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Corporate Entrepreneurship at the Individual Level: Measurement and Determinants

J.P.J. de Jongⁱ, S.K. Parkerⁱⁱ, S. Wennekersⁱⁱⁱ, C. Wu^{iv}

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Abstract

We develop a measure for employees' intrapreneurial behavior (IB) in organizations. IB is proposed to be a higher-order construct reflected in three dimensions: innovativeness, proactiveness and risk-taking. A nine-item measure is developed with survey data from 179 employees and their peers. We then explore how the measure correlates with various individual and contextual (job-related) variables, finding that IB is associated with proactive personality, educational attainment, job autonomy and job types (managers and sales people are more likely to be intrapreneurs). For age, we find that the relationship with IB is an inverted U.

INTRODUCTION

In addition to new venture creation and growth, it is recognized that entrepreneurial behavior by employees within organizations matters for economic progress. Recent findings based on survey data from the Global Entrepreneurship Monitor suggest that intra-company entrepreneurship is even more important than previously thought. Survey output in 11 countries shows a negative relationship between independent entrepreneurship and entrepreneurial activities within existing organizations (Bosma, Stam and Wennekers, 2010). Especially in advanced economies intra-company entrepreneurship appears to be an alternative to new venture creation (Bosma and Levie, 2010).

'Intrapreneurship' is one of the labels used for corporate entrepreneurship, i.e. entrepreneurship within organizations (Sharma and Chrisman, 1999). Intrapreneurship captures the identification and exploitation of opportunities within incumbent organizations. The term was coined by Gifford Pinchot (1987) who identified intrapreneurs as 'in-house entrepreneurs, those dreamers who can increase the speed and cost-effectiveness of technology transfer from R&D to the marketplace' (p.14). Although Pinchot's perspective was primarily one of individuals, most studies in the past two decades explored the phenomenon on entrepreneurship at the organizational level. For example, in Sharma and Chrisman's (1999) inventory of corporate entrepreneurship definitions only two out of 26 definitions referred to entrepreneurial activities at the individual level (p. 14-15). In this vein, Zahra, Jennings and Kuratko (1999), in their review of firm-level entrepreneurship, stated that 'the literature would benefit from revisiting the various units of analysis (...) To date, and perhaps predictably, the literature focuses on overall firm-level activities' (p. 55). They also recognized that informal entrepreneurial activities in organizations are barely studied, and that more research is needed to understand the conditions that foster such activities. In the past ten years however, the field has remained dominated by firm-level contributions (e.g., Rauch,

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Wiklund, Lumpkin and Frese, 2009; Lumpkin, Cogliser and Schneider, 2009; Ling, Simsek, Lubatkin and Veiga, 2008) while only few explore the individual-level perspective (for exceptions, see Monsen, Patzelt and Saxton, 2010; Marvel, Griffin, Hebda and Vojak, 2007) and none explicitly modeled individuals' intrapreneurial behavior.

In this paper we take the perspective of individuals in organizations. We believe this is important, as ultimately any corporate entrepreneurial activity is initiated and implemented by (groups of) individuals. We define intrapreneurial behavior (IB) as the identification and exploitation of opportunities by individual workers that (also) advance the organization. As we will discuss later, drawing on Miller's (1983) conceptualization of the entrepreneurial organization such behavior can be viewed as a higher-order construct, which is reflected in individuals' innovation, proactive and risk-taking behaviors.

Our contribution is twofold. First, we develop and empirically validate a measure of intrapreneurial behavior. While individual-level studies so far focused on employees engaging in new venture creation within organizations (Monsen *et al.*, 2010) or on their perceptions of organization-level determinants (e.g., Kuratko, Montagno and Hornsby, 1990; Hornsby, Kuratko, Shepherd and Bott, 2009), a measure of intrapreneurial behavior is still lacking. Such a measure facilitates the systematic study of individuals behind corporate entrepreneurial processes.

Second, to improve our understanding of who becomes an intrapreneur, and under what circumstances, we explore the individual and contextual antecedents of IB. This includes testing hypotheses on the demography of intrapreneurs (e.g., educational attainment, age, gender), but also job-related variables like autonomy, job variety and job types. In doing so, we contribute to the emergence of demographic profiles of intrapreneurs – which have yet to be identified (Menzel, Aaltio and Ulijn, 2007) – and learn to understand if and how job design would correlate with IB. For practitioners this exercise is helpful to identify potential intrapreneurs and to develop better and more focused interventions.

In the paper we first define intrapreneurial behavior and its proposed dimensions, and develop hypotheses on its correlations with individual and contextual variables. A nine-item measure is developed and validated with data collected from 179 employees and their peers. Subsequently, we test our hypotheses to find that IB is associated with proactive personality (showing that it is partly dispositional), educational attainment and age (inverted U-shape relationship, suggesting that middle-aged workers are most likely to be perceived as intrapreneurs). We also find significant associations with job types (managers and sales workers more likely to be intrapreneurial) and job autonomy. The final section then discusses our findings.

INTRAPRENEURIAL BEHAVIOR

Corporate entrepreneurship (CE) is increasingly regarded as an overall construct capturing all entrepreneurial activities in incumbent organizations (Sharma and Chrisman, 1999). The field originated from the strategic management literature, where early researchers proposed that entrepreneurial organizations can be identified by three dimensions: innovativeness, proactiveness and risk-taking. Miller (1983) suggested that the entrepreneurial organization is

'one that engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with proactive innovations (...) A non-entrepreneurial firm is one that innovates very little, is highly risk averse, and imitates the moves of competitors instead of leading the way. We can tentatively view entrepreneurship as a composite weighting of these three variables' (p.771).

Many then followed up exploring CE using different labels and introducing slightly different constructs, including entrepreneurial strategic posture (Covin and Slevin, 1989) or entrepreneurial orientation (Lumpkin and Dess, 1996), to mention only a few. Over the past decade, entrepreneurial orientation has become the most dominant label in this literature, but its salient dimensions are still based on Miller's original conceptualization (Rauch *et al.*, 2009).

When researchers apply the term 'intrapreneurship' it usually refers to individual workers rather than organizations or boardroom-level decision makers (e.g., Pinchot, 1987; Stevenson and Jarillo, 1990; Antoncic and Hisrich, 2003). In this paper we adopt this point of view. We regard corporate entrepreneurship as a firm-level and top-down process that business owners and general managers can engage in to foster new ventures, innovations and strategic renewal (cf. Sharma and Chrisman, 1999). Conversely, we regard intrapreneurship as a bottom-up process marked by the initiation and implementation of activities by individual workers to explore and exploit business opportunities.

We build on Miller's (1983) seminal work and later extensions by proposing that Miller's dimensions can also be applied to the individual level. Intrapreneurial behavior (IB) is defined as the identification and exploitation of opportunities by individual workers to (also) advance the organization. We propose that IB is a higher-order construct which explains the correlations between individuals' innovative, proactive and risk-taking behaviors. In the remainder of this section, we will show that these dimensions are not only part of previous intrapreneurship definitions, but have also been studied in the organizational behavior literature. Thus, we draw on and combine these two literatures to develop our hypotheses as discussed hereafter.

Innovativeness

In the corporate entrepreneurship (CE) literature, innovativeness is 'a predisposition to engage in creativity and experimentation through the introduction of new products' (Rauch *et al.*, 2009: p.763). The related individual-level literature also regards innovation as a key element. Pinchot (1985) proposed that intrapreneurs were a missing factor in corporate innovation activities at the time. One intrapreneurial role would be to increase the speed and cost-effectiveness of technology transfer from internal R&D to the marketplace. Pinchot defined intrapreneurs as 'those who take hands-on responsibility for creating innovation of any kind within an organization; they may be the creators or inventors but are always the dreamers who figure out how to turn an idea into a profitable reality' (p.ix). Similarly, Antoncic and Hisrich (2003) defined intrapreneurship as 'emergent behavioral intentions and behaviors that are related to departures from the customary ways of doing business in existing organizations' (p.9). Here, however, we argue that the innovativeness dimension is broader than new products or services. It may also include process-related innovations to bring new or improved production or

marketing methods, or to apply new kinds of resources. To be part of IB, innovations may include any opportunity deviating from the status quo that would also advance the organization.

In the organizational behavior (OB) literature, the construct of innovative work behavior captures various behaviors during the process of opportunity identification and exploitation. This literature defines innovation as the production, adoption and implementation of novel and useful ideas, including products or processes from outside an organization (Kanter, 1988). Innovative work behavior is then defined as individual's behavior aiming to achieve the initiation and intentional introduction (within a work role, group or organization) of new and useful ideas, processes, products or procedures (Farr and Ford, 1990). Kanter (1988) postulated individual innovation as a process that begins with problem recognition and the generation of novel or adopted ideas. Next, the innovative individual champions the idea to managers, peers and/or significant others, attempting to create support for it. Finally, these activities result in a prototype or model of the innovation that can be further assessed and adopted by the organization. More recent measures of innovative work behavior have then captured the different stages of the innovation process, including idea generation, championing and implementation (e.g., Scott and Bruce, 1994; de Jong and den Hartog, 2010).

Proactiveness

In the CE literature, proactiveness is an opportunity-seeking, forward-looking perspective characterized by high awareness of external trends and events and acting in anticipation thereof (Rauch *et al.*, 2009). Proactiveness has been associated with pioneering behavior (Covin and Slevin, 1989) and initiative taking to pursue new opportunities (Lumpkin and Dess, 1996), and refers to the extent in which organizations attempt to lead rather than follow in key business areas (Covin and Slevin, 1989). These elements – acting in anticipation, taking control, and self-initiation – are also present in the individual-level intrapreneurship literature. Pinchot (1985) described intrapreneurs as those who may get in trouble because they go beyond formal job descriptions. Vesper (1984) defined intrapreneurship as 'employee initiative from below in the organization to undertake something new, i.e. an innovation which is created by subordinates without being asked, expected, or perhaps even given permission by higher management to do so' (p.295).

The corresponding OB literature on proactive behavior stresses similar elements. Proactive behavior is defined as 'self-initiated and future-oriented action that aims to change and improve the situation or oneself' (Parker, Williams and Turner, 2006: p.636) and typically includes a range of behavioral constructs. Parker and Collins (2010) empirically classified three kinds of proactive behavior, each of which captures multiple constructs and depending on individuals' aspirations. First, proactive work behavior aims to improve the internal organizational environment, such as by improving work methods or influencing work colleagues (Parker and Collins, 2010). It includes behaviors like taking charge (voluntary and constructive efforts to effect organizationally-functional change with respect to how work is executed), voice (making innovative suggestions for change and recommending modifications to standard procedures even when others disagree) and also individual implementation of ideas. Second, proactive strategic behavior aims for a better fit between the organization and its environment. It includes strategic scanning (identifying organizational threats and opportunities) and issue selling

(influencing strategy formation by making others' aware of particular events or trends) to take control of, and causing change in, the broader organization's strategy. Third, proactive person/environment fit behavior focuses on improving the fit between a person and his/her organizational environment. It includes proactively seeking feedback, job role negotiation and career self-initiative.

We argue that proactive work and strategy-related behaviors are part of the intrapreneurial domain, as these are (also) meant to advance the organization. Person/environment fit behaviors are excluded as they primarily emphasize developing the self. Moreover, to better capture the domain of intrapreneurship, we explicitly include employees' proactive contributions to new business development, which is generally regarded a key component (Pinchot, 1987; Antoncic and Hisrich, 2003) but not explicitly present in the OB literature. New business development becomes manifest in the creation of spin-off ventures, or the introduction of new products, processes or product-market combinations.

Risk-taking

Since Cantillon (1755), who was among the first to define an entrepreneur as a person who bears the risk of profit or loss, risk-taking is considered a fundamental element of entrepreneurship (Antoncic and Hisrich, 2003; Wennekers, Thurik, van Stel and Noorderhaven, 2007). In the CE literature, risk-taking involves taking bold actions by venturing into the unknown, borrowing heavily, and/or committing significant resources to ventures in unknown environments (Rauch *et al.*, 2009: p.763). Entrepreneurial activities like innovation, venturing, and strategic renewal entail considerable risk, because time, effort, and resources must be invested before the distribution of their returns is known. Ling and colleagues (2008) for example demonstrated that risk-taking by top management team members increases the odds of corporate entrepreneurship activities.

Individual intrapreneurship definitions indicate that intrapreneurs engage in situations marked by a risk of potential losses. Thus, Vesper (1984) stressed that intrapreneurs would even act without their higher management's permission, Stevenson and Jarillo (1990) stressed opportunity pursuit beyond currently controlled resources, and Antoncic and Hisrich (2003) emphasized deviating from the status quo. In the related OB literature, proactive behaviors have also been considered 'risky' as they change the individual's environment by challenging the status quo or by selling controversial issues (Parker and Collins, 2010). In sum, at the individual level risk-taking is implicitly present in many of the related constructs that have been proposed.

We do recognize the ongoing debate on the role of risk-taking. It is often argued that entrepreneurs prefer moderate rather than high risks, and try to manage and reduce risks as much as possible. Pinchot (1987) himself for example stressed that once a challenging goal is chosen, intrapreneurs do everything they can to reduce the risk (p.16). Nevertheless, as an intrapreneur pursues opportunities and consequently operates in uncertain environments, some risk-taking will be part of his/her behavior by default. In this context, a meta-analytic review by Stewart and Roth (2001) showed that entrepreneurs whose primary goal was venture growth (versus family income) were more inclined to take risks, suggesting to those who are more likely to deviate from the status quo should bear higher risks.

Validation hypotheses

As discussed above, we propose that IB is a higher-order construct. Its supposed dimensions should accordingly be highly related. As innovativeness, proactiveness and risk-taking have common theoretical ties, rooted in the early CE literature on the entrepreneurial organization, this should become manifest in high empirical intercorrelations (cf. Law, Wong and Mobley, 1998; MacKenzie, Podsakoff and Jarvis, 2005). To ascertain the convergent validity of our measure, we hypothesized

H1 Innovativeness, proactiveness and risk-taking reflect a higher-order construct.

Next, to evaluate divergent validity we correlated the proposed measure of IB with two constructs that should be related but not identical, including employees' job performance and feedback seeking.

As for job performance, the CE literature consistently found that firms' entrepreneurial orientation is moderately related with their organizational performance (average correlation $r=.24$), and that this relationship is robust to different operationalizations of both constructs (Rauch et al., 2009). Moreover, individual level OB studies suggest a similar relationship. Individual innovation has for example been correlated with in-role job performance (Janssen and Van Yperen, 2004), actual promotions at work after two years, and salary increases (Seibert, Kraimer and Crant, 2001). Voice, taking charge and issue selling were associated with overall performance rated by supervisors (Grant, Parker and Collins, 2009). For risk-taking, Rauch and Frese's (2007) meta-analysis of individuals' entrepreneurial traits revealed a positive correlation with their entrepreneurial success. Findings so far suggest that IB should be positively related with job performance, but is not identical.

Feedback seeking aims to enhance the fit between a person and his/her organizational environment, and has been shown to be related-but-distinct from proactive work and strategy behaviors (Parker and Collins, 2010). Feedback seeking refers to the compatibility of the attributes of a person with the situation, such as whether his/her abilities fit the demands of a job or whether the values of the person are compatible with the organization. It is aimed to gather information to better respond to the demands of the environment, and thereby perform more effectively within the context (Ashford and Black, 1996). As we argued above, it is not considered to be in the domain of intrapreneurship, as it primarily emphasizes developing the self rather than the organization. We hypothesized

H2 Intrapreneurial behavior is positively related with, but distinct from (a) job performance, (b) feedback seeking.

POTENTIAL CORRELATES

As individuals' behavior is influenced by personal and environmental factors (Bandura, 1999), we focused on individual level and contextual variables to deepen our understanding of who is an intrapreneur, or who has a good chance to become one, and when.

Individual level

Our analysis of individual-level variables included proactive personality, educational attainment, age and tenure. We also tentatively explored if gender is related with IB. So, a main objective was to analyze demographic variables. Previous studies in the fields of individual innovation, proactive behavior and risk-taking already included subsets of these, but always to control for their effects and not as a primary target for research (Bindl and Parker, 2010). We anticipated that this will contribute to our understanding of intrapreneurial behavior and will enable practitioners to identify potential intrapreneurs and to develop better and more focused interventions.

Proactive personality is a dispositional trait to take action in order to influence one's environment and bring about change (Bateman and Crant, 1993). The prototypical proactive personality was introduced as someone who is relatively unconstrained by situational forces and who effects environmental change. People are not always passive recipients of environmental constraints on their behavior; rather, they can intentionally and directly change their current circumstances (Bateman and Crant, 1993). Proactive personality was found to relate positively with individual innovation, taking charge, voice, problem prevention and issue selling credibility (Parker and Collins, 2010). Also, relationships were found between proactive personality and the entrepreneurial behaviors of business owners, including entrepreneurial posture and starting a business (Becherer and Maurer, 1999). Proactive personality is therefore expected to be positively associated with IB. Given the past evidence on its empirical relationship with (elements of) IB, including this construct can also be regarded as a check of criterion validity.

Educational attainment has previously been connected to the decision to become self-employed (e.g., Delmar and Davidsson, 2000) and to the success of independent entrepreneurs, as it increases their capability to identify and exploit opportunities due to better prior knowledge, and better capacities to acquire external resources and to accumulate new knowledge and skills (Unger, Rauch, Frese and Rosenbusch, 2011: p.343-344). Drawing on similar reasoning, OB studies found similar positive relationships between education and proactive behaviors like voice (LePine and Van Dyne, 1998) and continuous improvement (Fuller, Marler and Hester, 2006). Moreover, human capital theory suggests that people desire to be compensated for their human capital investments. Human capital refers to skills and knowledge that individuals acquire through investments in schooling, on-the-job training and other types of experience (Becker, 1964). In the context of IB, we may assume that better educated people are more likely to be proactive and take risks to advance their careers. As intrapreneurial behaviors are generally associated with better job performance and appraisals, opportunity pursuit would be the way to make the most out of their human capital investments.

For age we anticipate that the relationship with IB is an inverted U. Entrepreneurship studies repeatedly showed this relationship for the decision to be self-employed (e.g., Long, 1982; Taylor, 1996). The Global Entrepreneurship Monitor annually documents across the globe how many citizens are involved in early-stage entrepreneurial activity, and finds that this applies most to middle-aged individuals (Bosma and Levie, 2010). Age is supposed to incorporate the positive effects of growing experience and the negative effects of declining uncertainty tolerance and desire to start a business (Bosma and Levie, 2010). Conversely, the organizational behavior literature provides mixed results on the impact of age (Bindl and Parker, 2010), but an inverted U-shape has not been tested here. We reason that age proxies both motivation and perceived

capability to engage in IB, and that both are necessary conditions. First, motivation for intrapreneurship should decrease with age. Baltes' (1987) life span theory states that younger people tend to perceive their future as open-ended (holding a 'time since birth' perspective) and are especially motivated by growth or knowledge-related goals, while elder people increasingly regard time as a constraint ('time till death' perspective) and prefer to deepen and maintain their existing relations. It has been shown that when people age, their openness to new experiences and change decreases (Terracciano, McCrae, Brant and Costa, 2005) and that such patterns also apply to work situations (e.g., Carstensen, Isaacowitz and Charles, 1999; de Lange, van Yperen, van der Heijden and Bal, 2010). Second, perceived capability should increase with age, which indicates experience in the workplace. Such experience strengthens individuals' prior knowledge, and capabilities to acquire missing resources, knowledge and skills (cf. Unger *et al.*, 2011). Third, previous work suggests that both motivation and capability are necessary conditions for IB. Existing models of entrepreneurial intentions and behavior (including the entrepreneurial event model and planned behavior theory) propose similar antecedents (e.g., Shapero, 1982; Kolvereid and Isaksen, 2006). It has also been proposed that motivation and capability interact, implying that both factors have threshold values below which no amount of the other can compensate (Krueger, 2003). Recent empirical contributions indeed report significant interactions between these factors (Fitzsimmons and Douglas, in press; de Jong, in press). In our current context, this would imply that middle-aged people are more likely to engage in IB.

Organizational tenure is the number of years that one is employed at the organization. It should be positively related with IB. Our reasoning again draws on accumulated experience and related human capital. In previous entrepreneurship studies, start-up success has been associated with domain-specific employment experience (Unger *et al.*, 2011). The longer people work for an organization, the more they have seen their domain-specific knowledge, skills and experiences accumulate, and the more likely they are to exploit opportunities because of enhanced prior knowledge, contacts with need sources, mastery of exploitation behaviors like persuasion and championing, and possession of relevant network contacts. Besides, experience people should have higher abilities and greater knowledge in the field of potential intrapreneurial efforts, which tends to result in higher risk-taking propensity (cf. Gifford 2003). Alternatively, we can argue that organizational tenure correlates with age. Despite increasing labor mobility, many workers still reside at a single organization, especially after their age exceeds a certain threshold. This would imply that tenure goes together with diminished motivation to engage in behaviors to deviate from any status quo – so the relationship between tenure and intrapreneurial behavior may alternatively be an inverted U. In our analysis we tentatively explored this possibility. In all

- H3 The relationship between intrapreneurial behavior and...
- ...(a) proactive personality is positive
 - ...(b) educational attainment is positive
 - ...(c) age is an inverted U-shape
 - ...(d) tenure is positive.

Regarding gender we did not have any strong presuppositions, so we tentatively explored how it related with IB. In the entrepreneurship literature males have been found to be

more likely to become self-employed (e.g., Bosma and Levie, 2010), but organizational behavior studies found mixed results – many report no relationship (e.g., Fuller *et al.*, 2006) while some found males to be more likely to engage in such behaviors (e.g., LePine and Van Dyne, 1998). An important issue is that gender often correlates with educational attainment and other variables we included, which needs to be controlled for (Bindl and Parker, 2010).

Context

We focused on job-related characteristics, including job autonomy, job variety, job types and being employed fulltime (rather than parttime). Examining such variables helps to delineate what situations may be helpful to trigger IB and provides managers with opportunities to create more favorable contexts. Besides, job autonomy and variety are 'usual suspects' which have been previously associated with elements of IB, as we will discuss next. Analyzing these variables enables us to further assess the criterion validity of our measure.

Job autonomy is one of the core constructs in the assessment of climate for corporate entrepreneurship (Hornsby *et al.*, 1993; 2002). Job autonomy has been demonstrated to correlate with the number of ideas implemented by higher-level managers (Hornsby *et al.*, 2009) and firm-level corporate entrepreneurship (Ling *et al.*, 2008). Moreover, at the individual level previous studies have connected job autonomy with various elements of IB. Defined as the ability to determine independently how to do a job or task, the construct has been empirically associated with innovative work behavior (e.g., Axtell *et al.*, 2000; de Jong and den Hartog, 2005) and personal initiative, idea implementation and problem solving (Bindl and Parker, 2010).

Job variety should also correlate with IB. In her early work on individual innovation, Kanter (1988) identified that when jobs provide very little challenge and meaning, employees can feel crippled. Rather, when organizations provide multiple sources of loosely committed resources at decentralized or local levels, structure open communications systems, and create extensive network structures, individual innovation is expected to be facilitated much better. In line with this reasoning, more recent studies empirically linked job variety and intrapreneurial behaviors – for example innovative work behavior (de Jong and den Hartog, 2005), personal initiative (Frese, Kring, Soose and Zempel, 1996; Salanova and Schaufeli, 2008) and problem solving and risk-taking (Salanova and Schaufeli, 2008).

For job types, we anticipated that some workers are more likely to be intrapreneurial because of their hierarchical position and/or network reach. First, we hypothesized that managers are more likely to be intrapreneurial. The CE literature generally recognizes middle-managers as a source of entrepreneurial activity (e.g., Kuratko *et al.* 1990; Hornsby *et al.*, 2002). More recent contributions to this literature showed empirically that at upper hierarchical levels, managers face better opportunities to identify and implement entrepreneurial ideas due to their different organizational roles (Hornsby *et al.*, 2009). Likewise, the OB literature identified middle-managers as masters of change by generating, championing and realizing innovative ideas (Kanter, 1988). Hierarchical position has also been correlated with proactive behaviors, i.e. Fuller and colleagues (2006) found that individuals' hierarchical position influenced their felt responsibility for constructive change, which in turn correlated with voice and continuous

improvement behaviors. Finally, managers have been central in analyses of risk-taking behaviors (e.g., Ling *et al.*, 2008). They then tend to be compared with independent entrepreneurs who are believed to be their counterparts outside the firm (Stewart and Roth, 2001).

We also anticipated that sales workers are more likely to be intrapreneurs, as they are generally more externally focused and have more diverse networks. External work contacts relate to the frequency of employees' contacts with individuals or groups outside the organization who may be sources of information, inspiration or resources. In support, de Jong and den Hartog (2010) found that the more external work contacts, the better knowledge workers were rated by their supervisors on their innovative work behavior. Similarly, Perry-Smith and Shalley (2003) suggested that those having more diverse networks (with more weak ties) are more exposed to non-redundant information, and this would facilitate deviant behaviors like opportunity exploration and championing ideas. Finally, sales people are recognized for their strong need to conquer (Mayer and Greenberg, 2006). Sales people often fail to make a deal, and need to be persistent and accept losses (of their time and resources) in order to succeed. As a consequence, they can be anticipated to be more proactive and willing to take risks.

Finally, being employed fulltime may be positively associated with IB. In the longer run, by working more hours they become advantaged in the work-related knowledge and experience that they accumulate, so that better entrepreneurial performance is expected (cf. Unger *et al.*, 2011). In this context, job-specific expertise has been found to promote proactiveness at work. Dutton and colleagues (2001) identified various facets of knowledge facilitating individuals' issue selling attempts to the top management. Similarly Howell and Boies (2004) found that contextual knowledge positively correlated with individuals' championing of ideas. Finally, entrepreneurship research has identified that risk perceptions diminish with experience. More experienced people perceive fewer risks connected with entrepreneurial behavior in the corresponding domain and are accordingly more likely to push for opportunity exploitation (Gifford, 2003). In sum

- H4 The relationship between intrapreneurial behavior and...
...(a) job autonomy, (b) job variety, (c) being a manager, (d) being a sales worker, and (e) being full-time employed is positive.

DATA

Sample and procedures

The data were collected at a Dutch company specialized in policy research and consultancy services. Its customer base includes Dutch ministries, provinces and cities, industry associations, Chambers of Commerce, antitrust authorities, financial services firms, and various services of the European Commission. At the time we collected our data the company employed 271 people. The organization structure was flat and very organic. Work was usually organized in externally commissioned projects. The organization chart contained nine business units, all managed by one or several managers to which other workers directly reported. Team sizes could range from 2 to 15 workers. Individual employees and managers (who are also fee-earners) could collaborate with any other worker in the company, also across business units. Most workers however had a 'hard core' of people that they collaborate with most often.

We collected data from three distinct sources. In a pen-and-paper survey workers first identified three colleagues with whom they had collaborated most often in the past three years. This survey also contained measures of proactive personality, job autonomy and job variety. All employees received the questionnaire along with a covering letter assuring confidentiality. Over six weeks up to three reminders were sent by e-mail to those who had not yet responded. Eventually, 189 employees participated, a response rate of 70%.

The second survey was our main source of data - a web survey sent out to 216 workers identified as a 'close collaborator'. For every colleague who had mentioned their name, they were asked to complete a list of items on his or her intrapreneurial behaviors, job performance and feedback seeking behavior. Thus, we relied on other-reports, arguing that IB is measured best if there is 'visible' evidence to close collaborators. Peer-based ratings were then expected to be more accurate than supervisor ratings (as managers were not necessarily collaborators on a day-to-day basis). The number of rated colleagues varied from 1 to 9 with an average of 2.625. Every identified colleague received an introductory e-mail with a web link enabling them to answer all questions for the first, second, and any other colleagues who had mentioned their names. During eight weeks, up to three reminders were sent. Eventually, 67% of the invited persons completed the survey. In terms of peer-ratings, the response was 419 out of 567 (=74%). After matching both datasets, we had obtained at least one peer-rating for 179 employees, which is 66% of all staff members. Twenty-eight employees were rated once, sixty-two were rated twice, and eighty-nine persons had obtained ratings from all their identified colleagues. Whenever individuals had multiple ratings we averaged their scores on the web survey items, as the intraclass correlation coefficients (ICCs) indicated high consistency (see hereafter).

The third source was administrative data provided by the organization. We included respondents' age and tenure (in years) and dummy variables for educational attainment (bachelor or master degree), males, job types (being a manager and/or sales person) and being employed full-time. The respondents in the final, matched dataset were 22 to 64 years old ($M = 42.6$, $SD = 11.5$). Their organizational tenure ranged from .2 to 40.9 years with a mean of 10.6 years ($SD = 10.2$). Fifty-five percent was employed full-time, 65 percent was male, 13 percent was a manager, 21 percent had a sales position, 22 percent had a bachelor degree, and 66 percent had a master degree.

To examine potential selectiveness of the sample, we computed various χ^2 - and t-tests to compare respondents in the final sample ($n=179$) with those who had not participated or had not obtained any peer ratings ($n=92$). Responses were not selective with the exception of gender. Among non-respondents, the share of males was 41 percent (versus 65 percent for respondents, $p<.001$). However, in the analyses reported hereafter we did not find a relationship between gender and intrapreneurial behavior, so it is unlikely that this bias has compromised our findings.

Measures

All constructs were measured with multiple items, mostly taken from existing measures and translated from their original language (English) in Dutch. A back translation procedure was applied first to ensure that all items were adequately formulated. The items are listed in the annex to this paper.

The second survey, in which employees rated their peers, included nine items on the various intrapreneurial behaviors. Innovativeness was measured with three items from Scott and Bruce's (1994) individual innovation measure. For proactiveness, we used two items from the proactive strategic work behavior measures gathered by Parker and Collins (2010), covering strategic scanning and issue selling credibility. Besides, as the intrapreneurship literature regards new business development as a key element, we included a third, new item to more explicitly capture such behavior ('This person puts effort in pursuing new business opportunities'). Voice and taking charge items were not included as these are conceptually and empirically heavily related with individual innovation (Parker and Collins, 2010). Finally, risk-taking was indicated by two items from Zhao *et al.*'s (2005) measure of risk-taking behavior. We added a new item to reflect boldness, again because this is an important behavioral element in previous descriptions of intrapreneurs ('This person first acts and then asks for approval, even if he/she knows that would annoy other people').

The response scale ranged from 1 (not at all) to 5 (very often). To check if the peer-ratings were homogenous we computed the intra-class correlation coefficients ICC(c,1) using a two-way random model with consistency agreement (McGraw and Wong, 1996). The ICC(c,1) values ranged from .20 to .50 ($p < .001$) indicating that aggregation was appropriate. So, whenever responses were obtained from multiple peers, for each item the mean score was computed. Cronbach's α for the overall measure was .91, while for each dimension it exceeded .80 indicating good internal consistency.

Job performance and feedback seeking were also measured in this survey. To measure job performance we used three items from Ashford and Black (1996) indicating the achievement of work goals, quality of work performance, and overall job performance. The response scale ranged from 1 (10%, indicating that an individual was considered to perform better than only 10% of his/her colleagues) to 9 (90%, indicating that he/she was doing better than 90% of his/her colleagues). These data were again aggregated as the ICC(c,1) coefficients ranged from .27 to .35 ($p < .001$) indicating high consistency. Cronbach's α was .93. For feedback seeking we adopted three items from Ashford (1986). The ICC(c,1) coefficients now ranged from .10 to .18, indicating that peers were less consistent in their evaluation of colleagues' feedback seeking behavior. This makes sense as such behavior is likely to differ across colleagues. All ICC values were however significant ($p < .05$) and this justified aggregating them. Cronbach's α was .88.

In the initial, pen-and-paper survey employees had provided data on the latent constructs that we investigated as potential antecedents. Response scales ranged from 1 (strongly disagree) to 7 (strongly agree). For proactive personality we used four items from Bateman and Crant (1993). Cronbach's α was .80. Job autonomy was measured with three items from Morgeson and Humphrey's (2006) decision-making autonomy measure ($\alpha = .89$). Job variety was measured with three items from Morgeson and Humphrey's (2006) task variety measure ($\alpha = .89$). Average scores were computed to indicate the extent to which participants' possessed each of these constructs. Finally, the other variables (educational attainment, age, tenure, gender, job types and full-time employment) were obtained from the administration of the surveyed organization.

RESULTS

We first conducted confirmatory factor analyses (CFA) to test H1 and H2, then engaged in hierarchical regression analyses to test our hypotheses on the correlates of IB.

Confirmatory factor analysis

We computed a range of CFA models to assess the fit of our nine-item IB measure against competing models. Drawing on maximum likelihood estimation, we assessed model fit by interpreting absolute measures (GFI and RMSEA, both indicating recovery of observed correlations between the items), incremental fit measures (TLI and NFI, comparing a proposed model to a baseline one-factor model with all items having unity factor loadings) and a parsimonious fit measure (χ^2/df , indicating whether model fit has been achieved by 'overfitting' data using too many coefficients). See table 1.

Table 1. Alternative measurement models and tests of discriminant validity[#] (n=179)

Model	Absolute fit		Incremental fit		Parsimonious fit
	GFI (> .90)	RMSEA (< .08)	TLI (> .90)	NFI (> .90)	χ^2/df (< 3.0)
I all nine items load on a single factor of IB	.765	.202	.750	.794	8.29
II three unrelated first-order factors (innovativeness, proactiveness, risk-taking), each indicated by three items	.753	.228	.683	.745	10.24
III higher order IB with three first-order factors, which are each indicated by three items	.940	.078	.963	.954	2.07
IV as III, model extended with first-order factors for job performance (JP) and feedback seeking (FS) which are each indicated by three items, and JP and FS correlate with higher-order IB	.901	.067	.956	.924	1.79
V as IV, correlation between IB and JP fixed on 1	.800	.129	.834	.829	3.97
VI as I, correlation between IB and FS fixed on 1	.796	.135	.819	.818	4.23

[#]Threshold values of fit measures in brackets (taken from Hair, Black, Babin and Anderson, 2007).

Model I specified all nine items to load onto a single factor of IB. Error terms between the items were not allowed to correlate. This model had a poor fit, suggesting that the items were not one-dimensional. Model II was designed with each proposed dimension reflected in its three corresponding three items, but no higher-order structure was assumed. Again, model fit was again unacceptable. Modification indices suggested that the three dimensions were correlated. In model III we specified that each dimension was indicated with three items, while intrapreneurial behavior was the higher-order factor. This model is equivalent with a first-order model in which the factors are allowed to correlate. It had an excellent fit. All standardized item loadings were exceeding .60, while the first-order constructs loaded on IB with .92 (innovativeness), .87 (proactiveness) and .77 (risk-taking) (all with $p < .001$). These results suggest convergent validity, i.e. the three dimensions can be regarded as reflections of a higher-order IB construct. H1 was supported.

To assess the distinctiveness of IB as a construct, we compared it with measures of job performance and feedback seeking collected from the same source. In model IV we extended the model by adding job performance and feedback seeking as first-order factors, each indicated by three items. These constructs were specified to correlate with IB, while again all error terms were forced to be unrelated. This model had an acceptable

fit. The correlations between IB and job performance and feedback seeking were .44 and .28, respectively ($p < .001$). Next, in model V we fixed the correlation between IB and job performance on unity – to assess if both constructs are clearly distinctive. In model VI we repeated this exercise for the correlation with feedback seeking. In both models the overall fit was not acceptable. The χ^2 -differences with one degree of freedom were 186.88 and 209.52, respectively ($p < .001$). Hypotheses H2a and H2b were supported.

Regression analysis

Table 2 gives the descriptive statistics relevant for our hypotheses on the correlates of IB. We found significant correlations with proactive personality, having a master degree, being male, job autonomy and variety, and being a manager or sales person. We also noted that many independent variables were inter-correlated, e.g. males were more likely to be in sales, to be employed full-time, to be older and to have longer tenure. To control for these correlations, we conducted hierarchical regression analyses to test H3 and H4.

Table 2. Descriptive statistics (n=179)

	M	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) IB	3.07	.65											
(2) Proactive personality	4.63	.99	.38**										
(3) Bachelor degree	.22	.42	-.10	-.04									
(4) Master degree	.66	.47	.34**	.10	-.75**								
(5) Age	42.6	11.5	.01	-.01	.17^	-.21*							
(6) Tenure	10.6	10.2	-.04	-.07	.07	-.17^	.69**						
(7) Male	.65	.48	.17^	.06	.02	.08	.25*	.26**					
(8) Job autonomy	5.58	1.02	.47**	.31**	-.04	.29**	.13	.02	.22*				
(9) Job variety	5.42	1.08	.36**	.25*	.00	.13	.18^	.10	.14	.65**			
(10) Sales	.21	.41	.37**	.09	-.01	.22*	.23*	.19^	.15^	.23*	.19^		
(11) Management	.13	.34	.32**	.11	-.01	.06	.27**	.23*	.14	.24*	.30**	.29**	
(12) Full-time employed	.55	.50	.08	.14	.00	.05	.12	.05	.31**	.10	.11	.16^	.18^

M = mean, SD = standard deviation, ** $p < .001$, * $p < .01$, ^ $p < .05$.

Some of the independent variables were substantially correlated for obvious reasons (e.g, tenure and age), suggesting that multicollinearity may be problematic. As a rule-of-thumb however, this is most likely when correlations exceed absolute values of .80 (Hair *et al.*, 2007). In the regression models presented hereafter, we explored potential multicollinearity by computing the variance inflation factors (VIFs) per independent variable. These were always < 3.0 and within common thresholds (Hair *et al.*, 2007).

Table 3 summarizes the output of the regression analysis. Age and tenure were first centered around their means to ease the interpretation of the interactional analyses to investigate the supposed curvilinear patterns (cf. Aiken and West, 1991). No structural equation modeling was applied here (we disposed of only 179 respondents, and the models did not converge due to over-fitting the data with too many parameters).

The first model included only the individual-level variables. First, proactive personality was positively related with IB ($p < .001$), so H3a was supported. This finding echoed previous studies in which proactive personality was empirically related with dimensions of IB. Given that proactive personality was measured in an independent source, the result can be interpreted as evidence for the construct validity of the IB measure. Second, the dummies for educational attainment significantly contributed to IB. Those having a master degree were much more likely to be regarded as intrapreneurs

($p < .001$), while an intermediary but significant result was found for those with only a bachelor degree (rather than no degree at all). H3b was supported. Third, age was not linearly related with IB, as we had expected (the inverted U-shape is tested hereafter). Fourth, for tenure we did not find a linear relationship with IB, so H3d was not supported. Finally, we did not find a significant result for gender.

Table 3. OLS regression models of intrapreneurial behavior (n=179)

	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
<i>Individual:</i>				
Proactive personality	.34**	.26**	.26**	.27**
Bachelor degree	.33*	.20 [^]	.23 [^]	.22 [^]
Master degree	.56**	.33*	.38**	.34*
Age (centered years)	.06	-.06	-.07	-.07
Tenure (centered years)	-.01	-.05	-.01	.06
Male	.08	.07	.06	.06
<i>Contextual:</i>				
Job autonomy		.17 [^]	.15	.18 [^]
Job variety		.06	.05	.06
Sales		.23*	.20*	.22*
Management		.17*	.17*	.15 [^]
Full-time		-.08	-.08	-.07
Age ²			-.12 [^]	
Tenure ²				-.13
<i>Model fit:</i>				
R ²	27.8%	40.0%	41.1%	40.4%
F-value	12.4**	11.8**	11.3**	11.1**
ΔR^2		12.2%	1.1%	0.4%
ΔF -value		8.0**	3.9 [^]	2.0

** $p < .001$, * $p < .01$, [^] $p < .05$.

In the second model we added all variables related to job context to the equation, and found that ΔR^2 indicated a significant improvement of model fit. First, job autonomy was significantly associated with IB ($p < .05$), supporting H4a, and again suggesting construct validity of the IB measure. Second, for job variety no significant result was found. This construct was substantially correlated with job autonomy, leaving not enough unique variance. If we omitted job autonomy from the equation, job variety became significant. In the discussion section we elaborate on this result. Third, we found that both sales workers and managers were more likely to be regarded as intrapreneurs ($p < .01$). H4c and H4d were supported. Finally, the effect parameter of full-time employment was not significant. It did not matter if workers were employed full-time or part-time, so H4e was rejected.

In the third model we added the quadratic component of age-squared. We found that model fit increased significantly ($\Delta F = 3.9$, $p < .05$) while the standardized effect parameter for the quadratic component was negative ($b = -.12$, $p < .05$). As the linear component was not significant, our findings are a classic example of an inverted U-shape relationship (Aiken and West, 1991: p.65-66), supporting H3c. Next, the fourth model tested the same relationship for organizational tenure. We found no support for our speculation of an inverted U, suggesting that age and tenure, although related, are demographic variables with different meanings and implications for intrapreneurship.

Finally, to further validate the proposed measure, we repeated the hierarchical regression analyses for the various dimensions. A characteristic of a higher-order construct is that its dimensions basically share the same antecedents (Law et al., 1998; MacKenzie et al., 2005). We found that the correlates of innovativeness, proactiveness and risk-taking were largely identical. For job types, being a manager was only related with proactiveness, and not with innovativeness and risk-taking. Besides, the curvilinear relationship with age was not significant for risk-taking (although the sign of the effect parameter was negative). All other estimated parameters were in line with table 3 (results available on request).

DISCUSSION

When Pinchot (1985; 1987) introduced the term intrapreneurship, he clearly aimed for individual workers' contributions to advance their organizations. Ever since the overarching field of corporate entrepreneurship emerged, however, the literature has been dominated by analyses at the organizational level. In this paper we developed a new measure for individuals' intrapreneurial behavior (IB), defined as the identification and exploitation of opportunities by individual workers to (also) advance the organization, and reflected in their innovative, proactive and risk-taking behaviors. Such a measure facilitates future investigations of the individuals in corporate entrepreneurial processes.

Drawing on the corporate entrepreneurship and organizational behavior literatures, we proposed that IB is a higher-order construct which is reflected in individuals' innovative, proactive and risk-taking behaviors. So, we argued that the dimensions of a well-known firm-level concept can also be applied at the individual level. This is because the three dimensions are key elements in previous definitions of intrapreneurship (e.g., Pinchot, 1985; Stevenson and Jarillo, 1990; Antoncic and Hisrich, 2003) and similar constructs have been empirically related in the organizational behavior literature (e.g., Parker and Collins, 2010). We introduced a measure of nine items covering the three first-order constructs, all with good internal consistency. Confirmatory factor analyses revealed strong intercorrelations between these constructs, and high and significant factor loadings in a higher-order factor model. This result echoes firm-level corporate entrepreneurship studies which generally find that innovativeness, proactiveness and risk-taking are heavily correlated. In their recent meta-analysis of entrepreneurial orientation studies, Rauch *et al.* (2009) found that 37 measures were one-dimensional, lumping innovativeness, proactiveness and risk-taking even together in a single factor, while 14 were multi-dimensional with strong intercorrelations. IB also appeared to be related-but-distinct from individuals' job performance and feedback seeking behaviors. Moreover, we found that IB was positively associated with proactive personality and job autonomy, which confirmed our presuppositions drawing on previous research. Follow-up analyses also showed that the three dimensions have similar correlational patterns with external variables. In sum, our findings suggest that the proposed measure of IB is reliable and valid (but obviously further investigations are merited, as we will discuss later).

We emphasize that IB is a higher-order construct that becomes visible in a simultaneous presence of innovativeness, proactiveness and risk-taking. Although highly correlated, their interrelationships are not deterministic and none can by itself be regarded as intrapreneurial behavior. The most obvious example may be proactive behavior which

can be much broader than opportunity pursuit for the sake of the organization. When aimed for a better person/environment fit, proactive behaviors are not considered intrapreneurial. Recall that our CFA models showed that IB is distinct from feedback seeking - one of the proactive person/environment fit behaviors identified by Parker and Collins (2010). The proactivity literature also does not regard innovation and risk-taking as necessary ingredients. Likewise, innovative behavior covers the novelty-related part of intrapreneurship, but unlike proactiveness, it is not necessarily about acting in anticipation, nor is it defined by accepting risk (e.g., Scott and Bruce, 1994; de Jong and den Hartog, 2010). Furthermore, risk-taking behavior can be directed towards any object and does not automatically imply beneficial novelty for the organization and anticipatory and self-initiated elements. Finally, although the three dimensions are well-known in the organizational behavior literature, we recognized that even in combined form and applying existing items from the literature, they do not capture the full intrapreneurial domain. We therefore also included new items related to new business development and boldness in pursuing opportunities.

Implications

We also analyzed how IB is associated with various individual and contextual variables. Although this analysis is only a first step, our results can be helpful to identify potential intrapreneurs and to develop better and more focused interventions. A number of hypotheses on the correlates of IB were confirmed. For the individual-level variables proactive personality was one of them, implying that IB is partly explained by a dispositional trait and accordingly difficult to intervene on. The most obvious intervention would be to account for proactive personality when recruiting new workers.

We also found a number of demographic variables to be important. Educational attainment was a strong correlate of intrapreneurial behavior. Having a master degree was in fact the most significant independent variable, but workers with 'only' a bachelor were rated to be more intrapreneurial as well (compared to those with no degree at all). This finding stresses the importance of workers' cognitive development, and suggests a number of potential interventions. If their most highly-educated staff members would refrain from intrapreneurship, managers should start to wonder why. Other antecedent variables might then be less favorable, for example scant intrinsic motivation or inadequate job design. Alternatively, our finding once more emphasizes the importance of on-the-job training and lifelong learning. From the perspective of intrapreneurship investing in additional education and training seems legitimate. Finally, it gives managers another reason to account for educational attainment when recruiting new staff.

Another finding was that the relationship between age and IB is an inverted U, implying that middle-aged workers are generally regarded as more intrapreneurial than their younger and elder colleagues. The inverted U pattern has already been demonstrated for independent entrepreneurs (e.g., Taylor, 1996; Bosma and Levie, 2010), but now also for intrapreneurs. This suggests that both workers' motivation and perceived capabilities are influential. For managers this would imply that lower expectations with regard to intrapreneurial behavior are justified for their most junior workers (due to lack of capability) and the most senior ones (because of diminished motivation). Note however that the role of and interaction between motivation and capability is only assumed here, and future research into this matter is recommended (see hereafter).

Our study of job-context variables stressed the significance of job types. It was confirmed that managers are more likely to be intrapreneurs, echoing past studies in which middle-managers were assumed to be prime sources of intra-company entrepreneurial activities (e.g., Hornsby *et al.*, 2009). These studies have suggested that managers are more autonomous and better capable of opportunity identification and exploitation, and that they regard entrepreneurial activities to be part of their job. Moreover, we found that sales workers were more intrapreneurial. Note that in previous studies this group of workers has been overlooked. Sales workers are generally better connected with external need sources, enjoy high autonomy, and they generally need to be proactive and take risks in order to succeed. For the top management of any organization these findings are important, as it indicates that they could expect more from workers in specific jobs. Also note that middle-managers and (senior) sales workers are generally among the direct subordinates of top managers, especially in small- and medium-sized organizations. From the top management perspective those who are more likely to be intrapreneurs are not very far away, and interventions to stimulate intrapreneurship may then well include their own leadership style.

Another finding was that job autonomy was directly related with IB, while job variety was only related when autonomy was left out of the equation. As both constructs are related, we regard this finding as evidence that job design matters for bottom-up opportunity pursuit, providing top managers with an object for intervention. Our finding is in line with Parker's (1998) work on the determinants of role-breadth self-efficacy (RBSE). Defined as the extent to which people feel confident that they are able to carry out a broader and more proactive role, RBSE is closely associated with proactive behaviors. In a longitudinal survey, it was found that changes in task autonomy directly impacted changes in RBSE, while changes in task variety only mattered if task autonomy was excluded. In conclusion, the degree of autonomy seems more influential than job variety. It is probably distinctive because it increases control over the work environment which generally enhances motivation. Besides, autonomy implies that workers get involved in higher level decision-making tasks, which is generally a source of new mastery experiences and will enhance IB. In contradiction, job variety is usually concerned with taking on a prescribed set of extra tasks, and not necessarily marked by increased motivation or mastery experiences (cf. Parker, 1998).

Other hypotheses were not confirmed. When analyzing the individual-level variables we found no influence of organizational tenure, suggesting that age and tenure have clearly different implications for corporate entrepreneurial processes. An alternative explanation would be that few years at the company does not necessarily imply that employees are not experienced – in future research we should record respondents' previous jobs and related experiences to empirically analyze this matter. We also found that gender is a bad proxy for intrapreneurial behavior. The bivariate correlation between being male and IB was positive (table 2), but after controlling for other individual-level variables this relationship vanished. Furthermore, in our list of job-context variables being employed fulltime did not work as expected. We went on to check this finding by entering full-time equivalents (ranging from .2 to 1.0) rather than a dummy variable into the regression, but the effect parameter remained insignificant. We also tried to explore if having two parttime jobs would make a difference, reasoning that for 'real' part-timers the relationship with IB could be negative, while for those with multiple jobs it might be

positive because of better contacts with external need sources. Unfortunately however, lack of reliable data (announcing a second job was not compulsory in the surveyed organization) kept us from doing this analysis.

We noticed that previous studies on the dimensions of IB, especially on individual innovation and proactive behaviors, seem to implicitly assume that any person is capable of recognizing and exploiting opportunities. Our results however suggest that top managers should differentiate their expectations. Employees seem more likely to engage in IB if they are better educated, middle-aged, and hold managerial and/or sales positions. Assuming that IB is perceived as important, our findings have implications for the recruitment of new workers and the management of incumbent ones - job design and in particular autonomy are important to trigger their identification and pursuit of opportunities.

Limitations and suggestions

The current research had limitations which directly create opportunities for future research. First and foremost, our data were collected in a single organization. Future studies should replicate our findings and build upon them, but preferably in other industrial and cultural contexts.

The analysis of individual and contextual variables can be regarded as a partial nomological net, a necessary condition to demonstrate construct validity, but obviously a plethora of other variables can and should be analyzed as antecedents. In the CE literature an obvious direction would be to explore how IB relates with climate for corporate entrepreneurship factors identified by Hornsby and colleagues (2002; 2009) – beyond autonomy these are management support, rewards/reinforcement systems, time availability and organizational boundaries. Moreover, we stress that the discriminant validity of the proposed measure can still be analyzed in more detail. We showed that IB is distinct from job performance and feedback seeking, but one should also collect the IB measure from multiple sources to enable a full multitrait-multimethod analysis (Campbell and Fiske, 1959; Lucas et al., 1996).

We assumed a range of mechanisms to justify why individual-level and contextual variables can be related with IB, including human capital, motivations and perceived capabilities. These mechanisms were however not tested. In order to really understand why variables are correlates, it is urgent that future contributions explore to what extent these intermediary variables are responsible for any of the associations that we observed. Moreover, we provided alternative explanations for finding no significant results for organizational tenure and fulltime employment. It would be interesting to find out if previous work experience moderates the relationship between tenure and IB. We would also applaud efforts to explore if having multiple jobs moderates the connection between part-time work and opportunity pursuit.

In conclusion, the construct of intrapreneurial behavior enables more fine-grained analyses of the role of individuals in corporate entrepreneurial processes. The construct can and should be connected with the many factors and models that have so far been offered in the corporate entrepreneurship literature. Our measure is available for application in such endeavors.

ANNEX: MEASURES

Intrapreneurial behavior

This employee...

...generate creative ideas¹

...search out new techniques, technologies and or product ideas¹

...promotes and champions ideas to others¹

...identifies long term opportunities and threats for the company²

...is known as a successful issue seller²

...puts effort in pursuing new business opportunities²

...takes risks in his/her job³

...when large interests are at stake, goes for the 'big win' even when things could go seriously wrong³

...first acts and then asks for approval, even if he/she knows that would annoy other people³

(Items reflecting ¹ innovativeness, ² proactiveness, ³ risk-taking. All rated on a five-point scale 'not at all' – 'very often')

Feedback seeking

This employee...

...seeks feedback from you about his/her work performance.

...seeks feedback from you about potential for advancement within your company.

...seeks information from other co-workers about his/her work performance.

(rated on five-point scale 'not at all' – 'very often')

Overall job performance

How do you assess this employee's...

...overall performance?

...quality (not quantity) of work performance?

...achievement of work goals?

(rated on nine-point scale, ranging from 'bottom, 10% of colleagues is doing worse' to 'top, 90% of colleagues is doing worse')

Proactive personality

No matter what the odds, if I believe in something I will make it happen.

I love being a champion for my ideas, even against others' opposition.

I excel at identifying opportunities.

If I believe in an idea, no obstacle will prevent me from making it happen.

(rated on seven-point scale 'strongly disagree' – 'strongly agree')

Job autonomy

My job...

...gives me a chance to use my personal initiative or judgment in carrying out the work.

...allows me to make a lot of decisions on my own.

...provides me with significant autonomy in making decisions.

(rated on seven-point scale 'strongly disagree' – 'strongly agree')

Job variety

My job...

...involves a great deal of task variety.

...concerns a wide array of responsibilities.

...involves doing a number of different things.

(rated on seven-point scale 'strongly disagree' – 'strongly agree')

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