



Measuring intrapreneurship at the individual level: Development and validation of the Employee Intrapreneurship Scale (EIS)



Jason C. Gawke ^{a,*}, Marjan J. Gorgievski ^a, Arnold B. Bakker ^{a,b}

^a Erasmus University Rotterdam, the Netherlands

^b University of Johannesburg, South Africa

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ABSTRACT

Although employees are recognized to be key for organizational new venture creation and strategic renewal (i.e., intrapreneurship), the current literature on intrapreneurship from an individual-level perspective is fragmented, and a valid measurement instrument is lacking. We address this gap and start with presenting a review of the current literature on employee intrapreneurship. Based on this review we define employee intrapreneurship as an agentic and strategic work behavior aimed at new venture creation and strategic renewal. Next, two studies are presented aimed at developing and validating a measurement instrument that captures employee venture behavior and strategic renewal behavior as two facets of employee intrapreneurship: the Employee Intrapreneurship Scale (EIS). In Study 1, the EIS was created and its factorial validity examined in three departments of a public organization (total $N = 1,475$). In Study 2, using a sample of private sector employees ($N = 243$), the convergent and discriminant validity of the EIS was tested using self-ratings of personal initiative, reward sensitivity, and punishment sensitivity, as well as their innovativeness and risk-taking behavior as rated by a close colleague. The results indicate that the Employee Intrapreneurship Scale is a valid and reliable instrument for capturing employee intrapreneurship in multiple contexts. Theoretical and practical implications are discussed.

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Intrapreneurship, defined as organizational venture creation and strategic renewal brought about by employees, has become crucial for organizations to survive and maintain their competitive advantage (Ireland, Hitt, & Sirmon, 2003; Morris, Webb, & Franklin, 2011). Research in private sector organizations has shown that intrapreneurship positively relates to profits and returns on sales and assets (Bierwerth, Schwens, Isidor, & Kabst, 2015), and has been argued to increase organizational effectiveness and public value creation (Kearney & Meynhardt, 2016). Over recent decades, research on organizational preparedness for intrapreneurial activity (Hornsby, Kuratko, Holt, & Wales, 2013) and on the stance of an organization to act entrepreneurially (Miller, 2011) has progressed significantly. Additionally, studies have shed light on the specific roles, responsibilities, and activities of employees at different managerial levels to ensure successful intrapreneurship (e.g., Floyd & Lane, 2000; Hornsby, Kuratko, Shepherd, & Bot, 2009).

In spite of this growing interest, a recent review has shown that research on the agentic and strategic employee behaviors contributing to new venture creation and strategic renewal (i.e., employee intrapreneurship) is scarce and fragmented (Blanka, 2018). As a result, theoretical advancement in the field of employee intrapreneurship is hampered. Given that employee intrapreneurship is recognized as being key to an organization's new venture creation and strategic renewal (Belousova & Gailly, 2013; Ireland, Covin, & Kuratko, 2009), the present research aims to address this gap. Specifically, we aim to advance our understanding of employee intrapreneurship and provide conceptual clarity by reviewing the current literature. Thereafter, we present two studies in which we develop a valid and reliable measurement instrument that captures employee intrapreneurial behavior: the Employee Intrapreneurship Scale (EIS). In Study 1 we build on our review and on expertise from scholars and practitioners to generate the items for the EIS. Moreover, in Study 1 we validate the EIS in three different departments of a national public administration. In Study 2, we cross-validate the EIS in another sample of employees of privately held companies, and we examine its discriminant and convergent validity.

* Corresponding author. Erasmus University Rotterdam, Center of Excellence of Positive Psychology, Woudestein, Mandeville Building, Room T16-16, P.O. Box 1738, 3000 DR, Rotterdam, the Netherlands.

E-mail address: gawke@essb.eur.nl (J.C. Gawke).

Our research makes several contributions to science and practice. First, by reviewing the current literature and identifying the defining characteristics of employee intrapreneurship, we advance our understanding of intrapreneurship as a research field. We argue that conceptual clarity is needed, as different conceptualizations have been used interchangeably to describe employee intrapreneurship (Blanka, 2018). Second, based on the review we conclude that a valid measure of employees' intrapreneurial behaviors is absent. As theoretical advancement strongly depends on both consistent terminology and consistent operationalization (Suddaby, 2010), we argue that by developing the EIS we set an important pre-condition for theoretical advancement in the field of intrapreneurship. Moreover, the validity tests of the EIS based on its nomological network provide first empirical insights into how employee intrapreneurship relates to behaviors associated with having an entrepreneurial orientation (i.e., innovativeness, risk taking, and personal initiative; Wakkee, Elfring, & Monaghan, 2010), and to employees' proclivity to perceive opportunities versus threats in the work environment (Corr, 2004). Third, we argue that practitioners may benefit from our review and the EIS. Our review may aid practitioners in more precise and appropriate terminology to communicate about intrapreneurship with clients and colleagues. Moreover, it is important that professional consultancy products aimed at facilitating intrapreneurship are evidence based in their development and operation. The EIS may be used to provide important metrics for such means.

1. Theoretical background

1.1. Organizational-level intrapreneurship

In the 1980s, the concept of intrapreneurship received widespread attention, and the importance was championed of entrepreneurial employees who create value for the organization and help gain competitive advantage (e.g., Pinchot, 1985). With the primary focus on the benefits for organizations, research on organizational-level intrapreneurship, also referred to as corporate entrepreneurship (Blanka, 2018), flourished and multiple conceptualizations were introduced. For instance, intrapreneurship was defined as the process whereby firms engage in diversification through internal development (Burgelman, 1983) and as a firm's activities directed at product and technological innovation, risk taking, and proactivity (Jennings & Lumpkin, 1989; Miller, 1983). In the 1990s, a more comprehensive conceptualization of intrapreneurship emerged which, to date, is still the most frequently used. According to this conceptualization, intrapreneurship refers to an organization's corporate venturing and strategic renewal activities as a result of its employees' intrapreneurial behaviors and effective use of human resources management (Blanka, 2018; Guth & Ginsberg, 1990; Morris, Kuratko, & Covin, 2011).

Corporate venturing refers to the creation and integration of new businesses, or portions of new businesses via equity investments, into the overall business portfolio of an organization (Narayanan, Yang, & Zahra, 2009). These businesses may span new products or services, but they may also be new (semi-autonomous) organizational entities residing both internally and externally. In contrast, strategic renewal involves opportunity-seeking and advantage-seeking behaviors to enhance an organization's ability to compete with industry rivals and to adequately react to internal advancements and developments in the market. Such activities are aimed at fundamental changes from the organization's past ways of operating (e.g., strategies, product offerings, and business models) or fundamental differentiation from industry standards or conventions (Ireland et al., 2003).

1.2. Employee-level intrapreneurship

The intrapreneurial roles and actions of both managerial as well as non-managerial employees are argued to be at the heart of an organization's new venture creation and strategic renewal (Belousova & Gailly, 2013; Blanka, 2018; Floyd & Lane, 2000). Senior-level managers are expected to play a central role in creating an organizational vision and architecture that facilitate intrapreneurship. Moreover, they are responsible for rationalizing if and how new businesses and strategic choices add value to the organization. Middle-level managers may play an evaluative role in championing, refining, and facilitating fruitful bottom-up ideas to senior management, and endorse intrapreneurship strategies coming from top-level executives to primary implementers (i.e., first-level managers). The roles of first-level managers and their employees are framed around operationalizing and experimenting with the resources provided by the organization to exploit opportunities that others have not observed or have failed to effectively exploit (Belousova & Gailly, 2013). Non-managerial employees may devote considerable time to contribute to intrapreneurship by deviating from their formal work requirements to increase their work variety or to contribute to organizational goals by generating and nurturing innovative ideas before formally revealing them to management (Globocnik & Salomo, 2015). The premise that employees throughout the organization contribute to intrapreneurship is supported by the existing literature. For instance, staff-level employees have been shown to proactively contribute to a breakthrough innovation by designing a new product (e.g., Marvel, Griffin, Hebda, & Vojak, 2007), and employees of various managerial levels have been found to facilitate and implement entrepreneurial ideas (e.g., Hornsby, Kuratko, Shepherd, & Bott, 2009).

With respect to the intrapreneurial activities of organizational members (i.e., employee intrapreneurship), the current literature is scarce and fragmented (Blanka, 2018). To gain more insight into the different approaches to employee intrapreneurship, we conducted a literature review. First, we searched the Web of Science, Scopus, and PsycINFO for studies published in peer-reviewed journals using the search term "intrapreneur*". Further inclusion criteria were that the type of publication had to be a journal article, the language was English, and the journal article was published between 2007 and 2018. This resulted in 367 hits. In addition, we included the 32 articles covered in Blanka's (2018) systematic review on intrapreneurship. After deleting doubles, we screened the abstracts of these studies and dropped studies that did not focus on individual-level intrapreneurship or did not provide a clear conceptualization and operationalization of employee intrapreneurship. Only 22 articles met our criteria. Three main approaches to employee intrapreneurship could be identified (see Table 1).

A first approach draws heavily on the entrepreneurial orientation literature, arguing that employee intrapreneurship is best conceptualized as a higher order factor of showing initiative, taking (calculated) risks, and creating innovations for the organization. In this category we counted seven articles (e.g., Rigtering & Weitzel, 2013; Valsania, Moriano, & Molero, 2016). In this conceptualization, scholars argue that showing initiative reflects the self-starting nature of employee intrapreneurship characterized by an awareness of external trends and events (Wakkee et al., 2010). For instance, staff-level employees may proactively combine existing resources to create a new product, or management may change organizational resources to anticipate changes in key business areas. Risk taking is considered a defining characteristic of intrapreneurial activity because the returns on resources invested are marked by a risk of potential loss. Such a loss may represent a failed new product, but it may also relate to an individual's reputation when selling a controversial issue (De Jong, Parker, Wennekers, & Wu, 2013).

Table 1
An overview of different conceptualizations of employee intrapreneurship between 2007 and 2018.

Approach	Conceptualization	References
1. The entrepreneurial orientation approach.	Employee intrapreneurship is conceptualized on the basis of an employees' entrepreneurial orientation (i.e., proclivity toward innovativeness, risk taking, and personal initiative).	De Jong, Parker, Wu & Wennekers (2013); Felício, Rodrigues, and Caldeirinha (2012); Moriano, Molero, Topa, and Mangin (2014); Rigtering and Weitzel (2013); Sun and Pan (2011); Valsania et al. (2016); Wakkee et al. (2010).
2. The intrapreneurial outcomes approach.	Employee intrapreneurship is conceptualized as employees' participation in an organization's intrapreneurial pursuits, or number of implemented intrapreneurial initiatives.	Bager, Ottósen, & Schott (2010); Camelo-Ordaz, Fernamdez-Alles & Ruiz-Nevado (2011); Guerrero and Peña-Legazkue (2013); Hornsby et al. (2009); Matthews, Schenkel, Ford, and Human (2009); Parker (2011); Stam (2013); Tietz and Parker (2012); Urbano, Alvarez, & Turro (2013).
3. The behavior-based approach.	Employee intrapreneurship is conceptualized on the basis of employee activities that contribute to firm-level intrapreneurship, and more recently as employees' agentic and anticipatory behaviors aimed at creating new businesses for the organization (i.e., venture behavior) and enhancing an organization's ability to react to internal and external advancements (i.e., strategic renewal behavior).	Gawke et al. (2017); Gawke, Gorgievski, and Bakker (2018); Mustafa, Lee & Hughes (2016); Park, Han, & Krishna (2014); Woo (2018); Zampetakis, Beldekos, and Moustakis (2009).

Finally, because intrapreneurial activity is aimed at advancing the organization, innovativeness is viewed as a key outcome (Barringer & Bluedorn, 1999; McFadzean, O'Loughlin, & Shaw, 2005). Innovativeness may reflect the value creation for the organization in the form of a new service or a novel working process.

A second conceptualization of employee intrapreneurship centers on employees' intrapreneurial contributions for their employer. In this category we have counted nine articles. Scholars using this approach predominantly relied on dichotomous, single item, measures to assess employee intrapreneurship, for example, by asking employees (1) whether they have a leading role in the development and/or implementation of new products or services (e.g., Guerrero & Peña-Legazkue, 2013), (2) if they have engaged in start-up activities for their employer in the past few years (e.g., Parker, 2011; Stam, 2013; Tietz & Parker, 2012), or (3) how many new entrepreneurial ideas they have implemented in their organization in a given period of time (Hornsby et al., 2009).

A third approach has an explicit focus on employees' agentic behaviors that contribute to firm-level intrapreneurship, such as radical and (smaller) incremental changes to products, processes, markets, organizational strategy or combinations of such. In this category we have counted six studies (e.g., Douglas & Fitzsimmons, 2012; Park, Kim, & Krishna, 2014). To provide clarity and consistency regarding what type of employee behaviors can be considered intrapreneurial behavior, employee intrapreneurship has recently been conceptualized as a specific type of agentic and strategic employee behavior that consists of employee venture behavior and employee strategic renewal behavior (e.g., Gawke, Gorgievski, & Bakker, 2017). Employee venture behavior captures employee activities aimed at creating, adding, or investing resources in new businesses. For instance, an employee may proactively establish collaborations to adopt technologies developed outside of the organization to reach a new market (Park et al., 2014) or to better render services to users (Edquist, Hommen, & McKelvey, 2001). In contrast, strategic renewal behavior captures more opportunity-seeking and advantage-seeking activities aimed at radically or incrementally renewing current products, services, working methods, and organizational strategy. For instance, employees may champion a strategic shift in when and where work is done (e.g., increase teleworking) to improve productiveness and organizational performance (Basile & Beaugard, 2016; Coenen & Kok, 2014).

1.3. Conceptualizing employee intrapreneurship for systematic research

Although all three approaches to employee intrapreneurship have their merits, we argue that a behavior-based approach is best

suited for the purpose of facilitating systematic research on employee intrapreneurial behaviors. Specifically, we argue that a conceptualization that centers on employee venture behavior and employee strategic renewal behavior provides more conceptual clarity on the defining features of employee intrapreneurship, compared to a conceptualization which defines intrapreneurial behavior in terms of the more general concepts of proactivity, risk taking and innovativeness. This clarity is needed to differentiate employee intrapreneurship from related behaviors, such as, for instance, innovative work behaviors (Janssen, 2000) and championing behaviors (Howell, Shea, & Higgins, 2005). Drawing from studies that use the behavior-based approach, intrapreneurial activities are argued to differ from innovative work behaviors as they may enhance an organization's ability to take risks and seize opportunities (e.g., scanning for environments with no fast-food services to establish a prime new outlet for a fast-food chain) without creating novel processes, services, or products (Gawke et al., 2018). In addition, employee intrapreneurship differs from championing behaviors in its emphasis on value creation through venture and strategic renewal behaviors, whereas championing centers on the promotion of innovations (Howell, Shea, & Higgins, 2005).

Furthermore, we argue that a behavior-based conceptualization yields more potential for theoretical advancement in the field of employee intrapreneurship than one that is solely linked to an employees' contribution to intrapreneurial output. Specifically, a behavior-based conceptualization allows for a broader theoretical exploration on potential factors that may hamper or foster employee intrapreneurship, as it also includes employee intrapreneurial behaviors that are not part of an official intrapreneurial pursuit or are still in an exploratory phase occurring without official mandates or supervisory control (Globocnik & Salomo, 2015). Moreover, a behavior-based approach to employee intrapreneurship would fit within the broader category of strategic proactive work behaviors (see for an overview Parker & Collins, 2010), which play a central role in established job design theories on employee motivation, wellbeing, and performance (e.g., Job Demands-Resources theory; Bakker & Demerouti, 2014; and Proactive Motivation theory; Parker, Bindle, & Strauss, 2010). As such, we argue that a behavior-based conceptualization would integrate more easily into the job design literature, thus facilitating scholars to advance our understanding on employees' motivation for employee intrapreneurship and how such behaviors may affect them.

Hence, in this research we conceptualize employee intrapreneurship as a specific type of agentic, strategic work behavior comprising employee venture behavior and strategic renewal behavior, and use this definition as a basis to develop a valid measure. To validate this conceptualization and operationalization,

we use the entrepreneurial orientation approach to employee intrapreneurship (e.g., De Jong et al., 2013). Moreover, because behavior is closely related to individuals' attitudes towards potential positive and negative outcomes (Ajzen, 1991), employee intrapreneurship is more likely to be pursued by individuals who have a positive perception of opportunities in the work environment (as opposed to seeing threats and expecting failure; Douglas & Fitzsimmons, 2012). Therefore, we examine a nomological network consisting of showing initiative, taking risks, innovativeness, and sensitivity to opportunities in the work environment (as opposed to sensitivity to threats).

2. Study 1: development of the Employee Intrapreneurship Scale (EIS)

The central goal of Study 1 is to develop the EIS. In line with our conceptualization of employee intrapreneurship, we expect the EIS to capture behaviors reflecting two factors: (a) employee venture behavior and (b) employee strategic renewal behavior. To generate and verify the items of the EIS, we will collaborate with expert scholars in the field of intrapreneurship, entrepreneurship, and employee behavior, and practitioners who have been identified as intrapreneurs by their managers. Thereafter, we will test the robustness of the factorial structure of the scale. Specifically, we develop the scale in one sample and perform measurement invariance tests in two new samples to provide initial insights into the quality of the EIS across different work contexts (cf. French & Finch, 2008). Given these goals, we formulate the following hypotheses:

Hypothesis 1. The Employee Intrapreneurship Scale will show a two-factor structure in each of the three samples.

Hypothesis 2. The two-factor structure will show measurement invariance across samples.

2.1. Method

2.1.1. Procedure and participants

Data were gathered with an online questionnaire in a national public organization. The personnel administration provided access to 2000 work email addresses of employees of three departments (departments "A", "B", and "C"). The core business of department A is to enhance the country's leading position in agriculture, industry and energy, and to invest in the sustainability of the economy. Department B focuses on promoting the interest of the public administration, its stakeholders, and beneficiaries abroad. It functions as the channel through which the entire organization communicates with foreign governments and international organizations. Department C is committed to improving quality of life and mobility in a clean, safe, and sustainable environment. It is important to note that although the three departments are part of the same national public organization, they operate relatively independently of each other.

All employees received an email containing information on the study, a request to complete the survey, and a link to the online survey. Of the 2000 employees who were contacted, 1428 completed the questionnaire (response rate = 71.4%). The data of the respondents from department A were used for scale development and exploratory factor analyses ($N = 775$). The mean age of the sample was 47.6 years ($sd = 9.9$), and 39.1% were female. A total of 44.9% of all participants held a university degree or higher. Most of the participants had a permanent contract (94.6%) and had worked for an average of 7.3 years ($sd = 7.8$) in their current position. The participants worked in the following areas: advisory (15.0%), operational management (12.9%), policy (11.4%), research and development

(4.4%), top management (5.7%), project management (4.3%), control (21.4%), operations (21.4%), and other (3.6%).

2.1.2. Phase 1: scale construction and exploratory factor analysis

Five experts in the field of work and organizational psychology, work behavior, and (corporate) entrepreneurship (one full professor, three assistant professors, and one Ph.D. candidate) separately generated items that were meant to capture employee intrapreneurship. In line with Hinkin's (1998) deductive method of item generation, all experts were provided with a short theoretical background (including a reference list), our conceptualization of employee intrapreneurship, and some considerations with regard to the formulation of the items. The first consideration was that the items should be formulated to be concise, they should directly capture behavior, and they should be clearly quantifiable. Second, the items had to be positively worded, as negatively worded items have been shown to produce problems with the factor structure (DiStefano & Motl, 2006; Schriesheim & Eisenbach, 1995). Finally, the experts were kindly asked to generate approximately ten items each to ensure a large enough pool of items from which a selection could be made. This process generated a total of 50 items.

We proceeded by examining the 50 items based on their content, deleted double items, and reformulated some items so that they would all have a similar length. In this process, nine items were deleted because they were identical in content and formulation. The 41 remaining items were presented to a team of three practitioners who had successfully implemented several innovations within their company to carefully reflect on the content. As a result, some items were reformulated. Next, we asked the five experts and the practitioners to rate each item on clarity and the extent to which the items reflected the construct of employee intrapreneurship (i.e., content validity assessment; Hinkin, 1995; 1998). Items that were rated as "very clear" and "very reflective of the construct of employee intrapreneurship" were selected. This selection resulted in a 17-item scale. A seven-point frequency scale (1 = never, 7 = very often) was chosen as a means to rate the items.

2.2. Results phase 1

2.2.1. Exploratory factor analysis

Principal factor analysis (maximum likelihood) with oblique rotation in SPSS was performed to examine the factorial structure of the 17 items (Worthington & Whittaker, 2006). The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.96, and Bartlett's test of sphericity showed an approximate $\chi^2 = 8016.50$, $df = 136$, $p < .001$, indicating that our data were suited for factor analysis (Williams, Onsman, & Brown, 2010). The criterion to retain factors was based on the eigenvalue and loading plots. Items were retained if they loaded higher than 0.32 on a factor. Cross-loading items (loading 0.32 on two or more factors) were dropped (Tangirala, Tabachnick, & Fidell, 2001). Based on this criterion, we deleted two of the 17 items; the final questionnaire thus included 15 items. In support of Hypothesis 1, the two factors explained 55% of the variance. The first factor (eigenvalue = 7.98) reflected strategic renewal behavior (eight items; Cronbach's alpha = .91). The second factor (eigenvalue = 7.46) reflected the dimensions of venture behavior (seven items; Cronbach's alpha = .87). The Pearson's r correlation was 0.77 between dimensions. The items, item means, standard deviations, Cronbach's alphas, and factor loadings are presented in Table 1.

2.3. Phase 2: validation of the factor structure and measurement invariance

2.3.1. Participants

Data from department B ($N = 427$) and department C ($N = 226$)

were used to test the factorial validity and reliability of the scale using multi-group confirmatory factor analysis. In addition, we tested measurement invariance across the different contexts. In department B, the mean age was 46.8 years ($sd = 11.1$); 34.8% were female; 55.7% held a university degree or higher; the participants had worked in their current position for an average of 7.1 years ($sd = 7.6$); and the vast majority had a permanent contract (94.6%). The participants worked in the following areas: advisory (20.4%), operational management (15.2%), policy (20.6%), research and development (10.1%), top management (4.2%), project management (3.5%), control (18.0%), operations (5.9%), and other (2.1%).

In department C, the mean age was 49.2 years ($sd = 9.9$); 50.9% were female; 55.8% held a university degree or higher; the participants had worked in their current position for an average of 7.3 years ($sd = 7.8$); and the vast majority had a permanent contract (91.2%). The participants also represented different fields of work: advisory (11.9%), operational management (28.8%), policy (28.8%), research and development (0.4%), top management (16.4%), project management (1.7%), control (0%), operations (8.0%) and other (4.0%).

2.4. Results phase 2 and conclusion study 1

2.4.1. Multigroup confirmatory factor analysis

The AMOS 20 software package (Arbuckle, 2005) was used to examine whether the two sub-dimensions of employee intrapreneurship are a valid representation of employee intrapreneurship in departments B and C (Hypothesis 1). We created a “Two-Factor Model” with two latent variables based on the results of Phase 1, namely, venture behavior (7 items) and strategic renewal behavior (8 items). The latent variables were allowed to covary. We compared the fit of this model against that of a “Baseline Model”, in which all structural paths are assumed to be zero, and that of a “One-Factor Model”, in which all items loaded on a single latent factor. The tests were performed simultaneously in departments B and C using multi-group confirmatory factor analysis, which resulted in one set of fit statistics for the overall model fit (Byrne, 2009).

To assess model fit, six indices were examined: the chi square, the standardized root mean square residual (SRMR), the Tucker-Lewis index (TLI), the comparative fit index (CFI), the incremental fit index (IFI) and the root mean square error of approximation (RMSEA; Hu & Bentler, 1999). To compare alternative models, we examined the Akaike information criterion (AIC). A lower AIC value indicates a better tradeoff between the fit and complexity of different models (Wagenmakers & Farrell, 2004).

In line with our expectations, the two-factor representation of employee intrapreneurship comprising employee venture behavior and employee strategic renewal behavior fit the data well in both groups (cf. Hu & Bentler, 1999). The factor loadings ranged between 0.60 and 0.81. Moreover, the Two Factor Model had the lowest AIC compared to the Baseline Model and the One-Factor Model, which means that the Two Factor Model best fit the data. Thus, fully supporting Hypothesis 1, the EIS shows configural invariance across samples.

2.4.2. Measurement invariance testing

To test Hypothesis 2 on the measurement invariance of the scale, we followed the steps as described in Van de Schoot, Lugtig, and Hox (2012). We first created a “Metric Model”, in which we constrained the factor loadings to be equal across groups (i.e., metric invariance), and compared the fit of this model to that of the unconstrained Two-Factor Model. The results indicate that respondents across groups indeed attribute the same meaning to the latent constructs under study (i.e., metric invariance), as indicated by a lower AIC for the Metric Model compared to the Two-Factor

Model. Second, we created the “Intercept Model”, in which only the intercepts across groups were constrained to be equal (i.e., intercept invariance), to test whether the meaning of the levels of the items are equal across groups. We found that the AIC of the Intercept Model is higher than that of the Measurement Model. We proceeded to examine all items based on the intercept differences across groups and released the intercept constraints of the items with the largest difference between groups one by one. After releasing three items (Item 3, 6, and 12, as noted in Table 1), the model (i.e., “Modified Intercept Model”) showed an increased fit compared to the Measurement Model, thus indicating partial intercept invariance (Steenkamp & Baumgartner, 1998). Finally, we created the “Scalar Model”, in which all the constraints of the Metric Model and the Modified Intercept Model were applied. The Scalar Model had the lowest AIC value and therefore the best tradeoff between model fit and model complexity (Wagenmakers & Farrell, 2004). Altogether, the fact that all factor loadings and twelve of the fifteen intercepts were invariant across both samples provides support for the cross-contextual stability of the EIS, thus supporting Hypothesis 2 (See Table 2).

To conclude, the results of Study 1 are in line with our conceptualization of employee intrapreneurship, showing that the EIS captures the two sub-dimensions of employee venture behavior and strategic renewal behavior. Moreover, the results of the measurement invariance test provide support for the factorial validity of the EIS across work contexts.

3. Study 2: construct validity of the Employee Intrapreneurship Scale (EIS)

The aim of Study 2 is to examine the construct validity of the EIS. Construct validity is achieved if the operationalization of the construct relates to other established constructs in line with theoretical assumptions (i.e., convergent and discriminant validity; Cronbach & Meehl, 1955; Clark & Watson, 1995). Our theoretical assumptions are guided by the work on entrepreneurial orientation (e.g., Rigtering & Weitzel, 2013) and research on what drives employees decision to act intrapreneurially (e.g., Douglas & Fitzsimmons, 2012; Urban & Nikolov, 2013). To reduce bias in our results that may result from single-source data, we examine construct validity based on both participants' self-ratings and ratings given to them by one of their close colleagues on the related constructs.

3.1. Theoretical background

3.1.1. Employee intrapreneurship and personal initiative

Personal initiative is a concept used to describe a class of active behaviors that individuals engage in without being told, without receiving an explicit instruction, or without having an explicit (work) role requirement (Frese & Fay, 2001). Subsequently, personal initiative is initiated on the basis of self-set goals, which can be a personally developed concept or can refer to taking charge of an idea or a project that has not yet been put into action. For example, showing personal initiative can mean not only proactively getting a glass of water when you notice that your colleague is thirsty but also proactively championing a colleague's concept for a new service. Individuals who show personal initiative engage in anticipatory actions to capitalize on upcoming opportunities rather than reactively respond to current demands (e.g., engaging in activities because one is asked to do so). Subsequently, personal initiative may coincide with changes in processes or procedures or with a modification of tasks, although this coincidence is not a criterion.

Due to the self-starting nature of personal initiative, scholars have argued that personal initiative is positively related to the

Table 2
Items, means, standard deviations, Cronbach's alphas, and factor loadings of the EIS (Study 1).

	M	SD	α	Factor loadings	
				1	2
<i>Strategic Renewal Behavior</i>			.93		
1. I undertake activities to realize change in my organization. ^a	3.53	1.42		.97	
2. I undertake activities to change the current products/services of my organization. ^a	3.65	1.42		.66	
3. I contribute ideas for strategic renewal for my organization. ^a	3.30	1.48		.71	
4. I conceptualize new ways of working for my organization. ^a	3.19	1.49		.64	
5. I utilize insights of other experts to innovate in my organization.	3.28	1.40		.69	
6. I undertake activities that change the structure of my organization.	2.78	1.43		.68	
7. I undertake activities that change the work practices of my organization.	2.99	1.41		.52	
8. I exploit opportunities in the labor market or society to renew my organization.	2.98	1.40		.65	
X. I actively mobilize people and resources to change my organization.	2.58	1.46		.45	.38
<i>Venture behavior</i>			.87		
9. I undertake activities to set up new business units. ^a	1.79	1.09			.62
10. I undertake activities to reach new market or communities for my organization. ^a	2.15	1.38			.86
11. I undertake activities that result in new departments outside of my organization. ^a	2.15	1.38			.53
12. I conceptualize new ways of service for my organization.	2.32	1.36			.69
13. I undertake activities that result in new projects within my organization.	2.90	1.44			.52
14. I actively establish new collaborations with experts outside of my own profession. ^a	2.87	1.56			.59
15. I conceptualize new products for my organization.	2.60	1.40			.58
X. I undertake activities that result in new departments within my organization.	2.48	1.37			.46

Note. Analysis was performed on Department A; N = 775. Kaiser-Meyer-Olkin measure of sampling adequacy = .96. Bartlett's test of sphericity: approximate $\chi^2 = 8016.50$, $df = 136$, $p < .001$. Answer categories are: 1 = never, 2 = rarely, 3 = occasionally, 4 = regularly, 5 = often, 6 = very often, 7 = always. Items numbered with an X were deleted after initial exploratory factor analysis.

^a Items that are part of the 8-item version of the EIS as used in Study 2.

pursuit of opportunities and activities to overcome challenges related to intrapreneurship (e.g., De Jong et al., 2013); however, studies on their relationship are limited. In contrast, the positive relationship between personal initiative and entrepreneurial activities in general is more established. For example, in a sample of Zimbabwean and South African entrepreneurs, Krauss, Frese, Friedrich, and Unger (2005) showed that their business performance positively related to personal initiative. Furthermore, in an intervention study (i.e., a 3-day program to promote personal initiative), Glaub, Frese, Fischer, and Hoppe (2014) showed that an increase in personal initiative coincided with an increase in entrepreneurial behavior and performance. Thus, based on the literature, we hypothesize the following:

Hypothesis 3. Personal initiative relates positively to employee venture behavior and employee strategic renewal behavior.

3.1.2. Employee intrapreneurship and innovativeness

The concept of employee innovativeness refers to a set of work behaviors that create (i.e., idea generation), introduce (i.e., idea promotion), and apply new ideas (i.e., idea realization) within a work role, team, or organization in order to benefit job performance, team performance, or the performance of the organization (Janssen, 2000). Idea generation captures the first step in the innovation process and often involves rearranging or combining existing resources to create a basis for a novel idea. For example, the internet was developed by combining the computer and the telephone (McFadzean, 2001). Once an idea has been generated, championing behaviors and coalition building are considered essential to bring a creative idea to life (i.e., idea promotion). For instance, the pivotal role of a manager's championing behaviors has been shown to strongly relate to the actual realization of breakthrough innovations (Hornsby, Kuratko, & Zahra, 2002). Finally, when a new product or service is created and is considered to be of incremental value, it has to be put into practice, which implies making the innovation a part of regular work processes. The latter is referred to as idea implementation.

Because intrapreneurship includes attitudes and actions that challenge bureaucracy and encourage innovation, scholars have recognized intrapreneurship as the primary act underpinning innovativeness within an organization (Barringer & Bluedorn, 1999; McFadzean et al., 2005). In line with this premise, in their qualitative study, Marvel et al. (2007) showed that intrapreneurial employees (i.e., employees who actively engage in venture and strategic renewal behaviors) in the technical sector were responsible for the creation, promotion, and implementation of several breakthrough innovations for their company. Camelo-Ordaz, Fernández-Alles, and Ruiz-Navado (2011) reported similar results in their qualitative study among intrapreneurial employees in the creative industry. However, it is important to note that intrapreneurship refers to departures from the customary way of doing things that may or may not be related to innovation (Antoncic & Hisrich, 2003). For example, a strategic choice to abolish a service due to market developments is not always innovative. Nonetheless, based on the literature, a positive relationship between employee innovativeness and employee venture behavior and employee strategic renewal can be expected. We formulate the following Hypothesis:

Hypothesis 4. Employee innovativeness relates positively to employee venture behavior and employee strategic renewal behavior.

3.1.3. Employee intrapreneurship and risk taking

In general, risk taking refers to the perceived probability of receiving rewards associated with the success of a situation while subjecting oneself to consequences associated with failure (Brockhaus, 1980). In the context of intrapreneurship, risk taking entails taking bold actions and allocating significant personal and organizational resources in intrapreneurial projects when the outcome is uncertain (Rauch, Wiklund, Lumpkin, & Frese, 2009). Hence, although individuals may engage in intrapreneurial behavior, expecting positive outcomes for themselves and/or their organizations, this engagement may result in a loss of physical,

social, and psychological resources (Shepherd, Patzelt, & Wolfe, 2011). For instance, the failure of an intrapreneurial activity may result in reputation damage, lowered social status, or even job threat.

Research on the relationship between risk-taking behaviors and employee intrapreneurship, or entrepreneurial behaviors in general, has generated mixed findings. While some scholars have found risk tolerance to be positively related to entrepreneurial behavior (Douglas & Shepherd, 2002; Stewart & Roth, 2004), other studies have found no relationship (e.g., Brockhaus, 1980; Miner & Raju, 2004). Recent experimental studies have shown a negative relationship between intrapreneurial intention and risk taking. In these studies, employee willingness to participate in a new venture decreased when employees were faced with the risk of losing their job or part of their salary if the venture failed (Monsen, Patzelt, & Saxton, 2010; Urban & Nikolov, 2013). However, to stay ahead of the competition and to capitalize on opportunities for new venture creation and strategic renewal, scholars have argued that risk taking is inherent to intrapreneurial activity (Shane, 2003). These risks for employees become apparent when intrapreneurial activities fall short of their goals, resulting in strong and enduring employee reactions, including grief and bitter disappointment (Shepherd, Covin, & Kuratko, 2009). Thus, although employees seem to be risk averse in general, when employees engage in employee intrapreneurship, such behavior is likely to coincide with risk taking. Hence, we formulate the following Hypothesis:

Hypothesis 5. Risk taking relates positively to employee venture behavior and employee strategic renewal behavior.

3.1.4. Employee intrapreneurship and reinforcement sensitivity

In addition to the related activities of intrapreneurship (i.e., showing initiative, being innovative, and taking risks), a strong attitude towards (expectations of) positive outcomes is considered a defining characteristic of individuals who have intrapreneurial intentions and who engage in intrapreneurial activities (Douglas & Fitzsimmons, 2012; Urban & Nikolov, 2013). To explain why intrapreneurial individuals perceive and react more strongly to cues from the environment indicating positive outcomes, we draw on reinforcement sensitivity theory (RST; Corr, 2004; Gray, 1991). RST postulates that individuals differ in their expectations and perception of outcomes of behavior due to two independent brain mechanisms, namely, the behavioral activation (or approach) system (BAS) and the behavioral inhibition system (BIS; Carver & White, 1994). The BAS governs appetitive behaviors in response to – expectations of – reward and is sensitive to cues that signal a greater than chance probability of positive outcomes. Therefore, an increased sensitivity of the BAS coincides with stronger reactions to cues that indicate (a chance of) positive outcomes. In contrast, the BIS governs risk assessment and defensive avoidance behaviors in response to competing motivational goals and is sensitive to cues that signal a greater than chance probability of negative outcomes. Subsequently, an increased sensitivity of the BIS is associated with stronger reactions to cues that indicate negative outcomes.

Although RST is not commonly used in organizational studies, the linkage between an individual's reward and punishment sensitivity and intrapreneurial behavior has been tentatively addressed in previous studies. For instance, the experimental study of Monsen et al. (2010) showed that when risks were met with increased rewards (e.g., high rates of profit sharing), the willingness to engage in intrapreneurial behavior significantly increased. However, when cues of reward were absent or not perceived to be substantial enough to cover the risks, the intrapreneurial intentions of employees decreased. In a similar vein, Urban and Nikolov (2013) found that the most important attribute influencing the decision to

engage in employee intrapreneurship is the probability of venture success, closely followed by financial reward. In contrast, job risk, pay risk and required effort were deterrents to employee intrapreneurship. Hence, we argue that an individual's sensitivity to signals of positive outcomes (i.e., BAS) is positively related to employee intrapreneurship. In contrast, an individual's sensitivity to punishment (i.e., BIS) is negatively related to employee intrapreneurship. Thus, we formulate the following final hypotheses:

Hypothesis 6a. Reward sensitivity (BAS) relates positively to employee venture behavior and employee strategic renewal behavior.

Hypothesis 6b. Punishment sensitivity (BIS) relates negatively to employee venture behavior and employee strategic renewal behavior.

3.2. Method

3.2.1. Procedure

Data were gathered with an online questionnaire among employees working in different private organizations. These employees were part of a panel database composed of individuals who had agreed to participate in research for pay. Firm size ranged from small (25–49 employees; 5%) to large (250 or more employees; 58%). Data were gathered in two stages. First, employees within this database were randomly selected and contacted via email with a request to participate in this research. The email contained a brief summary of the research and a link to the survey. Data were received from 535 respondents (response rate = 52%). Furthermore, the respondents were kindly asked to provide the contact details of a colleague with whom they closely collaborated (i.e., with whom they had work-related contact at least three days a week).

In the second stage, the “close collaborators” of the respondents were sent an email containing a kind request from their colleague (the respondent) to complete a questionnaire about them, a brief summary of the research and a link to the online survey. Data were received from 243 close collaborators (response rate = 45%). The complete dataset consisted of 243 pairs. This dataset was used for the analyses. A non-response analysis showed that the participants who did not provide the contact details of a close collaborator showed no significant differences in scores on the study variables and demographics.

3.2.2. Participants

The mean age of the participants was 41.5 years ($sd = 11.52$), and the majority of the participants had an intermediate or higher vocational educational level (76.1%). On average, the participants had held their current job for 11 years ($sd = 9.31$) and had a total of 21 years of work experience ($sd = 12.67$). For the close collaborators, the mean age was 41 years ($sd = 11.1$), and they had worked in their current job for 9.5 years ($sd = 7.8$). The respondents worked in the following areas: industry (17%); property and construction (6%); sales (12%); retail (2%); transport (9%); accountancy, banking and finance (7%); business, consulting and management (11%); marketing, advertising and PR (3%); healthcare (18%); culture (1%); the environment and agriculture (1%); and other (13%).

3.2.3. Measures

All measures were administered in Dutch. Measures that were not available in Dutch were translated from English into Dutch using the forward-backward translation method (Behling & Law, 2000). For the scales in which colleagues rated the participant (i.e., for innovativeness and risk taking), the items of the scales were reformulated so that the rater could answer them for the

participants.

Employee intrapreneurship was measured with 8 items of the EIS. The selection of the items was based on the confirmatory factor analysis (CFA) and measurement invariance test in Study 1 (Lugtig, Boeijje, & Lensvelt-Mulders, 2011). The scale consisted of four items from the venture behavior dimension and four items from the strategic renewal behavior dimension (see Table 2). Responses were given on a 7-point scale ranging from 1 (never) to 7 (always). Cronbach's alpha for both sub-dimensions was 0.94.

Personal initiative was utilized to capture proactivity and was measured with 7 items (Frese, Fay, Leng, & Tag, 1997). An example item is "I actively attack problems". The items were rated on a 5-point scale ranging from 1 (totally disagree) to 5 (totally agree). Cronbach's alpha was .86.

Reward sensitivity and punishment sensitivity (BAS and BIS) were assessed with the validated Dutch version of the BIS/BAS scales of Carver and White (1994) by Franken, Muris, and Rassin (2005). The BAS scale was assessed with 12 items covering three dimensions (i.e., reward, drive, and fun). Example items include "When I get something I want, I feel excited right away", "When I go after something I want, I move on it right away", and "I will often do things for no other reason than that they might be fun". The BIS scale was measured with 5 items (example item is "I worry about making mistakes"). Responses were given on a 4-point scale ranging from 1 (totally disagree) to 4 (totally agree). The Cronbach's alpha values of the combined BAS scale and the BIS scale were 0.81 and 0.74, respectively.

Innovativeness was rated by a close colleague and was measured with nine items from Janssen (2000) representing three dimensions (three items each), namely, idea generation, idea promotion, and idea realization. Some example items include the following: "[name of participant] creates new ideas for improvements" (idea generation); "[name of participant] mobilizes support for innovative ideas (idea promotion); and "[name of participant] transforms innovative ideas into useful applications" (idea realization). Responses were given on a 7-point frequency scale ranging from 1 (never) to 7 (always). Cronbach's alpha for the combined scale was 0.88.

Risk taking was rated by a close colleague and was measured with five items from the scale by Van den Brink, Koch, Ardtts, and Van Lankveld (2004). An example item is "[name of participant] regularly takes risks to gain a possible advantage". Responses were given on a 7-point scale ranging from 1 (never) to 7 (always). Cronbach's alpha was .85.

3.3. Data analysis

Using R (Lavaan package; R Core Team, 2015), we created a "Validity Model" containing latent variables for each of the study variables to test Hypotheses 3 to 6. The latent variables venture behavior, strategic renewal behavior, personal initiative, innovativeness, risk taking, and BIS were indicated by their separate items. The 12-item BAS was indicated by the summed scores of its sub-scales to decrease model complexity. To investigate convergent validity, we evaluated the strength and direction of the latent correlations between the latent study variables (Brown, 2014; Campbell & Fiske, 1959). We controlled for gender, age, education and tenure, as these variables have been shown to relate to intrapreneurial behavior (De Jong et al., 2013). To investigate discriminant validity, we followed the method proposed by Fornell and Larcker (1981) and Farrell (2010). Discriminant validity is achieved when the average variance extracted (AVE; the sum of the squared factor loadings of the indicators of a latent construct) is larger than the maximum shared variance (MSV; the squared correlation between two constructs), meaning that the latent variable accounts for more variance in the observed indicators of that

variable than in the other constructs. As other constructs, we included personal initiative, innovativeness, risk taking, reward sensitivity, and punishment sensitivity.

3.4. Results and conclusion study 2

3.4.1. Descriptive statistics

Before examining the Validity Model, we investigated the factorial validity of the EIS in this sample. We compared a two-factor model, in which employee venture behavior and employee strategic renewal behavior were each indicated by their items, to a one-factor model, in which items of both sub-dimensions were used as indicators for a single factor. In line with Study 1, the results confirmed that the two-factor solution of the EIS had a better fit to the data than the single-factor model ($\Delta\chi^2(1 \text{ df})$ of 59.71, $p < .01$). The model fit of the two-factor model was acceptable: chi square = 60.73, $df = 19$, CFI = 0.98, TLI = 0.97, RMSEA = 0.09, and SRMR = 0.02; also, all indicators of the latent variables were above the 0.32 threshold (Tangirala et al., 2001). Additionally, the Validity Model showed an acceptable fit to (Table 3). Hence, we proceeded to examine the convergent and discriminant validity of the EIS.

3.4.2. Hypotheses testing

To test Hypotheses 3 to 6 regarding the convergent and discriminant validity of the EIS, we examined the latent correlations between constructs in the Validity Model when controlling for age, education, gender, and tenure. In line with Hypothesis 3, personal initiative related positively to employee venture behavior ($r = 0.33$, $p < .01$) and employee strategic renewal behavior ($r = 0.48$, $p < .01$). Furthermore, in support of Hypothesis 4, innovativeness related positively to both venture behavior ($r = 0.45$, $p < .01$) and strategic renewal behavior ($r = 0.52$, $p < .01$). In addition, we found a positive relationship between risk-taking behavior and both venture behavior ($r = .52$, $p < .01$) and strategic renewal behavior ($r = 0.53$, $p < .01$), showing full support for Hypothesis 5. In line with Hypothesis 6a, BAS related positively to employee venture behavior ($r = 0.62$, $p < .01$) and strategic renewal behavior ($r = 0.64$, $p < .01$). However, contrary to Hypothesis 6b, neither venture behavior nor strategic renewal behavior showed a relationship with BIS ($r = 0.07$, $p = .32$, and $r = 0.01$, $p = .94$). See Table 4 for an overview of the latent correlations between the study variables. Concerning discriminant validity, the AVE of the venture behavior sub-dimension was 0.81, and that of the strategic renewal behavior sub-dimension was 0.79. The AVE values of venture behavior and strategic renewal behavior were higher than any of their maximally shared variances with the study variables, indicating discriminant validity (Farrell, 2010). Thus, the results of Study 2 show full support for the convergent and discriminant validity of the EIS (See Table 5).

4. General discussion

Recent developments in society have called for an increased understanding of the causes and consequences of employees' intrapreneurial activities. Although past research has shed light on the intrapreneurial roles and activities of employees within an organization, the absence of conceptual clarity and lack of a valid measure of employee intrapreneurship as a behavior-based construct has hampered systematic research examining this phenomenon. This study aimed to address this gap.

We reviewed research on employee intrapreneurship to provide conceptual clarity. Based on our review, we identified three main approaches to conceptualizing and measuring employee intrapreneurship. The first is based on the entrepreneurial orientation literature, and defines and operationalizes employee

Table 3
Results of Multi-group confirmatory factor analysis and invariance test of the EIS (Study 1).

Model	χ^2	df	SRMR	CFI	TLI	IFI	RMSEA	AIC
Baseline Model	6375.86	210	–	–	–	–	–	6495.89
One-Factor Model	780.24	180	.05	.90	.89	.90	.07	960.24
Two-Factor Model	603.94	178	.04	.93	.92	.93	.06	787.94
<i>Measurement Invariance</i>								
Metric Model	618.32	191	.04	.93	.92	.93	.06	776.32
Intercept Model	648.36	193	.04	.93	.93	.93	.06	802.36
Modified Intercept Model	625.65	190	.04	.93	.93	.93	.06	785.65
Scalar Model	639.94	203	.04	.93	.93	.93	.06	773.94

Note. Analyses were performed on department B and C: $N = 427$ and $N = 226$. $\chi^2 =$ ChiSquare; df = Degrees of Freedom; SRMR = standardized root mean square residuals; CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root-mean-square error of approximation; AIC = Akaike Information Criterion.

Table 4
Fit indices of the models regarding convergent and discriminant validity of the EIS (Study 2, $N = 243$).

Model	χ^2	df	SRMR	CFI	TLI	IFI	RMSEA
Baseline Model	7573.31	820	–	–	–	–	–
Validity Model	1157.89	728	.06	.94	.93	.94	.05

Note. $\chi^2 =$ Chi Square; df = Degrees of Freedom; SRMR = standardized root mean square residuals.

CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root-mean-square error of approximation.

intrapreneurship as proactivity, risk taking, and innovativeness (e.g., Rigtering & Weitzel, 2013). The second approach defines employee intrapreneurship based on intrapreneurial output, and in general has relied on single indicator measures (e.g., Stam, 2013). The third conceptualizes employee intrapreneurship as employees' agentic, strategic work behaviors aimed at creating new businesses for the organization (i.e., venture behavior) and enhancing an organization's ability to react to internal and external advancements (i.e., strategic renewal behavior). Of these approaches, we argued that the behavior-based approach yields the most potential for theoretical advancement of the intrapreneurship literature as it captures the defining characteristics of employee intrapreneurship (i.e., employee venture behavior and employee strategic renewal behavior) and allows for a broad theoretical exploration on potential factors that may hamper or foster employee intrapreneurship. Moreover, a behavior-based conceptualization of employee intrapreneurship fits well within mainstream job design (e.g., Bakker & Demerouti, 2014) and proactive work behavior literature (e.g., Parker, Bindl, & Strauss, 2010) that theorize antecedents and individual-level outcomes of employee behavior.

Table 5
Latent correlations between the control and study variables ($N = 243$).

Construct	Study variables											
	1	2	3	4	5	6	7	8	9	10	11	
<i>Control</i>												
1 Age	–											
2 Education	.26**	–										
3 Gender	.08	-.07	–									
4 Tenure	.73**	-.29**	-.02	–								
<i>Study Variables</i>												
5 Venture behavior	.07	.13*	-.13*	-.08	–							
6 Strategic renewal behavior	.02	.20**	-.15*	-.01	.90**	–						
7 Personal initiative	-.16*	.16*	-.05	.13*	.33**	.48**	–					
8 Innovativeness ^a	.05	.21**	-.11	-.04	.45**	.52**	.44**	–				
9 Risk taking ^a	.09	.27**	0	-.11	.52**	.53**	.24**	.56**	–			
10 Reward Sensitivity (BAS)	.07	.13	-.09	-.09	.62**	.64**	.56**	.42**	.42**	–		
11 Punishment Sensitivity (BIS)	.13	-.09	.23**	-.11	.07	0.01	-.17*	-.06	-.02	.20*	–	

Note. Results of study variables are based on latent correlations in the Validity Model.

^a These variables were rated by a direct colleague * $p < .05$, ** $p < .01$.

On the basis of the behavior-based conceptualization of employee intrapreneurship, we developed and validated a measure of employee intrapreneurship in two separate studies, named the Employee Intrapreneurship Scale (EIS). Results of factor analysis validated that the EIS measures two sub-dimensions, labeled employee venture behavior and employee strategic renewal behavior. In our studies, the two sub-dimensions were highly correlated, indicating that employee strategic renewal and new venture creation are likely to coincide and can, as expected, be considered as two indicators of employee intrapreneurship as the higher order construct.

Further validation based on the nomological network showed that, congruent with our expectations, both employee venture behavior and employee strategic renewal behavior related positively to employees' self-ratings of personal initiative and a close-colleague's rating of their innovativeness and risk taking, indicating convergent validity. Furthermore, our discriminant validity analyses showed that venture behavior and strategic renewal behavior are specific types of activities can be discriminated from these more general indicators of entrepreneurial orientation and activity. Together, the findings support the premise that engaging in employee intrapreneurship coincides with showing entrepreneurial activities (i.e., initiative, risk taking, and innovativeness). We encourage researchers to further explore the nomological network of employee intrapreneurship and increase our understanding on the similarities and differences between employee intrapreneurship and related concepts such as employee creativity (Anderson, Potocnik, & Zhou, 2014), employee voicing (Tangirala & Ramanujam, 2008), and job crafting (Tims, Bakker, & Derks, 2012).

As concerns relationships between reward sensitivity and employee intrapreneurship, in line with our expectations,

sensitivity to rewards (BAS; cf. [Corr, 2004](#)) showed strong positive relations with employee intrapreneurship. Our results were not in line with our expectation that an individual's sensitivity to negative outcomes (i.e., BIS; cf. [Corr, 2004](#)) would negatively relate to employee intrapreneurship. In contrast to experimental studies showing that the perception of risks decreased participation in intrapreneurial projects ([Monsen et al., 2010](#); [Urban & Nikolov, 2013](#)), we found no relationship between an employee's sensitivity to negative outcomes and employee intrapreneurial behavior. Similar results were found for the relationships between BIS and employees' innovativeness and risk taking behavior as rated by a close colleague. A possible explanation for this result is that the risks of intrapreneurial behaviors for an individual may be less salient, because the majority of the consequences are at the organizational level (e.g., loss of organizational resources). Therefore, an individual's sensitivity to risks and threats may be less influential in the context of employee intrapreneurship than, for instance, for entrepreneurship where the risk of project failure has direct consequences for the individual. However, previous studies have shown that engaging in intrapreneurial behaviors coincides with some risks for the individual. For instance, project failure may result in reputation damage or even job loss ([Shepherd et al., 2011](#)). Clearly, more research is needed to increase our understanding of risk sensitivity, risk perception, and the possible consequences of risks in the context of employee intrapreneurship.

4.1. Theoretical and practical implications

By providing a comprehensive behavior-based conceptualization and a valid measure of employee intrapreneurship, our study complements the large body of research on intrapreneurship and allows new types of research to be conducted to extend our theoretical understanding of employee intrapreneurship. For instance, research regarding the impact of intrapreneurship on employee well-being and job performance is scarce ([Blanka, 2018](#)). We argue that our behavior-based approach is well suited to be integrated in the job design and proactive behavior literature that focuses on antecedents and individual-level outcomes of employee behaviors. By utilizing the premises regarding the motivational and health impairment pathways in Job Demands–Resources theory ([Bakker & Demerouti, 2014](#)), research can shed light on the personal benefits and costs of employee intrapreneurship. Moreover, the importance of organizational preparedness for intrapreneurship to foster employee intrapreneurial activities within an organization has been highlighted in several studies (e.g., [Hornsby et al., 2013](#)). Combining the Corporate Entrepreneurship Assessment Instrument ([Hornsby et al., 2013](#)) and the Employee Intrapreneurship Scale in one study would enable researchers to uncover how an organization's intrapreneurial preparedness relates to the actual intrapreneurial behaviors of employees within the organization.

Our results showed that venture and strategic renewal behaviors related positively to employees' more general entrepreneurial orientation and activity, as well as to employee reward sensitivity (i.e., BAS; [Corr, 2004](#)). The latter findings expand the current evidence of the relationships between strong expectations of positive outcomes and intrapreneurial intentions (e.g., [Douglas & Fitzsimmons, 2012](#)) by showing that an increased sensitivity to rewards positively relates to actual employee venture behavior and strategic renewal behavior. Moreover, because several experimental studies have shown that participation in intrapreneurship is contingent on the perception of rewards and risks ([Monsen et al., 2010](#); [Urban & Nikolov, 2013](#)), we argue that our results may indicate that an individual's reward sensitivity disposition may be just as important in predicting employee intrapreneurial behavior as, for instance, the work design ([Hornsby et al., 2013](#)) and

managerial position ([Hornsby et al., 2009](#)). As such, we encourage scholars to include multiple types of predictors simultaneously in future studies to develop a more comprehensive understanding of important predictors of employee intrapreneurship.

Lastly, we argue that practitioners can benefit from our review and the EIS. Conceptual clarity aids practitioners in their communication about intrapreneurship to colleagues, management, and clients. Moreover, it is important that professional consultancy products aimed at facilitating intrapreneurship are evidence based in their development and operation. As this is not always the case (for a critique see [Anderson, Potocnik, Bledow, Hulsheger, & Rosing, 2016](#)), we argue that the EIS may be used to provide important metrics and make practitioner-oriented products more research-based.

4.2. Limitations of the current research

The current study has some limitations. First, although the current study consists of multiple heterogeneous samples drawn from the public sector and the private sector, all employees are based in one country. This limitation affects the generalizability of the results to other cultures. The literature has shown that national cultures are important factors to consider because measures of intrapreneurship may lack cross-national equivalence ([Antoncic & Hisrich, 2003](#)) and because culture may influence the relationship between entrepreneurial activity and performance ([Rauch et al., 2009](#)). Therefore, future research should employ a cross-national design to establish the generalizability of the EIS and to examine the influence of national culture.

A second limitation is the use of a cross-sectional design. Because the aim of this study was not to establish causality between the constructs under investigation, a cross-sectional design was adequate. However, to advance our theoretical understanding of employee intrapreneurship, future studies are advised to investigate explanatory and predictive models of employee intrapreneurship using multiple measurement moments and multiple data sources in their research design ([Ployhart & Ward, 2011](#)). For instance, examining the personal costs and benefits of employee intrapreneurship for employee well-being and performance may be of particular interest, in addition to the relationship between the job design and employee intrapreneurial behaviors.

A final limitation of our study is the lack of firm-level predictors and outcome variables. Because the aim of this study was to create a generic and valid scale of employee intrapreneurship, we opted for examining convergent and discriminant validity with variables that capture related employee behaviors and characteristics at the individual level. However, employee intrapreneurship is expected to relate to firm-level intrapreneurship and to ultimately affect firm-level performance ([Antoncic & Hisrich, 2003](#)). Future studies may overcome this limitation by including measurements at multiple levels to investigate how organizational-level activities relate to individual employee intrapreneurship.

4.3. Conclusion

In this study, we reviewed the intrapreneurship literature, based on which we defined employee intrapreneurship as an employee's agentic and anticipatory behaviors aimed at creating new businesses for the organization (i.e., venture behavior) and enhancing an organization's ability to react to internal and external advancements (i.e., strategic renewal behavior; [Gawke et al., 2017](#)). Following this definition, we developed a generic and valid scale, namely, the Employee Intrapreneurship Scale (EIS). With the EIS, researchers are empowered to systematically study employee intrapreneurial behaviors and increase our understanding of its

antecedents and consequences at the individual and organizational levels. Furthermore, organizations are increasingly relying on employee intrapreneurial behaviors to improve their adaptability and competitive position. Monitoring intrapreneurial activities in specific organizational units or examining the impact of new rules and regulations on employee intrapreneurial behaviors may be of interest. For all of these purposes, the EIS may be a useful tool for practitioners and decision makers.

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