EMPLOYEE EFFECTUATION - WHAT MAKES CORPORATE EMPLOYEES ACT LIKE ENTREPRENEURS?

Alvaro Filipe da Costa
RWTH Aachen University, dacosta@win.rwth-aachen.de

Malte Brettel
RWTH Aachen University

Recommended Citation
da Costa, Alvaro Filipe and Brettel, Malte (2011) "EMPLOYEE EFFECTUATION - WHAT MAKES CORPORATE EMPLOYEES ACT LIKE ENTREPRENEURS?," Frontiers of Entrepreneurship Research: Vol. 31 : Iss. 17 , Article 2.
Available at: https://digitalknowledge.babson.edu/fer/vol31/iss17/2

This Paper is brought to you for free and open access by the Entrepreneurship at Babson at Digital Knowledge at Babson. It has been accepted for inclusion in Frontiers of Entrepreneurship Research by an authorized editor of Digital Knowledge at Babson. For more information, please contact digitalknowledge@babson.edu.
EMPLOYEE EFFECTUATION – WHAT MAKES CORPORATE EMPLOYEES ACT LIKE ENTREPRENEURS?

Alvaro Filipe da Costa, RWTH Aachen University, Germany
Malte Brettel, RWTH Aachen University, Germany

ABSTRACT

Entrepreneurial employees are crucial to successful CE and for developing radical innovations. Entrepreneurial behavior means dealing with situations of uncertainty, which arise especially in the fuzzy front-end of innovation. Effectuation is a behavioral logic to deal with uncertainty. This study applies effectuation theory to the fuzzy-front end, and derives individual level and organizational antecedents to effectual and causal behaviors from the literature on entrepreneurial personality traits and CE organization. Using cross-sectional survey data from 56 corporate employees, we show that a proactiveness, tenacity, and internal locus of control influence specific behaviors, as do work discretion, time availability, and management support. This study contributes to CE and innovation literature by deepening the understanding of the effects of traits and organization on employee behavior, and advances effectuation theory by suggesting individual and environmental antecedents to effectual behavior.

INTRODUCTION

What we know

Recent research on CE moves the behavior and cognition of individuals into focus, and thus understands a company’s organization as a mere stage for individuals with entrepreneurial cognitions to take action (Ireland, Covin, & Kuratko, 2009). A number of models describing corporate entrepreneurial action have been developed (Antoncic, 2003; Hayton, 2005; Kuratko, Ireland, Covin, & Hornsby, 2005; Monsen, Patzelt, & Saxton, 2010). Individual behavior becomes particularly important in the early phases of CE, commonly referred to as the fuzzy-front end (FFE, Smith & Reinertsen, 1991). This phase is characterized by a high degree of uncertainty and a mostly unstructured and unguided search for ideas (Kim & Wilemon, 2002). In this phase, committed individuals act as boundary spanners towards the company’s external environment and as gatekeepers to the company’s decision makers (Reid & de Brentani, 2004). In fulfilling these functions, the fuzzy front-end activities contribute significantly to the success of following product development projects (Khurana & Rosenthal, 1998).

Like their self-employed kin, these corporate entrepreneurs face similar Knightian uncertainties, e.g. the dependency on unpredictable innovation outcomes (Knight, 1921; Phan, Wright, Ucbasaran, & Tan, 2009; Sharma & Chrisman, 1999). However, some differences set the corporate context apart, e.g. more generous resources endowment (Shrader & Simon, 1997), a separation between individual and organizational risk-taking (Antoncic, 2003), and the influence of the surrounding organization (Hornsby, Kuratko, & Zahra, 2002).

To deal with uncertain situations, expert entrepreneurs were found to apply a set of heuristics termed effectuation (Sarasvathy, 2001; Sarasvathy, 2008), which were also observed in broader
samples of entrepreneurs (Chandler, DeTienne, McKelvie, & Mumford, 2009) and in the context of corporate R&D projects (Brettel, Mauer, Engelen, & Küpper, 2011).

What we don’t know and why we should care

While these results suggest that effectual behavior may be found in the fuzzy front-end, it is yet unclear what causes employees in a corporation to act effectually. Are effectual and causal behaviors mutually exclusive or do they coexist? Which individual and organizational factors influence the use of these heuristics? An answer to these questions could be a significant step forward for CE research and practice, as specifically fostering certain behaviors may result in different innovation outcomes (Brettel et al., 2011), as well as for effectuation research. Furthermore, a better understanding of organizational stimuli and employees’ behavioral preferences can lead to an organization that is tailored to encourage particular employees, or conversely, a personnel selection and development to fully harness the organization’s support.

Approach: Linking insights about CE organization and entrepreneurial action in a social cognitive framework

We address these questions by drawing on Bandura’s social cognition theory (1986). Bandura posits that behavior, personal factors, and the external environment constantly influence each other. Ireland et al. (2009) mirror this framework by describing the interplay between an organization, individual cognition, and entrepreneurial behaviors. We operationalize entrepreneurial behavior using Sarasvathy’s (2001) four dimensions, each of which can take an effectual and a causal form. To measure the organization’s influence we draw on the various studies on factors that foster CE (Brown, Davidsson, & Wiklund, 2001; Damanpour, 1991; Dess, Lumpkin, & McGee, 1999; Hornsby, Kuratko, & Zahra, 2002; Marvel, Griffin, Hebda, & Vojak, 2007). For individual cognitive factors, we use insights from the Action Theory of Entrepreneurship, which states that entrepreneurial action is enabled by a mindset that is self-starting, proactive, and persistent in the face of obstacles (Frese, 2009).

We proceed as follows: We first discuss the applicability of effectuation theory in the FFE, and develop what effectuation means in this context. Then we describe personal cognitive and organizational influences and hypothesize their effects on effectual and causal behaviors. Next, we describe our methodical approach to empirically test our hypotheses. Next, we present the study results and discuss them in the light of theory. We conclude by discussing the contributions, limitations, and future research questions of this study.

THEORETICAL FOUNDATIONS AND HYPOTHESES

Effectuation as entrepreneurial behavior in the fuzzy front-end

The importance of individual behavior has been highlighted for successful CE in general (Ireland, Covin, & Kuratko, 2009), as well as for the fuzzy front-end in particular (Reid & de Brentani, 2004). Drawing on the parallels between independent and corporate entrepreneurship, we discuss the applicability of effectuation as one model to describe entrepreneurial behavior (Sarasvathy, 2001)

In her seminal work, Sarasvathy (2001) outlines effectuation as a set of behaviors that entrepreneurs use in the face of Knightian uncertainty, i.e. in situations where the probabilities of the possible consequences of one’s action are unknown. In Knight’s (1921) understanding, taking decisions in the face of uncertainty constitutes an entrepreneur, as most people avoid “ambiguous”
situations (e.g. Rode, Cosmides, Hell, & Tooby, 1999). Knight’s perspective is the cornerstone of a constructionist view on entrepreneurship, in which opportunities are created by taking decisions under uncertainty, rather than discovered in the environment (Alvarez & Barney, 2007; McMullen & Shepherd, 2006). In a more general sense, effectuation may be an epitome of control-based strategies that, in contrast to prediction-based strategies, rein in uncertainty by expanding one’s influence over the environment rather than by trying to precisely position oneself in an exogenous environment (Wiltbank, Dew, Read, & Sarasvathy, 2006).

The early stage of innovation is fraught with uncertainties, including unclear potentials of technology, demand and competitor actions (Zhang & Doll, 2001). FFE activities have the potential to reduce uncertainty, thereby improving the chances of effective and efficient product development (Verworn, Herstatt, & Nagahira, 2007). Individual action becomes especially important for discontinuous or radical innovations, as individuals rather than organizational routines recognize opportunities and channel information into the organization. (Reid & de Brentani, 2004; Rice, Kelley, Peters, & O’Connor, 2001)

A number of helpful fuzzy front-end activities have been proposed, many of which can be interpreted in the light of effectuation theory. Sarasvathy (2001; 2008) proposes 4 dimensions, each of which can take an effectual, control-oriented and a causal, prediction-oriented form.

The first dimension describes the starting point of the venture. In causal thinking, a set goal determines the means required to achieve this goal. For the FFE, this could mean actively aligning the concepts developed to the company strategy (Zhang & Doll, 2001), and continually developing a project plan to reach this goal (Verworn, 2009). Effectually, the means available determine potential outcomes. This is mirrored efforts to establish transparency about available knowledge in the company (Kim & Wilemon, 2002) and in acknowledging exaptation phenomena (Dew, Sarasvathy, & Venkataraman, 2004).

The second dimension covers the perception of risk. Causally, the focus lies on forecasting expected returns, as commonly done in a business plan (though not found to improve performance by Bertels, Koen, & Kleinschmidt, 2008). Effectuators, on the other hand, put an emphasis on keeping the potential losses in an affordable range. In the FFE, this is mirrored by noted “20%-rules” for employees to engage in innovative projects, e.g. at Google (Iyer & Davenport, 2008), or in using input control mechanisms (Poskela & Martinsuo, 2009), while granting a certain degree of autonomy and flexibility (examined for NPD projects by Tatikonda & Rosenthal, 2000). Deliberately using loss-limited experimentation to generate insights about an environment or to enact a new business models also reflects this dimension (Chesbrough, 2010).

The third dimension defines the attitude towards outsiders. Causally, outsiders are perceived as potential competitors, thus focusing on competitive analyses, which are emphasized in FFE literature (Zhang & Doll, 2001). In effectuation, outsiders may well be potential partners that can be involved in the project for mutual gain. This aspect is strongly present in FFE literature, as cooperation with suppliers, customers and even potential competitors are encouraged (Kim & Wilemon, 2002)

The fourth dimension delineates the mindset towards unexpected events. In causations, contingencies should be avoided. In the FFE, for this purpose process formalization (Kim & Wilemon, 2002) and rigorous planning (Verworn et al., 2007) has been proposed. Effectuators understand
contingencies as valuable opportunities. FFE literature acknowledges the emergence and value of surprising results and paths in the fuzzy front end (Kim & Wilemon, 2002; Rice et al., 2001); exaptation also often has surprising characteristics (Dew, Sarasvathy, & Venkataraman, 2004).

**Individual factors influencing entrepreneurial behavior**

Drawing on the results of independent entrepreneurship research seems warranted when examining individual factors influencing the choice of behaviors. Corporate entrepreneurs face similar Knightian uncertainties, e.g. the dependency on unpredictable innovation outcomes (Knight, 1921; Phan et al., 2009; Sharma & Chrisman, 1999). However, some differences set the corporate context apart, e.g. more generous resources endowment (Shrader & Simon, 1997) and a separation between individual and organizational risk-taking (Antoncic, 2003).

Entrepreneurship research has identified numerous promotive personality traits. While factors such as generalized self-efficacy, proactive personality, innovativeness, and achievement motives can be clearly attributed to entrepreneurship (Rauch & Frese, 2007), the question of how these factors influence the choice of entrepreneurial behaviors demands deeper theoretical grounding. In his Action Theory of Entrepreneurship, Frese (2009) develops three characteristics of active (rather than reactive) entrepreneurial actions: An entrepreneur needs to be **proactive**, **persistent** in the face of obstacles, and **self-starting**. How do these characteristics relate to the choice of effectual or causal behaviors?

**Proactiveness** is defined by Frese by having a long-term focus and anticipating future problems and opportunities. This bearing allows proactive persons to identify and seize opportunities and thus effect change in the environment (Crant, 1996). The long-term focus leads us to expect an inclination to work towards goals as guidelines for action:

\[
H_{1a}: \text{The higher personal proactiveness, the higher the goals orientation}
\]

The second aspect of proactiveness, anticipation of future opportunities, implicates being prepared and open to seize opportunities as they develop, rather than avoid them:

\[
H_{1b}: \text{The higher personal proactiveness, the higher the appreciation of unexpected events}
\]

\[
H_{1c}: \text{The higher personal proactiveness, the lower the avoidance of unexpected events}
\]

**Persistence** in the face of obstacles, according to Frese is required to overcome the inevitable problems and adversities any entrepreneurial venture faces. It fosters clear goals, a clearly communicated vision, and self-efficacy for entrepreneurs (Baum & Locke, 2004). Frese name two effects of persistence: Firstly, the agent needs tenacity to prevent being dissuades from his goals and plans, which allows him or her to follow a course of action, but may also result in stubbornness. Secondly, barriers external to one-self need to be overcome, for which tenacious efforts are needed. The first effect leads us to hypothesize strong goal orientation and a reluctance to change plans when contingencies occur:

\[
H_{2a}: \text{The higher personal persistence, the higher the goals orientation}
\]

\[
H_{2b}: \text{The higher personal persistence, the lower appreciation of unexpected events}
\]

\[
H_{2c}: \text{The higher personal persistence, the higher the avoidance of unexpected events}
\]
The second effect of persistence leads us expect a strong orientation towards the external market environment – a persistent person may be very conscious of the competition any may respond by either strengthening partnerships or competitive positioning:

\[ H2d: \text{The higher personal persistence, the higher the partnership orientation} \]

\[ H2e: \text{The higher personal persistence, the stronger the competitive analysis} \]

Self-Starting, according to Frese, describes taking action without external trigger. This corresponds to Rotter’s (1966) internal locus of control, which essentially describes the belief to be in control of one’s fate, and thus self-motivation initiative. Being in control of a situation implies reluctance to let external influences alter the course of one’s actions:

\[ H3a: \text{The stronger the internal locus of control, the lower appreciation of unexpected events} \]

\[ H3b: \text{The stronger the internal locus of control, the higher the avoidance of unexpected events} \]

Organizational factors influencing individual behavior

CE literature has extensively examined the question, which organizational factors foster CE activity (e.g. Brown, Davidsson, & Wiklund, 2001; Damanpour, 1991; Hornsby, Kuratko, & Zahra, 2002). Hornsby et al. have summarized the state of research with regards to middle managers and developed a five main factors model: Work Discretion, Time Availability, Management Support, Rewards / Reinforcements, and Organizational Boundaries. In a later refinement however, Organizational Boundaries was discarded (Hornsby, Holt, & Kuratko, 2008).

Work discretion refers to a job design that allows employees to take their own decisions about how they fulfill their jobs. Not being tied to specific procedures should make it easier for employees to utilize their personal knowledge and networks as means in developing an innovation idea:

\[ H4: \text{The higher the work discretion, the higher the means-orientation} \]

Time availability describes whether employees find the time to work on entrepreneurial projects besides their regular activities. When compared to a situation of high workload, available time may lead to more goal-oriented work, as there is time to fulfill all planned steps rather than a trimmed selection.

\[ H5a: \text{The higher the time availability, the higher the means-orientation} \]

\[ H5b: \text{The higher the time availability, the higher the goals-orientation} \]

Management support summarizes a climate in which calculated risks are supported by the management with championing and resources. For an employee this means being able to incur a certain risk of loss without negative consequences, and developing innovations from the unaffiliated resources provided by management:

\[ H6a: \text{The higher the management support, the higher the affordable loss-orientation} \]

\[ H6b: \text{The higher the management support, the higher the means-orientation} \]
Management support may also involve encouragement for changing directions if unexpected events, such as new insights or market opportunities emerge:

H6c: The higher the management support, the higher the appreciation of unexpected events

Rewards and Reinforcements mirrors the importance of incentive systems and recognition for employees. As this factor requires a certain degree of employee accountability in terms of target achievement and gains earned from developed innovations:

H7a: The stronger the rewards and reinforcements, the higher goals-orientation

H7b: The stronger the rewards and reinforcements, the stronger the focus on expected returns

METHODS

Sample

We conducted this study together with a multi-national, highly diversified corporation that strongly emphasizes innovation and entrepreneurship in its organization and culture. A sample of our partner’s German employees from various functions was surveyed. The survey addressed employees of all levels from the R&D, technical service, marketing, and sales function, some of which have already submitted an innovation idea in the past for corporate decision. From a total of approx. 1100 employees, 72 responded, yielding a response rate of 6.5%. From these, only complete datasets were considered for analysis, reducing the number entered to 52-56. The analysis sample shows an approx. 50% split between frontline workers and managers, and an approx. 50% split between R&D and other functions.

Dependent Variables

The dependent variables in this study are measures of effectual and causal behaviors. We decided to use a slightly adapted version of the operationalization by Brettel, Mauer, Engelen, & Küpper (2011) rather than the one suggested by Chandler, DeTienne, McKelvie, & Mumford (2009) for three reasons: Firstly the former scale reflects the 4 principles / dimensions outlined by Sarasvathy (2001; 2008), thereby making hypothesis generation and testing more straightforward. Secondly, the former scale more clearly separates behavioral logics from outcomes (e.g., the experimentation construct in Chandler et al. contains experimental actions as well as outcome attributes). Thirdly, being designed for corporate R&D projects, only minor adaptations to the items were necessary. As Brettel et al. suggested we measured effectuation and causation items independently from each other (rather than bipolarly like in their study). This allows us to examine both effectual and causal behaviors in parallel without presuming that they are mutually exclusive. The correlations shown in table 1 support this independence. All measures show high reliabilities with Cronbach’s α greater 0.7 (Means-driven 0.73, Goals-driven 0.81, Affordable loss 0.77, Expected Returns 0.87, Partnership 0.71, Competitive Analysis 0.92, Acknowledge Unexpected 0.73, Avoid Unexpected 0.74)

Independent Variables

All measures for individual factors were taken from extant literature. Proactiveness (α=0.83) was measured using an instrument proposed by Bateman & Crant (1993) and subsequently used in various studies from the entrepreneurship and career choice literature (Crant, 1996; Seibert, Kraimer, & Crant, 2001). For measuring persistence, the tenacity construct employed by Baum & Locke (2004) was used (α=0.78). As described above, we operationalized self-starting by drawing
on the locus of control construct. We used the “internal”-dimension ($\alpha=0.7$) from the multidimensional conceptualization by Levenson (1973), which was also used by Chen et al. (1998).

As organizational factor measures, the revised Corporate Entrepreneurship Assessment Instrument (CEAI) was used (Hornsby et al., 2008; Hornsby, Kuratko, & Zahra, 2002), with slight adaptations to the fuzzy front-end. Management Support, Work Discretion and Rewards and Reinforcements exhibit satisfactory reliabilities with Cronbach’s alphas of 0.79, 0.81, and 0.77 respectively. Time Availability’s reliability is slightly lower at 0.69.

**Control Variables**

We used the respondent’s *function* as a control variable, as procedures and customary working style could well differ between functions. *Hierarchy level* was also controlled to give consideration to the greater scope for entrepreneurial activities for managers. We also included *gender* to control for potential differences between men and women. Tenure and education were also controlled for, as both might have an effect on a person’s network or specialist knowledge, which both provide valuable means to effectuate with.

**Results**

The Pearson correlations of our variables are shown in table 1. No correlations exceed the recommended cutoff of 0.6, and estimating the variance inflation factor (VIF) does not yield values above the recommended value of 10 (Hair, Black, Babin, Anderson, & Tatham, 2006), so we conclude that no critical multicollinearity can be found in the data. Further descriptive data cannot be published at this time, as clearance from our partner company is still pending.

For testing our hypotheses, we employ a series of OLS regressions, using effectuation and causation behaviors as dependent variables. Table 2 reports the regression outcomes. We find our regression models to yield satisfactory $R^2$ values, given that no specific situational variables are included. Looking at the adjusted $R^2$, however, shows unsatisfactory results for the Expected Returns Model, which makes us doubt the explanatory power of this model.

For *proactiveness*, we can confirm H1b (positive effect on Acknowledge Unexpected) while hypotheses H1a (positive effect on goals-driven) and H1c (neg. effect on Overcome Unexpected) are rejected. For *persistence*, H2b (neg. effect on Ack. Unexpected) and H2e (pos. effect on Comp. Analysis) are confirmed. H2a (pos. effect on Goals-driven) and H2c (pos. effect on Overcome Unexpected) are rejected. For *internal locus of Control*, we confirm H3a (neg. effect on Acknowledge Unexpected) and H3b (pos. effect on Overcome Unexpected). Furthermore, we find a strongly significant negative effect on Competitive Analysis.

For *Work Discretion*, we detect a negative effect on Means-driven, although we hypothesized a positive effect (H4). For *Time Availability*, we can confirm H5b (pos. effect on Goals-driven), but reject H5a (pos. effect on Means-driven). For *Management Support*, we confirm H6b (pos. effect on Means-driven), and H6c (pos. effect on Acknowledge Unexpected). While we hypothesized a positive effect on Affordable Loss (H6a), we actually found a significant negative effect. For *Rewards and Reinforcements*, we have to reject both hypotheses H7a (pos. effect on Goals-driven) and H7b (pos. effect on Expected Returns).
DISCUSSION

The results of this study indicate that there is a connection between individual personality traits and organizational factors on employees’ choice of behavior. With the exception of Expected Returns, the proposed antecedents provide satisfactory explanatory power, considering that no situational influences (e.g. the innovativeness or uncertainty of the idea worked on) have been included. While we find no single antecedent that fosters both effectual and causal behaviors in the same dimension, we do find numerous effects where only effectual or causal behavior is affected. As the effectual and causal constructs in each dimension are not strongly negatively correlated (with the exception of Acknowledge vs. Overcome Unexpected), we conclude that both behaviors are not mutually exclusive.

Some results of this study are surprising and call for explanations: Firstly, the finding that employees with a strongly internal locus of control place lower emphasis on competitive analysis is intriguing, as it may indicate that these employees perceive their innovation ideas “outside competition”, either because they perceive a high innovativeness or because they see their ideas success not influenced by competitive positioning. The latter interpretation would suggest a co-creation approach (Read, Dew, Sarasvathy, Song, & Wiltbank, 2009); the associated expected positive effect on partnerships is not confirmed, however. Secondly, contrary to our hypothesis, we found a negative effect of Work Discretion on Means-orientation. This may be interpreted as tendency to work towards self-set goals rather than to orient oneself at means; the positive effect on Goals-orientation implicated by this explanation is missing, however. Thirdly, against our expectation, we found a negative effect of Management Support on Affordable loss. This suggests that our hypothesis derivation may have failed to consider the transformation of risk between organizational and individual level: When an employee’s superiors take responsibility for an idea by providing resources, the risk of losing this investment moves from the employee to the underwriting manager, thus making affordable loss orientation less important for said employee.

CONTRIBUTION

This study contributes in four ways. Firstly, we transfer the effectuation theory to the fuzzy front-end, thereby providing a novel way to examine individual behavior that has moved into the focus of both CE research and FFE literature (Ireland, Covin, & Kuratko, 2009; Reid & de Brentani, 2004).

Secondly, we propose and test personal and organizational antecedents to these behaviors, thereby answering questions about these antecedents from the innovation literature (e.g. Prather, 2000). The effectuation literature also has begun to controversially discuss the relationship between effectuation and traits (Goel & Karri, 2006; Saras Sarasvathy & Dew, 2008), without yet giving clear answers to Mitchell et al.’s (2007) question: “What cognitive differences and environments lead to heuristic-based logic and which lead to effectuation-based logic in identifying opportunity?” With this study, we hope to take a step towards answering this question.

Fourthly, we contribute to effectuation literature by empirically demonstrating the independence of effectuation and causation behaviors. The theoretical derivation and delineation of effectuation suggest a strong dichotomy between effectual and causal approaches, in reality both behaviors probably are not mutually exclusive (Read et al., 2009).

Lastly, we offer practitioners important hints on how to foster effectual and causal behaviors, given that the former may be more effective in producing highly innovative outcomes (Brettel et al., 2011). Furthermore, if certain ways of organizing affect behavior, and certain personality types
are inclined towards certain behaviors, matching organization and employee personalities may amplify desired behaviors, or if done wrongly, negate the effects of organizational design.

Limitations

This study has several limitations. Firstly, the sample may not to corporate employees as all respondents belong to the same corporation that, its internal diversity notwithstanding, probably shares cultural and organizational elements that do not apply to other companies. This calls for replication studies in other corporations to identify similarities and differences. Secondly, the absolute number of responses is limited, resulting in low significance levels, which could also be mitigated by replication. The data used is entirely self-reported by a single informant, which may cause bias. Triangulating responses with coworkers’ or superiors’ reports may solve this problem. Thirdly, this study only includes rather static antecedents, as neither personality traits nor the perceived organization change frequently. Including contingency variables, such as uncertainty or innovativeness, in subsequent studies should drastically increase the predictive power of the model. Fourthly, the strongly negative correlation between Acknowledge and Overcome Unexpected may be an artifact of the measuring model, the formulations of which strongly emphasize the dichotomy of both. Reviewing the measuring model may clarify this concern.

Future Research

Beyond these suggestions, future research should build on our study and deepen the understanding of antecedents to each of the four dimensions. By building deeper theoretical foundations for each, more nuanced effects may come to light. For instance, is locus of control only a direct influence on behavior, or does it also interact with Proactiveness? Work Discretion may also be a moderating factor to allow behavioral choice driven e.g. by Management Support. Interactions between individual and organizational level also seem likely, e.g. a lower reliance on Management Support for employees with a strongly internal locus of control. Beyond these topics, social cognitive theory suggests an effect of individual factors on the environment, either through actually changing it or by perceiving it in a biased way. This calls for a multi-level analysis, analyzing how employees of the same organizational unit perceive their environment and whether this perception is individually biased. Another question raised is the influence of teams and interactions in the teams on the behavior of the group.

Conclusion

Our findings offer a novel perspective on important questions: What does effectual behavior mean for corporate employees and what causes it? We bring together insights from the innovation and CE literature as well as from entrepreneurship research, and build a model inspired by the social cognitive theory. We find evidence supporting our theoretical deductions, but also encounter unexpected results that may spur research in this intriguing field.

CONTACT: Alvaro Filipe da Costa; dacosta@win.rwth-aachen.de.

REFERENCES


Table 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>Dimension 1</th>
<th>Dimension 2</th>
<th>Dimension 3</th>
<th>Dimension 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Means-driven</td>
<td>Goals-driven</td>
<td>Affordable Loss</td>
<td>Expected Return</td>
</tr>
<tr>
<td>Proactiveness</td>
<td>0.29 -1.51</td>
<td>0.156 -0.66</td>
<td>0.348 -1.54</td>
<td>0.117 -0.68</td>
</tr>
<tr>
<td>Tenacity</td>
<td>0.0592 0.27</td>
<td>0.424 1.53</td>
<td>0.294 1.37</td>
<td>0.128 0.75</td>
</tr>
<tr>
<td>int. Locus of Control</td>
<td>0.19 0.82</td>
<td>0.00177 0.01</td>
<td>0.252 1.53</td>
<td>0.00259 -0.42</td>
</tr>
<tr>
<td>Work Discretion</td>
<td>0.428* -1.87</td>
<td>-0.0601 -0.31</td>
<td>0.00615 0.04</td>
<td>0.128 0.98</td>
</tr>
<tr>
<td>Time Availability</td>
<td>0.12 0.72</td>
<td>0.406 2.31</td>
<td>0.259 1.39</td>
<td>-0.027 -0.20</td>
</tr>
<tr>
<td>Management Support</td>
<td>0.377** 2.45</td>
<td>-0.295 -1.51</td>
<td>-0.331 -2.01</td>
<td>0.217 1.40</td>
</tr>
<tr>
<td>Rewards &amp; Reinf.</td>
<td>-0.0178 -0.13</td>
<td>0.120 0.73</td>
<td>0.097 0.46</td>
<td>0.0734 0.56</td>
</tr>
</tbody>
</table>

Table 2

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Proactiveness</td>
<td>0.29 -1.51</td>
<td>0.156 -0.66</td>
<td>0.348 -1.54</td>
<td>0.117 -0.68</td>
<td>0.637** 1.05</td>
<td>-0.030 -0.81</td>
<td>-0.642 -1.38</td>
</tr>
<tr>
<td>Tenacity</td>
<td>0.0592 0.27</td>
<td>0.424 1.53</td>
<td>0.294 1.37</td>
<td>0.128 0.75</td>
<td>0.503 0.69</td>
<td>0.042 0.68</td>
<td>0.137 0.62</td>
</tr>
<tr>
<td>int. Locus of Control</td>
<td>0.19 0.82</td>
<td>0.00177 0.01</td>
<td>0.252 1.53</td>
<td>0.00259 -0.42</td>
<td>0.347 0.82</td>
<td>0.254 0.53</td>
<td>0.259 0.62</td>
</tr>
<tr>
<td>Work Discretion</td>
<td>0.428* -1.87</td>
<td>-0.0601 -0.31</td>
<td>0.00615 0.04</td>
<td>0.128 0.98</td>
<td>0.268 0.87</td>
<td>0.328 0.88</td>
<td>0.448 0.80</td>
</tr>
<tr>
<td>Time Availability</td>
<td>0.12 0.72</td>
<td>0.406 2.31</td>
<td>0.259 1.39</td>
<td>-0.027 -0.20</td>
<td>0.685 1.29</td>
<td>0.635 1.41</td>
<td>0.515 0.68</td>
</tr>
<tr>
<td>Management Support</td>
<td>0.377** 2.45</td>
<td>-0.295 -1.51</td>
<td>-0.331 -2.01</td>
<td>0.217 1.40</td>
<td>0.19 0.82</td>
<td>0.001 -0.68</td>
<td>0.543 0.80</td>
</tr>
<tr>
<td>Rewards &amp; Reinf.</td>
<td>-0.0178 -0.13</td>
<td>0.120 0.73</td>
<td>0.097 0.46</td>
<td>0.0734 0.56</td>
<td>0.056 0.78</td>
<td>0.114 0.66</td>
<td>0.785 0.79</td>
</tr>
</tbody>
</table>

Control Variables

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tech. Service</td>
<td>1.006** 2.70</td>
<td>0.032 0.03</td>
<td>0.735* 1.79</td>
<td>0.0284 0.07</td>
<td>0.832* -1.93</td>
<td>0.544* 1.69</td>
<td>-0.264 -0.79</td>
</tr>
<tr>
<td>Marketing</td>
<td>0.554 1.15</td>
<td>-0.826 -1.47</td>
<td>0.431 -0.58</td>
<td>-0.0868 -0.21</td>
<td>0.983* 1.91</td>
<td>0.177 0.50</td>
<td>0.447 1.11</td>
</tr>
<tr>
<td>Sales</td>
<td>0.460 0.83</td>
<td>0.326 0.76</td>
<td>0.599 1.56</td>
<td>0.161 0.49</td>
<td>0.324 0.86</td>
<td>0.186 1.38</td>
<td>0.489 0.67</td>
</tr>
<tr>
<td>Other</td>
<td>0.241 0.59</td>
<td>0.176 0.41</td>
<td>-0.152 -0.45</td>
<td>0.228 0.76</td>
<td>0.03 -0.14</td>
<td>0.019 0.09</td>
<td>0.636 0.78</td>
</tr>
<tr>
<td>Level: Team Leader</td>
<td>0.509 1.63</td>
<td>0.343 0.68</td>
<td>0.264 0.63</td>
<td>0.120 0.50</td>
<td>0.870** 2.51</td>
<td>0.375 1.20</td>
<td>0.255 0.90</td>
</tr>
<tr>
<td>Level: Dept. Head</td>
<td>0.228 0.65</td>
<td>0.267 0.62</td>
<td>0.599 1.56</td>
<td>0.161 0.49</td>
<td>0.103** 2.96</td>
<td>0.365 -1.34</td>
<td>0.203 0.61</td>
</tr>
<tr>
<td>Gender (1 = male)</td>
<td>0.0568 0.01</td>
<td>-0.916** -2.11</td>
<td>-1.182** -2.51</td>
<td>-0.206 -0.61</td>
<td>-0.247 -0.65</td>
<td>-0.656** -2.35</td>
<td>0.133 0.39</td>
</tr>
<tr>
<td>Education</td>
<td>0.301 1.60</td>
<td>0.119 0.52</td>
<td>-0.115 -0.59</td>
<td>0.168 0.08</td>
<td>0.345* -1.74</td>
<td>-0.519** -3.35</td>
<td>-0.113 -0.72</td>
</tr>
<tr>
<td>Tenure</td>
<td>0.0743 0.01</td>
<td>0.136 0.97</td>
<td>0.000 0.77</td>
<td>-0.0831 -0.31</td>
<td>0.281 0.25</td>
<td>0.134 1.39</td>
<td>-0.340** -2.76</td>
</tr>
</tbody>
</table>

* p <0.1
** p <0.05
*** p <0.01
† default is R&D
‡ default is frontline employee