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Editorial

Building the IJEBR brand
This article represents my first chance to write an editorial piece for IJEBR this year. It is an opportunity to reflect on the year to date and future opportunities. First, my thanks to the Editorial team that have worked so hard this year, namely, the Co-editors Professor Martina Battisti, Dr Elisabeth Berger, Dr Mohamed Yacine Haddoud, Professor Lois Shelton and Dr Richard Tunstall. The co-editor team continues to grow in line with the development of the journal so welcome Elisabeth and Yacine. Rebecca Fisher has also joined the journal as an Editorial Assistant to help support the progression of manuscripts through the system. My thanks also to Patti Davis, the Emerald Publisher and Aisha Mayet, the Content Editor for their support and hard work.

Overall, 2018 will be recognised as a significant year of achievement for the journal. In 2017, we were invited to join the Clarivate Analytics Journal Citation index. In July, 2018, we received our first full impact factor of 1.86. This is a very positive outcome and reflects well against our peer journal group and we will seek to grow the impact factor in coming years. Furthermore, our submission levels continue to grow. To date in 2018, we have received over 560 submissions this year and are well on track to beat our record. Similarly, article downloads and citations continues to increase as does our overall manuscript rejection rate. These are all important metrics in the measurement of growth of IJEBR as an international journal within the entrepreneurship discipline. In 2018, we have published 52 manuscripts, which have included 26 from special issues/sections. Special issues are an opportunity to explore some of the emerging themes within the discipline. This year has seen us publish important and timely special issues exploring environmental sustainability, social enterprises and entrepreneurial cognition. My thanks to all the guest editors, authors and reviewers involved. I see special issues as a key element of future IJEBRs’ contribution to enhancing the debate and thinking in the discipline. Please contact me if you wish to take a special issue proposal forward.

In 2019, we are increasing our number of issues to eight with a publication target of 64 manuscripts. It is of course essential that we maintain the quality of articles that we publish. Our increased submission and rejection levels due to achieving a full impact factor will allow us to maintain and increase our quality threshold. The journal continues its long UK association with the Institute of Small Business and Entrepreneurship (ISBE). I would urge ISBE members to embrace the journal and consider it as an avenue for their future research. In addition, please join the IJEBR network by offering to become a reviewer. This can be achieved by creating a user account on the IJEBR website and registering your research interests. Authors should check out the journal website for current calls for papers related to special issues. Member of the ISBE community has provided many excellent special issues in recent years including those currently under development on migrant entrepreneurship, intersectionality and entrepreneurship education. We have also a developing relationship with the Global Innovation and Knowledge Academy (GIKA) as a European platform to promote the journal. This issue closes with a special section from GIKA featuring four papers. The guest editors provide an overview of the issue and the enclosed manuscripts.

As always, my thanks to everyone who has contributed to the IJEBR community including authors, guest editors, reviewers and readers.

Paul Jones
Innovation, knowledge, judgement and decision making as virtuous cycles: editorial

In entrepreneurship, it is widely accepted that development is an overarching objective that concerns the world of business and society as a whole. In pursuit of sustainability, we must embrace a holistic perspective of entrepreneurship, adopting a sustainable approach to the economy, society and the environment (Hooi et al., 2016). Likewise, growth and development influence the transformation of society (Schaufeli et al., 2009). Through collaboration and personal values, capabilities and abilities are developed (Arnold et al., 2005), and this development is decisive in improving welfare.

The first article, “The main factors determining effective operation in case of a Family Business”, by Nábrádi, Tobak, Pető, Fenyves and Nagy, focusses on the key drivers that influence effective operations in family businesses. Family businesses seek long-term preservation in terms of value, development and growth, while aspiring to develop key external and internal factors that help these businesses achieve different organisational goals. The study offers a view based on the experience of successful practices in Hungarian food firms through the “Best Practice” model. According to this study, the primary predictors of success are knowledge, luck and generation.

The second article, “Wanting to change the world, is it too much of a good thing? How sustainable orientation shapes entrepreneurial behaviour”, by St-Jean and Labelle, examines the effect of sustainable orientation and entrepreneurial motivation as key drivers of entrepreneurial behaviour, which contributes to changing society. The study explains entrepreneurial behaviours that drive people to become sustainable entrepreneurs. The study highlights the relevance of social cognitive career theory in entrepreneurship. Results fail to demonstrate the negative effect of sustainable orientation on entrepreneurship as a career choice. Individuals who believe that they can change society have a greater level of engagement in entrepreneurial actions.

In the next article, “Growing and aging of entrepreneurial firms: implications for job rotation and joint reward”, Thongpapanl, Kaciak and Welsh investigate the importance of collaboration in interdepartmental relationships for information flow and interaction between functions. The study examines the effect of job rotation strategies and joint reward systems, evaluating different organisational factors such as firm age and size. The authors report the importance of facilitating integration within the firm to provide new knowledge and offerings through the innovation process.

“Shared leadership in entrepreneurial teams: the impact of personality” by Hensel and Visser provides readers with a deep understanding of the impact of personality traits and personal values on transformational leadership in the context of self-directed entrepreneurial teams. The results show that behaviours such as assertiveness in self-initiative, negotiation and conflicts should be combined with cognitive empathy and high levels of reflectiveness and alertness.

Domingo Ribeiro Soriano  
*University of Valencia, Valencia, Spain*

Carla Martinez-Climent  
*Universitat de Valencia Facultat d’Economia, Valencia, Spain, and*

Ana M. Tur-Porcar  
*Universitat de Valencia Facultat de Psicologia, Valencia, Spain*


The main factors determining effective operation in case of a family business

Júlia Tobak, Adrián Nagy, Károly Pető, Veronika Fenyves and András Nábrádi
Faculty of Economics and Business, University of Debrecen, Debrecen, Hungary

Abstract

Purpose – The purpose of this paper is to present the experience, successful management and the succession of generations in a Hungarian corporation in the food industry through the “Best Practice” model.

Design/methodology/approach – The chosen methodology for this paper is “The best practice model” prepared by The Solutionist Group. The model presents the characteristics of family businesses and illustrates how the process of sustainable enterprise differs in different fields concerning family and non-family businesses. In applying this model, the experience, successful management and the succession of generations will be presented in the case of a large Hungarian enterprise which has a determining role in the Hungarian food industry. The results are based on the question framework of the expert interviews.

Findings – The history of family-owned firms shows that in order to maintain appropriate business succession activity the family management has to plan in advance. Passing the baton to the next generation successfully is a complex and long-term family management role and it has strategic importance. To ensure business continuity, the successor has to take over the business and operate it well. That is why the sharing of knowledge, the innovation performance and the best practice are important parts of family company’s culture, and they consequently play an important part in the pass the baton project within family-owned firms.

Originality/value – This paper expands the knowledge about the succession of family businesses.

Keywords Family firms, Entrepreneurship, Knowledge, Human capital

Paper type Case study

Introduction

In order to achieve an efficient business operation, enterprises must harmonise corporate structure with organisational structure and administrative systems, which can be achieved by the strategic development of the organisation. Forecasts concerning the development of key external and internal factors help the enterprises in reaching different organisational goals. To be able to define parameters which determine the operation of the enterprise we have to know the capability of the enterprise, the technology applied in the enterprise, the enterprise knowledge base and the luck factor influencing the operation of the enterprise.

Nowadays, the role of the enterprise’s knowledge base has been revalued. Sharing the knowledge, a tendency towards innovation and the application of best practices have significant roles as ingredients of the individual enterprise’s culture (Morrison, 2006). The importance of knowledge and motivation as internal factors is unquestionable.

There is practical evidence concerning the positive relationship in Asia and Europe between family ownership and the performance of the enterprise. A survey of 240 state enterprises in Thailand supported the fact that in the case of family ownership there is a more positive relation between the return on assets ratio of the enterprise and the net sales revenues of sales than in the case of enterprises that are not family-owned. It means a greater and better achievement, to the will to perform (Chu, 2011).

By analysing the data of 435 bigger corporations in 12 European countries, it was stated that—regarding industrial control, capital structure and national impacts—family ownership results in greater profitableness and market value of the enterprise (Chu, 2011).

But what are the advantages of family businesses? According to Gere (1997), the advantages of family businesses are the following: the transmission of practice and knowledge to the
following generation without condition, the commitment of family members, the practice of communication with clients, the simple and fast decision making, security and the feeling of pride experienced together by the family members. Vecsenyi (2009) recognised another factor concerning the strength of family businesses: “a significant proportion family businesses give their name to the enterprise. This guarantees quality and commitment. In family businesses of several generations, secret recipes, practices and professional experiences are handed over from generation to generation”.

There is little known and a deficiency of authentic statistics concerning Hungarian family businesses, but their proportion possibly matches 70–80 per cent, a number also documented in the European Union (Mandl, 2008). According to the estimate by the SEED Foundation for Small Enterprise Economic Development, half of the joint ventures and at least 20 per cent of sole proprietorships are family businesses (Horváth, 2008). Researchers mostly agree that family businesses are over represented in agriculture, tourism catering, building industry, wholesale and retail trade, while their proportion is smaller in the financial sector (Westhead et al., 2001; Barclays Bank PLC, 2002; Peters and Buhala, 2004; Csákné, 2012). According to Scharle (2000), Hungarian family businesses are characteristically active in work-intensive sectors, almost two-third of them operate in agriculture, trade or catering.

There are several foreign models and case studies, confirmed by theoretical and practical experiences; it would be reasonable to adapt them to the Hungarian situation, since there is no considerable national experience, applied method or available database. For the approximate definition of the success factors’ proportion, a primary research work is needed which would conduct different business case studies and expert interviews and then analyse the results from multiple aspects. In line with this stated need, this paper presents a study which is designed to examine the experience, successful management and the succession of generations in a Hungarian corporation in the food industry through the “Best Practice” model of The Solutionist Group (2015) (Figure 1). Our study mainly focuses on the succession which plays an influential role in the life of family businesses. PWC’s Family Business Survey (2016) shows the relevance and the importance of the topic. PWC’s research has identified several important statistics that show, on a worldwide scale, that most family businesses do not survive the first generation, 43 per cent of family firms do not have a succession plan and only 12 per cent make it to a third generation.

### Theoretical framework

On the basis of our preliminary research, we can state that three main factors, knowledge, luck and communication between generations determine the successfulness of the long-term operation of a family-owned business. Starting the research with conducting expert interviews, we formed our question framework around the three main factors stated just stated. Among the questions asked during the interview for example, there was the following: how much percentage the head of the family contributes to knowledge, luck and generation as efficient operational characteristics. Table I contains the most important topics and questions of the expert interview.

To be able to measure the determining parameters, the concepts behind each of the factors have to be defined first. Under the term knowledge we mean the totality and system of acquired cognition. Knowledge is equal to cognition, which can be acquired and also equal to the skilled use of experiences. The management with physical, human and organisational resources also belongs to this category.

When it comes to the term “Luck”, our interpretation of luck is: any event/s unplanned and unforeseen, happening suddenly, independently of our will, having an effect on our lives (Magyar értelmező kéziszótár, 2003). With the appropriate knowledge and experience, we have to adjust to these situations.
Main factors determining effective operation

Figure 1.
The “Best Practice” model
Family businesses are interested in long-term preservation of values; thus, succession of generations plays a key role in their case. Hungary has entered the era in which the topic concerning the succession of generations is more and more relevant. More than 26 years have passed since the change of regime, which is more or less the same time period of a generation in family businesses. As a result, the reality and immediacy of generation succession in the case of these enterprises has become a necessary current issue (Nagy, 2007).

In this paper, we present where the family-owned businesses in the food industry, analysed on the basis of expert interviews, have progressed in the succession process according to the dimensions of undertaken responsibility and the process of generation succession (Figure 2). On the basis of our work, it was determined that there are five phases of succession in case of Hungarian family businesses. These phases are built on each other and the entire process from one phase to the next is summarised in Table II.

Handing over the management role is the last phase of the succession process. The succession process ends when the passing of the baton happens. During the process of handing over the management role, the manager of the enterprise leaves and the successor takes over. In this phase of succession, the exchange between the present-day manager and the successor is emphasised. The process of succession can be considered finished when the founder owner is already working in his/her own “sandpit”.

Methodology
There are several publications, models and theoretical approaches concerning the operation of family businesses. The chosen methodology for this paper is “The Best Practice model” prepared by The Solutionist Group (2015) (Figure 1). The model presents the characteristics of family businesses and illustrates how the process of sustainable enterprise differs in different fields concerning family and non-family businesses. The eight key factors that are

<table>
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<th>Questionnaire items</th>
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<td>Knowledge Physical resource (position, factory/plant, facilities, equipment, technology, raw materials and machines): Where do you acquire the information necessary for the development of your professional field? (benchmarking, internet, rival enterprises, etc.) How do you select technological equipment? How many years of payback do you estimate when purchasing a high-tech machine? What kind of innovations have you realised concerning production and processing? Human resources (expertise, specialised knowledge, qualification, selection): How many employees work in the enterprise? What do you base your decision on when hiring workforce? What kind of qualifications do they have? (qualification, vocational training, specialised knowledge) How characteristic fluctuation is? How much training is needed for the activity? Can the professionals be replaced? How dangerous is it to lose a professional? The situation of vocational training? Organisation resource (responsibilities, decision power, change of organisation and its causes) Have there been sudden, unforeseen or unplanned political, economic, social and/or technological events or changes which had a positive or a negative effect on the operation of the enterprise? Luck Which generation operates the enterprise at the moment? What is the ownership structure on the basis of the articles of association? What are the future plans and options concerning the following: 1. Selection of successor 2. Educating the successor 3. Handing over power</td>
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identified are: focus areas; inform, assess, report; urgent response; define share and plan; structures, governance; system, policies, documents and agreements; regular review, meeting and education; and sustainability, all of which are interdependent.

In applying this model, the experience, successful management and the succession of generations will be presented in the case of a large Hungarian enterprise which has a determining role in the Hungarian food industry. The results are based on the question framework of the expert interviews.

In the case of "traditional businesses", the business focus dominates exclusively, while in the case of family businesses, family influence is decisive. As seen in Figure 1, there is a close correlation between factors belonging to different phases. It is a common point that for the sake of continuity, management and other staff working at lower and upper levels have to communicate continuously and constant feedback is needed about activities and about their harmony with strategic aims. Every enterprise has different aims, they possess different views of their future and dissimilar system of values. It is also a common trait that the enterprises have to adapt to corporate culture and corporate policy, the question lies in the strength of corporate adaptation. In the case of a family-owned business, where safeguarding values have a long term and strategic significance, corporate communication takes place in another way. Reactions given as answers for problematic situations basically involve—as there are stronger family and emotional relations and ties—knowledge transfer and coaching and they are complemented with maintenance questions too. The Family Constitution, prepared by the Family Council, is crucially determinant, while in the case of non-family-owned businesses the organisational strategic directions determined by the board of directors, the senior management and the executive director have to be achieved, fitting the organisational culture and the corporate policy. An area where family-owned businesses fundamentally differ from non-family businesses is that the family, including the following generation, receives responsible tasks in planning, organising and management. The management has to handle the process smartly and treat both the family and the business carefully to have a sustainable family business.

**Source:** Own work

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**Figure 2.** Enterprises in the process of generation succession

Main factors determining effective operation
The selected family-owned business is presently operating in the northeastern area of Hungary. Master Good Group is engaged in integrated fodder production, poultry breeding, hatching, cramming and processing of broiler chicken. The group of companies is owned 100 per cent by the Bárány family. The family has been engaged in poultry breeding for 100 years extending to four generations, so that it is the oldest poultry breeding dynasty in Hungary. The first generation which began the tradition was the manorial poultry breeder of the Counts Széchenyi. The commitment to the profession represented by him was transferred from generation to generation. The key of the present successes of the Group also originates from this heritage.

In the beginning, the company launched with five persons; then its intensive development started in 1998 with projects of significant scale and amounts and extension of staff number. During this time several poultry breeding and broiler farms, further fodder mixing plants were established and the integration of agricultural plant cultivation also started. The group performs its activities ranging from the arable to the consumer’s table in

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<th>Phase label</th>
<th>Phase characteristics</th>
<th>When is it characteristic?</th>
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<tr>
<td>1. Education</td>
<td>From the birth of the successor the instilment of the child into the enterprise’s culture is a task belonging to the head of the family; this is an act by which the head creates a sense of security for themselves and the successor too. The beginning of attachment from the part of the successor. The successor spends years with the founder (characteristically the father) in the family business. The successor is involved in the activities only in a small scale.</td>
<td>The phase of education is continuous. During the time of primary school studies.</td>
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<td>2. Handing over experiences</td>
<td>The training process means the continuous teaching and handing over experiences constantly. A more serious level of the training phase when the successor receives different tasks. The father involves his successor in smaller decisions (e.g. meetings), after a time he leaves decision making to his successor. The key to a successful handover of experiences is the appropriate communication inside the family.</td>
<td>During the time of secondary school studies. During the university years. Approximately between the age of 15-35 of the successor.</td>
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<tr>
<td>3. Learners’ track</td>
<td>The successor improves his/her own management, control and professional abilities during the learner track. Besides completing different tasks the successor has to work alone and has to take a bigger responsibility, s/he can experience the weight of his/her own decisions personally. The successor perceives the business as his/her own. Other studies (abroad, professional).</td>
<td>It characterises the phase when the founder retires.</td>
</tr>
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<td>4. Handing over ownership and decision making rights</td>
<td>The founder-owner hands over the enterprise for good. Main activities are managed by the successors. Takeover on the basis of articles of association. The successor signs documents in the bank.</td>
<td>The founder has retired. The successor has his/her own family, child(ren).</td>
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<td>5. “Sandpit” of the founder</td>
<td>It is important to provide the founder with his/her own “sandpit”, so that s/he can work longer. Training of grandchildren.</td>
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Table II.
The characterisation of the main phases of succession
The integration of fodder plants, poultry breeding, hatching, industrial broiler cramming, as well as free-range breeding of farmhouse chickens and all the basic agricultural activities are done by two agrarian companies, out of which the more significant is the Baromfi-Coop Ltd. The primary processing of the live poultry, the production of prepared and processed products as well as the selling are organised and controlled by the Master Good Ltd.

The main plant for poultry processing was always famous for the good quality of the goods it produced. There is another processing plant owned by the Master Good Ltd whose building is known for its two towers which rise high over the countryside. This is the factory where the company manufactures its spiced and comfort foods. The target markets of this factory with spiced products are the domestic supermarket chains, while with its comfort foods it enjoys a significant share on the English market in this product type.

The farmhouse chicken is a real success story in the life of the company. When the company founder-owner László Bárány recognised the possible demand in 2000 and dreamed up the farmhouse chicken, many did not believe in its success. Since then the name of the product has been ringing familiar to all Hungarian consumers and its sales volume has been continuously increasing year by year by 20-30 per cent.

The reason for the company’s increase in turnover is that the sales channels are extended. The company is the main regional poultry meat supplier for the McDonald’s procurement chain, and just as significantly, it has been supplying to Austria, Germany and Poland as well. Certainly, the increasing turnover is contributed by the growing food prices as well (Kelet-Magyarország, 2008).

In the case of any enterprise selected for this analysis, on the basis of expert interviews we can state that success, efficiency and the achievement of the Master Good Corporation depend on knowledge, luck, and whether the new generation carries on the enterprise or not.

According to the opinion of the founder of the enterprise, businesses do not have to strive for success but successfulness and its continuous maintenance. In our accelerated world, the corporate knowledge has to be continuously expanded. It is necessary to collect experiences, study national and international models and use them at an appropriate level for an efficient operation. Reacting to positive and negative sudden events, the ability to adjust to them both need knowledge and experience. These events are called luck in this paper. According to the founder of the Master Good Corporation, luck has to be attributed a 10 per cent weight, as answering sudden events needs knowledge, which in the case of the analysed enterprise has a significance of 70 per cent.

Most family businesses do not survive the first generation; thus, succession has become a major problem (Ayres, 1990; Handler, 1994; Le Breton-Miller et al., 2004). Communication between the generations has a significant role in the sustainable operation of family businesses. The generation factor can be improved by conscious training, in the case of the Master Good Corporation the generation factor is 20 per cent.

The figure of The Solutionist Group (2015) cannot totally reflect the Hungarian practice we analysed. Although the fourth generation already participates in the life of the Master Good group corporation, there was a period of 40-50 years when privately owned enterprises were not allowed to operate in Hungary, and consequently the enterprise spanning generations had to be rebuilt in a vacuum. Thus, the existence of family focus (1), feedback (2) and immediate answer (3) and related activities were carried out only by the ex-owner himself, being part of the third generation, successors were possibly born at the time. The founder owner, the head of the family began to develop and build his enterprise. The actual definition of a future vision and aims must have started in the age of the successors, of the time when the present-day generation attended secondary school. It was the time when apart from producing the enterprise acquired the possibility of processing and established a poultry slaughterhouse and meat processing facilities. The preparation of the
new vision, mission statement and the aims took place without the successors, as opposed to the classic best practice model. The emergence of an administration structure (5), different corporate rules, the Family Constitution (6) and the Family Council (7) is partly identical in the examined case with the classic model. Directing the successors into secondary school, then university and to complete foreign vocational trainings was already purposeful. At the time, the owner had already involved his successors in the operation of the enterprise, and the Family Council started to take shape, which did not provide the possibility for decision making for the successors; however, they could share their opinion. After the successors acquired their university degree tasks were divided in a clear-cut way. Most of the decisions were made by the new generation. Inside the group corporation, the two successors were given individual management authority. One of them is responsible for animal husbandry, the other inherited the management of slaughtering, processing and the industrial food field. They made decisions individually concerning development and financial issues, but those decisions were under the supervision of the head of the family, the owner and the father. The emergence of regulations, behaviour codex, common committal, namely the corporate culture (6)—which in this case contains elements of the family culture—took place in the Master Good group corporation, when the executive functions were already given to the successors and the owner—head of the family exercised all the supervisory rights and rights to make decisions. The Family Constitution was put into effect when the Family Council (7) was established, with a delay, unlike in the case of the traditional model. The interpretation of the delay results from the fact that the group corporation did not possess a pre-drawn constitution. In the case of the family-owned business, analysed by us, the sustainable family business (8) took shape when the owner—head of the family reached his 64th birthday and thought that he would divide the decision and ownership rights totally between his sons and remain active only in his “sandpit”. The interlocking of family and corporate culture in an appropriate proportion and the strong secure operation characterise the running of the Master Good group corporation (8).

Conclusion
Five other Hungarian family-owned food industrial enterprises were interviewed in the framework of the study. Figure 2 illustrates where these enterprises (La Fiesta LLC, Heimann LLC, AquaPlastech LLC, BoldAgro LLC and Szamos LLC) are in the process of generation succession. According to the dimensions regarding degree of responsibility and the process of generation succession, the interviewed enterprises are in different stages. The reason for this is that they have other strategic objective to reach the different stages.

The Master Good Corporation selected to be examined performs at the highest level, as the succession of generations ensuring business continuity was successfully finished. The business is managed by the successors, two brothers. The operation of poultry integration is managed independently, with independent responsibility and authority.

There is not enough information concerning the succession of generations and succession issues for enterprises in Hungary, as this process was not characteristic in the ex-socialist countries so far (Nábrádi and Tobak, 2016). In general, it can be stated that—as indicated above—a period of a generation has passed since the change of regime; thus, this issue has become relevant nowadays in our country. Therefore, this is the reason why most of the companies are on the third “Learner’s track” stage. Among the three factors such as knowledge, luck and generation, on the basis of our study, we can declare that in the case of family businesses the most emphatic is the succession of generations in order to secure successful business continuity. The selection and education of the appropriate successor is a significant and responsible task for the founder owners (Bizri, 2016).

Concerning the analysed enterprises most of the successors are family members; however, there were cases where the founder owner was forced to educate the appropriate
successor from among the employees, as there was no family member who could be the successor of the enterprise. According to Dajnoki and Kun (2016), this mainly results from the fact that beginners currently have different expectations in the labour market from the expectations characteristic 20 years ago. Thus, holding onto the workforce is clearly a great challenge for most organisations. In the expert interviews, an option for solving this problem is outlined. In answering the questions concerning the succession of generations in the case of family businesses, and in preventing and tackling problems, the preparation/draughting/recording of the Family Constitution may help. The paper expands the knowledge about the succession of a family business. By being aware of responsibilities and rights in advance, the successor has a career model outlined to rely on a long-term career building plan.

References


**Corresponding author**

Júlia Tobak can be contacted at: tobak.julia@econ.unideb.hu

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Wanting to change the world, is it too much of a good thing? How sustainable orientation shapes entrepreneurial behaviour

Etienne St-Jean and François Labelle
Institut de recherche sur les PME, Université du Québec à Trois-Rivières, Trois-Rivières, Canada

Abstract

Purpose – When pursuing a sustainable orientation (SO), entrepreneurs can resolve environmental and social problems and act as change agents by pursuing opportunities related to market failures. While many studies focus on entrepreneurial intention, very few try to explain entrepreneurial behaviour. The purpose of this paper is to highlight the circumstances under which people could be led to become sustainable entrepreneurs. It examines the effect of SO, as well as the entrepreneurial motivation to change society as key drivers of entrepreneurial behaviour.

Design/methodology/approach – The hypotheses were tested in three waves (six-month interval) on a sample of 197 university students that are neither entrepreneurs, nor involved in any entrepreneurial processes. The authors measured entrepreneurial behaviour as a dependent variable and used subjective norms towards entrepreneurship, entrepreneurial self-efficacy, entrepreneurial attitude as well as entrepreneurial motivation and SO as independent variables.

Findings – Contrary to the expectations, sustainability orientation has a negative impact on entrepreneurial action. However, individuals who think that entrepreneurship can change society (instrumentality) exhibit higher entrepreneurial action. Furthermore, this belief positively moderates the negative impact of SO on entrepreneurial action. In other words, if someone thinks that entrepreneurship can change the world, not only he/she is more inclined to engage in entrepreneurial actions but their values of SO will not decrease their entrepreneurial action.

Research limitations/implications – A longer timeframe of longitudinal research is needed to overcome the limitation regarding the assessment of entrepreneurial action.

Practical implications – As a practical implication, educators who want to engage their institution as an engine of change towards sustainable development could highlight cases of sustainable businesses where profits, environmental and social issues were not neglected to improve the perceived feasibility and thus, entrepreneurial action.

Originality/value – Results demonstrate the negative effect of SO on entrepreneurship as a career choice, but not for those who believe that they can change society through this mean. This research highlights the relevance of Socio Cognitive Career Theory in the field of entrepreneurship, especially the neglected effect of outcome expectations on entrepreneurship as a career choice.

Keywords Motivation, Sustainable entrepreneurship, Psychology, Entrepreneurial intention

Paper type Research paper

Introduction

Sustainable entrepreneurship is when entrepreneurs pursue a triple bottom line in balancing economic wealth, environmental preservation and social equity (Hooi et al., 2016). This concept gained popularity in recent years, not only in research (e.g. Johnson and Schaltegger, 2016; Perez-Batres et al., 2012) but also in society in general. Indeed, as more and more people join the movement defending sustainability principles, enterprises are expected to follow suit. This is what emerged from the Conference of the Parties (COP21) held in Paris in December 2015, where 195 countries committed to reinforcing the world’s answer to the threat of climate change by setting targets and implementing sustainability practices and poverty alleviation measures (United Nations, 2015).

By their key position in society, small and medium-sized enterprises can fuel the shift towards sustainable development (Schaltegger and Wagner, 2011; York and Venkataraman, 2010).
Indeed, they represent more than 95 per cent of organisations located in developed countries (OCDE, 2005). Consequently, sustainable entrepreneurs, who adhere to these principles and develop sustainable businesses, are the driving force behind this transformation (Pacheco et al., 2010). However, despite the fact that the literature indicates that sustainable entrepreneurs will be crucial in reaching sustainable development goals, there is still little knowledge about the triggers of sustainable entrepreneurship in individuals. This is the main purpose of this study.

Recent works show that activists are those who will most likely want to become sustainable entrepreneurs (Kuckertz and Wagner, 2010). Indeed, as they promote values of sustainable development, thus demonstrating high sustainable orientation (SO), it is believed activists may perceive entrepreneurship as a means to apply their values and have a more significant effect on the societal changes close to their hearts. In that respect, these individuals would be interested in pursuing a sustainable opportunity that could lead to the creation of a sustainable enterprise (Spence et al., 2008; Wagner, 2012).

Nevertheless, these pioneering works do not take into account explanatory models of entrepreneurial intention and action to understand the phenomenon, particularly Social Cognitive Career Theory (SCT) (Lent et al., 2002) which is more explicit than the Theory of Planned Behaviour (TPB) (Ajzen, 1991) on dimensions related to motivation (Vroom, 1964). In that respect, on top of mobilising components of the TPB, this theory adds outcome expectation as an explanatory factor of entrepreneurial action. The founding idea being that if one’s SO (valence) is likely to stimulate the intention of becoming an entrepreneur to pursue a sustainable opportunity and put it into action, it will be moderated by one’s belief that entrepreneurship is a good way to change the world (instrumentality). This belief allows one to channel one’s SO values towards this career choice while those who think businesses and entrepreneurs are at the source of social and environmental problems will prefer to refrain from adopting this path.

The expected contributions of this study are multiple. First, it aims to validate the positive relationship between SO and entrepreneurial action in cultural contexts other than Germany and France (Ref: Kuckertz and Wagner, 2010) with the logic of replication and theory consolidation of this promising idea (Berthon et al., 2002). Second, this study serves to validate the relevance of SCT when analysing entrepreneurial intention and action, particularly pertaining to dimensions of motivation. Third, this study contributes to the enrichment of the Kuckertz and Wagner (2010) model by proposing a positive moderating effect of the belief that entrepreneurship can change the world on the relationship between SO and entrepreneurial action. Such a conceptualisation, if demonstrated, would allow to better understand the determinants on which one can act to stimulate entrepreneurial intention in those who show SO and their action towards business creation. Finally, from an educational and practical point of view, this study contributes to a better knowledge of the determinants of commitment from potential young entrepreneurs by presenting results of an inquiry performed amongst a population of university students. This enables educational institutions to adapt their speeches and training to, on one hand, enhance the development of SO in their students and, on the other hand, to implement activities that are likely to reframe the beliefs regarding the benefits entrepreneurship can bring to society. Ultimately, educational institutions are provided with means to participate in the transformation of society by promoting sustainability practices in a more pronounced way.

This paper starts by presenting the concept of SO and its expected relationship with entrepreneurial action. It continues with the explanation of how SCT components can moderate entrepreneurial action. This is followed by a presentation of the methodology behind an enquiry performed amongst university students. Finally, results are presented and discussed as well as potential contributions and directions for future research.
**Sustainability orientation and entrepreneurial intention**

Many researchers suggest that sustainable entrepreneurs may offer potential contributions to the social and environmental problems faced in a perspective of collective welfare (e.g. Cohen and Winn, 2007; Dean and McMullen, 2007; Patzelt and Shepherd, 2011; York and Venkataraman, 2010). Indeed, sustainable entrepreneurs found and develop organisations that reconcile economic, social and environmental objectives to counter the climatic and social upheavals which are, for the most part, a direct consequence of the activities of enterprises (IPCC, 2014).

Values are considered as relatively stable guiding principles in people’s life that support their attitudes and behaviours (Becker and Félonneau, 2011; Rokeach, 1973). Therefore, those who hold pro-environmental and pro-social values and choose to become entrepreneurs are likely to become sustainable entrepreneurs. The concept of SO refers to a person’s pro-environmental and pro-social values and implies positive attitudes towards the environment and society as well as a strong opposition to behaviours that can alter their state (Corral-Verdugo et al., 2009).

Previous studies have shown that individuals with an elevated SO also have a greater willingness to engage in actions that transform society (Howell, 2013; Stern et al., 1995). Some may do it by founding an enterprise aiming at fulfilling environmental and social needs while others would rather engage in civil action by joining, for example, activist organisations. In both cases, these individuals, thanks to their extensive knowledge base pertaining to the means of achieving sustainability, can identify sustainable opportunities that less engaged individuals cannot perceive (Wagner, 2012). They are also able to get things done more easily. Hence, the relationship between SO and entrepreneurial action is likely and would help explain the presence of sustainable entrepreneurs, including social entrepreneurs, who are a specific category (Seelos and Mair, 2005). In addition, SO is related to the entrepreneurial intention of university students (Kuckertz and Wagner, 2010), which has the potential to drive them towards action (Kautonen et al., 2015). Therefore, it is likely that people with a strong SO are more inclined to engage in entrepreneurship:

\[ H1. \text{ There is a positive relationship between an individual’s SO and entrepreneurial action.} \]

**Socio cognitive career theory and motivation theory**

In a recent meta-analysis, researchers demonstrated that the theories of intention leading to entrepreneurial behaviour benefit in combining together, as natural overlaps exist amongst their underlying concepts (Schlaegel and Koenig, 2014). This recommendation was applied by joining the TPB of Ajzen (1991) with the SCT of Lent et al. (2002) to demonstrate the entrepreneurial action of individuals with strong SO. The TPB suggests that before behaviour, intentions are determined through three variables: attitude towards the behaviour (or the career), subjective norms and perceived behavioural control. Also, SCT stipulates that two direct precedents influence intentions and actions towards the career: self-efficacy and outcome expectation. Outcome expectation consists of the valence and the instrumentality towards these “outcomes”. SCT partly relies on Vroom’s (1964) motivation theory stating that an individual has greater motivation to accomplish a task when the expected results are valued (valence), when the belief that actions will lead to reaching expected results is held (instrumentality), as well as their perceived capability to accomplish said task (expectation, which essentially corresponds to self-efficacy) (Vroom, 1964). As numerous studies mobilising TPB measure the perceived behavioural control through the entrepreneurial self-efficacy (e.g. Engle et al., 2010; St-Jean et al., 2014), combining the two explanatory theories of intention and performance of entrepreneurial action allows to retain five important constructs: attitude towards the career, subjective
norms, entrepreneurial self-efficacy, valence and instrumentality of expected results (outcome expectation).

Specifically, it may be proposed that an individual who believes entrepreneurship will help attain their goals (instrumentality) related to their values (valence) would be strongly motivated by this career (Lent et al., 2002). In the context examined today, individuals with strong SO (valence) should want to become entrepreneurs even more and carry out this action if they believe entrepreneurship will allow them to improve society on both social and environmental levels (instrumentality).

Considering that sustainability orientation is a hot topic and that society adheres to the values it promotes (i.e. respect for the environment) as well as younger individuals are particularly concerned about this matter (Kuckertz and Wagner, 2010), it is highly probable that the belief that entrepreneurship can change the world (instrumentality) could motivate students to take action towards this career. Bearing in mind the attractiveness of an entrepreneurial career among young individuals in Quebec (St-Jean and Duhamel, 2016), the belief that this career will improve society could be a stimulus fostering behaviours of entrepreneurial action. Consequently, the following hypothesis is formulated:

\[ H2. \] The belief that entrepreneurship can change the world (instrumentality) is linked to entrepreneurial action.

According to Vroom (1964), the combined effect of valence and instrumentality (which consists of an outcome expectation) will be the source of motivation and lead to the behaviour. Therefore, the belief that entrepreneurship can improve society both socially and environmentally (instrumentality) should mitigate the effect of SO on the performance of entrepreneurial action. Indeed if an individual believes that the world can be changed through entrepreneurship, he/she will be more inclined to take action towards this choice. Thus, those who possess a high SO and believe that entrepreneurship can change the world could perform entrepreneurial behaviour more than those who believe entrepreneurship is not an effective way of doing so. In this latter case, they will perform actions outside of entrepreneurship. Considering this reasoning, a third hypothesis is proposed:

\[ H3. \] The belief that entrepreneurship can change the world (instrumentality) interacts with SO (valence) to improve the performance of entrepreneurial action in a way that the greater the instrumentality is, the stronger the effect on entrepreneurial action.

Methodology

Research sample

This research sample comes from a one-year comprehensive longitudinal research on the entrepreneurial career conducted amongst Quebec university students (Canada). The sample that responded to the three stages (a six-month interval between each collection) corresponds to 623 individuals. Since the intent of this research aims at understanding entrepreneurial behaviour, students who had previously owned an enterprise, currently own one or were in a start-up process during the initial phase of collection (T0) were removed. This left 293 individuals who participated in all three phases of the collection.

Given the longitudinal character of the research, some questions were asked during the initial phase of the data collection, for example, age, gender, subjective norms, attitudes towards entrepreneurial tasks and self-efficacy or the fact of having attended entrepreneurship university classes. SO was posed at a 6-month interval with the initial collection (T1) and the performance of entrepreneurial action was asked one year following the initial collection (T2). Although attitudes can change over time, the study supposed that, on one hand, they are stable enough over a period of six months and, on the other hand, this
allows to reduce the risks associated with the common method bias (Podsakoff et al., 2003). The sample on which are based the subsequent analyses comprises 197 students who answered all the questions asked to confirm the hypotheses made[2].

Measures

Dependent variable
To measure entrepreneurial action, a scale developed by Thompson (2009) was used. This scale measures behaviours that demonstrate a strong commitment towards business start-up, including items such as “Spend time learning about starting a firm”, “Never search for business start-up opportunities” (reversed item) or “Are saving money to start a business”. As the questionnaire was administered in French, every measure was translated from English to French by two fully bilingual researchers. Inconsistencies were resolved through a third translation. The Likert scale ranges from 1 – 1 strongly disagree to 7 – 1 strongly agree. The measure is one-dimensional (57.09 per cent of the variance explained by a single factor) and has a Cronbach’s α of 0.849. The average score was used for subsequent analyses.

Independent variables
Entrepreneurial self-efficacy was measured using 20 items proposed by McGee et al. (2009). The items measure the level of confidence in the respondents’ ability to accomplish certain specific tasks as suggested by Bandura (1997). For this study, the tasks described were entrepreneurial tasks. Items covered the expected tasks related to an entrepreneurial career, including statements such as “Identify the need for a new product or service”, “Get others to identify with and believe in my vision and plans for a new business” and “Manage the financial assets of my business”. The scale ranged from 0 to 100 per cent, by steps of 10 per cent, depending on the perception of personal efficacy of the individual towards those questions. The Cronbach’s α represents 0.921. The average score of all 20 items was used for this research.

Subjective norms regarding an entrepreneurial career were measured using the scale developed by Kolvereid and Isaksen (2006), comprised of two series of six items. First, respondents are asked to rate the opinion of six groups of individuals regarding an entrepreneurial career: parents, spouse (if applicable), brothers/sisters (if applicable), family, close friends and acquaintances, with a scale ranging from −3 = extremely negative opinion to +3 = extremely positive opinion (and 0 = neutral). Then, respondents are asked to rate the importance attached to the opinion of these people about their choice of employment status, with a scale ranging from 1 – Not at all important to 7 – Extremely important. The opinion of each group of people was then multiplied by the importance given by the respondent, creating a score of subjective norms varying from −21 to +21 for each of the six groups of people. The Cronbach’s α for these six items represents 0.801. The average score of the items was used for this research.

Attitude towards entrepreneurship was measured by asking respondents to rate their interest in the five main duties of an entrepreneur (McGee et al., 2009): 1 – Identify a new product/service, 2 – Plan the development and marketing of new products/services, 3 – Explain and convince others of one’s vision or of one’s business project, 4 – Recruit, train and manage employees and 5 – Manage, organise and interpret financial statements. Respondents use a scale ranging from 1 – Not at all interested, to 5 – Extremely interested. The Cronbach’s α for these five items represents 0.785. The average score of the items was used for this research.

SO was measured using six items proposed by Kuckertz and Wagner (2010). They include statements such as “I think that environmental problems are one of the biggest challenges for our society” and “I think that entrepreneurs and companies need to take on a
larger social responsibility”. The scale ranges from 1 – I strongly disagree to 7 – I strongly agree. The Cronbach’s α for these six items represents 0.786. The average score of the items was used for this research.

Instrumentality of entrepreneurship to change the world rests in a simple question to verify if the respondent believes entrepreneurship allows social improvements such as having a fair and balanced society, improves people’s autonomy and dignity, reduces suffering, etc. The item was measured on a Likert scale ranging from 1 – Not at all to 5 – Extremely.

**Moderating variable**
A score for the interaction variable between SO and instrumentality of entrepreneurship to change the world was calculated. First, each variable of this study was centred to the mean. This procedure facilitates the interpretation of the interaction result. Second, the two variables were multiplied together.

**Control variables**
Certain variables are known to influence the intention to become an entrepreneur and, consequently, must be used as control variables (Spector and Brannick, 2011). Gender (Shinnar et al., 2012) and age (Kautonen et al., 2010) were used as control variables.

**Procedure**
The different variables and their correlations were first analysed to detect potential problems. Figure 1 shows the mean, standard deviation and correlation for each variable. No potential problem of multi-collinearity was detected. In addition, VIF indexes are well below the acceptable threshold of 10.0, which suggests usable data for hierarchical linear regressions.

Hierarchical linear regressions were conducted by first entering the control variables (model 1), then the variables of the TPB (model 2), followed by SO (model 3), to test H1. Entrepreneurship instrumentality to change the world was then added (model 4), followed by the interaction between this variable and SO (model 5). All cases with missing data for at least one question were removed, thus reducing the sample to 197 individuals (Table I).

**Results**
Table II shows the results of the analysis. It can be noted being a woman corresponds to a lower level of entrepreneurial action ($p = 0.003$). Age is not significant to explain action ($p = 0.279$) in the final model, but it is significant in model 1, where only the control variables appear ($p = 0.020$). Model 2 confirms the undeniable contribution of the TPB in
explaining entrepreneurial action ($\Delta$ adj. $R^2 = 0.32$), where attitudes ($p = 0.000$) and entrepreneurial self-efficacy ($p = 0.002$) are strongly significant to explain it, while subjective norms are not ($p = 0.194$). In Model 3, the negative effect of SO on entrepreneurial action ($p = 0.029$) is noticed, which is opposite to the expected relationship. Thus, the higher SO is, the less individuals place themselves in entrepreneurial action. Hypothesis 1 must then be rejected. Model 4 shows that instrumentality of entrepreneurship to change the world is significant and positive to explain entrepreneurial action, a situation that can also be noticed in model 5, which confirms $H_2$. In Model 5, instrumentality has a positive moderating effect ($p = 0.021$) on the relationship between SO and entrepreneurial action, which confirms $H_3$.

Figure 1 illustrates the moderating effect of instrumentality to change the world through entrepreneurship on the relationship between SO and entrepreneurial action. The analysis shows that the level of entrepreneurial action of those who are lightly oriented towards sustainability is equivalent for strong or weak instrumentality. Thus, believing that entrepreneurship can change or not change the world places people into a similar action level when they are lightly oriented towards sustainability. However, when they hold strong sustainable values and they believe entrepreneurship cannot contribute to change the world, the action level is lower than those who believe so. As for the latter, their entrepreneurial level of action remains stable and similar compared to those who have a weak SO.

**Discussion**

The goal of this research was to discover if an individual's SO could increase the likelihood of working towards an entrepreneurial career. Contrarily to what Kuckertz and Wagner (2010)
found amongst a sample of students, that is a positive relation between the SO and the intention to become an entrepreneur, this study shows the exact opposite. In fact, there is a negative and significant relationship between SO and entrepreneurial action. Although surprising at first glance, this result can be explained by a probably different conception from the potential benefit of entrepreneurship to promote sustainable development in the mind of Quebeckers. It is possible that in the mind of our sample of students, entrepreneurs are perceived as being more the cause of environmental problems rather than the solution. It is also possible that the cultural perspective plays a role in this important difference. Indeed, Kuckertz and Wagner (2010) enrolled French students from Alsace and others from Germany. Researches that focus on student entrepreneurial intention show that motivations to become an entrepreneur vary considerably depending on the country (Pruett et al., 2009). When one looks at the cultural differences between Germany and Canada according to the Hofstede (1984)[3] dimensions, it can be noticed that the main difference between the two cultures refers to long-term perspectives in which Germans will invest more in focussing on long term actions while Canadians will hope for much faster results. Thereupon, a society transformed by entrepreneurship may take much longer compared to activism, or even in the involvement in jobs related to SO values, where results happen faster. It is therefore possible that, as far as Canadian students are concerned, entrepreneurship is not perceived to be an interesting solution to those oriented towards sustainability. It suggests to pay attention to the instrumentality of entrepreneurship on one hand and to compare it amongst different cultures on the other.

In a replication perspective, this research nuances preceding studies done by Kuckertz and Wagner (2010). The results suggest to pursue the investigation on the relationship between SO and entrepreneurial career for a better understanding of the cultural contexts in which the individuals oriented towards sustainability will be willing to engage in such a career to transform society. Sometimes this relationship appears positive, sometimes negative, raising the question of the moderators that could explain this situation, other than cultural differences. Could it be caused by role models at local or national level that show engagement towards sustainability? Could it be that certain territories have more business opportunities related to sustainability (Wagner, 2012)? Or that certain trainings allow for better identification of them, for instance in the engineering field (Kuckertz and Wagner, 2010)? For now, these are only work hypotheses that should be tested in the future to identify the potential moderating variables of that process.

Another contribution of this research is in demonstrating that as far as university students are concerned, at least in Canada, the belief that entrepreneurship can change the world (instrumentality) brings them to take actions towards this career. From a theoretical point of view, this result allows to emphasise the relevance of the SCT (Lent et al., 2002) to explain the choice of an entrepreneurial career. Indeed, SCT highlights the importance of instrumentality, combined with valence, which constitutes outcome expectations, bringing the career choosing intentions and the steps to reach this objective. Contrary to the TPB, which excludes instrumentality and is limited to attitudes and self-efficacy (in addition to subjective norms), SCT adds a dimension that appears useful to explain entrepreneurial behaviour demonstrated by our results. In addition, this confirms the empirical results obtained by the meta-analysis performed on entrepreneur intention, which showed that models and theories gain by being combined to increase the explanatory power (Schlaegel and Koenig, 2014). SCT also suggests the effect of learning in influencing outcomes expectation, as well as self-efficacy, which allows a reconsideration of the works on entrepreneurial intention as well as entrepreneurial behaviour. The results presented here point in that direction and encourage the pursuit of studies in entrepreneurial career using SCT.

One of the major results of this research is the positive moderating effect of instrumentality on the relationship between SO and entrepreneurial action. As demonstrated, the belief that entrepreneurship can improve society neutralises the negative effect of SO on
entrepreneurial behaviours. Therefore, the effect of a belief related to instrumentality (Vroom, 1964) that is combined with valence (SO) to form an outcome expectation towards sustainability, which represents a necessary motivation in leading to behaviour. This confirms the relevance of assessing the entrepreneurial motivation by combining the effects of instrumentality and valence (Vroom, 1964) within SCT (Lent et al., 2002). Those results contribute to reframe the works done on the motivation of becoming an entrepreneur, which are generally limited to the reasons motivating a person to start up a business (e.g. Carsrud and Brännback, 2011; Kirkwood and Walton, 2010; Segal et al., 2005). Therefore, it would be useful to better understand the values associated to the entrepreneurial career choice as well as the beliefs associated to the instrumentality of becoming an entrepreneur. Furthermore, these beliefs, as well as the values, can change over time, despite the fact that they are quite stable. It is then possible to imagine that trainings could modify beliefs and values and, therefore, stimulate the motivation of becoming an entrepreneur. It is also probable that the somewhat realistic beliefs regarding an entrepreneurial career could change during the business creation process and after entering the career. For instance, an entrepreneur could believe that entrepreneurship would bring a lot of freedom and flexibility in schedule management, but the precarious situation of the first years may not allow freedom and flexibility, thus adjusting the instrumentality and, consequently, the motivation.

**Conclusion**

In order to reach sustainability, our societies need more entrepreneurs who exhibit SO. This paper contributes in showing how people with high SO can consider entrepreneurship as a career choice and start actions towards this goal. Through SCT theoretical lens (Lent et al., 2002), the aim was to investigate the effect of outcome expectations to bring motivation in order for an individual to take action to become an entrepreneur. A sample of 197 university students was used throughout a longitudinal design study.

The results show that the belief of instrumentality of entrepreneurship to change the world and SO as a value together improve the motivation towards becoming an entrepreneur. In fact, the analysis shows that SO reduces the willingness to become entrepreneur and lessen the actions towards this choice. However, the belief that entrepreneurship is a good way to change society (instrumentality) mitigates the negative effect of SO on entrepreneurship as a career choice.

This study contributes in showing the relevance of SCT in the field of entrepreneurship, especially the neglected effect of outcome expectations on entrepreneurship as a career choice. The results demonstrate the negative effect of SO on entrepreneurship as a career choice, but not on those who believe that they can change society through this mean. Thus, if someone thinks that entrepreneurship can change the world, not only he/she will be more inclined to take actions towards entrepreneurship but their values of SO will not decrease their entrepreneurial action.

Future studies need a longer timeframe of longitudinal research to overcome this study’s limitation regarding our assessment of entrepreneurial action. Starting a sustainable business could be perceived as demanding, for a triple bottom line would appear complicated to obtain. As a practical implication, entrepreneurship university courses could address social and sustainable entrepreneurship to illustrate that it might improve society. Consequently, this will have a direct effect on the performance of entrepreneurship action, but also a moderating effect that will drive those most activists to consider this career as a possibility. More generally, universities could organise lectures given by sustainable entrepreneurs. It would be a positive way to intervene. Globally speaking, information sessions organised by several organisations offering start-up support could also talk about the dimensions related to the instrumentality of an entrepreneurial career, which could have a beneficial effect on the motivation and, consequently, on performance.
Notes
1. Just as Kuckertz and Wagner (2010) suggest, the nature of the business to be created is not specified and the presumption is that “if individuals have a high sustainability orientation and plan to become self-employed, they will usually incorporate sustainability considerations when conceptualizing their ventures” (p. 332).
2. The regressions were calculated by removing all the cases, including one question skipped by the respondent.

References


**Corresponding author**

Etienne St-Jean can be contacted at: etienne.st-jean@uqtr.ca

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Growing and aging of entrepreneurial firms
Implications for job rotation and joint reward

Narongsak Thongpapanl
Brock University Goodman School of Business, St Catharines, Canada and
Research Administration Center (RAQ), Chiang Mai University, Chiang Mai, Thailand

Eugene Kaciak
Brock University Goodman School of Business, St Catharines, Canada and
Department of Quantitative Methods & Information Technology,
Kozminski University, Warsaw, Poland, and

Dianne H.B. Welsh
Bryan School of Business & Economics,
University of North Carolina at Greensboro, Greensboro, North Carolina, USA

Abstract
Purpose – The purpose of this paper is to explore whether job rotation strategies and joint reward systems are equally effective in encouraging cross-functional collaboration (CFC) under all organizational contexts, ranging from young and small firms to mature and large ones.

Design/methodology/approach – To ensure a wide applicability of findings in this study, the research model and hypotheses were tested with a sample of 232 Canadian firms active in a variety of industrial sectors. A survey instrument that comprised all the questionnaire items corresponding to the examined constructs is the foundation of the data used in this contribution.

Findings – This study shows that job rotation and joint rewards are strong and positive drivers of interdepartmental collaboration, which subsequently enhance firm performance. However, this illustration must be considered in the context of the firm shaped by its size and age because these two variables strongly and negatively moderate the relationships between CFC and its two antecedents.

Research limitations/implications – The study was limited to Canadian firms only. The manufacturing sector was not differentiated into subsectors, such as technology. Future studies could compare subsectors of manufacturing to see if there is any correlation between types of industries, age, and size.

Originality/value – Not all firms will be able to take advantage of the widely accepted values of job rotation and joint reward systems in generating CFC. Firms, to an extent, appear to be confronted with the liability of aging but not with the liability of smallness.

Keywords Innovation, Growth, SMEs, Small firms

Paper type Research paper

Introduction
In view of increasing globalization, firms around the world need to be innovative to respond to continuous threats and opportunities stemming from dynamic business environments (Donate et al., 2016). A firm’s ability to innovate is closely related to its intellectual capital (Subramaniam and Youndt, 2005; Swart and Kinnie, 2010). This asset is a part of the intangible resources of the firm embedded in its employees, organizational procedures, and culture (Donate et al., 2016; Kong, 2009). Firms integrate the specialized knowledge of employees in order to co-generate new knowledge to produce offerings (Grant, 1996b) and achieve a competitive advantage (Reed et al., 2006). To achieve this goal, firms encourage interdepartmental integration through knowledge sharing across various functions (Magnusson et al., 2014; Strese et al., 2016).

Research emphasizes the importance of the relationships between the demand side (marketing and sales) and supply side (R&D) in the firm in the creation of value for...
customers (Esper et al., 2010; Piercy and Ellinger, 2015). By integrating the marketing and R&D sides, firms encourage the creation of new knowledge (De Clercq et al., 2011; Korhonen-Sande and Sande, 2014). The creation of knowledge is developed through knowledge exchange and knowledge combination (Nahapiet and Ghoshal, 1998). Knowledge creation relies on the exchange of previously unconnected information that resides in different functional areas (Cabrera and Cabrera, 2002). Cross-functional integration is critical for creation of new knowledge. Nevertheless, this integration can face many challenges that stem from the variations in the “thought-worlds” (Griffin and Hauser, 1996), cultures, and attitudes (Korhonen-Sande and Sande, 2014) between the marketing and R&D departments. Therefore, it is important for the organizations to understand how to facilitate integration among firm functions to create new knowledge and offerings through innovation and entrepreneurial activities.

Further research is necessary to advance our understanding of how and when to encourage collaboration between marketing and R&D functions. Empirical research on antecedents of interactions between the firm’s departments is scarce (Strese et al., 2016). Cross-functional collaboration (CFC) is treated as an exogeneous element of organizational behavior, and there is no clear evidence that addresses how to achieve it (Piercy and Ellinger, 2015). On the other hand, only few studies in the literature consider the cross-functional relationships as an outcome or an intermediate variable related to various organizational antecedents (Korhonen-Sande and Sande, 2014; Strese et al., 2016; Xie et al., 2003). Therefore, the purpose of this study is to fill this gap by advancing research on the factors that determine the CFC process in particular, using the knowledge-based view (KBV). According to KBV, the firm’s sustainable competitive advantage is driven by integration across functional units (Grant, 1996a). The firm transforms knowledge entrenched in cross-functional teams into new products that form its competitive advantage (De Luca and Atuahene-Gima, 2007).

Various integration mechanisms have addressed these issues. In line with the KBV, two critical mechanisms that can enable CFC have been identified: job rotation strategies, and joint reward systems (Tan et al., 2014). As Xie et al. (2003) noted, the simple application of job rotation systems is not enough by itself to realize an efficient collaboration between marketing and R&D; firms must also provide motivation for the functions to collaborate by installing joint reward systems. Thus, it is critically important to simultaneously study joint reward and job rotation systems. In line with this area of research, this study argues that job rotation and joint reward systems are indispensable antecedents of CFC. Job rotation strategies address the building of mutual knowledge and understanding between the two functions, while joint reward systems offer the motivation for CFC (Hong and Vai, 2008).

Management practices are not necessarily directly related to the firm’s outcomes (Donate et al., 2016). Rather, an internal “black box” seems to exist in the connections between these input and output variables. The research design of this study considers the factors of organizational processes (job rotation strategies and joint reward systems) to be directly related to human cognition and social relations and further reflected in intermediate variables such as CFC. This study also incorporates the size and age of the firm as factors that typically affect innovation and entrepreneurial activities (Donate et al., 2016; Scheepers et al., 2014). The study is structured as follows: First, the conceptual framework is presented. Subsequently, the methods of data collection, data analysis, and results are described. In the discussion section, the interpretations of our findings are discussed and followed by a summary of the key findings, limitations, and future research.

Theoretical background and hypotheses development

Direct effects of job rotation on CFC

Job rotation refers to mobilizing managers across functional departments (Tan et al., 2014). As Campion et al. (1994) noted, job rotation is distinguished from job promotion, as the
former does not usually involve a change in compensation. Job rotation introduces employees to a broader set of tasks and personnel, which augments the understanding and shared practices between functions (Gherardi et al., 1998). Job rotation also enables enhanced learning and skill acquisition of employees in addition to allowing them to better understand the capabilities and challenges of other departments (Campion et al., 1994). Job rotation, as a factor of organizational climate, encourages information exchange and is conducive of cross-functional trust (Fain and Wagner, 2014). Thus, job rotation can assist in developing a deeper and broader understanding of another functional department. This is achieved as the rotating employee becomes privy to the other department’s “thought-world” and knowledge domain during the time of rotation within the other function. Thus, job rotation allows the rotating employee to better understand the extent of knowledge, its sources, and the correct approach to access the needed knowledge from the right person. This, in turn, can lead to higher levels of CFC.

While understanding the organization’s knowledge is crucial to CFC, it is also very important to understand who possesses the various sources of specific knowledge within the other departments (Grant, 1996b). Organizations and their departments are composed of knowledge “specialists” who possess very specific knowledge. Thus, a key aspect of CFC is to identify and understand who owns the specific knowledge within each function. Innovation and creation of new knowledge are achieved when department managers are able to recognize whom to approach for a specific complementary knowledge that they need. Job rotation has been shown to positively impact socialization and interfunctional network development (Campion et al., 1994). Upon rotating across various functions, managers build relationships with various members and develop a better understanding of who owns the different specific knowledge components within each department. Therefore, job rotation enables CFC by knowing whom to consult when specific knowledge is needed. Finally, while perceiving the extent of knowledge and its sources is important, realizing the approach to work with other department is also vital to ensuring CFC between marketing and R&D. Job rotation enables members from various functions to co-participate (Gherardi et al., 1998), which increases their familiarity and experiences of dealing with each other to reduce learning barriers that arise from lack of trust and confidence (Andrews and Delahaye, 2000). This further promotes the development of joint knowledge transfer (Lagerstrom and Andersson, 2003). Moreover, establishing a shared understanding and developing a cross-functional network of contacts can enable CFC only if the rotating managers understand the subcultures, norms, and procedures used by the other departments. Indeed, different functions tend to develop their own subcultures as a result of the specialization of knowledge within each department. Differences in subcultures can be a major source of conflicts and can establish barriers that inhibit the teamwork between functions (Leveson, 1996). Job rotation can expose managers from various departments to other subcultures, which can help establishing a shared understanding of how to approach and work in a cross-functional manner. This should encourage CFC between marketing and R&D by understanding how to approach the right person for the right knowledge within each department. Therefore, it is hypothesized that (Figure 1):

\[ H1. \text{ Job rotation is positively related to CFC.} \]

**Direct effects of joint reward on CFC**

While job rotation strategies are said to address the challenges of encouraging shared knowledge and understanding, it is argued here that joint reward systems offer the appropriate levels of mutual motivation between marketing and R&D functions to collaborate in an effort to achieve superordinate goals (Hong and Vai, 2008; De Clercq et al., 2015). As Xie et al. (2003) explicate, installing job rotation strategies in the firm is a necessary but not
a sufficient integration mechanism that enables CFC. They find that establishing shared understanding and knowledge is complemented by addressing the issues of motivation to engage in CFC when joint reward systems are used. Therefore, it is important for CFC research concerning job rotation strategies to include joint reward systems in the same model considering their complementary effects (and vice versa).

Joint reward systems are conceptualized here as mechanisms that offer economic incentives to functional managers to focus on firm level rather than functional or individual goals (De Clercq et al., 2013, 2015; Magnusson et al., 2014). Incentives such as joint rewards offer employees motivation by linking the effort to a reward (Pearsall et al., 2010; Tan et al., 2014). Studies show that employees often exert a persistent, concentrated cognitive, and behavioral effort toward the realization of their objectives once rewards and goals are aligned (Cong et al., 2017; Rynes et al., 2005). Similar to job rotation systems, joint reward structures are also factors of organizational climate, and therefore they boost information sharing and encourage cross-functional trust (Fain and Wagner, 2014). Research has also shown the consistent effectiveness of joint reward systems for interdependent teams, such as marketing and R&D, which depend on high levels of interaction and extensive knowledge sharing (Piercy and Ellinger, 2015). Contrariwise, mutually exclusive reward schemes are frequently associated with poor cross-functional relationships.

Joint reward systems are closely aligned with the concept of “stretch” as outlined by Gibson and Birkinshaw (2004). “Stretch” can be conceptualized as the common ambition shared by functional managers to focus on the overall success of their firm rather than focusing on individual departmental interests. According to Xie and colleagues (2003), joint rewards act via the expected outcome of the intergroup process, creating the motivation to work together, which leads to higher levels of goal congruity between marketing and R&D functions. In line with this reasoning, it is argued here that joint reward systems can align goals between different departments and encourage employees to work together toward a common goal.

According to De Clercq et al. (2015), functional departments must integrate their existing activities in order to collaborate. Joint reward systems can motivate functional managers to place further emphasis on collaborative as opposed to individual efforts of departments by shifting their commitment toward firm-level goals (Collins and Clark, 2003). Joint reward systems can also augment the probability of knowledge exchange across functions (Lee and Ahn, 2007), a critical component to CFC. Therefore, it is hypothesized that:

\[ H2. \text{ Joint reward systems are positively related to CFC.} \]

**Moderating effects of firm size on the job rotation-CFC relationship**

Firm size is associated with the extent of the firm’s resources, existence of internal procedures, market presence and network effects, and competitive strength (Aldrich and Auster, 1986; Strese et al., 2016). Firm size should have a significant impact on its ability to

*Figure 1.* Conceptual model

![Conceptual Model](image-url)
behave in a collaborative manner across its functions (Magnusson et al., 2014). It is still unclear how the size of a firm impacts the effectiveness of job rotation strategies on CFC between marketing and R&D.

Large firms face critical barriers to knowledge exchange due to organizational inertia (Acs and Audretsch, 1991; Tan et al., 2014). The greater the number of firm employees, the more complex the firm management is; larger firms are forced to develop bureaucratic levels of hierarchy and layers of formal reporting lines (Terrien and Mills, 1955). This bureaucratic climate can enable organizations to become more efficient with their current technologies and customer base (Ranger-Moore, 1997). Nevertheless, high levels of bureaucracy can also cause large firms to become slow responders and more resistant to change (Chandy and Tellis, 2000). Specifically, large firms can have great difficulties in creating new offerings through exchange and combination of knowledge across functional departments due to the bureaucracy caused by multiple layers of administration and reporting lines. These layers can impede knowledge flow, suppressing new ideas and generating several barriers to innovation and entrepreneurial activities (Sharma, 1999).

According to the KBV, the creation of new knowledge across departments is critical to innovation, but this process does not occur automatically (Grant, 1996b). Firms must enable CFC between marketing and R&D to foster innovation (De Luca and Atuahene-Gima, 2007). As Hong and Vai (2008) show, the use of job rotation strategies is a mechanism that encourages CFC. They find that a lack of shared understanding and knowledge is one of the key barriers of CFC between marketing and R&D. Although job rotation can enable CFC, it can also add costs and implementation challenges (Campion et al., 1994). These include additional training, heightened error rates, increasing costs and expenses, as well as decreasing efficiency. In addition, job rotation systems may encourage short-sighted behaviors.

One critical question is whether job rotation strategies are equally effective in all organizational contexts. As a firm grows, its complexity increases. When knowledge, its sources, and methods of its access become extremely complex and bureaucratic, the effectiveness of job rotation systems to enable CFC between marketing and R&D may be diminished. This is because the benefits of job rotation are suppressed and costs are amplified in such situations. Specifically, employee learning will become less effective in more complex firms with higher levels of distal and varietal knowledge due to bounded rationality (Chidambaram and Tung, 2005). The complex environment of larger firms creates larger variations in specialized knowledge. According to the KBV, common knowledge is critical to the integration of knowledge bases, which can enable CFC among functions (Hong and Vai, 2008). Rotating employees may add to the complexity of the firm. Job rotation systems may be less effective in enabling CFC between marketing and R&D functions in larger firms than in smaller firms. Therefore, it is hypothesized that:

*H3a.* Firm size negatively moderates the job rotation-CFC relationship such that, the larger the size of the firm, the less positive the relationship between job rotation and CFC is.

**Moderating effects of firm size on the joint reward-CFC relationship**

Joint reward systems offer the motivation for functional department managers across the firm to create new knowledge by CFC (Xie et al., 2003). Similar to job rotation, it is unclear whether joint reward systems are effective and efficient in all contexts.

While joint rewards encourage knowledge creation and innovation by CFC (Xie et al., 2003), they have challenges and costs (Latane and Nida, 1981). A recent review of the literature (Pearsall et al., 2010) have found that joint reward systems may lead to a phenomenon called “social loafing” due to the associated decrease in accountability and effort levels of individuals within a team (Karau and Williams, 1993). Firm size has been shown to increase the likelihood...
of social loafing within groups (Chidambaram and Tung, 2005). That is, individuals in group settings may feel as though they can “hide in the crowd” when they are not held accountable for their individual performance. Additionally, individuals within group dynamics may not feel that their efforts will significantly impact the overall performance and outcomes of the team regardless of their contributions (Rynes et al., 2005). Joint reward systems can lead to a lower sense of accountability and to an increase in dispensability of effort since they do not directly reward the efforts of individuals (Latane and Nida, 1981).

Additionally, the issue of fairness in appropriating the rewards to the deserved people and groups becomes more challenging as the firm complexity increases. Liden et al. (2004) pointed out that unfair distribution of rewards and compensation appears to increase employees’ social loafing. Individuals are more likely to decrease their efforts if they perceive that they are receiving an inequitable portion of resources and/or rewards from the organization in comparison to their inputs (Tyler, 1994). Additionally, perceptions of fairness in the policies used to make human resource decisions, such as allocation of rewards, may have an impact on performance-to-outcome expectancies. This has been shown to encourage the amount of effort dedicated to task behaviors (Karau and Williams, 1993).

This study posits that joint reward systems will be less effective in offering motivation to collaborate between marketing and R&D in larger firms. The perception that there are enough employees to pick up the slack is amplified, which enhances the effects of “social loafing.” Such enhanced “free-riding” effect due to increased firm size will likely lead to less motivation and effort by each employee. Therefore, it is hypothesized that:

\[ H3b. \text{ Firm size negatively moderates the joint rewards-CFC relationship such that the larger the size of the firm, the less positive the relationship between joint rewards and CFC is.} \]

*Moderating effects of firm age on the job rotation-CFC relationship*

Firm age – the number of years since the inception of the firm – is a suitable proxy for external firm legitimacy, existence of established external relationships, resiliency, and/or pervasiveness of internal processes and routines (Gopalakrishnan and Bierly, 2006; Strese et al., 2016). With regard to organizational change and innovation, mature firms suffer from the liabilities associated with the aging process (Dougherty and Hardy, 1996). Thus, organizational inertia constrains the firm’s ability to change and adapt, with core organizational functions being the least probable to change (Baum, 1996).

Firms must install knowledge sharing mechanisms in order to encourage knowledge sharing (Grant, 1996b). Of interest in this study is the effectiveness of job rotation systems in enabling CFC between marketing and R&D functions. While job rotation is demonstrated to be an effective mechanism to enable shared knowledge and understanding (Campion et al., 1994), and thus CFC between functional departments (Hong and Vai, 2008), it is not an easy mechanism to effectively and efficiently manage. The development of common knowledge by job rotation strategies can only happen if the employees are able to exchange knowledge that is different from what they currently know. This can be the case in mature organizations in particular. As the existing R&D’s or marketing’s “thought-worlds” and routines become entrenched within the respective domain, the injection of the knowledge base of the rotating employee may be stifled and blocked by the forces of inertia and organizational rigidity (Dougherty and Hardy, 1996). Thus, developing a shared understanding and common knowledge base may be impeded if either the rotating employee or the host department is inflexible and unable to accept the possibility of different and divergent knowledge that may change their routines, thoughts, and processes. In this case, the effectiveness of job rotation in enabling a shared or common knowledge domain between marketing and R&D functions may be prohibited or supressed by the
forces of inertia and rigidity in more mature organizations (Dougherty and Hardy, 1996). This will likely reduce the effectiveness of job rotation strategies in enabling CFC. Hence, it is hypothesized that:

\( H4a. \) Firm age negatively moderates the job rotation-CFC relationship such that the greater the age of the firm, the less positive the relationship between job rotation and CFC is.

**Moderating effects of firm age on the joint reward-CFC relationship**
While reward interdependence is known to encourage knowledge creation and innovation by CFC (Xie *et al.*, 2003), it faces increasing challenges and costs as firms age (Latane and Nida, 1981) (i.e., depletion of resources, established internal routines, process formalization, or managerial mindset). These characteristics are likely to burden the organization's ability to utilize a joint reward system. When competition for internal resources is increased, the attractiveness of joint rewards is reduced in individual cross-functional areas. Thus, the level of CFC among departments is decreased (Buchanan and Badham, 2008). This situation is worsened in aging firms as resources and knowledge slowly decline with time in value and usefulness toward the unavoidable obsolescent conditions. This is paralleled by less willingness to share and exchange potentially valuable resources by cross-functional managers despite the presence of a joint reward system (Ranger-Moore, 1997).

The maturity of a firm is translated in increasing the efficiency, predictability, and reproducibility of its routines, processes, and practices. This can escalate the costs of identifying the contributions of each department to CFC (Hauptman and Hirji, 1999). Moreover, a differential hierarchical status among organizational departments is likely to deflate the effectiveness of a joint reward system in the facilitation of CFC (Pearce, 1993). This status is commonly found in many established firms whereby some departments appear more instrumental than others in their contributions to overall performance. As a firm ages, the emerging organizational schemas – including the managerial mindsets, dominant logics (Prahalad, 2004), and interconnected choices (Siggielkov, 2001) reduce the ability of a reward system to unite areas in collaborative work. Therefore, it is hypothesized that:

\( H4b. \) Firm age negatively moderates the joint reward-CFC relationship such that, the greater the age of the firm, the less positive the relationship between joint rewards and CFC is.

**Methodology**

*Sample and data collection*
The authors tested the hypotheses with 1,500 randomly selected representative Canadian firms from a private market research company with respondents in R&D or marketing. A survey instrument was then sent to one randomly selected functional manager per firm. To examine and validate the clarity of the survey, informal interviews were undertaken with six randomly chosen functional managers (three R&D and three marketing). These six interviews were not included in the initial sample. They included the discussion of the survey instrument and the challenges associated with cross-functional cooperation in the selected firms. This input helped us improve the readability and relevance of our survey instrument. The data collection relies on Dillman’s (1978) total design method. Of the 950 potential respondents, 232 (24 percent) completed the surveys, which are consistent with other studies (Aiken and Bousch, 2006). The responding firms operate in manufacturing, non-financial services, mining, construction, transportation, wholesale, retail, and finance. There were no substantial differences between respondents or non-respondents, early or late
respondents (Armstrong and Overton, 1977). Following prior research (De Clercq et al., 2011, 2013), the validity of the key constructs of the study was tested by administering a follow-up survey six months after the initial one. In the follow-up survey, a shortened format of the original questionnaire was used; for each construct, one proxy item was chosen – different from the specific items in the original survey – that best captured the content domain of the construct. In total, 78 responses to the follow-up survey were received and all validation items were found to correlate positively with the original measures.

Measures of constructs
The scales used to measure the constructs came from extant literature. All items were assessed on five-point Likert scales, ranging from 1 (strongly disagree) to 5 (strongly agree), and were normally distributed. In Table I, the measures used in the analyses are listed, detailing their individual items, overall reliability estimates (Cronbach’s $\alpha$, composite reliability), and average variance extracted (AVE). In line with the research focus, the measures assess the perceptions of respondents about the relationship between the R&D and marketing-related functions in their organizations. In addition, the questions in the survey were designed to capture phenomena that take place at the firm level rather than at the functional manager level.

CFC is measured in a manner similar to that used by prior research on functional managers’ development of harmonious relationships with peers in other departments (Kahn, 1996; Song et al., 2000). For instance, respondents assessed whether other functional departments carried out their responsibilities and commitments or whether it was worthwhile to spend time and effort to develop and maintain a relationship with other functions.

<table>
<thead>
<tr>
<th>Factor loading</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-functional collaboration ($\alpha = 0.85$; CR = 0.92; AVE = 0.70)</td>
<td>Factor loading</td>
</tr>
<tr>
<td>There is close interaction and collaboration between people in the two functions</td>
<td>0.945$^a$</td>
</tr>
<tr>
<td>There is a high level of knowledge sharing between people in the two functions</td>
<td>0.916</td>
</tr>
<tr>
<td>The other function carries out its responsibilities and commitments most of the time</td>
<td>0.644</td>
</tr>
<tr>
<td>Spending time and effort on developing and maintaining a relationship with the other function is worthwhile</td>
<td>0.840</td>
</tr>
<tr>
<td>People are satisfied with their relationship with the other function</td>
<td>0.811</td>
</tr>
<tr>
<td>Joint Reward ($\alpha = 0.78$; CR = 0.78; AVE = 0.54)</td>
<td>Factor loading</td>
</tr>
<tr>
<td>In terms of the company’s rewards system […]</td>
<td></td>
</tr>
<tr>
<td>Different departments share the rewards of a successfully commercialized new product</td>
<td>0.774$^a$</td>
</tr>
<tr>
<td>Individual departments are evaluated on their joint performance instead of separate departmental performance</td>
<td>0.683</td>
</tr>
<tr>
<td>Our senior management promotes cross-functional team cohesion over separate functional loyalty</td>
<td>0.747</td>
</tr>
<tr>
<td>Job rotation ($\alpha = 0.80$; CR = 0.84; AVE = 0.64)</td>
<td>Factor loading</td>
</tr>
<tr>
<td>In terms of the company’s internal functioning […]</td>
<td></td>
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<tr>
<td>Planned job rotation of employees is emphasized as a device for developing employees’ capabilities</td>
<td>0.836</td>
</tr>
<tr>
<td>Employees are rotated across functional areas</td>
<td>0.944$^a$</td>
</tr>
<tr>
<td>People in a given functional department (e.g., R&amp;D, marketing) sometimes take on roles in another functional department</td>
<td>0.567</td>
</tr>
</tbody>
</table>

Notes: CR, construct reliability; AVE, average variance extracted. *Initial loading was fixed to 1 to set the scale of the construct.
The measure ($\alpha = 0.80$) correlates positively with its single-item counterpart from the follow-up survey ($r = 0.41$, $p < 0.001$).

Joint reward is measured with three items that assessed the interdependence of functional areas’ rewards (Xie et al., 2003). For example, respondents indicated the extent to which managers were evaluated on their joint performance instead of separate area performance and whether they shared the rewards of successfully commercialized new products. The measure ($\alpha = 0.78$) correlated positively with its single-item counterpart from the follow-up survey ($r = 0.46$, $p < 0.001$).

Job rotation was based on three measurement items adapted from Xie et al. (2003); respondents thus indicated the extent to which employees rotated across functional areas or if people in a given functional unit sometimes took on roles in another functional unit. The measure ($\alpha = 0.80$) also correlated positively with its single-item counterpart from the follow-up survey ($r = 0.33$, $p < 0.01$).

In terms of the two moderating variables in the proposed model, firm size is measured as the log transformation of the number of full-time employees, and firm age is assessed as the number of years the company had been in business.

**Control variables**

To account for the variations across industries in terms of their maturity and propensity for innovation and entrepreneurial activities, the firm’s industry is controlled for. Additionally, the study also controls for the functional area (R&D or marketing). To determine if the results might be influenced by the background of the respondents, two separate sets of regressions for the R&D and marketing-related functions are run as a post-hoc test. The results are consistent with the reported regression results.

**Assessing the reliability and validity of measures**

Following Anderson and Gerbing (1988), a five-factor measurement model that includes the key constructs of the conceptual model, using AMOS 6.0, was estimated. The confirmatory factor analysis (CFA) revealed factor loadings greater than 0.40, normalized residuals less than 2.58 and modification indices less than 3.84 (Anderson and Gerbing, 1988). No deletions of scale items were needed to improve the model fit. The authors have found that the measurement model fits the data well: $\chi^2(57) = 95.824$, goodness-of-fit index (GFI) = 0.94, Tucker-Lewis index (TLI) = 0.97, confirmatory fit index (CFI) = 0.98, and root mean squared error of approximation (RMSEA) = 0.05. The convergent validity of the scales is affirmed with the significant factor loadings in the measurement model ($t = 2.0$; Gerbing and Anderson, 1988) and the magnitude of the AVE estimates (equal to or greater than 0.50, Bagozzi and Yi, 1988). Assessment criteria support the discriminant validity of the constructs. None of the confidence intervals for the correlations between constructs includes 1.0 ($p < 0.05$) (Anderson and Gerbing, 1988), and the AVE estimates of the constructs are greater than the squared correlations between the corresponding pairs of constructs (Fornell and Larcker, 1981). The authors have found significant differences between the unconstrained model and a constrained model (Anderson and Gerbing, 1988) for all 10 pairs of constructs. Diagnostic analyses were conducted to rule out the possibility of common method bias. A CFA for a single-factor model was conducted and a poor fit with the data was found ($\chi^2(65) = 563.010$, GFI = 0.72, TLI = 0.62, CFI = 0.69, RMSEA = 0.18), significantly worse ($\Delta \chi^2(8) = 467.186$, $p < 0.001$) than the fit of the five-factor model. The authors compared several pairs of structural equation models (SEM) where the authors paired a model that includes an interaction term with another model in which a common method factor is added (Podsakoff et al., 2003). The $\chi^2$ difference between the two models was not significant ($\Delta \chi^2(1) = 0.012$; ns), and only small changes in the size and significance of the paths across the two models emerged. The same pattern of results emerged for
the SEM equivalents of the models in which the other two-way interactions were included. These results, together with arguments that common method bias is less prevalent in studies using highly educated respondents and multi-item scales (Bergkvist and Rossiter, 2007) and for moderating effects rather than main effects (Simons and Peterson, 2000), alleviate concerns related to the use of a common respondent. The study used a proxy item in the follow-up survey. This approach increases confidence that the positive and significant correlations between the original and follow-up items can be interpreted as evidence contrary to the presence of common method bias.

Analysis and results
The correlations and descriptive statistics are provided in Table II. Moderated hierarchical regression analysis is used to test the hypotheses of the study (Cohen and Cohen, 1983). After mean-centering the interacting variables, the variance inflation factor values are far below the threshold of 10, which suggests that multicollinearity is not a problem (Aiken and West, 1991). In Table III, the regression results are provided. Model 1 contains only the control variables, Model 2 adds the effect of joint reward and job rotation, Model 3 adds firm size, and Model 4 includes its moderating effects. In Model 2, the positive effects of job rotation ($\beta = 0.119$, $p < 0.001$) and joint reward ($\beta = 0.416$, $p < 0.05$) on CFC are found – supporting $H1$ and $H2$, and the two variables explain additional variance ($\Delta R^2 = 0.343$, $p < 0.001$). In Model 3, firm size has no significant direct effect on CFC. Model 4 shows the significant presence of the negative moderating influences of firm size on the job rotation-CFC relationship ($\beta = -0.101$, $p < 0.01$) and joint reward-CFC relationship ($\beta = -0.065$, $p < 0.05$) – supporting $H3a$ and $H3b$, and explaining additional variance ($\Delta R^2 = 0.053$, $p < 0.001$). Model 5 shows that firm age has no significant direct effect on CFC. Model 6 reveals a significant interaction effect between job rotation and firm age on CFC ($\beta = -0.005$, $p < 0.05$), which provides weak support for $H4a$, with no significant interaction effect between joint reward and firm age on CFC. $H4b$ is not supported.

Discussion
This study examined the direct impact of job rotation and joint reward systems on CFC between R&D and marketing departments with the moderating effects of the firm’s size and age on these relationships. According to the applied KBV framework, the firm’s sustainable competitive advantage is propelled by integration across the firm’s functional units (Grant, 1996a). The firm transforms knowledge embedded in cross-functional teams into new offerings which are crucial to competitive advantage (De Luca and Atuahene-Gima, 2007).

Research on antecedents of collaboration across the firm’s departments is scant (Strese et al., 2016). CFC is considered only as an exogenous predictor in modeling firm performance (Donate et al., 2016; Piercy and Ellinger, 2015). Literature does not explain what factors enhance or impede successful collaboration across departments. This study attempts to fill this gap by looking at the factors that impact CFC, either directly (job rotation and joint reward systems) or indirectly (firm size and age).

CFC is affected by a number of drivers. Research treats it as an exogenous factor without looking deeper into its nature and antecedents. This study shows that job rotation and joint rewards are strong, positive drivers of collaboration, which may enhance the firm performance. Our research shows significant and positive effects of job rotation and joint reward system on CFC, which endorses our expectations formulated in $H1$ and $H2$, respectively. Due to employee learning effects (Campion et al., 1994), job rotation systems help managers across various departments to acquire an understanding of what is known, by whom, and how to access the right person for the right knowledge, which inspires CFC. Joint reward systems help different departments in aligning goals and working together for a common target (Magnusson et al., 2014). However, this observation must be considered in
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<th>12</th>
<th>13</th>
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<tbody>
<tr>
<td><strong>1. Cross-functional collaboration</strong></td>
<td>1</td>
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<td><strong>2. Job rotation</strong></td>
<td>0.356**</td>
<td>1</td>
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<td><strong>3. Joint reward</strong></td>
<td>0.574**</td>
<td>0.430**</td>
<td>1</td>
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<td><strong>4. Company size (log)</strong></td>
<td>-0.074</td>
<td>0.048</td>
<td>-0.042</td>
<td>1</td>
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<tr>
<td><strong>5. Company age</strong></td>
<td>-0.012</td>
<td>-0.006</td>
<td>-0.051</td>
<td>0.522**</td>
<td>1</td>
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<tr>
<td><strong>6. Industry: manufacturing</strong></td>
<td>0.162*</td>
<td>-0.019</td>
<td>-0.049</td>
<td>0.108</td>
<td>0.091</td>
<td>1</td>
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<tr>
<td><strong>7. Industry: services</strong></td>
<td>-0.006</td>
<td>-0.069</td>
<td>-0.003</td>
<td>-0.155*</td>
<td>-0.132*</td>
<td>-0.580**</td>
<td>1</td>
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<tr>
<td><strong>8. Industry: mining</strong></td>
<td>-0.153*</td>
<td>0.040</td>
<td>0.012</td>
<td>-0.064</td>
<td>-0.100</td>
<td>-0.307**</td>
<td>-0.198**</td>
<td>1</td>
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<tr>
<td><strong>9. Industry: construction</strong></td>
<td>0.074</td>
<td>0.062</td>
<td>0.154*</td>
<td>0.037</td>
<td>0.046</td>
<td>-0.126</td>
<td>-0.081</td>
<td>-0.043</td>
<td>1</td>
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<tr>
<td><strong>10. Industry: transportation</strong></td>
<td>-0.116</td>
<td>0.046</td>
<td>-0.017</td>
<td>0.097</td>
<td>0.014</td>
<td>-0.231**</td>
<td>-0.149*</td>
<td>-0.079</td>
<td>-0.032</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>11. Industry: wholesale</strong></td>
<td>0.018</td>
<td>0.120</td>
<td>0.095</td>
<td>-0.069</td>
<td>-0.084</td>
<td>-0.191**</td>
<td>-0.123</td>
<td>-0.065</td>
<td>-0.027</td>
<td>-0.049</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td><strong>12. Industry: retail</strong></td>
<td>-0.005</td>
<td>-0.039</td>
<td>0.002</td>
<td>0.084</td>
<td>0.345**</td>
<td>-0.155*</td>
<td>-0.099</td>
<td>-0.053</td>
<td>-0.022</td>
<td>-0.040</td>
<td>-0.063</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>13. Marketing-related function</strong></td>
<td>-0.039</td>
<td>-0.136*</td>
<td>-0.040</td>
<td>0.167*</td>
<td>0.193**</td>
<td>0.034</td>
<td>-0.038</td>
<td>-0.083</td>
<td>0.069</td>
<td>-0.015</td>
<td>0.026</td>
<td>0.003</td>
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<tr>
<td>Mean</td>
<td>3.610</td>
<td>2.494</td>
<td>3.369</td>
<td>5.647</td>
<td>32.871</td>
<td>0.474</td>
<td>0.272</td>
<td>0.095</td>
<td>0.017</td>
<td>0.066</td>
<td>0.039</td>
<td>0.026</td>
<td>0.491</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.710</td>
<td>0.910</td>
<td>0.919</td>
<td>1.991</td>
<td>36.305</td>
<td>0.500</td>
<td>0.446</td>
<td>0.294</td>
<td>0.130</td>
<td>0.230</td>
<td>0.194</td>
<td>0.159</td>
<td>0.501</td>
</tr>
</tbody>
</table>

**Notes:** *p < 0.05; **p < 0.01
the firm’s context shaped by its size and age, as our study shows that these variables strongly and negatively moderate the relationships between CFC and its antecedents (following the $H3a$, $H3b$, and $H4a$).

The firm size and age have typically been used in previous research only as control variables, but with mixed results. For example, Engelen et al. (2015) found the two variables positively affecting firm performance. Conversely, Donate et al. (2016) and Tsai et al. (2014) found no significant effects of size and age in their research models. There have only been a few past studies in which firm size and age were used as moderating variables. For example, BarNir et al. (2003) hypothesized that firm size and age would negatively moderate the relationships among their model’s variables. However, their results were only partially significant as none of the interaction terms impacted the overall significance of the model nor was the added variance significant. Size and age and their impact on firm performance were also investigated as explanatory variables by Ranger-Moore (1997). In line with our results, his study showed that increased age worsens firm performance, which suggests liability of aging. However, his study found that increased size appears to improve firm performance, which suggests liability of smallness, contrary to our findings.

With respect to our research findings, while job rotation can help employees from various functions develop a shared understanding with each other, the rotating of multiple employees across different knowledge domains may introduce significant levels of complexity and difficulty as firms become larger (Atuahene-Gima, 2005). Moreover, in larger firms, the perception that there are enough employees to pick up the slack is amplified, which enhances the effects of “social loafing” and “free-riding,” making joint reward systems less effective or even ineffective in promoting CFC. Our findings also suggest that the effectiveness of job rotation in enabling a shared or common knowledge domain between marketing and R&D functions may be prohibited or suppressed by the forces of inertia and rigidity in more mature organizations (Dougherty and Hardy, 1996). Additionally, as firms’ age, the organizational schemas that emerge through time are likely to lower the ability of a joint reward system to unite functional areas to work collaboratively. In short, contributing

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
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<tbody>
<tr>
<td>Industry: manufacturing</td>
<td>0.500**** 0.307 0.301 0.414**** 0.334 0.336</td>
<td></td>
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<tr>
<td>Industry: services</td>
<td>0.385 0.188 0.166 0.277 0.189 0.198</td>
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<tr>
<td>Industry: mining</td>
<td>0.071 -0.171 -0.188 -0.099 -0.174 -0.165</td>
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<td>Industry: construction</td>
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<tr>
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<td>0.057 -0.107 -0.099 -0.113 -0.088 -0.087</td>
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<tr>
<td>Industry: wholesale</td>
<td>0.455 -0.117 -0.136 -0.107 -0.123 -0.186</td>
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<tr>
<td>Industry: retail</td>
<td>0.354 -0.197 -0.197 -0.049 -0.176 -0.170</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Marketing-related function</td>
<td>-0.063 0.004 0.021 0.034 0.031 0.034</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1: Job rotation</td>
<td>0.119* 0.123* 0.101**** 0.116* 0.077</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H2: Joint reward</td>
<td>0.416*** 0.413*** 0.376*** 0.420*** 0.408***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm size (log employed)</td>
<td>-0.022 -0.017</td>
<td>-0.002 -0.003****</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>$H3a$: Job rotation $\times$ firm size</td>
<td>-0.101**</td>
<td>-0.065*</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>$H3b$: Joint reward $\times$ firm size</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>$H4a$: Job rotation $\times$ firm age</td>
<td>-0.005*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>$H4b$: Joint reward $\times$ firm age</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>$R^2$</td>
<td>0.063</td>
<td>0.406</td>
<td>0.409</td>
<td>0.459</td>
<td>0.411</td>
<td>0.424</td>
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<tr>
<td>$\Delta R^2$</td>
<td>0.343***</td>
<td>0.003</td>
<td>0.063***</td>
<td>0.005</td>
<td>0.018****</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** *Base case = Industry: finance; **Base case = R&D-related function. Unstandardized coefficients (two-tailed $p$-values) *$p < 0.05; **$p < 0.01; ***$p < 0.001; ****$p < 0.10
to the work of Soetanto’s (2017) and Scheepers et al.’s (2014), firms that increase collaboration across departments appear to face the liability of aging but not the liability of smallness as they apply these mechanisms.

**Conclusion**

In summary, this study contributes to existing theories and current practices in the entrepreneurship fields (e.g., Strese et al., 2016; Donate et al., 2016; Piercy and Ellinger, 2015; Fain and Wagner, 2014; Korhonen-Sande and Sande, 2014; Xie et al., 2003) by illustrating that CFC is a complex construct affected by a number of drivers. Extant research typically treats it as an exogeneous factor without any attempts to look deeper into its nature and antecedents. This study reaffirms that two such factors, job rotation and joint rewards, are strong and positive drivers of the interdepartmental collaboration, which subsequently may enhance the firm’s performance. However, this observation must be considered in the firm’s context shaped by its size and age, as these two variables strongly and negatively moderate the relationships between CFC and its antecedents. Not all firms will be able to take advantage of this seemingly positive influence of job rotation and joint reward systems on CFC. Rather, only firms that are both small and young will be able to benefit from such HR practices. Thus, firms that strive to increase collaboration across various departments face liability of aging but no liability of smallness.

**Limitations and future studies**

There are a number of limitations to our study. The sample includes only Canadian firms, and the manufacturing sector was not differentiated into subsectors, such as technology. Another limitation is that the industries were not analyzed in manufacturing to gage the extent to which parts were manufactured elsewhere and assembled in Canada, which could bias the results. Future studies could compare subsectors of manufacturing to examine if there is any correlation between types of industries, age, and size. The sample could be expanded to include other countries. Industry sectors could be compared between countries. The results indicate that start-ups and entrepreneurial firms may have a strategic advantage in implementing job rotation and joint reward systems over older and larger firms. Future studies could focus on the optimal firm size and age for engaging CFC and on the optimal level of job rotation and amount of joint reward systems.

**References**


**About the authors**

Narongsak Thongpapanl, PhD, is a Professor of Marketing and Product Innovation at the Goodman School of Business (Canada), Brock University’s CCOVI Research Fellow (Canada), and Chiang Mai University’s RAC Research Fellow (Thailand). His main research interests include new product development, innovation and technology management, e-commerce/m-commerce, wine marketing, strategic marketing management in high-tech environments, marketing knowledge creation and management in highly dynamic settings, and integration of marketing and technology competences. He has published in leading business journals as the JAMS, JIM (International), JIM (Interactive), JBV, ET&P, JPM, Technovation, R&DM, IEEE TEM, IBR, JBR, ISBJ, SBE, JBE, ECRA, and JCIS, among others. Narongsak Thongpapanl is the corresponding author and can be contacted at: TEK@brocku.ca

Eugene Kaciak, MSc, PhD, Dr Hab., is a Professor of Management at the Goodman School of Business (Canada) and Kozminski University (Poland). He received the MSc and PhD Degrees in Economics at Warsaw School of Economics (Poland) and his Doctor Habilitatus degree at Kozminski University. He taught at various business schools in Poland (Warsaw School of Economics, Krakow Academy of Economics, Kozminski University), Algeria (University of Algiers), and Canada (University of Alberta, Laurentian University, Brock University). He has published in JMR, JBR, JSBM, IBR, IEMJ, JLOS, JDE, JIE, among other journals. His research interests include women entrepreneurship, family firms, and international entrepreneurship.

Dianne H.B. Welsh, PhD, SPHR, is the Hayes Distinguished Professor of Entrepreneurship and Founding Director of the Entrepreneurship Programs and Center at The University of North Carolina Greensboro. She holds a PhD Degree from the University of Nebraska-Lincoln and a MSc Degree in Psychology. She is the 2015 Fulbright-Hall Distinguished Chair for Entrepreneurship for Central Europe. Dianne is a recognized scholar in family business, international entrepreneurship, women-owned businesses, human resource management, and franchising with seven books and over 170 publications. She has published in AMJ, JIBS, JBR, ETP, JBV, FBR, JSBM, IEMJ, JFBS, JIK, among other journals.
Shared leadership in entrepreneurial teams: the impact of personality

Rainer Hensel
Research Platform The Next Economy/Research Group Sustainable Talent Development,
The Hague University of Applied Sciences,
The Hague, The Netherlands, and
Ronald Visser
Department of Entrepreneurship and Retail Management,
The Hague University of Applied Sciences, The Hague, The Netherlands

Abstract
Purpose – The purpose of this paper is to develop a model to better understand which personality traits and personal values impact transformational leadership qualities in self-directed entrepreneurial teams as perceived by team members.

Design/methodology/approach – A cohort consisting of six self-directed entrepreneurial teams was selected. A multi-rater system was applied to assess the perceived transformational leadership qualities. A model was developed, using three dimensions of transformational leadership as dependent variables: inspiring others, stimulating interaction among group members and communicating a strong vision.

Findings – The ability to inspire others was predicted by friendliness, measuring a positive labeling of social phenomena. In addition, two positive moderation effects emerged as being related to inspirational capacities: assertiveness and despondency, and assertiveness and emotional empathy interacted. The second moderation effect also impacted the capacity to stimulate group interaction. The personality traits “modesty” and the personal value “human relations” were negatively related to the perceived capacity to communicate a strong vision. Furthermore, a significant but moderate effect of team membership on the capacity to inspire others respectively stimulate interaction seems to exist.

Practical implications – The research results offer valuable opportunities to enhance or to develop those informal, transformational leadership qualities positively influencing entrepreneurial effectiveness.

Social implications – As entrepreneurship in small, self-directed teams is a popular phenomenon, research results add to the understanding of group interaction related to informal leadership.

Originality/value – Shared or informal transformational leadership in the context of self-directed, entrepreneurial teams is a relatively new phenomenon. Integrating a multi-rater assessment of leadership with personality combines interesting perspectives.

Keywords Leadership, Start-ups, Entrepreneurship, Team

Introduction
A strong global tendency exists for entrepreneurs to collaborate in small self-directed teams (Bridge and O’Neill, 2012; Kissi et al., 2015; Unger et al., 2011). Moreover, larger organizations focus on entrepreneurial qualities of employees in projects or self-directed teams based on the need to continuously adapt to the external environment in order to remain competitive (Garvin et al., 2008; Volberda, 1996). Widespread consensus exists that entrepreneurship effectiveness highly depends on innovative, creative and adaptive capacities (Lukes et al., 2017). A fundamental reconceptualization of critical performance indicators and competencies in entrepreneurship has shown that creative, associative thinking in designing innovative business models, and the visionary use of the strength of a social network, play a crucial role in entrepreneurial success (Venkataraman et al., 2012).

Innovative entrepreneurship seems to form a key issue in research on entrepreneurial effectiveness, as it studies a form of entrepreneurship that generates a unique product/service...
with high competitive value (Brandstätter, 2011; Oosterbeek et al., 2010). Wide scientific consensus exists that innovation in teams demands transformational leadership qualities, such as inspiring others, stimulating frequent and high-quality social interaction, expressing strong entrepreneurial visions, and using the talents and individual capacities of team members (see for an overview in Bass, 1999; or in Garcia-Morales et al., 2012; Howell and Avolio, 1993; Özaralli, 2003). Transformational leadership qualities have a positive impact on team members’ perceived empowerment of critical successful behaviors, as well as on team members’ creative capacities – success criteria which have proved to be directly related to team effectiveness (Gumusluoglu and Ilsev, 2009; Özaralli, 2003). In addition to this positive impact on individual capacities, transformational leadership qualities are supportive for an organizational innovation performance (Gumusluoglu and Ilsev, 2009) and an innovative team climate, which are needed for the entrepreneurial exploitation of business opportunities (Howell and Avolio, 1993). These insights have important implications, namely that transformational leadership qualities positively influence entrepreneurial abilities on an individual, as well on a team and organizational level. Further convincing evidence for the importance of transformational leadership qualities for entrepreneurship organized in teams stems from research showing that these transformational leadership qualities enhance new ventures or start-ups performance (Ensley et al., 2006) and venture growth in small, entrepreneurial firms (Baum et al., 1998).

Leadership in self-directed teams is not formally appointed or hierarchically structured. This form of leadership is referred to as informal or shared leadership (Carson et al., 2007; Pearce, 2004). However, very little is known about transformational leadership qualities when the major leadership style can be characterized as being “shared and informal” and entrepreneurial teams are self-directed. Consequently, in this paper the relationship of perceived transformational leadership qualities with personality and personal values in small self-directed teams will be studied, in which shared informal leadership is the dominant leadership style. Personality and personal values, both being important social constructs, should be regarded as a key, dispositional characteristics related to personal qualities or competencies (Arnold et al., 2005, pp. 316-319). A dispositional characteristic implies that these variables function as important pre-dispositions to outperform (Smith and Schneider, 2004).

The results of this study could be quite useful for the (strategic) training and development of shared, informal leadership qualities in small, self-directed entrepreneurial teams, performance management, as well for HRM appraisal techniques. The relevance of this insight is accentuated by studies showing that the design of self-directed team-work within organizations, and competence development, are important for the effectiveness of an innovational entrepreneurial process (Harper, 2008; Mitchelmore and Rowley, 2010; Shipton et al., 2006). Moreover, these studies illustrate that designing self-directed team-work and competence development are important for innovational and entrepreneurial capacities of teams and organizations.

From an economic, national point of view, the rationale to conduct this study follows the claim that enhancing our understanding of an entrepreneurial effectiveness is utterly relevant, as entrepreneurialship and entrepreneurial qualities are key for economic strength (Aghion et al., 2005; Oosterbeek et al., 2010; Unger et al., 2011; Van Praag and Versloot, 2007).

Further theoretical considerations and literature review
The global tendency to organize entrepreneurial activities to collaborate in small self-directed teams seems to make sense, as studies indicate that it is related to entrepreneurial effectiveness (Bridge and O’Neill, 2012; Kissi et al., 2015; Unger et al., 2011). Starting a business in a team adds to the chances of success (Kraaij and Elbers, 2016), especially when technological and business-oriented expertise has to be combined. When multiple entrepreneurs combine their
talents and readily available resources, they can co-create new business opportunities (Sarasvathy, 2001). Of course, a higher number of team members increases the possibilities to include and use the strength of a social network, an important key performance indicator in innovative or disruptive entrepreneurship (Venkataraman et al., 2012). In addition, research on the shared mental model framework has shown that multi-dimensional group view enhances individual visions or perspectives on complex information (Mathieu et al., 2000). Studies show that team starters grow more rapidly, obtain more revenue and make profit. In line with these findings, start-up incubators and accelerators frequently require start-ups to have multiple founders, ideally from different backgrounds (Brummelkamp and Timmermans, 2013). Moreover, if innovation is highly relevant for an entrepreneurial success, teams should be highly autonomous and the leadership style should be informal and shared. The innovative and adaptive capacities of semi-autonomous groups, with a directive hierarchical leadership style often labeled as self-managed groups, are inferior to those of highly autonomous self-directed groups (Keuning et al., 2010; O’Connell et al., 2002).

Informal or shared leadership seems to have a stronger positive impact on the entrepreneurial or intrapreneurial team performance than traditional vertical leadership (Antonicc and Hisrich, 2001; Ensley et al., 2006; Pearce et al., 2008). Moreover, poor performing teams are dominated by leaders applying traditional leadership styles by giving task directives and structuring tasks in a top-down leadership style (Pearce, 2004). Informal leadership seems additionally valuable in the context of knowledge work or knowledge innovation in a work context that is characterized by entrepreneurship in complex environments (Wang et al., 2014). These findings are consistent with the growing acknowledgment that besides technological determinants of innovations, there are social aspects of organizing that seem to make a significant difference for the innovative capacities and competitive advantage of SME and large organizations (Mol and Birkinshaw, 2009; Volberda et al., 2013). One of the salient management innovations is working in self-directed teams (e.g. Pfeffer and Veiga, 1999).

Transformational leadership qualities
As pinpointed earlier, wide consensus exists that transformational leadership qualities are important for teams to be innovative, especially when innovative entrepreneurship is highly relevant for organizational effectiveness (see for an overview in Baum et al., 2014, pp. 145-146; and in Garcia-Morales et al., 2012). In contrast to rational, goal-directed leadership (often referred to as transactional leadership), transformational leaders recognize the affective needs and responses of employees (House and Shamir, 1993). It is worth highlighting that transactional leadership is negatively related to team- and business-unit performance, especially when innovation is demanded to cope with complex and competitive markets (Howell and Avolio, 1993). A qualitative study examining the leadership behaviors of 55 founder-CEOs illustrates that in the initial stages of starting up a company leaders typically display transformational leadership, while in the later growth stages it shifts toward transactional leadership (Baldegger and Gast, 2016). Strong and salient relationships exist between personality and transformational leadership qualities (Judge and Bono, 2000). Extraversion and agreeableness have an important positive impact on transformational leadership. In addition, when innovation and creativity are key performance indicators, openness proves to be highly relevant (Bono and Judge, 2004). But little is known about the relatedness of the described transformational leadership qualities to personality and personal values in the context of shared entrepreneurial leadership qualities in small, self-directed teams.

Therefore, the following four dimensions of transformational leadership are core focus points in this study: idealized influence, inspirational motivation, intellectual stimulation and individual consideration (Bass, 1998; Bass and Avolio, 1994).
The capacity to inspire others, elicit initiative and interaction among team members, and communicate a strong vision should be regarded as core competencies of the creation of effective and innovative shared models in self-directed groups (Bridge and O'Neill, 2012; Mathieu et al., 2000; Kissi et al., 2015).

Strong relationships exist between transformational leadership and the Big 5 personality traits extraversion and agreeableness (see for an overview in García-Morales et al., 2012). Consequently, researchers argue that the globally applied Big 5 model of personality should be applied in entrepreneurial research when personal qualities or competencies are important variables in the research design (Zhao and Seibert, 2006).

It seems to be righteous to assume that the investigated leadership qualities, especially the transformational leadership quality to stimulate interaction, are dependent on group dynamics. In this study, the influence of team membership will be analyzed by applying a multi-level approach. The application of this multi-level methodology is based on studies showing that interaction/moderation effects between individual and team characteristics predict a team performance (Gumusluoglu and Ilsev, 2009; Howell and Avolio, 1993; Özarálli, 2003).

The central research question is:

**RQ1.** Are shared, informal leadership qualities in small, self-directed entrepreneurial teams related to Big 5 personality traits, personal values and team membership?

**Methodology**

**Participants**

To analyze the relationship described above, a cohort was selected in which individuals were comparable in entrepreneurial experience and expertise, such as finance and marketing. Leadership qualities could otherwise be related to a variance of experience or entrepreneurial expertise, not to a variance of leadership qualities and their related personality characteristic or personal values. Therefore, undergraduate students of a development program in business administration in higher vocational education, dedicated to the development of both entrepreneurial and intrapreneurial competencies, were selected to participate in this study ($n = 66$, 6 teams; 71 percent male, 29 percent female; age: $M = 21.2/SD = 2.1$). All the measures could be collected for everybody in this course, only eight individuals had to be excluded because of a low number of ratings ($< 6$). All participants shared very homogeneous entrepreneurial experiences, as they had previously worked in different small entrepreneurial start-up teams for about eight months, one year prior to the two-day training course.

**Measures**

To judge transformational leadership qualities, a multi-rater system was designed. Every team member was rated by all the other team members within one team, judging each team member on four items. The average number of raters was 7.1 for each participant of the study. The applied methodology follows research showing that the reliability of a multi-rater system is superior to the construction of multiple items, but it demands six to eight raters to exceed the reliability level of 0.7 (Hensel et al., 2010). Even more important, by using external raters instead of a self-assessment instrument, measuring problems with respect to common method bias as well as sample bias can be avoided.

The measurement of transformational leadership qualities was based on the four core dimensions of transformational leadership: idealized influence, inspirational motivation, intellectual stimulation, and individual consideration.

A confirmative factor analysis was conducted to look for the construct validity of the four latent variables of shared, informal leadership, which is measured by four rating items.
A model was developed and tested using MPlus 7.4 software. Following Smith and Schneider (2004) and Hensel et al. (2010), special attention will be given to the subscales of the Big 5 model of personality. Consequently, a multi-level model was constructed to test for the influence of team characteristics on the dependent variables. Personality traits and personal values were included as level 1 variables, and team membership as level 2 variables.

To measure personality, a Big 5 test was designed, based on the globally applied five-factor model of personality (McCrae and Costa, 1997). To measure personal values, the four factor instrument of Robert Quinn was used as a basis for an assessment test, each dimension extended with four items (Quinn, 1991; Quinn et al., 1996).

**Data analysis**

The explorative and confirmative factor analysis to test the five domains and their related six-facet subscales of the personality test, as well as Quinn’s four dimensional model used to measure personal values, will be executed using MPlus 7.4 software. To seek and analyze moderation effects, dummy variables will be created based on the results of a preliminary multivariate regression analysis (method: stepwise) in SPSS (Version 23). The final model will be developed and tested using MPlus 7.4 software.

**Results**

The collinearity diagnosis revealed that no collinearity problems seem to exist. All of the tolerance levels were significantly higher than 0.1, and all VIF levels were significantly lower than 10; the highest VIF level being 3.675, indicating that no collinearity problems seem to exist (Menard, 2002; Field, 2009). In addition, the analysis of small eigenvalues did not reveal any collinearity problems.

**Explorative and confirmative factor analysis**

With respect to the designed four items to measure the experienced transformational leadership qualities, the fit indices revealed that a one-factor model proved to be superior (RMSEA = 0.00, CFI = 1/TLI = 1, SRMR = 0.00, therefore, a saturated model).

Only the items measuring inspiring others, stimulating interaction and communicating a strong vision loaded with high factor loadings to one factor. Consequently, the fourth item measuring individual consideration was eliminated from the model.

**Shared, informal leadership in small entrepreneurial teams**

The model in which the subscales and the facets were included proved to be superior to the model that was only using the Big 5 major dimensions, the domains. Bootstrapping (10,000) was used because of the small number of participants ($n = 66$).

**Analysis of the (endogenous) variable shared, informal leadership**

The upper part of the model represents the measurement part of shared, informal leadership. The latent endogenous variable shared, informal leadership is measured by three multi-rated judgments on the following three leadership qualities:

1. Quality 1: this person has the ability to inspire team members;
2. Quality 2: this person stimulates interaction among team members; and
3. Quality 3: this person communicates a strong vision.

Therefore, shared, informal leadership is the only latent, endogenous variable, measured by three exogenous variables, qualities 1-3. Fit indices of this measurement part of the
model are good, but when analyzed separately from the rest of the model, it proves to be a saturated model (RMSEA: 0, CFI: 1/TLI: 1, SRMR: 0). The construction of this endogenous latent variable, shared, informal leadership, proves to be very satisfying. Table I shows that all three leadership qualities are significant and strong measures of this endogenous variable.

The lower part of the model represents the structural part. Only manifest, exogenous variables were used; therefore, the lower part should be considered to be a simple regression model with three dependent variables, being leadership qualities 1-3. The reason to include only the exogenous or manifest variables in this part of the model is that the maximum number of iterations is exceeded when all related exogenous measures of the Big 5 facet subscales are included in the model, and the moderation effects are calculated by using the XWITH command. The applied methodology is based on research of McNeish (2017), showing that the use of only exogenous variables is allowed when the measures originate from a model with a proven validity. This is the case for the Big 5 model of personality (Bono and Judge, 2004) and the model of Quinn et al. (1996). It should be highlighted though, as mentioned in the introduction, that the central focus of this study is to look for similarities and differences in the way personality and personal values are related to the three specific transformational leadership qualities.

The fit indices of the model illustrated in Figure 1 are good/very acceptable (Geiser, 2012): RMSEA: 0.058; CFI: 0.988/TLI: 0.974; $\chi^2$ test of model fit for the baseline model: $\chi^2$ value: 224.954/degrees of freedom: 24/p-value: 0.000; SRMR: 0.054.

The lower, structural part of the model shows that all relations of the three specific success criteria, the three leadership qualities with personality and values, are significant and strong.

In Table II, the predictors of leadership quality 1 measured by the rating of the capacity to inspire others are shown.

The estimated proportion explained variance of this part of the model is high: 33 percent ($R^2$ (stand.) estimate: 0.33). Table II shows that the ability to inspire others is related to two moderations, and that interaction effects seem to exist, both having a significant and a relatively strong positive effect on the experienced capacity to inspire other team members. Moderation effects exist between the sub-skill assertiveness and despondency, and between assertiveness and emotional empathy.

One of the six subscales of the domain dimension extraversion is assertiveness ($p < 0.001$), which measures assertive behaviors. Despondency, originating from the Big 5 domain dimension neuroticism, measures a tendency to experience feelings of guilt and low self-efficacy when confronted with frustrations. It should be accentuated that the moderation effect between assertiveness and despondency is positive, indicating that higher forms of despondency lead to higher experienced capacities to inspire others. The leadership quality to inspire others is also related to friendliness. Friendliness measures the capacity to enhance the cohesion in groups and between people.

Table III shows the significant relations of personality traits with the capacity to stimulate interaction between group members.

The estimated proportion explained variance is again relatively high, 27 percent ($R^2$ (stand.) estimate: 0.2687).

<table>
<thead>
<tr>
<th>Shared, informal leadership measured by</th>
<th>Estimate</th>
<th>Two-tailed p-value</th>
</tr>
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<tbody>
<tr>
<td>Quality 1: ability to inspire others</td>
<td>0.762</td>
<td>0.000</td>
</tr>
<tr>
<td>Quality 2: stimulate interaction</td>
<td>0.745</td>
<td>0.000</td>
</tr>
<tr>
<td>Quality 3: strong vision</td>
<td>0.627</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Furthermore, the two moderation effects which are significantly related to the capacity to inspire are significantly related to quality 2, the capacity to stimulate interaction.

Table IV shows the significant relations of personality traits with the capacity to communicate a strong vision.

The estimated proportion explained variance is high, 35 percent ($R^2$ (stand.) estimate: 0.3476). The leadership quality to communicate a strong vision is related to the moderation effect between assertiveness and emotional empathy, to the subscale despondency and to the subscale modesty. Modesty measures an unpretentious attitude when comparing performance with significant others and a humble way of attributing success to oneself.
A higher score on this dimension is negatively related to the experienced leadership quality to communicate a strong vision. The same holds for the variable values on human relations, one of the four major dimensions of the personal values system of Quinn.

**Multi-level analysis**

In the multi-level model, team membership is included as a level 2 variable. A basic multi-level analysis revealed the following results on the intra-class coefficient:

- variable correlation leadership quality 1, inspire others: 0.07;
- variable correlation leadership quality 2, stimulate interaction: 0.1; and
- variable correlation leadership quality 3, strong vision: 0.05.

Although relatively small, all of these intra-class correlations are relevant (Geiser, 2012) and justify the testing of the (multi-level) hypothesis that group membership influences the studied transformational leadership qualities. This is especially the case for quality 2, the intra-class coefficient being 0.1, and to a lesser degree quality 1, inspire others, with an intra-class coefficient of 0.07.

For leadership quality 1, the capacity to inspire others, a significant level 2 influence was found. The residual variance of the multi-level constraint one-way random effects ANOVA model is 0.23, being significantly lower than the variance of the null (intercept-only) model, being 0.37. The %between% effect was significant, with \( p < 0.001 \). When compared to the simple regression model and selecting only the simple regression model as described above, the proportion explained variance \( (R^2) \) of the multi-level constraint model increases from 33 to 37 percent.

For quality 2, stimulate interaction, the residual variance of the multi-level constraint one-way random effects ANOVA model is 0.18, being significantly lower than the variance of the null (intercept-only) model, being 0.29. The %between% effect has a significance of \( p < 0.001 \). When compared to the single-level regression model of leadership quality 2, the proportion explained variance \( (R^2) \) of the multi-level constraint model increases from 26 to 28 percent.

Therefore, the multi-level analysis revealed that a significant but small-to-moderate effect (Geiser, 2012) of team membership on the capacity to inspire others and stimulate interaction seems to exist.

In summarizing the results, one can conclude that significant relationships exist between the moderation/interaction effect between assertiveness and emotional empathy and of all three experienced leadership qualities with the capacity to:

1. inspire others;
2. to stimulate interaction; and
3. to communicate a strong vision.

<table>
<thead>
<tr>
<th>Table IV.</th>
<th>Estimate</th>
<th>Two-tailed p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderation between: assertiveness × emotional empathy</td>
<td>0.510</td>
<td>0.003</td>
</tr>
<tr>
<td>Despondency</td>
<td>0.361</td>
<td>0.001</td>
</tr>
<tr>
<td>Modesty</td>
<td>−0.194</td>
<td>0.005</td>
</tr>
<tr>
<td>The personal value on: human relations</td>
<td>−0.225</td>
<td>0.004</td>
</tr>
</tbody>
</table>

Leadership quality 3: capacity to communicate a strong vision \( (R^2 \) (stand.) estimate: 0.3476)
The moderation/interaction effect between assertiveness and despondency is significantly related to the leadership qualities, with the capacity to:

1. inspire others; and
2. to stimulate interaction.

Moreover, the personality trait friendliness was positively related to the leadership quality inspiring others. Higher scores on despondency but lower scores on modesty and lower scores on the personal value dimension “human relations” are related to a higher experienced capacity to communicate a strong vision.

Furthermore, moderate but significant effects of team membership exist on the experienced leadership quality 1: inspire others, and on leadership quality 2: stimulate interaction.

**Discussion**

In the final model presented in Figure 1, its fit indices, regression weights, and proportion explained variances all give strong support to the theoretical insight into the impact of the subscales of the Big 5 model of personality. To a lesser degree, the personal value on human relations are quite important for the experienced transformational leadership qualities in small, self-directed, entrepreneurial teams, when shared or informal leadership is the dominant leadership style.

Furthermore, although of lesser influence, a small but relevant effect of team membership exists. This leads us to conclude that specific personality traits, especially their moderation effects, are strongly related to the three transformational leadership qualities. Values on human relations and team membership have a small but relevant effect, and the results justify the conclusion that a major influence originates from personality traits. This means that the intra-psychological construct like personality plays a major role in transformational informal or shared leadership qualities.

Although the effect of team membership is relatively modest, the role of team membership should not be underestimated. Research described earlier has revealed that an entrepreneurial team performance is dependent on individual as well as team/organizational characteristics (Gumusluoglu and Ilsev, 2009; Howell and Avolio, 1993; Özaralli, 2003). Individual capacities relate to creativity and innovative, associative thinking and reasoning. However, on an organizational level, team variables like aggregated team members’ visions on perceived empowerment and especially a climate supporting innovation proved to be highly relevant. The implication of these insights is that in the context of performance management, furthermore in the training and development of transformational leadership qualities, group dynamics on inspirational and visionary processes should be an elementary part of the learning and development curriculum or the appraisal techniques.

Moreover, the model seems to show that the three success criteria, with respect to the experienced shared, informal leadership, offer very good opportunities to operationalize this form of leadership and self-directed teams. This implicates that for shared informal leadership qualities related to transformational leadership, the qualities to inspire others to stimulate interaction and communicate a strong vision seem to be highly relevant. The fact that the fourth transformational leadership dimension, individual consideration, was excluded from the model is very much in line with other research.

Studies have shown that the capacity to empower team members in an entrepreneurial context are related to two transformational leadership dimensions (Baum et al., 1998; Özaralli, 2003):

1. inspirational influence on the capacity to inspire others; and
2. expressing a strong vision.
The empowerment of team members and employees proves to have a high conceptual overlap with the transformational leadership dimension individual consideration. This transformational leadership quality is related to the stimulation of individual talents and capacities. This leads us to conclude that the use, activation and stimulation of talents and individual capacities in the context of small, self-directed entrepreneurial teams is positively influenced by the leadership qualities: inspiring others, and expressing a strong vision.

**Leadership qualities 1 and 2: inspiring others and stimulating interaction**

The capacity to inspire others, often labeled as inspirational influence, is a major dimension of the transformational leadership model (for an overview see: Joshi *et al.*, 2009). This dimension enhances: the perceived empowerment of team members (Özaralli, 2003), team members’ individual creative capacities (Gumusluoglu and Ilsev, 2009), a positive climate for organizational innovation (Sarros *et al.*, 2008), and shared perceptions on trust, general goal commitment and commitment of team membership (Joshi *et al.*, 2009). All of these issues have proved to be highly relevant for a team performance (Arnold *et al.*, 2005). Moreover, an inspiring leader is perceived by followers to be more knowledgeable and sensitive to a broad diversity of dysfunctional group processes to cope effectively with complex problems (Bass, 1998).

The level 1 analysis shows that the moderation effect between assertiveness with emotional empathy and assertiveness with despondency is highly relevant. Both moderation effects are significantly related to these two leadership qualities: the capacities to inspire others and to stimulate team member interaction. This highlights the importance of the two combinations of the facets assertiveness with emotional empathy and assertiveness with despondency.

**Assertiveness** (*p < 0.001*) measures assertive behaviors, self-directedness and initiative during social interactions, but assertiveness can be characterized by a strong focus on own interests. It is not surprising that this Big 5 domain dimension proves to be highly relevant for the experienced shared, informal leadership in small entrepreneurial teams. The subscale assertiveness originates from the domain dimension extraversion, a domain dimension closely related to transformational leadership qualities (Bono and Judge, 2004), which are again important to be innovative and for empowering others. But the moderation effect between assertiveness and empathy highlights the insight that experienced shared, informal leadership is related to a form of assertiveness and self-initiative, which combines these leadership qualities with strong(er) empathy and the desire to understand the emotions of others. It should be accentuated that the central aim of these small entrepreneurial groups was to develop shared, informal leadership skills. In the absence of an appointed leader, the participants had to develop shared mental models in order to accomplish the various group assignments. The “shared mental models” framework is a globally applied theoretical framework (Jonker *et al.*, 2011, pp. 132-151) and it is interesting to see how specific personality traits enhance the leadership ability to inspire others and stimulate interaction in small entrepreneurial teams to develop a shared vision.

The moderation effect between assertiveness and despondency is an interesting one. Despondency measures a tendency to experience feelings of guilt and sadness. It is closely related to a lower frustration tolerance. A lower frustration tolerance is defined as a tendency to give up quickly when activities are blocked or frustrated (Costa and McCrae, 1992). Despondency originates from the domain dimension neuroticism. Most research results, especially meta-studies, point out that higher averages on the facets originating from the domain dimension neuroticism have a negative influence on human performance (Barrick *et al.*, 2001; Barrick and Mount, 1991). However, in this study the predictive directions of this dimension despondency is positive, meaning that higher averages on this dimension lead to higher forms of experienced shared, informal leadership qualities.
Although this might sound confusing, quite a few theoretical frameworks seem to be available to explain this positive influence of higher averages on despondency.

Studies on brain learning have taught us that effective brain learning in complex and ambiguous work and learning situations demands alertness (Li et al., 2015). Lower scores on despondency can be interpreted as a low(er) form of alertness, the latter being evoked by lower anxiety levels (Heilig, 2004). The attribution theory has taught us that individual differences with respect to attributing success to oneself or to external causes are related to despondency (Arnold et al., 2005). The same holds for the self-efficacy framework (Bandura, 1993). Based on these results, it is hypothesized that assertiveness is only experienced as a leadership quality by team members in small entrepreneurial teams, if it is also combined with a justified self-estimation based on reflectiveness with respect to self-efficacy and alertness needed to be innovative and learning in complex and ambiguous environments.

Another explanation for the value of despondency in combination with assertiveness with regard to experienced shared, informal leadership qualities comes from the research on creativity. The “mood-as-input” model of Martin et al. (1993) suggests that people use their mood as a signal of what is well or wrong in a specific situation. A negative mood therefore spurs individuals to change the situation at hand. In this line of reasoning, despondency can be seen as a change initiating facet of personality. However, it is important to note that this mechanism might only be of value when the tasks that a team has are short in nature. Previous studies have found that a low frustration tolerance reduces perseverance. However, the measured shared, informal leadership qualities in the context of a two-day training program as well as the effect of despondency on effectiveness might not be displayed as they seem to be long-term effects.

Furthermore, the leadership quality inspiring others is related to the personality trait friendliness. Friendliness is a Big 5 subscale, originating from the domain dimension extraversion. Friendliness measures interest in others and friendliness toward others. Higher averages on this dimension enhance the capacity to be effective in the context of change management, team conflict solving, team development and entrepreneurial effectiveness, because high scores enhance the capacity to strengthen the cohesion whilst interacting with significant others (Smith and Schneider, 2004). This is a very important aspect of your style of cooperation, working with significant others, for team effectiveness, attracting customers and for effective conflict solving. The results for friendliness accentuate the importance of cohesion and effective win-win conflict solving, as these issues are highly important for effective team development and team performance (Arnold et al., 2005).

However, it should be accentuated that a second-level influence of group membership on the capacity to inspire other seems to exist. Therefore, it seems to be justified to deduce that this informal leadership quality is not only related to individual characteristics, and furthermore to the synergy of group members to inspire each other. This leads us to conclude that in organizational or vocational developmental programs on informal leadership, attention should be given to the quality of the inspiring group processes.

Leadership quality 3: communicating a strong vision

Just as the capacity to inspire others, expressing a strong vision has a positive impact on team members’ perceived empowerment of critical successful behaviors (Baum et al., 1998). This leadership quality, communicating a strong vision, is also related to the moderation effect of assertiveness with emotional empathy and is often labeled as compassion. Therefore, assertiveness in combination with understanding emotions of other team members is relevant for this leadership quality.

Subsequently, communicating a strong vision is also related to the personality trait modesty, a Big 5 subscale originating from the domain dimension agreeableness. Lower scores on modesty are associated with lower experienced capacities to communicate a
strong vision. It is not really difficult to interpret this result. A strong vision should be supported, verbally and non-verbally, by a relatively strong belief in oneself and one’s ideas. It is very reasonable to assume that higher scores on modesty lead to a more modest presentation of the personal entrepreneurial vision. This study seems to implicate that this could undermine the capacity to create enthusiasm or a strategic goal commitment of team members, based on a strong personal entrepreneurial vision. Strategic goal commitment is strongly and positively related to general team performance (Latham and Locke, 1991).

The only leadership quality being significantly related to personal values is leadership quality 3, to communicate a strong vision. The line of reasoning described above, with respect to the personality trait modesty, also seems to be applicable to the personal value on human relations. It means that strong values on this dimension are probably associated with higher values regarding the importance of good social relationships. The latter, of course, is again associated with a strong external focus of the interests and emotions of others (Quinn, 1991). Consequently, high values on human relations could undermine a strong focus on own, personal entrepreneurial visions, and therefore weaken the expressed authenticity.

In summarizing the results, the study shows that for experienced shared, informal leadership qualities measured by the capacity to inspire others, stimulate interaction and communicate a strong vision, the following personality traits associated with specific leadership qualities are utterly relevant:

- assertiveness/self-initiative, combined with emotional empathy;
- friendliness (enhance group cohesion);
- lower modesty, emotional empathy and values on human relations (authenticity);
- values on flexibility/innovation combined with openness for underlying mechanisms of behavior; and
- team capacities related to inspiring others and initiative.

Therefore, the qualities and their related personality traits and values seem to be relevant for a deeper understanding of leadership qualities in small, shared, informal organized entrepreneurial teams.

**Conclusions**

The research results reveal that the sub-dimensions of the Big 5 model of personality, and to a lesser extent personal values, are relevant for informal leadership qualities in small entrepreneurial teams. From a theoretical point of view, it is very interesting to see that the sub-dimensions (facets) offer more insights into these leadership qualities, when compared to the Big 5 domain dimensions. The most salient implication of the research results is that these dimensions offer interesting developmental profiles of leadership competencies in small, entrepreneurial self-directed teams. The training and development of entrepreneurial leadership competencies is highly relevant, as it enhances entrepreneurial success (Kissi et al., 2015).

The above-mentioned personal qualities offer good possibilities for reflection on the strengths, weaknesses and performance management on transformational leadership qualities in small, self-directed, entrepreneurial teams. Both the reflections and performance management could take the form of a double loop learning process, by analyzing and developing underlying transformational leadership qualities, such as personal qualities related to Big 5 personality traits and personal values. This can be done on an individual as well as on a group level. As explained in the introduction, successful entrepreneurship highly depends on innovational capacities, which demands transformational leadership qualities.
An individual reflection on personal qualities and personal effectiveness, as well as a timely activation of competencies or personal qualities during the launch and pre-launch phase, is important for an entrepreneurial success (Erken et al., 2016; St-Jean, 2012).

Future research should clarify the complex relationship between despondency and the capacity to inspire and stimulate interaction, as facets originating from the domain dimension neuroticism can hamper general performance. Consequently, future research could analyze whether despondency has an initial, positive short-term effect in the early stages of venture start-up. But because despondency has a negative effect on frustration tolerance, it could have a long-term negative effect as the business develops. This might be caused by long-run strategic activities being blocked, as negative frustration tolerance cannot be transformed into creative problem solving.

An important limitation of this study is that only students participated in it. Future research should analyze whether the research findings are generalizable to other populations. However, most start-up teams hold team members with average ages between 20 and 30 years. From a methodological point of view, it should be highlighted that a strict selection of respondents should take place because the teams should be comparable in entrepreneurial experience and entrepreneurial expertise. Moreover, it would be very interesting to see whether professional development interventions such as training and coaching, focusing on transformational qualities, would enhance innovative and adaptive capacities.

References


Costa, P.T. and McCrae, R.R. (1992), *Revised NEO Personality Inventory (Neo Pi-R) and Neo Five Factor (Neo-FFI) Inventory Professional Manual*, Psychological Assessment Resources Inc., Odessa, FL.


**Further reading**


**Corresponding author**

Rainer Hensel can be contacted at: r.w.hensel@hhs.nl

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