects to occur when ownership feelings exist in the absence of formal ownership (Pierce et al., 2003). Investing in innovation and acting in novel ways link ownership feelings with entrepreneurial behaviour, as the latter directly refers to innovative ideas and novel ways of action. Based on our discussion of the four routes through which psychological ownership might motivate entrepreneurial behaviour we test the following hypothesis:

*H1: Psychological ownership of agents toward their company is positively related to their individual-level entrepreneurial behaviour.*

Literature views individual-level entrepreneurial behaviour as a core aspect of and critical antecedent to firm-level corporate entrepreneurship. It is the behaviour through which the latter is practiced and put into action in established organizations (Hornsby, Kuratko & Zahra, 2002; Kuratko et al., 2004; Kuratko et al., 2005); it constitutes corporate entrepreneurship's operational essence (Hornsby et al., 2002; Kuratko, 2010). In a similar vein, Burgelman (1983) finds that the "motor" of corporate entrepreneurship resides in the autonomous initiatives of individuals within the organization (p. 241). Put differently, individual-level entrepreneurial behavior is the foundation for implementing corporate entrepreneurship at the firm level (Kuratko, 2010; Smith & Di Gregorio, 2002). Corporate entrepreneurship, in turn, is the conduit through which individual-level entrepreneurial behavior leads to competitive advantage (Dess, Lumpkin & McGee, 1999; Kuratko, Hornsby, Naffziger & Montagno, 1993) and improved company performance (Zahra, 1991). Indeed, the positive link between corporate entrepreneurship and company performance is well established (Covin & Slevin, 1991; Guth & Ginsberg, 1990; Rogoff & Heck, 2003). Combining these arguments, we expect individual-level entrepreneurial behaviour of psychological owners to be positively related to company performance, which is the ultimate goal of both psychological owners and principals:



*H2: Individual-level entrepreneurial behaviour of agents exhibiting psychological ownership toward their company is positively related to company performance.*

The preceding arguments explain why ownership feelings are positively related to individual-level entrepreneurial behaviour and why the latter is positively related to company performance. To further justify these links we draw from expectancy theory (Steel & Konig, 2006; Vroom, 1964). It assumes that the value of a first-level outcome is a function of the instrumentality of that behaviour for the actor and the value of the second-level (organizational-level) outcome associated with that behaviour (Pierce et al., 1991). In our model, individual-level entrepreneurial behaviour is a first-level outcome with high value for the psychological owner, as discussed previously. Company performance is a second-level organizational outcome associated with entrepreneurial behaviour that has high value itself, as it constitutes the main goal of psychological owners. In sum, our theorizing suggests that entrepreneurial behaviour mediates the relationship between psychological ownership and company performance (Baron & Kenny, 1986; Preacher & Hayes, 2008b). Consequently, we hypothesize the following:

*H3: Individual-level entrepreneurial behaviour mediates the relationship between agents' psychological ownership and company performance.*

### **Monitoring of Psychological Owners**

Monitoring mechanisms such as direct observation of the agent, performance evaluation, and assessing progress toward goals can alleviate information asymmetries between principals and agents (Eisenhardt, 1989). By making behaviour more transparent, monitoring helps to curb opportunism (Eisenhardt, 1989; Ross, 1973) and motivates positive behaviour (Chrisman et al., 2007). Building on this assumption, we extend our previous predictions by suggesting that the

relationship between psychological ownership, entrepreneurial behaviour, and company performance is contingent on the level of monitoring.

Under low levels of monitoring, a strong positive relationship between psychological ownership and individual-level entrepreneurial behaviour is likely to be observed. This will occur because when both monitoring and psychological ownership are low, agency theory predicts that agents are inclined to shirk their duty and do not invest their limited resources in entrepreneurial activities that are in the principal's interest but in not theirs. However, increases in psychological ownership motivate entrepreneurial behaviour through the routes of heightened responsibility, empowerment, efficacy, sense of control, proclivity to invest in innovation, and acting in novel ways even when monitoring is low.

Under high levels of monitoring, we expect the relationship between psychological ownership and individual-level entrepreneurial behaviour to be weaker. When monitoring is high and psychological ownership is low, managerial mischief and opportunism will be curbed in accordance with the traditional agency argument (Chrisman et al., 2007; Eisenhardt, 1989; Jensen & Meckling, 1976). Building on our previous arguments, a high level of monitoring should therefore encourage entrepreneurial behaviour among agents with low psychological ownership. When psychological ownership increases, however, there is a stronger alignment of interests between agents and principals (Pierce et al., 2003). For agents with high psychological ownership, though, high levels of monitoring are essentially superfluous, as they are already motivated to act like principals (Chrisman et al., 2007; Jensen & Meckling, 1976; Ross, 1973). Put differently, the marginal beneficial effect of high levels of monitoring on entrepreneurial behaviour is reduced, although not completely erased, due to alignment of interests induced by psychological ownership. Hence, we expect that under conditions of high monitoring, the

difference in entrepreneurial behaviour between weak and strong psychological owners is lower than under conditions of low monitoring, mainly because high monitoring brings weak psychological owners' entrepreneurial behaviour closer to that of strong psychological owners. Hence, the positive effect of psychological ownership on individual-level entrepreneurial behaviour should be stronger when monitoring is low compared to when it is high:

*Hypothesis 4a: Monitoring moderates the positive relationship between agents' psychological ownership and their individual-level entrepreneurial behaviour such that the relationship is stronger when monitoring is low compared to when it is high.*

We further propose that monitoring conditionally influences the strength of the hypothesized indirect relationship between psychological ownership and company performance through individual-level entrepreneurial behaviour, as formally stated below:

*Hypothesis 4b: Monitoring moderates the positive and indirect effect of agents' psychological ownership on company performance (through agents' individual-level entrepreneurial behaviour) such that the relationship is stronger when monitoring is low compared to when it is high.*

## **METHOD**

### **Sample and Procedure**

We purchased addresses of managers from the two largest professional address data providers in Switzerland and Germany. The selection criterion was “*senior managers*”, defined as heads or directors of various departments (e.g., marketing, research and development, production, logistics, human resources, sales). These senior managers are considered as credible key informants (Kumar, Stern & Anderson, 1993). No further selection criteria were applied, which allowed us to randomly retrieve 10,750 valid email addresses. We sent those managers an email with a link to an identification-based online survey instrument that prevented multiple responses. With one reminder email, we achieved a response rate of 9.5%. Research shows that a 10-12%

response rate is typical for studies that target managers in mid-sized firms (MacDougall & Robinson, 1990) and executives in upper echelons (Geletkanycz, 1998; Koch & McGrath, 1996). Our rate of 9.5% is thus comparable to studies in similar settings. We used only fully completed questionnaires for our analyses and excluded managers who own company shares, given our interest in ownership feelings in the absence of legal ownership. This resulted in a final sample of 714 respondents. Managers' mean age is 45.9 years (S.D. = 8.68); 28.6% are female. Mean tenure with the firm is 12.33 years (S.D. = 9.41 years); 60.5% hold a University or University of Applied Science ("*Fachhochschule*") degree. Average company size is 1009.7 employees (S.D. = 4'200.81; range = 22 - 65'000; median = 250), with 55.8% of the companies in the manufacturing and 25.3% in the service sector. Mean firm age is 75.42 years (S.D. = 61.78); only approximately 3 per cent of all firms are publicly held.

## Measures

**Psychological ownership.** We used a seven-item instrument developed and validated by Pierce et al. (1992) and Pierce et al. (2004) which is commonly used in empirical psychological ownership studies (e.g., Liu et al., 2012; O'Driscoll et al., 2006). Sample items include "*This is my organization*" and "*I feel a very high degree of personal ownership for this organization.*" The seven-point Likert-type scale ranges from 1 = *strongly disagree* to 7 = *strongly agree*. Cronbach's Alpha is 0.88. After translating the scale from English into German, two independent bilingual experts unfamiliar with the original scale re-translated the items from German into English. Together with a native English speaker, the original English version of the scale was compared with the translation. No major differences were found. This translation procedure was applied to all measures. All items appear in Appendix A.

**Entrepreneurial behaviour.** As illustrated, individual-level entrepreneurial behaviour of senior managers is conceptually distinct from firm-level constructs such as corporate entrepreneurship or entrepreneurial orientation (EO). It refers to individuals' actions related to the discovery and exploitation of unnoticed entrepreneurial opportunities (Smith & Di Gregorio, 2002). These actions include identifying new means to create new businesses or reconfigure existing ones (Hornsby et al., 2009), scanning the environment for opportunities and threats (Kraut et al., 2005), recognizing, surfacing, and generating innovative and entrepreneurial ideas by observing the market and competition (Burgelman, 1983; Kraut et al., 2005; Shepherd et al., 2007), as well as helping others to act entrepreneurially (Kuratko, 2010). Building on this definition, we relied on the following six items as they adequately reflect the constructs' core essence as defined in the literature in general and the context of senior managers in particular:<sup>1</sup>

*"I often make innovative suggestions to improve our business"* (based on Eddleston & Kellermanns, 2007); *"I often generate new ideas by observing the world"*; *"I often come to new ideas when observing how people interact with our products and services"*; *"I often generate new ideas by observing our customers"* (based on Dyer et al., 2008); *"I boldly move ahead with a promising new approach when others might be more cautious"*; and *"I devote time to help others find ways to improve our products and services"* (see Pearce et al., 1997). The Likert-type scale ranges from 1 = *strongly disagree* to 7 = *strongly agree*; Cronbach's Alpha is 0.83.<sup>2</sup>

**Monitoring.** Four items from Chrisman et al. (2007) were used. Sample items include *"In our company there is personal, direct observation"*; *"In our company, short-term performance is evaluated regularly"*; and *"To assess my performance, input from other managers and subordinates is used."* Items range from 1 = *strongly disagree* to 7 = *strongly agree* on a seven-point Likert-type scale. Cronbach's Alpha is 0.70.

**Company performance.** Because reliable performance data about privately held firms, which represent the majority of the firms in our sample, are very difficult to obtain, it is customary to rely on self-reported performance data. We asked respondents to rate their company's current performance compared to their competitors in five areas: growth in sales, growth in market share, growth in profits, job creation, and growth in profitability (adapted from Dess & Robinson, 1984; Eddleston et al., 2008). Performance indicators were measured on a seven-point Likert-type scale ranging from *worse* (1) to *better* (7). Cronbach's Alpha is 0.93.<sup>3</sup>

**Control variables.** We used dummy variables for industry and service sectors, as the competitive environment of a company may impact entrepreneurial activities and performance (cp. Antoncic & Hisrich, 2001). Variables were coded "0" for companies not active in the respective industry and "1" otherwise. We also controlled for company age and size as well as respondents' age, gender, and tenure (see Hornsby et al., 2009). For gender, we used a dummy variable with "0" for female and "1" for male. As company size is not normally distributed, we used its natural logarithm. Also, we controlled for the presence of incentive-based pay systems that may create interest alignment next to formal ownership (e.g., Block & MacMillan, 1993) by using a dummy variable, coded "1" in the presence of such pay systems, and "0" otherwise.

## RESULTS

To test for non-response bias, data from early and late respondents were compared using ANOVA, a test based on the assumption that late respondents are more similar to non-respondents than are early respondents (cp. Oppenheim, 1966). We found no significant differences in the mean scores of our variables. In addition, we compared the answers of managers who completed the whole survey with the answers of those who filled out only part of

the survey and dropped out before completion. For the variables that were available for both groups, we did not detect any significant differences in the respective mean scores. This indicates that non-response bias is not a serious problem in our sample.

To address the potential of common method bias, we conducted Harman's one factor test (Harman, 1967; Podsakoff & Organ, 1986). Even though it is not without limitations, this procedure is still commonly used. An exploratory factor analysis with all our study variables (cp. Podsakoff, MacKenzie, Lee & Podsakoff, 2003) leads to a four-factor solution which accounts for 57.12% of the total variance. The first factor explains 28.44% of the variance, which provides initial evidence that common method bias is not a major problem because no single factor accounts for the majority of variance. As additional precaution and to assess the validity and distinctiveness of our measures for psychological ownership, individual-level entrepreneurial behaviour, company performance, and monitoring, we conducted a confirmatory factor analysis (Podsakoff et al., 2003). The corresponding structure shows an acceptable fit ( $\chi^2(150) = 1117.4$ , GFI = 0.902, CFI = 0.904, RMSEA = 0.079). The results of a one-factor structure are significantly worse ( $\chi^2(170) = 6330.4$ , GFI = 0.577, CFI = 0.386, RMSEA = 0.188; difference in  $\chi^2 = 5213$ , df = 20,  $p < 0.001$ ). We also centred the variables (Aiken & West, 1991) and found that the Variance Inflation Factor does not exceed 2.3 and that the condition index does not exceed 2.96. This suggests that multicollinearity is not a concern (Hair et al., 2006).

We tested our moderated mediation model in two steps (cp. Preacher et al., 2007). First, we tested a simple mediation model (Hypotheses 1-3). Second, we tested the proposed moderation effect (Hypothesis 4a) and the overall moderated mediation model (Hypothesis 4b). To test the mediation model, we applied the SPSS macro of Preacher and Hayes (2008a) which combines the stepwise procedure of Baron & Kenny (1986) with the Sobel test and also allows

bootstrapping. This macro has been applied in recent studies that investigate mediation effects (e.g., Cole, Walter & Bruch, 2008; Ng & Chan, 2008). The moderated mediation effect, also known as conditional indirect effect, is tested with another SPSS macro developed by Preacher et al. (2007). It tests for a statistically significant indirect effect which depends on the value of a moderator, including the recommended bootstrapping (see also Cole et al., 2008; Ng & Chan, 2008). Means, standard deviations, and Pearson correlations appear in Table I.

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 Insert Table I about here  
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Table II presents the results for Hypotheses 1-3. There is a positive significant relationship between psychological ownership and individual-level entrepreneurial behaviour, supporting Hypothesis 1 ( $\beta = 0.16$ ,  $p < 0.001$ ). In support of Hypothesis 2, we find a positive significant relationship between individual-level entrepreneurial behaviour and performance ( $\beta = 0.12$ ,  $p < 0.001$ ). We also reveal an indirect effect of psychological ownership on company performance, which supports Hypothesis 3. The formal two-tailed significance test shows that the indirect effect is significant ( $z = 3.25$ ,  $p < 0.01$ ). Bootstrap results confirm the Sobel test with a bootstrapped 99% CI around the indirect effect not containing zero (0.003, 0.042). The direct effect of psychological ownership on performance is smaller than the total effect, indicating partial mediation (Baron & Kenny, 1986; Preacher & Hayes, 2008b).

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 Insert Table II about here  
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With entrepreneurial behaviour as the dependent variable, Table III shows that the interaction term of psychological ownership and monitoring is significant and negative ( $\beta = -0.05$ ,  $p < 0.05$ ), supporting Hypothesis 4a. To illustrate the interaction effect, we plotted simple slopes one standard deviation below and one above the mean of the monitoring measure (Figure 2).



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Insert Table III and Figure 2 about here  
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Table III also shows that the interaction term of psychological ownership and monitoring is negatively significant in the dependent variable model ( $\beta = -0.07$ ,  $p < 0.01$ ), which supports Hypothesis 4b. In addition, we examined the conditional indirect effect of psychological ownership on performance through individual-level entrepreneurial behaviour at three values of monitoring: the mean (4.19) as well as one standard deviation above (5.21) and below (3.17) the mean. Normal-theory tests show that the conditional indirect effect is significant ( $p < 0.05$ ) only for the two lower values of monitoring. Applying the Johnson-Neyman method in the macro of Preacher et al. (2007) reveals that the conditional indirect effect is significant at  $p < 0.05$  for values of monitoring between 3.1 and 4.6.

## DISCUSSION

Our study investigates whether ownership feelings in the absence of formal ownership can align agents' interests with those of principals, thus turning agents into psychological principals. Applying a moderated mediation model to a sample of 714 non-owning senior managers from two European countries, we show that individual-level entrepreneurial behaviour mediates the positive relationship between psychological ownership and company performance, whereas this indirect effect depends on the level of monitoring.

Our findings make several contributions to the literature. First, our study complements standard agency writings that have emphasized formal ownership of managers (see Daily et al., 2003; Dalton et al., 2003; Pugh et al., 2000) by showing that psychological ownership without formal ownership can align the interests of agents and principals. One advantage of

psychological ownership over other proposed remedies is that it avoids the costs associated with agent stock ownership. As high monitoring becomes increasingly ineffective with rising ownership feelings, monitoring agents with strong ownership feelings could be reduced, which would lower agency costs. Our findings also offer agency theorists a possible explanation of the inconclusive results regarding the effect of agents' stock ownership on company performance (Daily et al., 2003; Dalton et al., 2003; Pugh et al., 2000). As Pierce and Furo (1990) note, formal ownership will only lead to behavioural consequences if ownership feelings are first created. And for these ownership feelings to emerge, stock ownership programs need to provide rights to obtain information and to exercise influence in addition to the right to hold shares. Even though we investigate psychological ownership as an alternative to legal ownership and do not test for their interaction, the fact that, in many studies, stock ownership of managers fails to generate the intended performance effects might be due to the failure of formal ownership programs to create sufficiently high levels of psychological ownership. By showing that ownership feelings in the absence of legal ownership align the interests of principals and agents, we complement the "*I own – I do*" relationship from standard agency theory with the "*I feel I own – I do*" relationship from psychological ownership literature.

It is important to reiterate that our underlying assumption about managers is consistent with agency theory. That is, agents are self-centred and seek to achieve their own goals through the pursuit of individual-level entrepreneurial behaviour, which leads to enhanced company performance. However, we depart from standard agency theory assumptions by arguing that formal ownership is not a necessary precondition to incentivize agents to align their goals with those of the principal. Since perceptions of ownership fulfil basic human needs, such as efficacy,

identity, and territoriality, it is psychological owners' experience of non-financial benefits of ownership that can lead to interest alignment and the curtailment of expropriating behaviour.

We do not, however, support the absence of opportunism that is argued for under the stewardship, identification, and commitment theory umbrellas (e.g., Davis et al., 1997; Mael & Ashforth, 1992; Mowday, Porter & Steers, 1982). Scholars who take this position generally believe that monitoring systems predicated on the risk of opportunism are counterproductive. This is because they undermine stewards' pro-organizational desires, signal distrust, lead to relationships dominated by utilitarian quid pro quo economic exchanges through the use of incentives and crowd out pro-organizational behaviour in general (Deci, Koestner & Ryan, 1999; Takahashi, 2000). Hence, if psychological owners were stewards, they would reduce their absolute level of entrepreneurial behaviour when being monitored. We do not find such an effect. Taken together, we do not regard managers as selfless and altruistic stewards, but rather as opportunistic agents who reciprocate since doing so advances their own cause.

A second contribution of our study is to the psychological ownership literature. Ours is the first study we know of to empirically verify the claim that psychological ownership turns agents into psychological principals (Pierce et al., 2003). Our findings underline the relevance of psychological ownership and give psychological ownership scholars empirical reasons for connecting their work with that of agency theorists. In addition, our results speak to those scholars who have focused on the outcomes of psychological ownership (Avey et al., 2009; Liu et al., 2012). Based on theoretical arguments and empirical evidence, we introduce individual-level entrepreneurial behaviour and, indirectly, company performance as new correlates. Furthermore, we also address the question of whether psychological ownership converts agents into stewards (Pierce et al., 2003). As demonstrated, we do not find evidence for this claim. Our

results also address the issue of a potential downside of psychological ownership (Pierce et al., 2003). Arguments pertaining to a preventive part of psychological ownership (Avey et al., 2009) or defensive territorial behaviours (Brown, Lawrence & Robinson, 2005) suggest that excessive levels of ownership feelings could lead to less individual-level entrepreneurial behaviour. However, both our theoretical reasoning and our empirical findings show the opposite. In addition, a post-hoc test for a curvilinear relationship between psychological ownership and individual-level entrepreneurial behaviour was not significant.

A third contribution of our study is to the literature on entrepreneurship. We show that individual-level entrepreneurial behaviour is an effective way of assessing whether ownership feelings are expressed, which complements existing research on that type of behaviour (e.g., Kuratko et al., 2005) and illustrates the value that entrepreneurship research could have in the agency theory context. We also provide empirical support for the arguments of some scholars who view individual-level entrepreneurial behaviour as an antecedent to corporate entrepreneurship (Hornsby et al., 2002; Kuratko et al., 2005) and who investigate the corporate entrepreneurship-performance link (Covin & Slevin, 1991; Zahra, 1995). Combining these perspectives led us to hypothesize and confirm a previously untested link between individual-level entrepreneurial behaviour and company performance. Lastly, while past entrepreneurship research has mainly considered organizational factors as antecedents to entrepreneurial behaviour (Hornsby et al., 2009; Hornsby et al., 2002; Kuratko et al., 2005), we emphasize the importance of individual-level factors such as psychological ownership.

For practitioners, our study offers valuable insights by introducing a new way to contend with agency problems. Our findings suggest that company owners should seriously consider the effects of increasing psychological ownership among non-owning managers (Pierce et al., 2003;

Pierce et al., 2004). Doing so could allow them to forego the use of costly incentives and stock ownership plans as interest alignment mechanisms. Since formal ownership is not necessary for ownership feelings, this approach might be especially appealing to family firms, which constitute the majority of firms around the world (Astrachan & Shanker, 2003; Sharma, 2004). This is due to the fact that diluting control by giving shares to non-family managers opposes the dominant wish of many families to maintain transgenerational control (Chua, Chrisman & Sharma, 1999; Gomez-Mejia et al., 2007).

### **LIMITATIONS AND FUTURE RESEARCH**

Notwithstanding its theoretical and practical contributions, we would be remiss not to note the limitations of our study. First, we cannot derive conclusions with regard to causality because we used cross-sectional survey data. However, we think that our theoretical reasoning, our empirical tests, the collection of multiple responses for a subset of firms, the validation of our subjective dependent variable using objective data, as well as our additional precautions against common method bias lend validity to our measures and results. Second, our findings may be limited by the moderate response rate of 9.5%. However, based on sample characteristics and tests for non-response bias we are confident that our data constitute a representative sample. Third, we cannot rule out that social desirability bias is present in our data. If so, however, we believe that our central variables are equally susceptible to such a bias, as they all refer to positively connoted pro-organizational attitudes, behaviours, and outcomes. Hence, we suggest that the nature of the relationships between our variables would not be fundamentally altered. Last, there might be a cultural bias, as all respondents are from Germany and Switzerland. While these two countries can be regarded as very similar in cultural terms (cp. Hofstede, 2001), a cultural bias might exist

in comparison to other countries. Legal arrangements, social elements and culture as a context factor may differ between countries and may influence conceptualizations of ownership and related feelings (Pierce et al., 2003; Rousseau & Shperling, 2003).

The findings of our study open up numerous avenues for future research, which, in turn, could also address the abovementioned limitations. First, we encourage agency theory scholars to delve deeper into the examination of the effectiveness of stock ownership plans. Here, the role of psychological ownership could be investigated in more detail. Examples are levels of agent stock ownership and characteristics of ownership programs that are most likely to foster ownership feelings (cp. Ang et al., 2000; Pierce & Furo, 1990) as well as the joint effects of formal and psychological ownership (cp. Pierce & Furo, 1990). As a whole, this might better explain the (in-)effectiveness of stock ownership (Daily et al., 2003; Dalton et al., 2003; Pugh et al., 2000). Next to psychological ownership, we also recommend the application of individual-level entrepreneurial behaviour in the agency theory context, as we have shown that it is a reliable mean to evaluate agents' expression of ownership feelings. In addition, as psychological ownership can lead to different behavioural and attitudinal consequences (Pierce et al., 2003) and as we find a partial mediation effect of entrepreneurial behaviour, it could be useful for agency scholars to test alternative mediators such as affective commitment or organizational citizenship behaviour (Avey et al., 2009) in a moderated mediation model. While many agency theory studies focus only on the CEO level (Cruz et al., 2010), we encourage researchers to test our model on different managerial hierarchy levels, since hierarchy might affect pro-organizational behaviour (Hornsby et al., 2009). Second, we note for psychological ownership scholars that ownership feelings, unlike legal ownership, do not protect agents from owner opportunism such as hold-up (Rajan & Zingales, 1998; Williamson, 1985). In this context, it may thus be of interest

to examine how stable or fragile such feelings are in light of the decisions and behaviours of the formal owners. As psychological ownership is thought to foster feelings of burden-sharing with the organization (Pierce et al., 2003), it may also be valuable to explore the advantages and disadvantages of psychological ownership in the face of economic decline. Third, we encourage entrepreneurship scholars to expand their research into the agency theory domain, as the construct of individual-level entrepreneurial behaviour may enrich traditional agency research by taking a fresh look at the effect of stock ownership programs. Finally, building on the fact that our sample included respondents from Germany and Switzerland only, we call for a replication of our study in other cultural contexts with differing conceptualizations of ownership to see if our findings are upheld (Rousseau & Shperling, 2003).

## **CONCLUSION**

Summing up, our study shows that psychological ownership is a viable way to alleviate agency problems. Our moderated mediation model tested on a sample of 714 non-owning senior managers shows that psychological ownership can turn agents into psychological principals. Adding to one of the most vivid discussions in managerial theory, our study provides fresh insights for research and practice and opens up many promising avenues for future research.

## NOTES

<sup>1</sup> We also considered the Pearce, Kramer and Robbins (1997) and the Dyer, Gregersen and Christensen (2008) scales for entrepreneurial and innovative behaviour as measurement instruments. However, while both scales capture certain aspects of individual-level entrepreneurial behaviour as defined in the literature, they are incomplete or biased in certain dimensions. The Pearce et al. (1997) scale is geared towards proactiveness and does not adequately capture entrepreneurial aspects such as idea generation. The Dyer et al. (2008) scale captures the idea generation element, but has a much broader scope that reaches beyond the main definition of entrepreneurial behaviour, for instance by including networking activities. We wish to thank an anonymous reviewer for pointing at these aspects.

<sup>2</sup> Next to face validity, statistical tests indicate that our measure appropriately captures individual-level entrepreneurial behaviour as defined in the literature. First, our Cronbach's Alpha of 0.83 is well above the critical threshold, suggesting internal consistency of the measure (Hair, Black, Babin, Anderson & Tatham, 2006). Second, all six items load on one factor, with factor loadings between 0.64 and 0.82. Third, a factor analysis performed on our sample using items from an established measure of corporate entrepreneurship (based on Eddleston & Kellermanns, 2007) reveals that our six entrepreneurial behaviour items all load on one separate factor, with factor loadings between 0.61 and 0.81 (Cronbach's Alpha for the corporate entrepreneurship measure: 0.84). Together with the high correlation between our entrepreneurial behaviour measure and the corporate entrepreneurship measure (0.28,  $p < 0.01$ ) this supports our claim about the distinctiveness and at the same time relatedness of individual-level entrepreneurial behaviour and firm-level corporate entrepreneurship. Fourth, our measure exhibits convergent validity, as we find high correlations with the complete measures of Pearce et al. (1997) (0.69,  $p < 0.01$ ) and Dyer et al. (2008) (0.78,  $p < 0.01$ ), which were also included in our data set.

<sup>3</sup> We believe that the use of subjective data is adequate for testing our hypotheses keeping in mind the following considerations and precautions. First, subjective performance data has been shown to correlate highly with objective performance data (Dess & Robinson, 1984; Love, Priem & Lumpkin, 2002). Second, the reliability of performance data is high when reported in an anonymous survey like in our study (Nunnally & Bernstein, 1994). Third, the use of subjective performance data, and more specifically, the comparison to similar firms that controls for industry effects, is not uncommon in studies where public information is lacking (Love et al., 2002; Schulze, Lubatkin, Dino & Buchholtz, 2001). Fourth, our respondents can be regarded as key informants due to their senior management positions and their average tenure of more than 12 years. We thus believe that they have sufficient experience, insight and access to relevant information to provide reliable performance judgments. Fifth, we investigated inter-rater agreement in our sample (cp. Kozlowski & Klein, 2000; LeBreton & Senter, 2008). When one target is assessed by multiple raters with multiple items, such as company performance in our case, the  $r_{wg(j)}$  index may provide the necessary empirical support to justify the aggregation of individual-level data to a higher level (e.g., company level) (LeBreton & Senter, 2008). As we have 122 double answers from 61 companies in our sample, we calculated the inter-rater agreement for all these 61 pairs, achieving an average  $r_{wg(j)}$  of 0.77 (median = 0.86). This indicates strong agreement well above the 0.7 threshold (LeBreton & Senter, 2008), which supports the validity of our company-level performance measure. Sixth, we tested the validity of our subjective performance measure with partly available objective data. 452 of our respondents are employed in Germany-based companies. For those we obtained objective performance data for 2007-2009 from the German "*Elektronischer Bundesanzeiger*" database where the German ministry of justice compiles audited balance sheets and income statements of private firms. We then calculated different objective performance ratios, such as profit growth, return on assets (ROA) growth, return on sales (ROS) growth, and return on equity (ROE) growth. When correlating these objective measures with the corresponding items of our subjective performance measure, we found the self-reported profit growth item to be positively and significantly correlated with objective profit growth ( $r = 0.29$ ,  $p < 0.05$ ). Moreover, the self-reported profitability growth item was positively and significantly correlated with ROA growth ( $r = 0.35$ ,  $p < 0.05$ ), ROE growth ( $r = 0.37$ ,  $p < 0.05$ ), and ROS growth ( $r = 0.29$ ,  $p < 0.05$ ). These correlations are of similar strength compared to other studies that investigate subjective and objective performance measures of privately held companies (e.g., Ling & Kellermanns, 2010). In sum, we believe that our subjective company performance data represents a reliable measure for the purpose of testing our theoretical predictions.



## REFERENCES

- Aiken, L. S. and West, S. G. (1991). *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, CA: Sage.
- Alchian, A. A. and Demsetz, H. (1972). 'The Property Right Paradigm'. *The Journal of Economic History*, **33**(1), 777-795.
- Amabile, T. M. (1988). 'A Model of Creativity and Innovation in Organizations', in Staw, B. M. and Cummings, L. L. (Eds), *Research in Organizational Behavior*. Greenwich, CT: JAI Press, 123-167.
- Ang, J. S., Cole, R. A. and Lin, J. W. (2000). 'Agency Costs and Ownership Structure'. *The Journal of Finance*, **55**(1), 81-106.
- Antoncic, B. and Hisrich, R. D. (2001). 'Intrapreneurship: Construct Refinement and Cross-Cultural Validation'. *Journal of Business Venturing*, **16**(5), 495-527.
- Astrachan, J. H. and Shanker, M. C. (2003). 'Family Businesses' Contribution to the U.S. Economy: A Closer Look'. *Family Business Review*, **16**(3), 211-219.
- Avey, J. B., Avolio, B. J., Crossley, C. R. and Luthans, F. (2009). 'Psychological Ownership: Theoretical Extensions, Measurement and Relation to Work Outcomes'. *Journal of Organizational Behaviour*, **30**(2), 173-191.
- Baron, R. M. and Kenny, D. A. (1986). 'The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations'. *Journal of Personality and Social Psychology*, **51**(6), 1173-1182.
- Bateman, T. S. and Crant, J. M. (1993). 'The Proactive Component of Organizational Behavior: A Measure and Correlates'. *Journal of Organizational Behavior*, **14**(2), 103-118.
- Beal, R. M. (2000). 'Competing Effectively: Environmental Scanning, Competitive Strategy, and Organizational Performance in Small Manufacturing Firms'. *Journal of Small Business Management*, **38**(1), 27-47.
- Beggan, J. K. (1992). 'On the Social Nature of Nonsocial Perception: The Mere Ownership Effect'. *Journal of Personality and Social Psychology*, **62**(2), 229-237.
- Belk, R. W. (1988). 'Possessions and the Extended Self'. *Journal of Consumer Research*, **15**(2), 139-168.
- Bergami, M. and Bagozzi, R. P. (2000). 'Self-Categorization, Affective Commitment and Group Self-Esteem as Distinct Aspects of Social Identity in the Organization'. *British Journal of Social Psychology*, **39**(4), 555-577.
- Berle, A. and Means, G. (1932). *The Modern Corporation and Private Property*. New York: Harcourt, Brace & World Inc.
- Block, Z. and MacMillan, I. C. (1993). *Corporate Venturing*. Boston, MA: Harvard Business School Press.
- Block, Z. and Ornati, O. A. (1987). 'Compensating Corporate Venture Managers'. *Journal of Business Venturing*, **2**(1), 41-51.
- Brown, G., Lawrence, T. B. and Robinson, S. L. (2005). 'Territoriality in Organizations'. *Academy of Management Review*, **30**(3), 577-594.
- Brown, M. P., Sturman, M. C. and Simmering, M. J. (2003). 'Compensation Policy and Organizational Performance: The Efficiency, Operational, and Financial Implications of Pay Levels and Pay Structure'. *Academy of Management Journal*, **46**(6), 752-762.
- Burgelman, R. A. (1983). 'A Model of the Interaction of Strategic Behavior, Corporate Context, and the Concept of Strategy'. *Academy of Management Review*, **8**(1), 61-70.

- Chen, C. C., Greene, P. G. and Crick, A. (1998). 'Does Entrepreneurial Self-Efficacy Distinguish Entrepreneurs from Managers?'. *Journal of Business Venturing*, **13**(4), 295-316.
- Cho, M. (1998). 'Ownership Structure, Investment, and the Corporate Value: An Empirical Analysis'. *Journal of Financial Economics*, **47**(1), 103-121.
- Chrisman, J. J., Chua, J. H., Kellermanns, F. W. and Chang, E. P. C. (2007). 'Are Family Managers Agents or Stewards? An Exploratory Study in Privately Held Firms'. *Journal of Business Research*, **60**(10), 1030-1038.
- Chua, J. H., Chrisman, J. J. and Sharma, P. (1999). 'Defining the Family Business by Behavior'. *Entrepreneurship Theory & Practice*, **23**(4), 19-39.
- Cole, M. S., Walter, F. and Bruch, H. (2008). 'Affective Mechanisms Linking Dysfunctional Behavior to Performance in Work Teams: A Moderated Mediation Study'. *Journal of Applied Psychology*, **93**(5), 945-958.
- Covin, J. G. and Slevin, D. P. (1991). 'A Conceptual Model of Entrepreneurship as Firm Behavior'. *Entrepreneurship Theory and Practice*, **16**(1), 7-25.
- Cruz, C. C., Gomez-Mejia, L. R. and Becerra, M. (2010). 'Perceptions of Benevolence and the Design of Agency Contracts: Ceo-Tmt Relationships in Family Firms'. *Academy of Management Journal*, **53**(1), 69-89.
- Cummings, L. L. and Anton, R. (1990). 'The Logical and Appreciative Dimensions of Accountability', in Srivasta, S. and Cooperrider, D. (Eds), *Appreciative Management and Leadership*. San Francisco: Jossey-Bass, 257-286.
- Daily, C. M., Dalton, D. R. and Rajagopalan, N. (2003). 'Governance through Ownership: Centuries of Practice, Decades of Research'. *Academy of Management Journal*, **46**(2), 151-158.
- Dalton, D. R., Daily, C. M., Certo, S. T. and Roengpitya, R. (2003). 'Meta-Analyses of Financial Performance and Equity: Fusion or Confusion?'. *Academy of Management Journal*, **46**(1), 13-26.
- Dalton, D. R., Hitt, M. A., Certo, S. T. and Dalton, C. M. (2007). 'The Fundamental Agency Problem and Its Mitigation: Independence, Equity, and the Market for Corporate Control'. *Academy of Management Annals*, **1**(1), 1-64.
- Davis, J. H., Schoorman, F. D. and Donaldson, L. (1997). 'Toward a Stewardship Theory of Management'. *Academy of Management Review*, **22**(1), 20-47.
- Deci, E. L., Koestner, R. and Ryan, R. M. (1999). 'A Meta-Analytic Review of Experiments Examining the Effects of Extrinsic Rewards on Intrinsic Motivation'. *Psychological Bulletin*, **125**(6), 627-668.
- Dess, G. G., Lumpkin, G. T. and McGee, J. E. (1999). 'Linking Corporate Entrepreneurship to Strategy, Structure, and Process: Suggested Research Directions'. *Entrepreneurship Theory & Practice*, **23**(3), 85-102.
- Dess, G. G. and Robinson, R. B. (1984). 'Measuring Organizational Performance in the Absence of Objective Measures: The Case of the Privately-Held Firm and Conglomerate Business Unit'. *Strategic Management Journal*, **5**(3), 265-273.
- Dirks, K. T., Cummings, L. L. and Pierce, J. L. (1996). 'Psychological Ownership in Organizations: Conditions under Which Individuals Promote and Resist Change', in Woodman, R. W. and Pasmore, W. A. (Eds), *Research in Organizational Change and Development*. Greenwich, CT: JAI Press, 1-23.
- Dittmar, H. (1992). *The Social Psychology of Material Possessions: To Have Is to Be*. New York: St. Martin's Press.

- Donaldson, L. (1990). 'The Ethereal Hand: Organizational Economics and Management Theory'. *Academy of Management Review*, **15**(3), 369-381.
- Dutton, J. E., Dukerich, J. M. and Harquail, C. V. (1994). 'Organizational Images and Member Identification'. *Administrative Science Quarterly*, **39**(2), 239-263.
- Dyer, J. H., Gregersen, H. B. and Christensen, C. (2008). 'Entrepreneur Behaviors, Opportunity Recognition, and the Origins of Innovative Ventures'. *Strategic Entrepreneurship Journal*, **2**(4), 317-338.
- Eddleston, K. A. and Kellermanns, F. W. (2007). 'Destructive and Productive Family Relationships: A Stewardship Theory Perspective'. *Journal of Business Venturing*, **22**(4), 545-565.
- Eddleston, K. A., Kellermanns, F. W. and Sarathy, R. (2008). 'Resource Configuration in Family Firms: Linking Resources, Strategic Planning and Technological Opportunities to Performance'. *Journal of Management Studies*, **45**(1), 26-50.
- Eisenhardt, K. M. (1989). 'Agency Theory: An Assessment and Review'. *Academy of Management Review*, **14**(1), 57-74.
- Etzioni, A. (1991). 'The Socio-Economics of Property'. *Journal of Social Behavior and Personality*, **6**(6), 465-468.
- Ezzamel, M. (2005). *Governance, Directors and Boards*. Cheltenham, UK: Edward Elgar.
- Fama, E. F. and Jensen, M. C. (1983). 'Separation of Ownership and Control'. *Journal of Law and Economics*, **26**(2), 301-325.
- Floyd, S. W. and Wooldridge, B. (1997). 'Middle Management's Strategic Influence and Organizational Performance'. *Journal of Management Studies*, **34**(3), 465-485.
- Formanek, R. (1991). 'Why They Collect: Collectors Reveal Their Motivations'. *Journal of Social Behavior and Personality*, **6**(6), 275-286.
- Furby, L. (1978). 'Possession in Humans: An Exploratory Study of Its Meaning and Motivation'. *Social Behavior and Personality*, **6**(1), 49-65.
- Geletkanycz, M. A. (1998). 'The Salience of "Culture's Consequences": The Effect of Cultural Values on Top Executive Commitment to the Status Quo'. *Strategic Management Journal*, **18**(8), 615-634.
- Gomez-Mejia, L. R., Haynes, K. T., Nunez-Nickel, M., Jacobson, K. J. L. and Moyano-Fuentes, J. (2007). 'Socioemotional Wealth and Business Risks in Family-Controlled Firms: Evidence from Spanish Olive Oil Mills'. *Administrative Science Quarterly*, **52**(1), 106-137.
- Guth, W. D. and Ginsberg, A. (1990). 'Corporate Entrepreneurship'. *Strategic Management Journal*, **11**(5), 5-15.
- Hair, J. F., Black, B., Babin, B., Anderson, R. E. and Tatham, R. L. (2006). *Multivariate Data Analysis*. Upper Saddle River, NJ: Prentice Hall.
- Harman, H. H. (1967). *Modern Factor Analysis*. Chicago, IL: University of Chicago Press.
- Hill, C. W. and Snell, S. A. (1989). 'Effects of Ownership and Control on Corporate Productivity'. *Academy of Management Journal*, **32**(1), 25-46.
- Hmieleski, K. M. and Corbett, A. C. (2008). 'The Contrasting Interaction Effects of Improvisational Behavior with Entrepreneurial Self-Efficacy on New Venture Performance and Entrepreneur Work Satisfaction'. *Journal of Business Venturing*, **23**(4), 482-496.
- Hmieleski, K. M. and Corbett, A. C. (2006). 'Proclivity for Improvisation as a Predictor of Entrepreneurial Intentions'. *Journal of Small Business Management*, **44**(1), 45-63.
- Hofstede, G. (2001). *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations across Nations*. Thousand Oaks, CA: SAGE.

- Hornsby, J. S., Kuratko, D. F., Shepherd, D. A. and Bott, J. P. (2009). 'Managers' Corporate Entrepreneurial Actions: Examining Perception and Position'. *Journal of Business Venturing*, **24**(3), 236-247.
- Hornsby, J. S., Kuratko, D. F. and Zahra, S. A. (2002). 'Middle Managers' Perception of the Internal Environment for Corporate Entrepreneurship: Assessing a Measurement Scale'. *Journal of Business Venturing*, **17**(3), 253-273.
- James, W. (1890). *The Principles of Psychology*. New York: Holt.
- Jensen, M. C. and Meckling, W. H. (1976). 'Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure'. *Journal of Financial Economics*, **3**(4), 305-360.
- Judge, T. A. and Ferris, G. R. (1993). 'Social-Context of Performance Evaluation Decisions'. *Academy of Management Journal*, **36**(1), 80-105.
- Kellermanns, F. W., Walter, J., Lechner, C. and Floyd, S. W. (2005). 'The Lack of Consensus About Strategic Consensus: Advancing Theory and Research'. *Journal of Management*, **31**(5), 719-737.
- Koch, M. J. and McGrath, R. G. (1996). 'Improving Labor Productivity: Human Resource Management Policies Do Matter'. *Strategic Management Journal*, **17**(5), 335-354.
- Korman, A. H. (1970). 'Toward a Hypothesis of Work Behavior'. *Journal of Applied Psychology*, **54**(1), 31-41.
- Kozlowski, S. W. and Klein, K. J. (2000). 'A Multilevel Approach to Theory and Research in Organizations: Contextual, Temporal, and Emergent Processes', in Klein, K. J. and Kozlowski, S. W. (Eds), *Multilevel Theory, Research, and Methods in Organizations*. San Francisco: Jossey-Bass, 349-381.
- Kraut, A. I., Pedigo, P. R., McKenna, D. D. and Dunnette, M. D. (2005). 'The Role of the Manager: What's Really Important in Different Management Jobs'. *Academy of Management Executive*, **19**(4), 122-129.
- Kumar, N., Stern, L. W. and Anderson, J. C. (1993). 'Conducting Interorganizational Research Using Key Informants'. *Academy of Management Journal*, **36**(6), 1633-1651.
- Kuratko, D. F. (2010). 'Corporate Entrepreneurship: An Introduction and Research Review', in Acs, Z. J. and Audretsch, D. B. (Eds), *Handbook of Entrepreneurship Research*. New York: Springer, 129-163.
- Kuratko, D. F., Hornsby, J. S., Naffziger, D. W. and Montagno, R. V. (1993). 'Implementing Entrepreneurial Thinking in Established Organizations'. *S.A.M. Advanced Management Journal*, **58**(1), 28-39.
- Kuratko, D. F., Ireland, D. R. and Hornsby, J. S. (2004). 'Corporate Entrepreneurship Behavior among Managers: A Review of Theory, Research, and Practice', in Katz, J. A. and Corbett, A. C. (Eds), *Advances in Entrepreneurship, Firm Emergence and Growth*. Bingley, UK: Emerald Group Publishing Limited, 7-45.
- Kuratko, D. F., Ireland, R. D., Covin, J. G. and Hornsby, J. S. (2005). 'A Model of Middle-Level Manager's Entrepreneurial Behavior'. *Entrepreneurship Theory & Practice*, **29**(6), 699-716.
- Lawler, E. E. and Hall, D. T. (1970). 'Relationship of Job Characteristics to Job Involvement, Satisfaction, and Intrinsic Motivation'. *Journal of Applied Psychology*, **54**(4), 305-312.
- LeBreton, J. M. and Senter, J. L. (2008). 'Answers to 20 Questions About Interrater Reliability and Interrater Agreement'. *Organizational Research Methods*, **11**(4), 815-852.
- Ling, Y. and Kellermanns, F. W. (2010). 'The Effects of Family Firm Specific Resources on Tmt Diversity: The Moderating Role of Information Exchange Frequency'. *Journal of Management Studies*, **47**(2), 322-344.

- Liu, J., Wang, H., Hui, C. and Lee, C. (2012). 'Psychological Ownership: How Having Control Matters'. *Journal of Management Studies*, **49**(5), 869-895.
- Love, L. G., Priem, R. L. and Lumpkin, G. T. (2002). 'Explicitly Articulated Strategy and Firm Performance under Alternative Levels of Centralization'. *Journal of Management*, **28**(5), 611-627.
- Lumpkin, G. T. and Dess, G. G. (1996). 'Clarifying the Entrepreneurial Orientation Construct and Linking It to Performance'. *Academy of Management Review*, **21**(1), 135-172.
- MacDougall, P. and Robinson, R. B. (1990). 'New Venture Strategies: An Empirical Identification of Eight 'Archetypes' of Competitive Strategies for Entry'. *Strategic Management Journal*, **11**(6), 447-468.
- Mael, F. and Ashforth, B. E. (1992). 'Alumni and Their Alma Mater: A Partial Test of the Reformulated Model of Organizational Identification'. *Journal of Organizational Behavior*, **13**(2), 103-123.
- McCracken, G. (1986). 'Culture and Consumption: A Theoretical Account of the Structure and Movement of the Cultural Meaning of Consumer Goods'. *The Journal of Consumer Research*, **13**(1), 71-84.
- McDonald, M. L., Khanna, P. and Westphal, J. D. (2008). 'Getting Them to Think Outside the Circle: Corporate Governance, Ceos' External Advice Networks, and Firm Performance'. *Academy of Management Journal*, **51**(3), 453-475.
- Meyer, J. P. and Allen, N. J. (1997). *Commitment in the Workplace: Theory, Research and Application*. Thousand Oaks, CA: SAGE.
- Morck, R. (1996). 'On the Economics of Concentrated Ownership'. *Canadian Business Law Journal*, **26**(1), 63-85.
- Mowday, R. T., Porter, L. W. and Steers, R. M. (1982). *Employee-Organization Linkages: The Psychology of Commitment, Absenteeism, and Turnover*. New York: Academic Press.
- Ng, K.-Y. and Chan, K.-Y. (2008). 'Personality and Leader Effectiveness: A Moderated Mediation Model of Leadership Self-Efficacy, Job Demands, and Job Autonomy'. *Journal of Applied Psychology*, **93**(4), 733-743.
- Nonaka, I. and Takeuchi, H. (1995). *The Knowledge Company: How Japanese Companies Create the Dynamics of Innovation*. New York: Oxford University Press.
- Nunnally, J. C. and Bernstein, I. H. (1994). *Psychometric Theory*. New York: McGraw-Hill.
- Nyberg, A. J., Fulmer, I. S., Gerhart, B. and Carpenter, M. A. (2010). 'Agency Theory Revisited: Ceo Return and Shareholder Interest Alignment'. *Academy of Management Journal*, **53**(5), 1029-1049.
- O'Driscoll, M. P., Pierce, J. L. and Coghlan, A. M. (2006). 'The Psychology of Ownership: Work Environment Structure, Organizational Commitment, and Citizenship Behaviours'. *Group & Organization Management*, **31**(3), 388-416.
- Oppenheim, A. N. (1966). *Questionnaire Design and Attitude Measurement*. New York: Free Press.
- Osterloh, M. and Frey, B. S. (2000). 'Motivation, Knowledge Transfer, and Organizational Forms'. *Organization Science*, **11**(5), 538-550.
- Pearce, J. A., Kramer, T. R. and Robbins, D. K. (1997). 'Effects of Managers' Entrepreneurial Behavior on Subordinates'. *Journal of Business Venturing*, **12**(2), 147-160.
- Pierce, J. L. and Furo, C. A. (1990). 'Employee Ownership: Implications for Management'. *Organizational Dynamics*, **18**(3), 32-43.

- Pierce, J. L. and Jussila, I. (2010). 'Collective Psychological Ownership within the Work and Organizational Context: Construct Introduction and Elaboration'. *Journal of Organizational Behavior*, **31**(6), 810-834.
- Pierce, J. L., Kostova, T. and Dirks, K. (2003). 'The State of Psychological Ownership: Integrating and Extending a Century of Research'. *Review of General Psychology*, **7**(1), 84-107.
- Pierce, J. L., Kostova, T. and Dirks, K. T. (2001). 'Toward a Theory of Psychological Ownership in Organizations'. *Academy of Management Review*, **26**(2), 298-310.
- Pierce, J. L., O'Driscoll, M. P. and Coghlan, A. (2004). 'Work Environment Structure and Psychological Ownership: The Mediating Effects of Control'. *The Journal of Social Psychology*, **144**(5), 507-534.
- Pierce, J. L., Rubenfeld, S. A. and Morgan, S. (1991). 'Employee Ownership: A Conceptual Model of Process and Effects'. *Academy of Management Review*, **16**(1), 121-144.
- Pierce, J. L., Van Dyne, L. and Cummings, L. L. (1992). *Psychological Ownership: A Conceptual and Operational Examination*. Southern Management Association Proceedings, Valdosta, GA.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y. and Podsakoff, N. P. (2003). 'Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies'. *Journal of Applied Psychology*, **88**(5), 879-903.
- Podsakoff, P. M. and Organ, D. W. (1986). 'Self-Reports in Organizational Research: Problems and Perspectives'. *Journal of Management*, **12**(4), 531-544.
- Porteous, J. D. (1976). 'Home: The Territorial Core'. *Geographical Review*, **66**(4), 383-390.
- Preacher, K. J. and Hayes, A. F. (2008a). 'Asymptotic and Resampling Strategies for Assessing and Comparing Indirect Effects in Multiple Mediator Models'. *Behavior Research Methods*, **40**(1), 879-891.
- Preacher, K. J. and Hayes, A. F. (2008b). 'Contemporary Approaches to Assessing Mediation in Communication Research', in Hayes, A. F., Slater, M. D. and Snyder, L. B. (Eds), *The Sage Sourcebook of Advanced Data Analysis Methods for Communication Research*. Thousand Oaks, CA: Sage, 13-54.
- Preacher, K. J., Rucker, D. D. and Hayes, A. F. (2007). 'Addressing Moderated Mediation Hypotheses: Theory, Methods, and Prescriptions'. *Multivariate Behavioral Research*, **42**(1), 185-227.
- Price, L. L., Arnould, E. J. and Folkman Curasi, C. (2000). 'Older Consumers' Disposition of Special Possessions'. *The Journal of Consumer Research*, **27**(2), 179-201.
- Pugh, W. N., Oswald, S. L. and Jahera, J. S. (2000). 'The Effect of Esop Adoptions on Corporate Performance: Are There Really Performance Changes?'. *Managerial and Decision Economics*, **21**(5), 167-180.
- Rajan, R. G. and Zingales, L. (1998). 'Power in a Theory of the Firm'. *Quarterly Journal of Economics*, **113**(2), 387-432.
- Rauch, A., Wiklund, J., Lumpkin, G. T. and Frese, M. (2009). 'Entrepreneurial Orientation and Business Performance: An Assessment of Past Research and Suggestions for the Future'. *Entrepreneurship Theory & Practice*, **33**(3), 761-787.
- Redmond, M. R., Mumford, M. D. and Teach, R. (1993). 'Putting Creativity to Work: Effects of Leader Behavior on Subordinate Creativity'. *Organizational Behavior and Human Decision Processes*, **55**(1), 120-151.

- Rogoff, E. G. and Heck, R. K. Z. (2003). 'Evolving Research in Entrepreneurship and Family Business: Recognizing Family as the Oxygen That Feeds the Fire of Entrepreneurship'. *Journal of Business Venturing*, **18**(5), 559-566.
- Ross, S. (1973). 'The Economic Theory of Agency: The Principal's Problem'. *American Economic Review*, **63**(2), 134-139.
- Rousseau, D. M. and Shperling, Z. (2003). 'Pieces of the Action: Ownership and the Changing Employment Relationship'. *Academy of Management Review*, **28**(4), 553-570.
- Schulze, W. S., Lubatkin, M. H., Dino, R. N. and Buchholtz, A. K. (2001). 'Agency Relationships in Family Firms: Theory and Evidence'. *Organization Science*, **12**(2), 99-116.
- Shane, S. A. and Venkataraman, S. (2000). 'The Promise of Entrepreneurship as a Field of Research'. *Academy of Management Review*, **25**(1), 217-226.
- Sharma, P. (2004). 'An Overview of the Field of Family Business Studies: Current Status and Directions for the Future'. *Family Business Review*, **17**(1), 1-36.
- Sharma, P. and Chrisman, J. J. (1999). 'Toward a Reconciliation of the Definitional Issues in the Field of Corporate Entrepreneurship'. *Entrepreneurship: Theory & Practice*, **23**(3), 11-27.
- Shepherd, D. A., McMullen, J. S. and Jennings, P. D. (2007). 'The Formation of Opportunity Beliefs: Overcoming Ignorance and Reducing Doubt'. *Strategic Entrepreneurship Journal*, **1**(1-2), 75-95.
- Smith, K. G. and Di Gregorio, D. (2002). 'Bisociation, Discovery and the Role of Entrepreneurial Action', in Hitt, M. A., Ireland, R. D., Camp, S. M. and Sexton, D. L. (Eds), *Strategic Entrepreneurship: Creating a New Mindset*. Oxford, UK: Blackwell Publishers, 130-150.
- Spreitzer, G. M. (1995). 'Psychological Empowerment in the Workplace - Dimensions, Measurement, and Validation'. *Academy of Management Journal*, **38**(5), 1442-1465.
- Steel, P. and Konig, C. J. (2006). 'Integrating Theories of Motivation'. *Academy of Management Review*, **31**(4), 889-913.
- Takahashi, N. (2000). 'The Emergence of Generalized Exchange'. *American Journal of Sociology*, **105**(4), 1105-1134.
- Tan, J. and Peng, M. W. (2003). 'Organizational Slack and Firm Performance During Economic Transitions: Two Studies from an Emerging Economy'. *Strategic Management Journal*, **24**(13), 1249-1263.
- Tosi, H. L., Gomez-Mejia, L. R., Loughry, M. L., Werner, S., Banning, K., Katz, J., Harris, R. and Silva, D. (1999). 'Managerial Discretion, Compensation Strategy, and Firm Performance: The Case for Ownership Structure', in Ferris, G. (Ed), *Research in Personnel and Human Resources Management*. Stamford, CT: JAI Press, 163-209.
- Tosi, H. L., Werner, S., Katz, J. P. and Gomez-Mejia, L. R. (2000). 'How Much Does Performance Matter? A Meta-Analysis of Ceo Pay Studies'. *Journal of Management*, **26**(2), 301-339.
- Van Dyne, L. and Pierce, J. L. (2004). 'Psychological Ownership and Feelings of Possession: Three Field Studies Predicting Employee Attitudes and Organizational Citizenship Behaviour'. *Journal of Organizational Behaviour*, **25**(4), 439-459.
- Vroom, V. (1964). *Work and Motivation*. New York: Wiley.
- Werner, S., Tosi, H. L. and Gomez-Mejia, L. R. (2005). 'Organizational Governance and Employee Pay: How Ownership Structure Affects the Firm's Compensation Strategy'. *Strategic Management Journal*, **26**(4), 377-398.
- White, R. W. (1959). 'Motivation Reconsidered: The Concept of Competence'. *Psychological Review*, **66**(5), 297-330.

- Williamson, O. E. (1985). *The Economic Institutions of Capitalism*. New York: Free Press.
- Williamson, O. E. (1981). 'The Economics of Organization: The Transaction Cost Approach'. *American Journal of Sociology*, **87**(3), 548-577.
- Wiseman, R. M. and Gomez-Mejia, L. R. (1998). 'A Behavioral Agency Model of Managerial Risk Taking'. *Academy of Management Review*, **23**(1), 133-153.
- Zahra, S. A. (1995). 'Corporate Entrepreneurship and Financial Performance: The Case of Management Leveraged Buyouts'. *Journal of Business Venturing*, **10**(3), 225-247.
- Zahra, S. A. (1991). 'Predictors and Financial Outcomes of Corporate Entrepreneurship: An Exploratory Study'. *Journal of Business Venturing*, **6**(4), 259-286.
- Zahra, S. A., Jennings, D. F. and Kuratko, D. F. (1999). 'The Antecedents and Consequences of Firm-Level Entrepreneurship: The State of the Field'. *Entrepreneurship Theory and Practice*, **24**(2), 45-63.
- Zhao, H., Hills, G. E. and Seibert, S. E. (2005). 'The Mediating Role of Self-Efficacy in the Development of Entrepreneurial Intentions'. *Journal of Applied Psychology*, **90**(6), 1265-1272.



**TABLE I**  
**Means, Standard Deviations, and Pearson Correlations**

		Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11
1	Industry	0.56	.5	1										
2	Service	0.25	.44	-.66**	1									
3	Company Age	75.42	61.78	.03	-.03	1								
4	Number of employees (ln)	5.72	1.11	-.06	.09*	.15**	1							
5	Age respondent	45.90	8.68	-.01	.02	.09*	.03	1						
6	Gender	0.71	0.45	.08*	-.05	.03	.09*	.26**	1					
7	Tenure	12.33	9.41	-.04	.01	.12**	.03	.51**	.11**	1				
8	Performance-based pay	1.38	.48	-.05	.05	.05	-.13**	-.09*	-.19**	.04	1			
9	Psychological Ownership	4.32	1.29	-.02	-.05	.01	.03	.17**	.15**	.13**	-.13**	1		
10	Individual-level entrepr. beh.	4.88	0.88	-.09*	.01	.04	.07	.16**	.19**	.08*	-.1**	.28*	1	
11	Monitoring	4.19	1.02	-.07	.04	.00	.11**	.05	.05	-.04	-.14**	.15**	.22**	1
12	Performance	4.64	0.90	-.05	-.02	-.04	.11**	.02	.03	.03	-.14**	.24**	.18**	.15**

N = 714

\* p < .05

\*\* p < .01

**TABLE II**  
**Regression Results for Simple Mediation**

<i>Variable</i>	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>		
Psychological ownership to entrepr. behaviour (H1)	0.16	0.02	6.21	0.00		
Individual-level entrepr. behaviour on performance (H2)	0.12	0.04	3.2	0.00		
Total effect of psychological ownership on performance	0.16	0.03	6.33	0.00		
Direct effect of psychological ownership on performance	0.14	0.03	5.48	0.00		
<i>Partial effects of control variables on performance</i>						
Industry	-0.11	0.08	-1.3	0.19		
Service	-0.09	0.1	-0.99	0.32		
Company age	0.00	0.00	-0.98	0.33		
Company size (ln employees)	0.07	0.03	2.45	0.01		
Manager age	-0.01	0.00	-1.21	0.23		
Gender	-0.05	0.07	-0.66	0.51		
Tenure	0.00	0.00	0.67	0.51		
Performance-based pay	-0.2	0.07	-2.97	0.00		
<i>Bootstrap results for indirect effects (H3)</i>						
	Data	Boot	Bias	SE	LL 99% CI	UL 99% CI
Effect	0.02	0.02	0.00	0.01	0.003	0.042
<i>Indirect effect and significance using normal distribution (H3)</i>						
Sobel	Value	SE	LL 99% CI	UL 99% CI	z	p
	0.02	0.01	0.01	0.05	3.25	0.00

Note: N = 714. Unstandardized regression coefficients reported. Bootstrap sample size = 5,000. LL = lower limit, UL = upper limit, CI = confidence interval. In Preacher & Hayes' (2008a) SPSS macro, normal theory tests are not possible in models with covariates. To conduct the Sobel test, the covariates were thus excluded for this specific calculation.

**TABLE III**  
**Regression Results for Conditional Indirect Effect**

Predictor	<i>Mediator Model (entr. beh.)</i>				<i>Dependent var. model (perf.)</i>			
	Coeff	SE	t	p	Coeff	SE	t	p
Constant	2.25	0.53	4.26	0.00	2.3	0.54	4.24	0.00
Psychological ownership	0.35	0.1	3.48	0.00	0.41	0.1	4.01	0.00
Monitoring	0.38	0.1	3.5	0.00	0.36	0.11	3.31	0.00
P.O. times Monitoring (H4a and H4b)	-0.05	0.02	-2.15	0.03	-0.07	0.02	-2.77	0.01
Individual-level entrepr. behaviour					0.1	0.04	2.51	0.01
<i>Control variables</i>								
Industry	-0.21	0.08	-2.54	0.01	-0.1	0.08	-1.18	0.24
Service	-0.08	0.09	-0.89	0.38	-0.09	0.1	-0.1	0.32
Company age	0.00	0.00	-0.05	0.96	0.00	0.00	-1.01	0.29
Company size (ln employees)	0.03	0.03	0.89	0.37	0.07	0.03	2.36	0.02
Manager age	0.01	0.00	1.61	0.11	-0.01	0.00	-1.22	0.22
Gender	0.24	0.07	3.28	0.00	-0.05	0.07	-0.69	0.49
Tenure	0.00	0.00	0.18	0.86	0.00	0.00	0.75	0.45
Performance-based pay	-0.27	0.07	-0.39	0.7	-0.19	0.07	-2.78	0.01
<i>Conditional indirect effect</i>								
Monitoring			Boot	Boot SE	Boot z	Boot p		
- 1 SD (3.17)			0.02	0.01	2.02	0.04		
Mean (4.19)			0.01	0.01	2.09	0.04		
+ 1 SD (5.21)			0.01	0.01	1.52	0.13		

N = 714; unstandardized regression coefficients are reported. Bootstrap sample size = 5,000.

**FIGURE 1**  
**Theoretical Model**

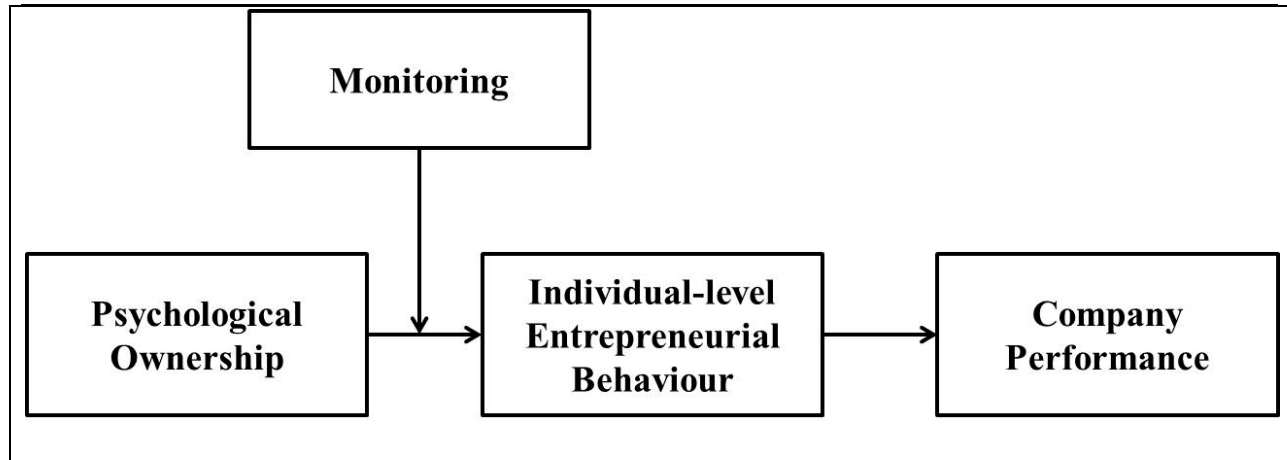
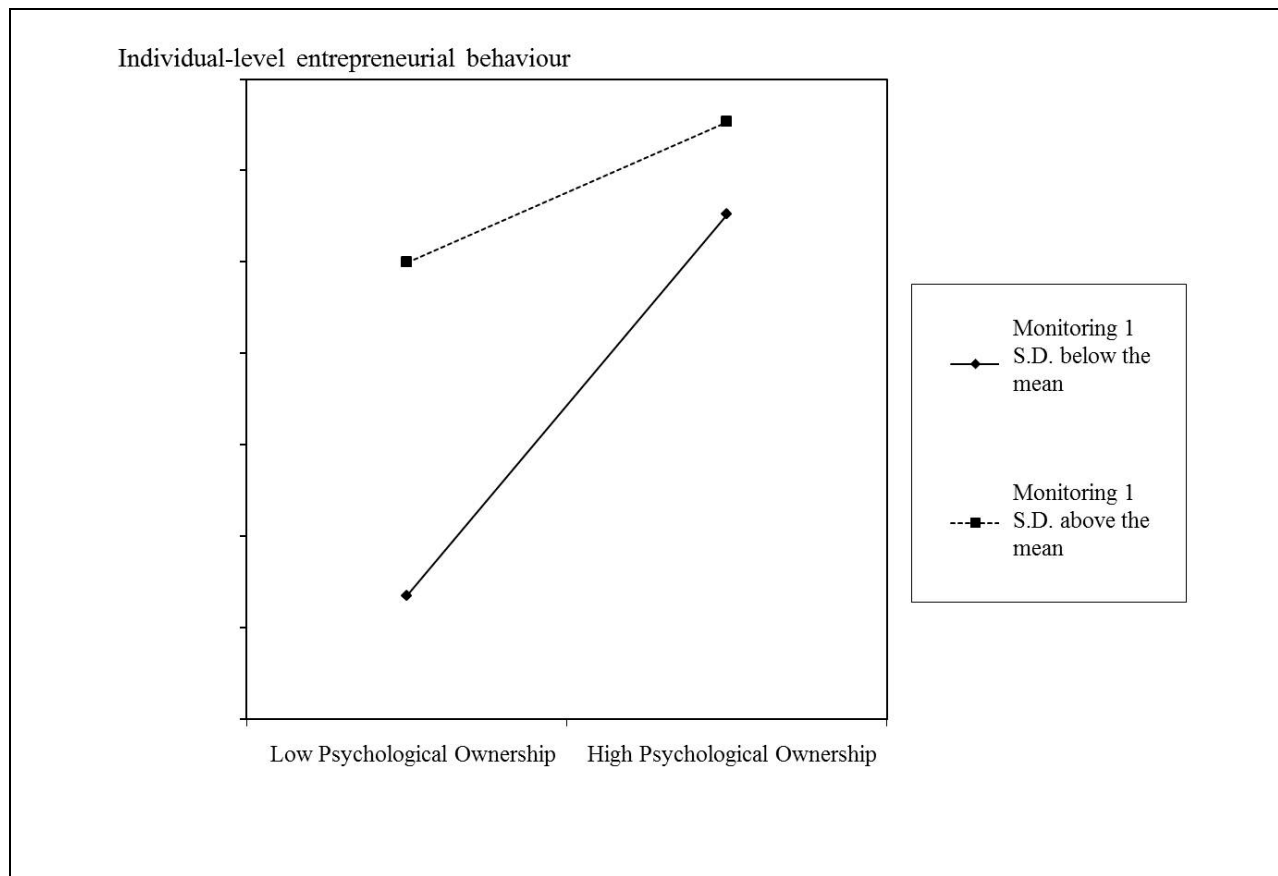


FIGURE 2

## Interaction Plot of P.O. and Monitoring on Individual-level Entrepreneurial Behaviour



## APPENDIX

### Scale Items, Factor Loadings, and Reliabilities

Variable	Item text	Factor loading	$\alpha$
Psychological ownership	This is MY organization.	0.78	0.88
	I sense that this organization is OUR company.	0.72	
	I feel a very high degree of personal ownership for this organization.	0.83	
	I sense that this is MY company.	0.85	
	This is OUR company.	0.69	
	Most people working for this organization feel as though they own the firm.	0.57	
	It is hard for me to think about this organization as MINE (reversed)	0.70	
Individual-level entrepreneurial behaviour	I often make innovative suggestions to improve our business.	0.65	0.83
	I often generate new ideas by observing the world.	0.82	
	I often come to new ideas when observing how people interact with our products and services.	0.82	
	I often generate new ideas by observing our customers.	0.75	
	I boldly move ahead with a promising new approach when others might be more cautious.	0.64	
	I devote time to help others find ways to improve our products and services.	0.74	
Monitoring	In our company there is personal, direct observation.	0.73	0.70
	In our company, short-term performance is evaluated regularly.	0.84	
	In our company, progress regarding to long-term goals is evaluated regularly.	0.75	
	To assess my performance, input from other managers and subordinates is used.	0.48	
Performance	<i>How would you rate the current performance of your company compared to your competitors in the following dimensions?</i>		0.93
	Growth in sales	0.88	
	Growth in market share	0.82	
	Growth in profits	0.86	
	Creation of jobs	0.70	
	Growth in profitability	0.83	