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Individual Entrepreneurial Orientation and Intrapreneurship in the Public Sector

Abstract

This paper investigates the relationship of individual entrepreneurial orientation (IEO) and intrapreneurial activities in the public sector. Moreover, the influence of the two self-regulatory modes locomotion and assessment are used to provide further insights into this relationship. This empirical study focuses on a quantitative analysis of 266 public sector employees from municipalities and cities in the German-speaking countries gathered through an online survey. The results demonstrate that public sector employees with a high level of IEO are more likely to work on explorative activities which are the foundation for every intrapreneurial process. Furthermore, the results highlight that IEO does not have an influence on exploitative activities. The respective self-regulatory mode is identified as an important moderator for the relationship. Our research shows that an archetype of an intrapreneur who is strong in scanning for new opportunities and evaluating them is possible.

Keywords

Intrapreneurship, Individual Entrepreneurial Orientation, Public Sector

Introduction

Intrapreneurship, *Corporate Entrepreneurship* (CE), *Corporate Venturing* or *Intrapreneuring* are all (widely synonymously used) terms that deal with the creation of something new out of an existing organization (Burgelman, 1983; 1985; Lumpkin and Dess, 1996; Pinchot, 1985). This renewal and revitalization of an organization leads to positive consequences on organizational performance (Schollhammer, 1981, 1982; Kanter, 1984; Rule & Irvin, 1988; McKinney & McKinney, 1989; Guth & Ginsberg, 1990; Zahra, 1991). The effects of intrapreneurship are typically investigated in private companies. However, also municipalities now face a growing series of challenges and resource constraints that fundamentally call into question their historical activities and ways of doing things. In turn, the challenges of municipalities justifies investigating intrapreneurship in municipalities and cities as well.

The entrepreneurial orientation (EO) of employees is attracting growing research interest in recent years. Bolton & Lane (2012) developed a scale to analyze the *individual entrepreneurial orientation* (IEO) of employees. The origin of IEO is based on EO itself (Mustafa et al., 2018). Specifically, the original *Covin and Slevin* EO scales focus on individuals in the guise of organizations' most senior managers—its CEOs—but do not specifically regard them as individuals, but rather only as representatives who speak for the *whole* company. This position relies on the efficacy of *upper echelon theory* to

1 explain why organizations in time come to reflect their senior managers (Covin & Miller, 2014; Ham-
2 brick and Mason, 1984). Hence, CEO EO becomes organizational EO. The hegemony of this position
3 is problematic. First, it has led to a denial of the possibility that EO might exist at other levels of analysis
4 within the organization (Covin and Wales, 2019). Second, the theory fails to explain adoption of EO
5 characteristics and exhibition of EO behaviors elsewhere in the organization (e.g., Wales et al., 2011).
6 In turn, only the EO of organizations constituted by EO levels of key Decision-makers (mainly CEOs)
7 are regularly investigated. Third, and in contrast, it is not only the CEO himself who fosters innovation.
8 Employees are an important factor to creating innovation within a firm (Hughes et al., 2018). For exam-
9 ple, when effectively galvanized, employees try to solve organizational issues (Zampetakis &
10 Moustakis, 2010, 2012), innovate in the workplace to enhance workplace performance (Hughes et al.,
11 2018), facilitate intrapreneuring behavior (Mustafa et al., 2016), and create new ideas to fight competi-
12 tion (Croonen et al., 2016).

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The aim of this article is to examine the relationship of an individual orientation of an employee and his ability to conduct intrapreneurship in municipalities and cities. Therefore, we investigate the relationship of IEO with exploration and exploitation as two phases of CE (*exploration*, the opportunity identification phase, and the phase of *exploiting* the newly found opportunity within the organization) on the basis of 266 respondents in the context of municipalities and cities of every size. While exploration activities are the foundation for intrapreneurial success, exploitation activities are necessary to keep the organization running.

Theoretical foundations and development of hypotheses

The most open definition used for intrapreneurship is “entrepreneurship within existing firms” (Antoncic & Hisrich, 2001, p. 497). It means the creation of something “new” (Lumpkin and Dess, 1996), and describes a process of innovating and implementing regardless of the resources currently controlled (Carrier, 1996; Stevenson & Jarillo, 1990). Therefore, CE is a two-phased approach. The first phase within an intrapreneurial process is opportunity recognition. The second phase is the implementation of the intrapreneurial idea and the exploitation of the opportunity (Heinze & Weber, 2016; Sarasvathy, 2001; Eckhardt & Shane, 2003). Both phases are essential for a successful intrapreneurial process (Heinze & Weber, 2016).

A new logic: Exploring a new opportunity

Existing firms are an imperfect environment for the construction of new business (Fast & Pratt, 1981). However, these organizations are a proactive ground for opportunities, as they already provide potential funding, which is an effective combination to start innovations (Burgelman, 1983). Opportunities in

1 intrapreneurship arise from changes in institutions and the surrounding environment (Sine & David,
2 2003). While entrepreneurship concentrates on the recognition and exploitation of opportunities (Eck-
3 hardt & Shane, 2003), intrapreneurship is stronger tied to the creation of these opportunities. Opportu-
4 nities must be searched proactively, while the incumbent organization and their employees are typically
5 not interested in change; this is in part because salaried employees do not require to or necessarily have
6 a risk-taking appetite in the role they occupy (e.g., Hughes and Mustafa, 2017), unless they bear a form
7 of entrepreneurial orientation intrinsically. Based on the research of Heinze and Weber (2016), the re-
8 lationship between creation and exploitation is described as closer in intrapreneurship than in entrepre-
9 neurship. The authors demonstrated that one employee can create the opportunity and exploit it simul-
10 taneously in an intrapreneurial process. Eckhardt & Shane (2003) also show that an employee with a
11 positive cognition of entrepreneurship will result in a higher opportunity recognition. For employees
12 searching for new opportunities, a strong explorational approach is expected to be important.
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23 ***Implementation: Exploiting the opportunity***

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26 Heinze and Weber (2016) investigated the implementation process of an intrapreneurial process and
27 derived five intrapreneurial tactics to implement an opportunity. New logics are initially isolated be-
28 cause of their limited dissemination new ideas are easily ignored within the organization (Weber et al.,
29 2008). This results in the necessity of conflicts between the upcoming and existing logic (Zietsma &
30 Lawrence, 2010). That conflict can result in different possible outcomes ranging from a total integration
31 of the new logic to a symbolic adoption or its rejection (Westpahl & Zajac, 2001; Kraatz & Block, 2008).
32 In this implementation process, the intrapreneur (the person integrating the new idea) is a key person
33 (Briscoe & Safford, 2008). However, not everyone within the organization may support or share the
34 same belief in the emerging new logic. There are always individuals that are afraid of losing out when
35 a new logic emerges and resist it, resulting in “passionate resistance” (Heinze & Weber, 2016, p. 157;
36 Haveman & Rao, 1997).
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45 Institutional change can foster new opportunities. It can be described as an effect coming in
46 waves and existing in times of no change and times of change. Internal workers in an improved position
47 to change organizations and integrate a new logic because they are part of the organization, enjoy trust
48 and may take part in the decision-making process (Heinze & Weber, 2016). Nevertheless, they further
49 describe intrapreneurship as a strategy of lower and mid-level employees, and these employees do not
50 typically possess sufficient decision-making power. Advantageously, however, a lower status in their
51 organization means such individuals are likely to become dissatisfied with existing systems, resulting
52 in their drive for intrapreneurship (Battilana, 2006; Howard-Grenville, 2007; Meyerson & Scully, 1995).
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61 ***The inner dimension of intrapreneurship***

1 Antoncic and Hisrich (2001) developed a four-dimensional model for intrapreneurship. First, the dimen-
2 sion of *new business venturing* can be constituted in two different possibilities. Opportunities can be
3 exploited within the firm (Stopford & Baden-Fuller, 1994) in the form of new products or services (Rule
4 & Irwin, 1988). Another possibility is the creation of a spin-off, a new firm with a less formal relation-
5 ship than the original (Zahra, 1991; Anton & Yao, 1995). Based on the form of formalization and the
6 distance between the existing and the new venture, scholars use different expressions such as *internal*
7 *venturing*, *autonomous business unit creation*, *corporate start-ups* or *newstreams* to represent new busi-
8 ness venturing (Vesper, 1984; Hisrich & Peters, 1984; MacMillan et al., 1984; Kanter & Richardson,
9 1991).

16 Second, the innovation dimension includes the creation of new products, services or methods of
17 production (Schollhammer, 1982). Therefore, intrapreneurship makes use of incremental and radical
18 innovation (Schumpeter, 1942, Antoncic & Hisrich, 2001), which is the advancement of products and
19 services as well as technologies (Knight, 1997). However, some research constituted intrapreneurship
20 as mainly incremental development, as intrapreneurs are less influential in the organization than the
21 influence typically granted to or available to an entrepreneur (Heinze & Weber, 2016).

27 Third, self-renewal addresses the transformation of organizations in a highly embattled environ-
28 ment. Organizations today are influenced by pressure from the four sides of customer, competitor, tech-
29 nology and legal changes (Kuratko et al., 2011). Based on today's transient environment, organizations
30 must rethink their business model, whether they are private or public entities. The revitalizing effect of
31 intrapreneurship motivates employees, creates new strategies and leads to improved financial figures
32 (Zahra, 1991). Zahra (1993) demonstrated in a study that the dimension fosters several important factors
33 like the strategic orientation, the organizational change and a refinement of the business concept. Fur-
34 thermore, a strategic change of the business is viewed as a form of intrapreneurship (Vesper, 1984).
35 Further supporting that an entrepreneurial corporation as one that can stay flexible, adaptable and able
36 to renew the business (Muzyka et al., 1995).

44 Fourth, proactiveness is a dimension deeply established in the entrepreneurship literature. Pro-
45 activeness is an aggressive strategy to compete with competitors (Knight, 1997), constituted by taking
46 risks and following an experimental approach (Stopford & Baden-Fuller, 1994). A proactive orientation
47 constitutes a strong leader role for a business in taking the initiative to find and exploit opportunities.
48 By trying to creating new opportunities rather than checking or mirroring the competitor, they perform
49 an aggressive strategy to compete with rivals (Lumpkin & Dess, 1996; Covin & Slevin, 1991).

57 **Development of Hypotheses**

59 *Individual Entrepreneurial Orientation in the Context of Exploration and Exploitation*

1 The relationship between firm performance and EO is an often-investigated research question. Authors
2 claim EO to be a unidimensional construct and explain the different dimensions (risk-taking, innova-
3 tiveness and proactiveness) to have similar effects on performance (Covin & Slevin, 1989). However,
4 newer supports other results too (see Covin & Wales, 2019). Authors describe that the dimensions can
5 occur in different combinations and that the effect of the sub-dimensions could vary (Lumpkin & Dess,
6 2001; Covin et al., 2006; Hughes & Morgan, 2007; Kraus et al., 2018).
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11 Earlier, we demonstrated the importance of investigating IEO in the form of individual entre-
12 preneurial behavior (Mustafa et al., 2018). Our position is that for organizations to effectively harness
13 and realize the potential of senior manager's EO for the firm, employees must express behaviors that
14 are akin to firm EO in the form of IEO. Indeed, recent (re)conceptualizations of EO suggest that it bears
15 an attitudinal and behavioral element (Anderson et al., 2015). While underdeveloped, it is likely that to
16 employees, the expression by senior managers of firm EO is emblematic of organizational attitude, the
17 desire of senior managers. But unless employees themselves exhibit intrapreneurial behavior, the poten-
18 tial of firm EO may go unrealized. The efforts of employees (Hughes et al., 2018) and the extent of their
19 ownership of intrapreneurship (Mustafa et al., 2016) is theoretically vital. This investigation outlines the
20 influence of IEO as an overall concept on work activities and shows the relationship of the sub-dimen-
21 sions risk-taking, innovativeness and proactiveness on the two possible intrapreneurship activities of
22 exploration and exploitation.
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32 Several studies have already investigated the EO of an organization and have highlighted the
33 relationship to performance. However, not all studies found a positive one (Rauch et al., 2009). Moving
34 to an individual level, Hughes et al. (2018) recently identified that innovative behavior influences indi-
35 vidual and team workplace performance positively. Individuals engaging in explorative activities are
36 considered to be potentially successful intrapreneurs. Being explorative is described as investing time
37 into new activities, which is similar to the self-renewal dimension which Antoncic and Hisrich (2001)
38 described intrapreneurship to be based on. Therefore, working (intra)entrepreneurially in a new un-
39 known environment is explorative. By contrast, exploitative work deals with routines, refinement and
40 execution.
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48 *Risk-taking* as being part of an entrepreneurial (and therefore also intrapreneurial) process is
49 founded in the early definitions of Cantillon (1734). An entrepreneur faces several risks, from financial
50 ones to reputational; however, also employed staff face forms of personal risks within their roles. Espe-
51 cially by working on explorative activities, employees must sometimes cross the border of the organi-
52 zation's strategy and culture (Shane, 1994; Day, 1994). An employee working on explorational activities
53 faces a high personal risk. Within an organization, the risk dimension is more personal. It includes to
54 challenge existing norms (Heinonen & Toivonen, 2008) or reduce bureaucracy (Zampetakis &
55 Moustakis, 2007; 2010). Often, they may not be supported by management (Mustafa et al., 2018), re-
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1 sulting in further personal risk for the employee. These risky behaviors are more likely to support ex-
2 plorative behavior than exploitative. For exploitative behavior, the tasks are clear and do not allow chal-
3 lenging norms or changing processes to reduce bureaucracy, nor is it strictly necessary. For exploration,
4 such actions are required, exposing the individual employee to risk. Validating this theoretical concern,
5 studies report that trust in ones work colleagues and line managers bear effects on the efficacy of indi-
6 vidual innovative behavior, for example (Hughes et al., 2018).
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11 The definition of *innovativeness* describes explorative activities dealing with something new
12 and unknown (Schumpeter, 1942; Lumpkin & Dess, 1996). Although innovation varies between its level
13 of newness (Hage, 1980), it typically deals with the will to update something old to a newer version,
14 identifying opportunities, generating new ideas and developing new products/services (Subramaniam &
15 Youdt, 2005), even at a cost to established products, services and markets served by the organization
16 (Kyriakopoulos et al., 2016). Atuahene-Gima (2005) described a relationship of exploitation and incre-
17 mental innovation as well as exploration and radical innovation. The literature review of Mustafa et al.
18 (2018) indicated Innovation as the most common part for personal entrepreneurial behavior.
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25 *Proactiveness* is an essential part of the entrepreneurial process (Schumpeter, 1942), and, in
26 likelihood, the intrapreneurial process. Proactiveness leads to an earlier detection of new possibilities
27 and opportunities. A problem associated with proactiveness is the implicit time element—whether pro-
28 activeness requires some aspect of pre-detection (Covin & Wales, 2019). However, we see this as a
29 conceptualization of proactiveness as a property, not as a behavior. Proactive behavior refers to efforts
30 by the individual to scan their environment for weak signals and peripheral information in an effort to
31 detect new trends or emerging situations before they fully evolve or take shape. Therefore, it is likely of
32 value to explorational activities. Indeed, Miller and Friesen describe proactive organizations as ones that
33 act early and do not only react on established trends (1978). Extrapolated to the employee, such behavior
34 results in proactive employees working ahead of trends and not only following them. To do so, they
35 must go beyond existing boundaries and leverage their knowledge to seek new solutions.
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44 On these foundations, we establish the following hypotheses:
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49 *H1: The higher the IEO characteristics of an employee, the higher the value of exploration.*
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51 *H1.1: The higher IEO Risk characteristics are, the higher the value of exploration.*
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53 *H1.2: The higher IEO Innovation characteristics are, the higher the value of exploration.*
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55 *H1.3: The higher IEO Proactiveness characteristics are, the higher the value of exploration.*
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60 *H2: The higher the IEO characteristics of an employee, the lower the value of exploitation.*
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1 *H2.1: The higher IEO Risk characteristics are, the lower the value of exploitation.*
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3 *H2.2: The higher IEO Innovation characteristics are, the lower the value of exploitation.*
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5 *H2.3: The higher IEO Proactiveness characteristics are, the lower the value exploitation.*
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8 9 ***The influence of locomotion and assessment***

10 *Locomotion and assessment* are the two different orientations a person can follow in *regulatory mode*
11 *theory*. They are modes of self-regulation and describe how people act (Higgins & Kruglanski, 2003;
12 Kruglanski et al., 2000). Both modes are tied to entrepreneurship. Locomotion is defined as the move-
13 ment from one state to another without any direction or destination in mind, whereas, assessment is an
14 “orientation to measure, interpret, or evaluate the rate, amount, size, value or importance of something,
15 to appraise critically for the purpose of understanding or interpreting, or as a guide in taking action”
16 (Avent & Higgins, 2003, p. 526). The variables shape a person’s character and are stable in general,
17 however in specific situations one type can dominate the other (Higgins et al., 2003). Both dimensions
18 are relatively independent of each other, resulting in the possibility of individuals being strong on both
19 locomotion and assessment (Avnet & Higgins, 2003; Amato et al., 2017). Amato et al. (2017) state that
20 both regulatory modes can be related to opportunity recognition and evaluation. They demonstrated
21 several overlaps of entrepreneurship and self-regulatory modes. Their research shows a highly signifi-
22 cant effect of locomotion on the scanning for opportunities, and a highly significant effect of assessment
23 on the evaluation of opportunities. So, locomotion drives people into new opportunities, assessment
24 helps to identify the best alternatives.
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27 *Locomotion* is an action-based factor that describes people willing to implement new opportu-
28 nities (Kuhl, 1983 & 1985). This orientation is an important factor for an intrapreneur when facing an
29 existing organization. Locomotion describes the movement in general, moving from one station to the
30 next (Higgins, 2003). This moving behavior demonstrates a connection with IEO and explorational ac-
31 tivities. Action orientation and performance orientation are both factors that are supported and fostered
32 through a locomotion (Sellin et al., 2003). Moreover, locomotion-oriented people are motivated to move
33 from task to task. As a result, they are not interested in doing the same task all the time (Avnet &
34 Higgins, 2003; Higgins et al., 2003). Considering this prior research, employees with a high value of
35 locomotion are less committed to exploitative activities because these activities are routines that do
36 not allow one to move on. By contrast, they are highly interested in explorative activities where new
37 activities can be repeated daily. Furthermore, locomotion is positively influencing the scanning for new
38 opportunities which shows similarity to EO in case of opportunity recognition. Thus, these are important
39 factors for municipality employees to discover ideas or be open for ideas of private companies.
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59 On this foundation, we assert the following hypotheses:
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1 *H3.1: Locomotion positively influences the relationship of IEO and exploration activities.*

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3 *H3.2: Locomotion negatively influences the relationship of IEO and exploitation activities.*

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7 *Assessment* is a more strategic orientation compared to locomotion and leads people to consider their
8 behavior more. People with a high manifestation of assessment are likely to deal with the past and not
9 start performing (Furtner & Sachse, 2017) without evaluating all potential combination and outcomes
10 (Amato et al., 2017). Employees who have a high level of assessment analyze possibilities and wait for
11 alternatives before they decide (Sok et al., 2016). They work “to do the right thing” (Kruglanski et al.,
12 2000, p. 793). Assessment oriented employees are more effective in finding inefficiencies and in cor-
13 recting them. It is positively influencing association and evaluation, which eventually leads to business
14 success (Amato et al., 2017). Here the authors expect assessment to moderate the relationship of IEO
15 and exploration and exploitation. Employees with a strong expression of assessment are expected to be
16 able to implement strategies because of their willingness to focus intently on their work, and do so with
17 stamina and persistence. We thus hypothesize:

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26 *H4.1: Assessment negatively influences the relationship of IEO and exploration activities.*

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29 *H4.2: Assessment positively influences the relationship of IEO and exploitation activities.*

30 31 32 33 **Empirical Part**

34 35 ***Methodology***

36
37 This study is based on a quantitative methodology to understand the underlying research model (see
38 figure 1) and test the hypotheses. The data for the empirical analysis was collected through an online
39 survey, which was conducted in April 2018 and which addressed the employees of municipalities and
40 cities in the German-speaking regions of Europe, i.e. Austria, Germany, Liechtenstein and Switzerland.
41 We sent the questionnaire to 1,694 randomly-selected municipalities and collected a total of 266 indi-
42 vidual responses after deleting incomplete surveys. This results in a response rate of 15.7%, which is
43 above average for an academic survey of this type in the German-speaking named countries (e.g., Kraus
44 et al., 2018; Eggers et al., 2019).

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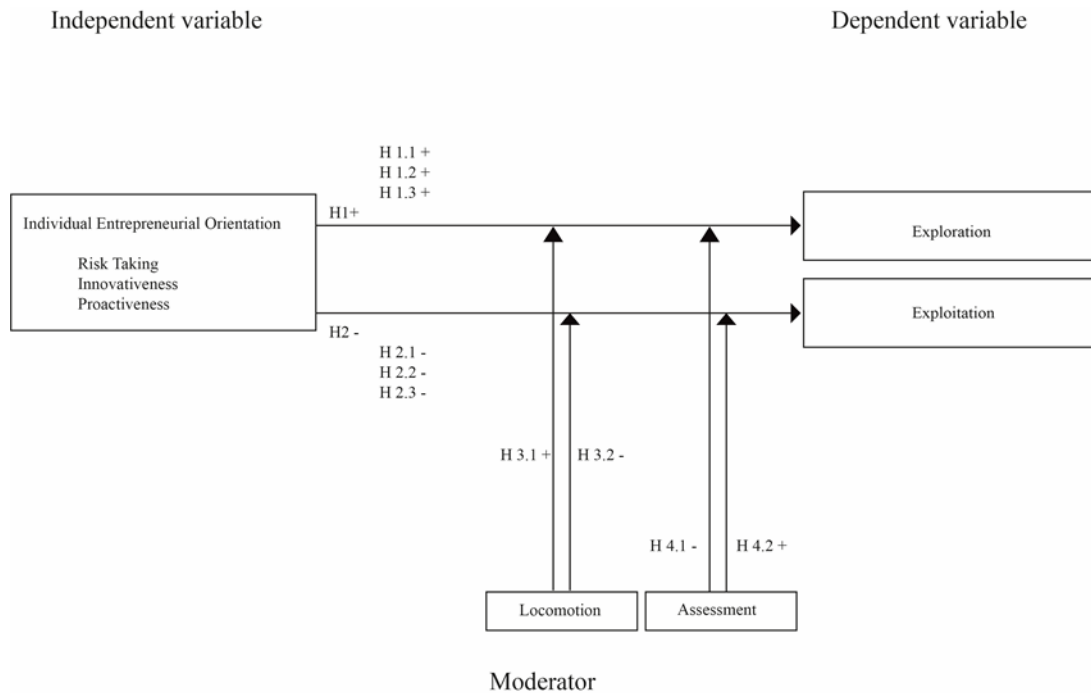


Fig. 1 Research model

The scales used for the survey are based on reliable and valid constructs taken from existing literature:

Individual entrepreneurial orientation: The IEO scale used is developed by Bolton and Lane (2012) and shows three different subdimensions (risk-taking, innovativeness and proactiveness). A factor analysis led to the removal of unsatisfactory items resulting in a Cronbach's alpha value of .626. Similar results occurred in existing literature (Bolton and Lane, 2012; Bolton, 2012).

Individual-level exploration and exploitation: As a dependent variable, the study considers individual-level exploration and exploitation by Mom, van den Bosch & Volberda (2009). The factor analysis resulted in a Cronbach's Alpha of .841 for exploration and .724 for exploitation. One item of the exploitation scale was eliminated because of a high cross-loading.

Locomotion and assessment: For the moderator variables, self-regulating modes of locomotion and assessment, the scale used is a German version of the original one from Kruglanski et al. (2000), translated by Sellin et al. (2003). Because of insufficient factor loadings three items were removed. The final Cronbach's Alpha were .740 for Locomotion and .756 for Assessment.

Table 1 shows the means, standard deviations and correlations of the applied variables.

Public Sector Intrapreneurship

Table 1 Mean, standard deviation and correlations

	Mean	Std. Dev.	Gender	Education	Risk	Innovation	Proactiveness	IEO	Locomotion
Gender	1.52	.50	1						
Education	3.07	1.38	-.184**	1					
Risk	3.45	.57	-0,105	.163**	1				
Innovation	3.50	.61	-0,043	.122*	.373**	1			
Proactiveness	4.12	.50	-0,043	-0,018	0,072	0,021	1		
IEO	3.69	.37	-0,096	.141*	.740**	.743**	.495**	1	
Locomotion	4.40	.52	-0,002	0,067	.465**	.309**	.229**	.505**	1
Assessment	3.33	.69	-0,113	0,093	0,067	.152*	0,046	.137*	.20
Exploration	3.78	.95	-.202**	.241**	.445**	.336**	.202**	.498**	.46
Exploitation	3.96	.67	-0,039	-.181**	-0,061	-0,095	.134*	-0,023	0,0

Notes. n =266; * p < 0.05; ** p < 0.01 (two-tailed).

1
2 **Results**
3

4 To test the hypotheses, we used correlation and regression analysis. Regarding hypotheses H1, H1.1,
5 H1.2 H1.3, Table 2 shows the results of the regression analysis of IEO and its subdimensions influencing
6 explorational activities. The results demonstrate significant relationships among the variables. There-
7 fore, the whole block of H1 was accepted. Considering the block of hypotheses H2 (Table 3) only a
8 positive significance for proactiveness is found. Therefore, there seems to be no relationship among IEO
9 and exploitation. So, the hypotheses H2, H2.1, H2.2 and H2.3 are rejected.
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17 **Table 2** Summary of regression analyses of exploration

	Standardized Beta Factor	R ²	Corrected R ²
H1 IEO	.498***	.248	.245
H1.1 Risk	.385***		
H1.2 Innovation	.199**	.261	.251
H1.3 Proactiveness	.172**		

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29 Dependent variable: Exploration

30 n = 266,

31 * p < .05; ** p < .01; *** p < 0.001
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37 **Table 3** Summary of regression analyses of exploitation

	Standardized Beta Factor	R ²	Corrected R ²
H2 IEO	-.023	.001	-.003
H2.1 Risk	-.040		
H2.2 Innovation	-.083	.029	.018
H2.3 Proactiveness	.139*		

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49 Dependent variable: Exploitation

50 n = 266;

51 * p < .05; ** p < .01; *** p < 0.001
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56 The results of the moderating variable locomotion (Table 4) show that it fosters the relationship of IEO
57 and exploration and does not have a significant effect on the IEO and exploitation relationship. Con-
58 cluding, H3.1 is confirmed while H3.2 is rejected. Turning to hypotheses H4.1 and H4.2, the effect of
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assessment on the direct relationships, the results (Table 5) indicate that assessment harms the relationship of IEO and exploration and supports the relationship of IEO and exploitation. So, both hypotheses are accepted.

Table 4 Summary of regression analyses of the locomotion effect

	Standardized Beta Factor	R ²	Corrected R ²
H3.1 IEO and Locomotion	.561***	.314	.312
Dependent variable: Exploration			
H3.2 IEO and Locomotion	.050	.002	-.001

Dependent variable: Exploitation

n = 266;

* p < .05; ** p < .01; *** p < 0.001

Table 5 Summary of regression analyses of the assessment effect

	Standardized Beta Factor	R ²	Corrected R ²
H4.1 IEO and Assessment	.322***	.104	.101
Dependent variable: Exploration			
H4.2 IEO and Assessment	.138*	.019	.015

Dependent variable: Exploitation

n = 266;

* p < .05; ** p < .01; *** p < 0.001

Table 6 Hypotheses results summary

	Hypothesis	Approved
H1	<i>The higher the IEO characteristics of an employee, the higher the value of exploration.</i>	YES

1	H1.1	<i>The higher IEO Risk characteristics are, the higher the value of exploration.</i>	YES
2	H1.2	<i>The higher IEO Innovation characteristics are, the higher the value of exploration.</i>	YES
3	H1.3	<i>The higher IEO Proactiveness characteristics are, the higher the value of exploration.</i>	YES
4	H2	<i>The higher the IEO characteristics of an employee, the lower the value of exploitation.</i>	NO
5	H2.1	<i>The higher IEO Risk characteristics are, the lower the value of exploitation.</i>	NO
6	H2.2	<i>The higher IEO Innovation characteristics are, the lower the value of exploitation.</i>	NO
7	H2.3	<i>The higher IEO Proactiveness characteristics are, the lower the value of exploitation.</i>	NO
8	H3.1	<i>Locomotion positively influences the relationship of IEO and exploration activities.</i>	YES
9	H3.2	<i>Locomotion negatively influences the relationship of IEO and exploitation activities.</i>	NO
10	H4.1	<i>Assessment negatively influences the relationship of IEO and exploration activities.</i>	YES
11	H4.2	<i>Assessment positively influences the relationship of IEO and exploitation activities.</i>	YES

Table 6 and Figure 2 give an overview on the hypotheses and the general results of the empirical tests.

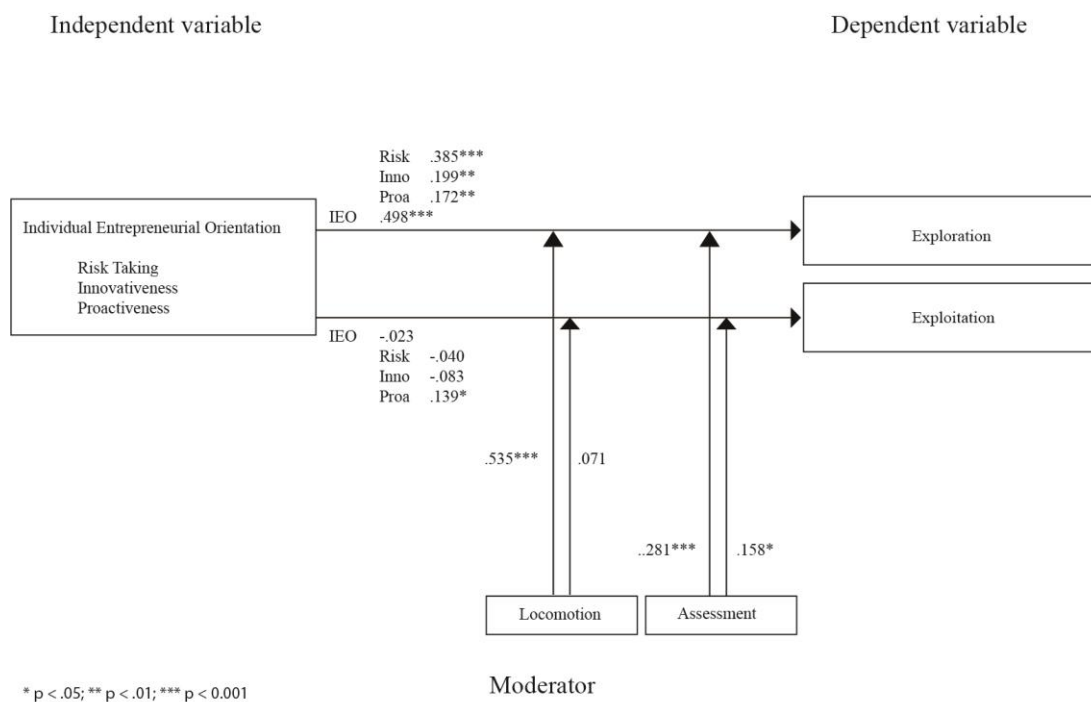


Fig. 2 Results shown in the research model

Discussion

EO is often described as vital to organizational performance. The positive revitalizing effect of EO is regularly reported in the literature (Rauch et al., 2009). But, there remains a theoretical and conceptual leap from organizational EO to entrepreneurial behaviors and intrapreneurial outcomes elsewhere in the organization and especially among individuals; and it is ultimately upon the behaviors of individuals that organizational activity and corporate entrepreneurship depend. This study investigated the relationship of IEO and exploration and exploitation as a consequence. Explorative activities are a necessary part of intrapreneurship. Literature suggests that the intrapreneurial process starts with a new logic, which means the creation of something new (Heinze & Weber, 2016; Sarasvathy, 2001; Eckhardt & Shane, 2003). Thus, creation of a new product, service or process can be enhanced through participating in explorative activities, and those individuals engaging on more explorative work are more likely to detect larger numbers of opportunities, and especially novel ones. We reveal the primacy of IEO to germinating exploration.

Entrepreneurially oriented employees are highly effective explorers according to our results. The results showed that IEO is strongly connected to explorative activities. Organizations that are willing to renew themselves and create innovations should therefore find or develop employees with a high amount of IEO. These employees are innovation drivers that create and find new opportunities. Kearny et al. (2008) has established a first model of public sector CE. The model consists of internal and external factors. In comparison to the research conducted in this study, only the internal factors are considered. The authors named structure, decision-making, rewards, culture, risk-taking and proactivity as factors to shape CE activities in public organizations. Our study highlights and sheds light on the beginning of the intrapreneurial process at the employee level and shows that both risk-taking and proactivity are necessary factors that lead to explorative activities. However, their model does not pay attention to the factor of innovation at first. They describe innovation as a result of the factors of proactiveness and risk. Russell (1999) describes internal innovation as something that is started by individuals or groups and can be influenced by the organization and the environment. Mulgan and Albury (2003) suggested several factors that described public sector organizations as a challenging environment for innovation. They draw attention to a culture of risk aversion and the lack of coping with risk and change management. This is a relevant point as our study revealed the highest beta factors for the relationship of risk and exploration, which suggests that the higher the ability of a public sector employee for risk-taking, the more time they spend on explorative activities within the organization. A meta-analysis on EO and performance shows a positive but less significant relationship for the risk dimension (Rauch et al., 2004). Bureaucratic organizations are generally seen as less risky than other organizations. They are more closely associated to exploitative tasks. Changes in the working process often reflect legislation changes and therefore require a longer time duration. This could lead employees with a high level of individual risk to be more strongly associated to explorative activities. However, the literature suggests that there

1 are major differences in the individual and the organizational risk dimension (Mustafa et al., 2018). The
2 risk dimension in IEO should be further researched to answer the question of how organizational and
3 individual risk differ.
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6 The intrapreneurial process is divided into two parts. Part one is the recognition of opportunities
7 and part two is the exploitation of opportunities. Often employers are afraid that employees concentrat-
8 ing on the identification of new opportunities are less effective in exploiting opportunities. This hypoth-
9 esis could not be supported in this study. Although the authors could not show the opposite effect, the
10 hypothesis is still overruled. Therefore, there still exists the possibility of a perfect intrapreneur that can
11 act on both exploration and exploitation. This result is further supported through the research of Heinze
12 & Weber (2016), in which they demonstrated that in some organizations the person that discovers an
13 opportunity is the same person who exploits this opportunity.
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20 Minimal literature deals with the relationship of entrepreneurship and self-regulation. However,
21 Amato et al. (2017) found that existing research and literature imply a strong relationship between en-
22 trepreneurship and self-regulation. They evidenced the first set of results of this relationship by indicat-
23 ing that people high on locomotion are successful in scanning for new opportunities. A high level of
24 assessment indicates that employees are strong in evaluating these new opportunities. Since the literature
25 suggests that it is possible to be a locomotor and an assessor concurrently, this describes a successful
26 intrapreneur, a person being able to identify and evaluate an opportunity. Combining existing research
27 with the results of this study a clear image of a potentially successful intrapreneur can be drawn.
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34 Our moderator analysis suggests that a person with high IEO and high locomotion works on ex-
35 plorative tasks and is therefore a perfect fit for an organization seeking new opportunities. As locomo-
36 tion is related to intrinsic motivation, this is a further indication that employees with a high level of
37 locomotion are vital for intrapreneurship (Kruglanski & Higgins, 2006; Pierro et al. 2006). Within ex-
38 isting literature, assessment is positively related to the ability of evaluating opportunities, which is a
39 crucial second part of intrapreneurship. Assessing opportunities actively helps intrapreneurs to identify
40 unrealistic opportunities and resolve them. Therefore, the assessment process decreases the personal risk
41 an intrapreneur must take. This investigation showed that the moderator assessment plays an important
42 role. However, between IEO and exploitation there is no significant relationship. This suggests that a
43 pure IEO does not influence an employee's exploitative activities. However, the results of the moderat-
44 ing effect demonstrate that individuals with an assessment attitude do engage in exploitative activities.
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53 Literature further suggests that it is possible to be strong in locomotion as well as assessment (Am-
54 ato et al., 2017), which provides the possibility of an *archetype* of an intrapreneur who is strong in
55 scanning for new opportunities and evaluating them. Since literature also supports the possibility of an
56 individual being able to successfully engage in exploration and exploitation activities simultaneously
57 (Mom et al., 2009) this further supports the possibility of a perfect Intrapreneur. To conclude, this study
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1 shows that locomotion and assessment do have a strong connection to intrapreneurship. The results
2 highlighted that there is the theoretical possibility of a perfect Intrapreneur. This intrapreneur is shaped
3 through a high level of IEO, in combination with a strong balanced level of locomotion and assessment
4 and exploration and exploitation.
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10 **Conclusion**

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12 Municipalities and cities must show innovative approaches. Either they must develop strategies for in-
13 dividual challenges, or they need to integrate solutions from private companies. In both cases, intrapre-
14 neurial action is required. While a long list of private companies are providing innovative solutions for
15 cities and municipalities, the stereotype of an inefficient administration remains predominant. Decision
16 cycles in municipalities and cities are long and often follow a steep hierarchy. Based on the democratic
17 system political key Decision-makers (e.g. mayors) are often changed, resulting in an increased im-
18 portance of individual employees. They must see an opportunity and start to pursue it either internally
19 or work with external companies.
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26 For municipalities and cities, innovative behavior appears increasingly crucial to their sustain-
27 ability. For example, an increasing number of cities are using social media to communicate with citizens.
28 Others use solutions that arouse with the “Internet of Things” to measure water levels and create novel
29 ways of risk management. Therefore, these organizations should hire employees with the potential to
30 engage in explorative activities to find further solutions. Employees with a high level of IEO fulfil this
31 description. Decision-makers in municipalities and cities can use the ten items of IEO to explore their
32 potential employees on their level of IEO. On this foundation, an organization can create a highly effec-
33 tive team for undertaking intrapreneurial activities.
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40 Decision-makers should be aware of the innovation potential of existing employees. Based on
41 the level of IEO, heterogeneous teams can be created for explorative tasks. Furthermore, employees
42 with a high level of IEO that are mostly working on exploitative activities could be transferred to more
43 explorative activities to prevent them from looking for a new job because of dissatisfaction. Employees
44 with a high level of IEO are more likely to be interested in explorative than exploitative jobs. To effec-
45 tively engage in intrapreneurial activities, the responsible ones can create teams for explorative tasks.
46 To increase the level of IEO and the general EO of the team, educational programmes could be a poten-
47 tial solution. With trainings and workshops employees already working on explorative tasks could in-
48 crease their awareness for opportunities. Municipalities and cities that are interested in innovative be-
49 havior should consider hiring employees with a high level of IEO and create teams for intrapreneurial
50 activities.
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59 The moderator analysis further suggests that decision-makers should check on the regulatory
60 mode of their employees. People with a locomotion mind-set are more likely to engage in explorational
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1 activities than the ones with an assessment mind-set. A locomotion mind-set is shaped by an ongoing
2 transition. Locomotion describes a state of moving. It can be used to describe a design thinking innova-
3 tion process. For this process a lot of ideas are collected and evaluated throughout the whole process
4 (Beckman & Barry, 2007). On the other hand, a high level of assessment would try to find one idea and
5 assess it deeply.
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10 In recent years, the private sector created several solutions for municipalities and cities. This
11 study suggests, that especially sales teams should wisely consider their first contact within a city or
12 municipality. A contact person with a low level of IEO is less interested in explorative tasks and seems
13 to be the wrong choice for a first contact with an innovative product or service. Employees with a high
14 level of IEO could be more fostering and help private companies to sell their solution to cities and
15 municipalities. However, the question results of how to identify these employees. We suggest a solution
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24 **Limitations, problems and future research**

25 As every research, also ours holds some limitations. *First*, this research is designed as a cross-sectional
26 analysis. To overcome this limitation, a second study should be conducted to identify the issues time
27 has on the outcome. Because the entrepreneurial mind-set of an employee is nothing that changes within
28 months or even years, the results are expected to be similar. *Second*, the geographical bias builds another
29 limitation. For this study, only German-speaking organizations were involved. Germanic countries are
30 very similar from a cultural point of view because of their close geographical separation and the shared
31 language. Although several studies showed that the cultural effect on EO is only weak, a cross-cultural
32 study with respondents on different continents could strengthen the establishment of IEO as a scale and
33 support this study. Furthermore, this study only deals with employees of municipalities and cities. To
34 overcome this limitation, a further study should investigate the relationship of IEO and exploration/ex-
35 ploitation on a corporate level. *Third*, this study was conducted under the limitation of self-assessment.
36 Because of this, the participants had to rate themselves. This limitation could be overruled through a
37 third-party assessment. The discussion about risk showed potential interpretations for the strong result
38 of the risk dimension. There are different factors that could have caused this outcome. To further inves-
39 tigate the difference among personal and organizational risk, further studies with the use of IEO scales
40 in different populations are necessary. However, we also demonstrated that the result is possibly based
41 on the population used in this study. Further investigation could help to answer this question.
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56 A unique characteristic of municipalities and cities are that their key decision-makers are legit-
57 imized through elections. Therefore, the leaders in these organizations are not always educated to lead
58 organizations of these sizes. Future research should deal with the question of what effect the leadership
59 qualities of mayors might have on their authorities. We also suggested that private companies have to
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1 consider their contact partner in municipalities and cities wisely. To sell an innovative product or service
2 to a city, it is necessary to address the best potential partner that could help to convince the rest of the
3 decision-makers. This person seems to be a person with a high level of IEO. However, it is not easy to
4 identify the level of IEO for an employee of another organization. Therefore, we suggest further research
5 exploring the intersection of IEO and personal public profiles on social media such as LinkedIn, Xing,
6 Facebook etc. Research could help to identify employees with a high level of IEO based on public
7 profiles.
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13 Furthermore, in recent years the context of *smart city* developments flourished. Cities and mu-
14 nicipalities seem to be a fruitful area for entrepreneurship and intrapreneurship research. Therefore, we
15 suggest to concentrate on smart city developments and their relationship with entrepreneurship and in-
16 trapreneurship in future research. Cities and municipalities are important employers that are strongly
17 faced global changes like digitalization, climate change, demographic changes and so on. In recent years,
18 they were typically administratively focused organizations with steep hierarchies. Future research could
19 concentrate on the relationship of adopting new technologies in cities and municipalities and the overall
20 EO within the organization. Cities and municipalities are an interesting research object in the area of
21 business model innovation. In recent years they realized that they do own a lot of data. Individual cities
22 are already starting to provide this data to private organizations. The case of a city or municipality as
23 data provider is novel and could result in completely new money streams.
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Appendix

Table 7: Constructs, subdimensions, items and sources of the online survey

Construct	Subdimensions	Items	Source				
Individual Entrepreneurial Orientation	Risk-taking	I like to take bold action by venturing into the unknown	Bolton & Lane, 2012				
		I am willing to invest a lot of time and/or money on something that might yield a high return					
		I tend to act "boldly" in situations where risk is involved					
	Innovation	In general, I prefer a strong emphasis in projects on unique, one-of-a-kind approaches rather than revisiting tried and true approaches used before					
		I prefer to try my own unique way when learning new things rather than doing it like everyone else does					
		I favour experimentation and original approaches to problem solving rather than using methods others generally use for solving their problems					
		Proactiveness		I usually act in anticipation of future problems, needs or changes			
				I tend to plan ahead on projects			
				Self-Regulation	Locomotion	I don't mind doing things even if they involve extra effort.	Sellin et al., 2003; Kruglanski et al. 2000
						I am a "workaholic.	
I feel excited just before I am about to reach a goal.							
I enjoy actively doing things, more than just watching and observing.							
I am a "doer."							
When I decide to do something, I can't wait to get started.							
By the time I accomplish a task, I already have the next one in mind.							
Assessment	Assessment	Most of the time my thoughts are occupied with the task I wish to accomplish.					
		When I get started on something, I usually persevere until I it.					
		I am a "go-getter."					
		I spend a great deal of time taking inventory of my positive and negative characteristics.					
		I like evaluating other people's plans.					
		I often compare myself with other people.					
		I often critique work done by myself or others					

1 I often feel that I am being evaluated by others
 2 I am a critical person
 3 I am very self-critical and self-conscious about what I am
 4 saying
 5 I often think that other people's choices and decisions are
 6 wrong.
 7 When I meet a new person I usually evaluate how well he
 8 or she is doing on various dimensions (e.g., looks,
 9 achievements, social status, clothes).

Table 7 (continued)

Construct	Subdimensions	Items	Source
Ambidexterity	Exploration	Searching for new possibilities with respect to prod-	Mom et al., 2009
		ucts/services, processes, or markets	
		Evaluating diverse options with respect to products/ser-	
		vices, processes, or markets	
		Focusing on strong renewal of products/services or pro-	
		cesses	
		Activities of which the associated yields or costs are cur-	
	rently unclear		
	Activities requiring quite some adaptability of you		
	Activities requiring you to learn new skills or knowledge		
	Activities that are not (yet) clearly existing company pol-		
	icy		
	Exploitation	Activities which you carry out as if it were routine	
	Activities which serve existing (internal) customers with		
existing services/products			
Activities of which it is clear to you how to conduct them			
Activities primarily focused on achieving short-term			
goals			
Activities which you can properly conduct by using your			
present knowledge			
Activities which clearly fit into existing company policy			

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Ms. Ref. No.: IEMJ-D-19-00167

Title: Individual Entrepreneurial Orientation and Intrapreneurship in the Public Sector

Reviewer A

Comments to the Authors.

Please comment shortly each of these sections and explain how you will improve them:

<p>Introduction</p> <p>1. Thanks for the very interesting study. This is an under researched area and has the potential to make a nice contribution to the literature. I really enjoyed reading/reviewing your very interesting work and hope that my suggestions will help you develop this paper a bit more.</p> <p>2. The transition between concepts in the introduction seems to make a large leap. For instance, I understand that the objective of your study is to focus on the micro-foundations/agency of the individuals embedded within larger corporate structures. However, the presentation of this is not fluid and could be a little confusing to those not familiar with the lit. I would recommend providing a bit more of a justification on the reasons for focusing on the individual IEO versus firm-level EO to strengthen your contribution. (As I think this is where you have the clearest and strongest contribution.)</p> <p>3. I also think that you have a (potentially) strong contribution to the development of the smart city context and concepts of civic/public entrepreneurship work. Yet, the introduction doesn't quite capture how cool of a topic it is. I recommend providing a bit more background information on Entrepreneurship in the Public Sector, and how this might be driving the development of the smarty city.</p>	<p>Thank you for you for your appreciation. I will respond to all your comments in the next version.</p> <p>Thank you for outlining this useful point. I will revise the introduction to demonstrate the relevance of the IEO construct and justify its use here. Therefore, we will cite the review of Mustafa et al., 2018. We will also cite the publications of Zampetakis & Mousakou, 2018 and Croonen et al., (2016) that the empirical evidence shows that organizations innovativeness.</p> <p>Thank you for this point. However, I will address the one Reviewer 2 identified. As we have not included an empirical part on Smart Cities, we will provide more connections in the introduction and conclusion. We apologies that we did not address your comment in this respect. It was a direct response to Reviewer 2's point was strongly made in these notes.</p>
<p>Theoretical Framework</p>	

<p>4. The literature review was comprehensive and well written throughout. There was a clear layout, and it was easy to see the logic behind the inclusion of certain aspects. However, I think this needed to be edited and reviewed a bit more. I'd recommend the use of a proof reader.</p>	<p>Thank you for identifying this. We added a new section to the literature review and improving the readability of the new section about the inner dimensions of the topic. Moreover, we added a section for a native speaker.</p>
<p>Conclusions 5. The methodology, data, and stats look nicely done with interesting results. The paper is close to being ready for publication, following the updates to the literature review and writing.</p>	<p>Thank you for your contribution to the paper. I believe the revised version is more readable and clear in its contribution.</p>

Reviewer B

Comments to the Authors.

Please comment shortly each of these sections and explain how you will improve them:

<p>Introduction Thank you very much for giving me the opportunity to read the article "The Influence of Individual Entrepreneurial Orientation on Work Activities and Intrapreneurship in the Public Sector", being submitted for potential consideration for publication in the International Entrepreneurship and Management Journal (IEMJ).</p> <p>It was a pleasure reading it, especially since there are almost no articles on individual-level entrepreneurial orientation (what you denominate "I-EO") yet, which is absolutely surprising since the original Covin/Slevin EO scales do focus on individuals, i.e. CEOs, but do not regard them as individuals, but rather only as representatives who speak for the WHOLE company. I agree with the authors in so far that there is an absolute and clear need to evaluate the I-EO of individuals on ALL levels of the company, and not only on the CEO/TMT level. Therefore, I have to applaud the authors with their approach to make I-EO visible on a co-worker level AND in an absolutely specific and special context: namely public organizations, a so far also totally under-researched context with regards to innovation or entrepreneurship.</p>	
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<p>All in all, an absolutely well-written, timely and interesting article which definitely deserves to find a greater public through publication in a solid entrepreneurship journal such as IEMJ. Nevertheless, I would like to ask the authors to take care of a number of outstanding issues to be solved in a next revision, such as:</p> <ol style="list-style-type: none"> 1. Repetition in Introduction and Theoretical background: Two phased approach is mentioned very close to each other. Could save some words by being less detailed in the introduction. 2. Also, concerning IEO's origin in the multidimensional EO literature, I would suggest to cite a more recent paper showing this configurational approach very clearly: Kraus, S., Kallmuenzer, A., Stieger, D., Peters, M., & Calabrò, A. (2018). Entrepreneurial paths to family firm performance. <i>Journal of Business Research</i>, 88, 382-387. https://doi.org/10.1016/j.jbusres.2017.12.046 	<p>Thank you very much for your warm support for our manuscript and the extremely grateful to you. In what light of your recommendations.</p> <p>Thank you for identifying the repetition shortening the paragraph about the detail only in the theoretical foundation used a paragraph to bring explorative CEs two phases.</p> <p>Thank you for this helpful point. The revised version of our manuscript.</p>
<p>Theoretical Framework</p> <p>3. Improvement of the hypotheses development paragraphs. Hypotheses are poorly derived from literature. H1 and H2 need more work. H3 and H4 are fine.</p>	<p>We further supported the hypotheses individual entrepreneurial behaviour Mustafa et al., 2018, which offers a individual entrepreneurial behaviour the risk dimension as you later mentioned findings of the risk dimension for our integrated into the manuscript. The</p>
<p>Discussion</p> <p>4. Discussion: The discussion about risk could be stronger. The results show stronger effects than earlier studies. Why so? Because people in municipalities are generally less risky? So the ones that take risks are the</p>	<p>The literature highlights that the risk and individuals is different. This difference be an important factor for the results of the special population as you mentioned</p>

<p>ones that work in more explorative ways? Or is it just because risk is lower with performance but high with exploration.</p> <p>5. Discussion: The idea that the initial contact point of a private company that wants to sell to a city of municipality sounds interesting. It would be good to further support that. Maybe it is not the key decision maker. In recent years in practice, evangelists are often the people a firm wants to contact. How can they be found? Take it further to the future research part and show potential possibilities how to detect an evangelist. Connect IEO to personal Social Media activity?</p>	<p>this section and showed the two po drawing our attention to this valuab</p> <p>Evangelists are not investigated a lo the idea of investigating the IEO lev their public profiles sounds interest research and practical implications.</p>
<p>Conclusion</p> <p>6. Future Research: One of the positions in the discussion was that exploration leads to more innovation. Authors mention that explorational activities are tied to opportunity recognition. So, it would be interesting to investigate this relationship with an opportunity recognition scale. This paper is a nice foundation to do so.</p> <p>7. I am not so sure about the connection between public sector activity and "smart cities". For the discussions part in the end, this might make sense, but the usage of the word beforehand seems to be a bit arbitrary.</p> <p>8. Good luck with further improvement of this interesting study!</p>	<p>Thank you for identifying this point in the further research section to fu</p> <p>We can see your point as our empir smart cities either. Therefore, we d the introduction, and started to dis Conclusion section of the study.</p> <p>Thank you, we hope our comments We want to thank you for the feedb the paper meet with your satisfacti</p>
<p>Overall</p> <p>8. Native-speaker proofreading/copy-editing required for the next round. P 3: studies - lower case P 3: "to being" - "being" or "to be" P 3: innovation - lower case P16: Appendix: "thanusing" - "than using"</p>	<p>To resolve these issues a native spe paper and edited each point.</p>