

# **The Organizational Pervasiveness of Entrepreneurial Orientation across Hierarchical Levels**

**Abstract** This contribution dedicated to Entrepreneurial Orientation (EO) is centred on the homogeneity of EO across hierarchical levels within organizations. According to the resource-based view of the firm, a path analysis through multiple regression models aims at highlighting significant differences between the perceptions of two hierarchical groups – work group leaders and work group members. Through reports from 301 individuals in four companies the attention is drawn to the organizational homogeneity of EO, which has not so far been empirically tested. Contrasting the perceived EO and the multiple relationships between two different hierarchical levels, reveals no significant differences between work group leaders and work group members. Thus we can continue to rely on the organizational homogenous pervasiveness of EO. However, as one of the first studies in this sphere this contribution has its limitations.

**Keywords:** entrepreneurial orientation · entrepreneurial orientation construct · individual entrepreneurial orientation · work group entrepreneurial orientation

## **INTRODUCTION**

As one of the most widely recognized and extensively discussed concepts within the research pool of entrepreneurship (Wales *et al.*, 2011), entrepreneurial orientation (EO) has been presented in a proper light for the last three decades. While many scholars define the EO construct as a universal toolkit for measuring EO as a major engine for the growth and performance of an

organization (e.g. Covin and Slevin, 1991; Jantunen *et al.*, 2005; Lisboa *et al.*, 2011; Dess *et al.*, 2011; Moruku, 2013), other researchers criticize this concept with respect to its international multidimensionality, validity and reliability (e.g. Lumpkin and Dess, 1996; Lyon *et al.*, 2000; George, 2011). The research stresses that the construct remains consistent as a measurement across cultures (Swierczek and Ha, 2003; Hansen *et al.*, 2011), and that multidimensionality in EO is mainly a conceptual consideration (Covin and Lumpkin, 2011; Covin and Wales, 2012). More specifically, several seminal contributions rely on the organizational pervasiveness of the construct throughout different levels (e.g., Covin and Slevin, 1991; Atuahene-Gima and Ko, 2001; Covin *et al.*, 2006; Wiklund and Shepherd, 2003; 2005), although according to Wales *et al.* (2011) empirical investigations are rare in this framework. In the resource-based view (RBV), this article aims to shed light on the mystery surrounding of the homogenous pervasiveness of the concept of EO as an organizational-wide phenomenon with respect to hierarchical perspectives.

To illustrate EO within institutions, differences and varying relationships at various company levels – the individual, the work group, the firm – perceived by hierarchical groups (work group members and work group leaders) are explored and compared. Of particular interest is whether the set of predictors in EO at different organizational levels results in multiple regression models that perform equally for the two defined different hierarchical groups entitled work group leaders – representing the traditional informants of the EO construct – and work group members – to demonstrate the pervasiveness of the EO concept as an organization-wide phenomenon throughout diverse levels. Testing the path of EO levels and the final perceived EO-performance relationship in RBV as assessed by different essential organizational groups of individuals – work group leaders and work group members – in four organizations, will enhance the descriptive perspective of the theory by Wales *et al.* (2011) on the diverse EO manifestation. Furthermore, it will also examine

the traditional single informant way of measuring the EO-performance relationship in RBV from a methodological point of view. Thus prior investigations dedicated to individual EO (e.g., Joardar and Wu, 2011; Bolton, 2012; Langkamp Bolton and Lane, 2012; Goktan and Gupta, 2013; Lechner and Gudmundsson, 2014) and to the EO of work groups (e.g., Van Doorn *et al.*, 2013; Li and Liao, 2010) are merged. This examination of EO as a homogeneous entrepreneurial behaviour within an organization will serve to enhance EO research as well as practices for fostering entrepreneurship at different levels. As such, the following research question will be investigated:

*Does the long assumed organizational homogeneity of EO pervade similar perceived relationships at different EO levels within an organization as reflected in different hierarchical groups such as work group leaders and work group members?*

First of all, this article introduces the theoretical background for developing the hypotheses. After outlining the methodological approach, the results are examined through a series of tests and analyses. Finally, in the discussion section, the critical conclusion and the theoretical and practical implications are summarized including the limitations of this investigation to draw the attention to further recommended research avenues in this context.

## **THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT**

First of all, firm-level EO is defined as “*the strategy-making processes that provide organisations with a basis for entrepreneurial decisions and actions*” (Rauch *et al.*, 2009, p. 762). Researchers have so far relied on the organizational pervasiveness of EO homologically and/or homogenously across all organizational levels without examining, explaining or arguing for its justification in-depth (Covin and Slevin, 1991; Wiklund, 1999; Krauss *et al.*, 2005). In addition, a

whole research stream dedicated to individual EO has grown into a serious body of literature within the research field of entrepreneurship (e.g. Joardar and Wu, 2011; Bolton, 2012; Langkamp Bolton and Lane, 2012; Goktan and Gupta, 2013; Lechner and Gudmundsson, 2014). Generally, all firms are heterogeneous because every employee is an individual, forming multiple groups that differ in several characteristics. However, conceptionally, some work groups evince a clear pattern with similar characteristics, thus being more homogenous than heterogeneous (Gruenfeld and Tiedens, 2010). Moreover, in this regard gender also plays a role in perceptions of EO (Fellnhofer *et al.*, 2016). Overall, the latent differences between hierarchical groups are relevant for the traditional single informant way when assessing the EO-performance relationship, which is the most implemented methodological design in the EO literature (e.g. Calantone *et al.*, 2002; Wiklund and Shepherd, 2003; Jantunen *et al.*, 2005; Wang, 2008; Merlo and Auh, 2009). Therefore, homogeneity across these groups would be pervasive and manifest an organizational homogenous EO construct in the RBV literature. Penrose (1960) favours the RBV, claiming that an organization represents a grouping of resources. Barney (1991) emphasized that the resources are rare, inimitable, valuable and non-substitutable to create competitive advantage and impact firm performance. In this study, EO is the firm's resource for improving firm performance across levels. In particular, this study builds on the measurement instrument developed for individual EO by Langkamp, Bolton and Lane (2012), which has only been tested on and validated by 1,100 students. Several researchers support the view that personality traits correlate with EO (e.g. Zhao *et al.*, 2010; 2005; Okhmina, 2010), which also stresses the adequacy of the EO construct for measurement on an individual basis. At the heart of the individual EO construct, individuals explicate the entrepreneurial behaviour of an organization (Lee and Peterson, 2000; Poon *et al.*, 2006; Joardar and Wu, 2011; Bolton, 2012; Langkamp Bolton and Lane, 2012). Accordingly,

individual EO will influence different levels of EO within an organization. Consequently, with respect to the assumed organizational pervasiveness of EO (Wales *et al.*, 2011) and the validated scale to measure one's individual EO (Bolton, 2012), the following hypotheses are presented.

***Hypothesis 1: Different groups of individuals promote work group's EO in the same way.***

*Hypothesis 1a: Work group leader's individual EO promotes work group's EO.*

*Hypothesis 1b: Work group member's individual EO promotes work group's EO.*

From individual EO up to firm EO, this study assumes that EO pervades organizations to the work group level as a link between individual EO and firm EO. In the framework of work groups, as sets of individuals working together towards defined objectives, Weaver *et al.* (2002) and Van Doorn *et al.* (2013) argue that key managers have the ability to facilitate the value-creating potential within the EO-performance relationship. However, only few scholars (e.g. Weaver *et al.*, 2002; Zhang *et al.*, 2013; Van Doorn *et al.* 2013) have used the EO scale proposed by Miller/Covin and Slevin (1989a) for work group leaders. Despite the well accepted organizational EO phenomenon (Covin and Slevin, 1991) work groups at subordinate levels have not so far been examined in detail. A major focus has been set on the founding entrepreneurial team when considering individual EO (e.g., Weaver *et al.*, 2002; Covin and Miller, 2013; 2014; Kollmann and Christofor, 2014). In line with Martin (2002) it is assumed that the pervasiveness of EO is a homogenous multi-layered and multi-faceted phenomenon throughout an organization and as such, the following assumptions are made.

***Hypothesis 2: Different groups of individuals assess the work group's EO-firm's EO relationship in the same way.***

*Hypothesis 2a: Work group's EO assessed by work group leaders affects firm's EO.*

*Hypothesis 2b: Work group's EO assessed by work group members affects firm's EO.*

As the firm-level concept of EO has been fruitfully measured as correlating positively with superior performance in the traditional single informant way (e.g. Covin and Slevin, 1989a; Schepers *et al.*, 2014; Veidal and Flaten, 2014; Gunawan *et al.*, 2015; Grimmer *et al.*, 2015), the following hypotheses are proposed as a final step towards answering the research question.

***Hypothesis 3: Different groups of individuals assess the firm's EO-performance relationship in the same way.***

*Hypothesis 3a: Firm's EO assessed by work group leaders affects firm's performance.*

*Hypothesis 3b: Firm's EO assessed by work group members affects firm's performance.*

*Insert Figure 1 Here*

Based on the research model outlined in Figure 1, we present the methods, including the research settings and sample characteristics, the different tests in regard to data reliability and validity as well as fundamentals in relation to the analyses of the results.

## **METHODOLOGY**

### **Research settings and sample characteristics**

The questionnaire-based survey for this project was conducted between June and September 2015. As shown in Table 1, the randomly chosen research sample consists of 301 individuals in

four globally active companies from four sectors – to be precise, construction, ICT, transportation and the aircraft parts business. The entire personnel of each of the four companies was invited by their respective human resources departments to participate in the research project.

*Insert Table 1 Here*

Several methods are applied to the sample to improve the validity and reliability of the study (Podsakoff *et al.*, 2003). In particular, the major dependent variable – performance indicators by subjective evaluation – was cross checked against objective sources (Podsakoff *et al.*, 2012). No significant difference was detected between objective and subjective performance measurements. This result confirms the validity and reliability of this study. Several supplementary precautions were taken to avoid common-method bias as recommended by Podsakoff *et al.* (2003). First and foremost, all established items regarding EO are taken from different well-cited authors. Next, several diverse scale types are applied. Additionally, several of the methods used here reduce the risk of common method bias. Total anonymity and confidentiality were guaranteed at the outset (Reio, 2010) and the results of the study were compiled into a report. Common-method and single informant bias do not appear to be critical in this study (Glick, 1985; James *et al.*, 1993; Kumar *et al.*, 1993).

### **Data reliability and validity tests**

To enhance the measuring of the EO construct this research is built on the modification of certified scales including numerous well-cited items that have been approved elsewhere. First of all, the *EO of the firm* is calculated with a well-cited twelve-item scale developed by Covin and Slevin (1989b) and adapted by Wales *et al.* (2013). Then, *EO at work group level* is explained

through a modified scale with fourteen item originally proposed by Hughes *et al.* (2007). *Individual EO* is measured on the 17-item scale by Covin and Slevin (1989b) adapted by Langkamp Bolton and Lane (2012) and also in Bolton (2012). Finally, this study uses self-reported items to measure firm performance (Wiklund and Shepherd, 2005). These were cross-validated with objective data.

As suggested in earlier studies (e.g. Haertel, 1985; Murphy and Davidshofer, 1988; Fraenkel and Wallen, 1993) several tests were used to strengthen the reliability and validity of this contribution. Initially, Cronbach's alpha was calculated (Cronbach, 1951) and yielded values for all variables higher than 0.885, reflecting strong internal consistency according to Nunnally (1978) and Hair *et al.* (1995). Then the bivariate Pearson's correlation coefficients between all variables were examined and summarized in Table 3, concluding that the instruments are valid because all correlations are below 0.70 (Tabachnick and Fidell 1996). Consequently, even though the significant correlations stress multi-collinearity, this issue does not seem to be critical in this framework (Bartlett, 1937). In the next step, Kaiser-Meyer-Olkin tests (Dziuban and Shirkey, 1974) ensure that the items provide sufficient information. The scales are appropriate because all the variables reach very good values of more than 0.5 for all items (Kaiser 1974), to be precise more than 0.82, which is very good. An eigenvalue of more than 1 is pursued (Parlett, 1980). All determinants of the constructs' correlation matrix are greater than the necessary value of 0.00001. Then the communalities are not less than 0.5. On the whole, the total variance is well described according to prior studies (e.g. Hair *et al.*, 1995; Lattin *et al.*, 2003; Smith *et al.*, 2007). In the final stage, a good level of interrater reliability is demonstrated by highly significant intra-class correlations (Jones *et al.*, 1983; James *et al.*, 1984). Consequently, the validity and reliability of the construct applied are adequate.



## RESULTS

A path analysis with a number of series-connected multiple regression analyses is conducted. First of all, the data is split into that for work group leaders and work group members. After that, several multiple regression analyses for each, starting from individual EO to work group's EO up to firm's EO and finally firm performance are conducted. The unstandardized coefficients B, the standardized coefficients Beta ( $\beta$ ), R square, and the adjusted R square are compared between the two models – the work group leaders and the work group members. After that, a comparison is made of how the different predictors set forecast the next step – work group EO, firm EO and firm performance. For the two main groups (work group leaders and work group members) this is done by applying Fisher's Z-tests. Finally, further investigations such as Mann Whitney tests, independent t-tests, and one-way MANOVA are conducted to identify potential significant differences between the two groups under investigation. These analyses and tests build a basis for establishing the amount of variation in EO between the two main groups to find interesting implications for the traditional way to measure EO based on a single informant per firm. These analyses contrast the “single informant way of measuring EO and performance” with the “multiple informant way” through hierarchical levels across four organizations to shed further light on the long assumed organizational homogeneity of the EO construct. This has not so far been verified.

Table 2 presents the linear regression analyses results for testing the sub-hypotheses for hypothesis 1 and hypothesis 2. Hypothesis 1 assumes that the perceived individual EO of the different groups promotes the sublevel of the firm's EO entitled work group's EO equally. First of all, this expected homogeneity is explored by two regression models between the perceived EO at the individual level and the work group's EO: Hypothesis 1a states that the perceived work group

leader's individual EO promotes work group's EO, which is supported through a significant impact ( $\beta = 0.566^{***}$ ). Furthermore, hypothesis 1b states that the perceived individual EO of the work group members promotes work group's EO – significant support is likewise found ( $\beta = 0.627^{***}$ ). Overall, the regressions of both models related to the *perceived individual EO of different hierarchical groups show similar impacts on the perceived EO level of the work group*.

At this stage it is important to mention in reference to hypothesis 1 that gender does not influence the perceived individual EO-work group EO relationship as assessed by the work group leaders ( $\beta = 0.103$ ) in contrast to the significant influence of gender in the assessment performed by group members ( $\beta = 0.338^*$ ). In addition, when group leaders perceive this relationship there is no significant influence of the sector, while there is a significant and different impact between different sectors when work group members analyse these different levels of the EO relationship.

Table 2 also presents the linear regression analyses results for testing the sub-hypotheses for hypothesis 2. Hypothesis 2 assumes that different groups of individuals assess the work group's EO equally. First of all, this expected homogeneity is explored by two regression models between the perceived work group's EO and the firm's EO. Hypothesis 2a assumes that work group's EO assessed by work group leaders affects firm's EO, which is supported through the highest significant impact ( $\beta = 0.628^{***}$ ) compared to the other model. Furthermore, hypothesis 2b also states that the perceived work group's EO assessed by work group members affects firm's EO, and significant support is found here, too ( $\beta = 0.552^{***}$ ). Overall, the regression of both models related to the *perceived work group's EO impact on firm's EO* shows similar results despite different assessment groups.

Of the control variables gender plays a crucial role in the perceived EO levels in the assessment by work group leaders ( $\beta = 0.322^{**}$ ). Female leaders tend to assess the work group EO lower than

do male leaders, while female and male work group members tend to rank the different EO levels similarly. This different impact holds true for company experience ( $\beta = 0.427^*$ ) as well. Work group's EO is perceived to be higher the higher the company experience of the work group leader is, while work group members with different company experiences assess the EO of the work group and firm similarly. Nevertheless, the work group members with the greatest company experience tend to rank these EO levels higher than the work groups with less company experience.

*Insert Table 2 Here*

Table 2 also summarizes the linear regression analyses results for testing the sub-hypotheses for hypothesis 3. Hypothesis 3 assumes that different groups of individuals assess the firm's EO-performance relationship equally. First of all, this expected homogeneity within organizations is explored by two regression models between the perceived firm's EO and firm performance. Hypothesis 3a assumes that the perceived firm's EO assessed by work group leaders affects firm's performance, which is significantly supported ( $\beta = 0.201^{***}$ ) in our sample. Furthermore, hypothesis 3b also states that the perceived firm's EO assessed by work group members affects firm's performance, and significant support is found for this as well ( $\beta = 0.152^{***}$ ). Overall, the regression of both models related to *the perceived impact of firm EO on firm performance shows equal results* across different assessment groups. These findings confirm that the perceived EO-performance relationship assessed by different hierarchical work groups provides a similar picture throughout the organization. The assumed homogeneity across levels in earlier research (e.g. Covin and Slevin, 1991; Atuahene-Gima and Ko, 2001; Covin *et al.*, 2006; Wiklund and Shepherd,

2003; 2005) finds empirical support in the present study when the perceptions of 133 work group leaders and 168 work group members are analysed.

*Insert Table 3 Here*

Furthermore, the adjusted R squares point out the percentage of the variance in the dependent variables that are explicated by the impact of the independent variables. Across all assessment groups the adjusted R squares are not significantly different. In response to Rauch *et al.* (2009) descriptive statistics are reported in Table 3 to enhance the methodological standards with respect to Low and MacMillan (1988). Consistent with earlier studies, the perceived firm EO-performance relationship analysed by correlation, regardless of which group of individuals is assessing it – work group leaders ( $r = 0.337^{**}$ ), work group members ( $r = 0.271^{**}$ ) or the whole work group ( $r = 0.300^{**}$ ) – reflects the benchmark, which is on average 24% (Rauch *et al.*, 2009). These similar correlations as well as the similar means of the different groups stress the homogeneity of the EO construct within organizations when taking the perceptions of work group leaders and members into account.

*Insert Table 3 Here*

After analysing the different sub-hypotheses at each level, we now compare the “fit” of these predictor sets in the two groups – work group members and work group leaders – using Fisher's Z tests, where the R values are compared (Bortz, 1993, p. 201 ff). Table 4 presents the results of the comparison of the Fit ( $R^2$  values) of the two models. As shown in the table, there is enough support

for hypothesis 1: The different groups of individuals promote the sub-level of the perceived firm's EO – work group's EO – equally. In addition, no significant difference between model 1 and 2 is found in regard to hypothesis 2: Different groups of individuals tend to assess the work group's EO equally. Finally, when comparing the findings on hypothesis 3, no significant difference is detected, either: Different groups of individuals assess the perceived firm's EO-performance relationship equally. As noted, on the basis of the sample data it can be concluded that the predictor set performs similarly for both groups – work group leaders and work group members. Accordingly, the EO concept as a homogenous organizational phenomenon throughout multiple levels is supported when these two groups – work group leaders and work group members – are analysed from different hierarchical positions.

*Insert Table 4 Here*

Overall, Mann-Whitney U or independent samples tests revealed no significant differences between the hierarchical groups of individuals assessed. These outcomes are confirmed by performing multivariate tests, a one-way MANOVA and also independent t-tests on the level of the individual items within the EO construct.

## **DISCUSSION**

The main aim of this study on EO was to conduct multiple analyses of the extent of variation in EO within firms, work groups and individuals across levels based on the RBV. This investigation reveals the methodological nature of the EO construct throughout an organization by focusing on two core groups of individuals, namely work group leaders and work group members.

According to a path analysis using multiple regression models across groups and levels, additional tests such as Mann Whitney U test, independent t-tests, and one-way MANOVA, no significant differences emerge to draw wider attention to the homogenous organizational EO construct while strengthening the traditional usefulness of single informants.

First of all, this study does discuss the descriptive claim of Wales *et al.* (2011) in regard to a homogenous organizational pervasiveness of EO, at least when analysing the potentially different perceptions of work group leaders and work group members. However, work group members and work group leaders assess the different EO levels equally, likewise the final perceived EO-firm performance relationship. In addition, when it comes to the comparison of the regression and correlation analyses in regard to the EO-performance relationship, the results assessed by the work group members and work group leader provide a similarly accurate picture when taking earlier research into account. Based on these findings, according to the homogenous pervasiveness of EO, the traditional use of single informants for measuring EO tends to reflect a “true” picture when assessing the EO-performance relationship.

*Insert Figure 2 Here*

The results of the various regression analyses (Unstandardized Coefficients), as indicated in Figure 2, stress that there are interesting implications for the reliability of the traditional way of measuring EO based on a single informant per firm. Contrasting the “single informant way of measuring EO and performance” with the “multiple informant way” by differentiating between the perceptions of work group leaders and work group members shows similar effects between individual assessments and the perception of the work group's EO, its impact on the perceived

firm's EO, as well as on the assessed firm-level EO-performance relationship. Homogeneity between these two groups is tested by further independent samples tests, revealing no significant difference in the assessment of the work group's EO or firm's EO between the leaders and work group members. In contrast to earlier claims that EO is exhibited to different degrees across an organization (e.g., Kemelgor, 2002; Monsen and Wayne Boss, 2009; Wales *et al.*, 2011) or between different sexes (Fellnhofer *et al.*, 2016), this study supports the organizational homogenous approach of the EO construct between different hierarchical groups when taking into account the perceptions of 133 leaders and 168 work group members in four companies active in different sectors. In other words, it does not (significantly) matter who is asked when it comes to the perceived firm's EO-performance relationship.

### **Theoretical and practical implications**

In regard to the practical implications this closer inspection of the predictability of EO and, in turn, the perceived EO-performance relationship at different levels speaks for the future examination at different EO levels within organizations to support human resources departments in managing entrepreneurship more effectively internally (Monsen and Wayne Boss, 2009). In addition, the EO construct as a complementary instrument might help investors to identify entrepreneurial firms with a relatively high probability of directing them towards success. An intercompany benchmark might support human resource decision-making processes to enhance EO, which will also lead to better performance.

The theoretical implications of this study serve to add to the body of literature on EO with interesting aspects related to homogeneity in EO perceptions between hierarchical groups to

achieve an accurate EO-performance ratio. Although an enormous body of research has investigated entrepreneurial characteristics such as entrepreneurial attitudes (Robinson *et al.*, 1991; Nabi *et al.*, 2008) in regard to risk-taking and innovativeness (Domke-Damonte *et al.*, 2008; Lee *et al.*, 2011; Macko and Tyszka, 2009) or towards proactiveness (Zampetakis *et al.*, 2009), social influences (Robinson *et al.*, 1991; Peterman and Kennedy, 2003; Levenburg and Schwarz, 2008), entrepreneurial experience within the family (Nabi *et al.*, 2008; Zampetakis *et al.*, 2009; Roberts and Robinson, 2010) at the individual level as well as a mixture of attitudes and traits variables (Domke-Damonte and Faultstich, 2008; Levenburg and Schwarz, 2008; Macko and Tyszka, 2009), or individual EO (Langkamp Bolton and Lane 2012), this study is the first to explore perceived EO between two hierarchal groups across different levels in companies and as such has some limitations, which will be discussed in the next section.

### **Limitations and avenues for further research**

The study has a few limitations, which need to be addressed and which may have a potential impact on the findings and the research questions. First of all, employing a quantitative research design with a sample size of 301 individuals in four firms limits the extent to which the results can be generalized. This should be kept in mind and requires further research. Re-evaluating the research question based on a larger sample size including more firms will achieve even greater reliability and validity (of the results). A larger group of work group leaders and work group members from more firms might lead to significant differences, for instance between sectors, work groups or genders. Moreover, the research data from individuals is nested within four firms. Consequently, the proposed models will benefit from further analytical techniques such as structural equation modelling to enhance the research results.



However, while this study addresses the proposals of Wales *et al.* (2011) to analyse EO across organizational levels, across managerial groups as well as across non-managerial groups, and whereas multiple respondents are employed to extend the application of EO deeper into an organization, in future these outcomes require further investigation with different and appropriate performance measures for each level. Our results suggest that a positive EO-performance relationship exists at all levels, however, as noted in the limitations section, further investigations are necessary. Furthermore, while the body of EO literature continues to grow, little research has addressed actions and practices and the evaluation of these to improve EO in companies. What are the drivers to improve the perceived EO-performance relationship in the long run? In light of the work done by Lorenz *et al.*, (2015) do different EO-performance levels lead to different (entrepreneurially oriented) employer satisfaction? Additionally, it might be interesting to ascertain if there are differences between different business areas as outlined by Anderson *et al.* (2013). Answering these questions would surely advance our understanding to foster research knowledge along fruitful practical paths.

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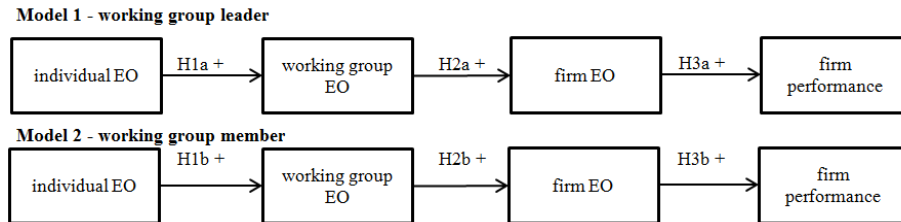
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## APPENDIX

**Figure 1** Research model with the assumed directions



**Table 1** Sample characteristics

	Firm A	Firm B	Firm C	Firm D	sum
				Aircraft parts supplier	
Sector	Construction	ICT	Transportation		
Employees	85	14	249	278	<b>626</b>
Participating employees				177	
	71	10	43		<b>301</b>
Females	25	2	7	126	<b>160</b>
Males	46	8	36	51	<b>141</b>
Response rate within the firm	83.53 %	71.43 %	12.05 %	63.67 %	<b>48.08 %</b>

**Table 2** Linear regression analyses results

Unstandardized Coefficients B (Standardized Coefficients Beta $\beta$ )	H1 work group EO		H2 Firm EO		H3 Firm performance	
	Model a Work group-leader	Model b Work group member	Model a Work group-leader	Model b Work group member	Model a Work group leader	Model b Work group member
Individual EO	.566*** (.540)	.627*** (.519)	-----	-----	-----	-----
Work group EO	-----	-----	.628*** (.648)	.552*** (.593)	-----	-----
Firm EO	-----	-----	-----	-----	.201*** (.298)	.152*** (.221)
<b>Control variables</b>						
Gender (female=1, male=2)	.103 (.046)	.338* (.150)	.322** (.149)	.048 (.023)	.108 (.074)	-.069 (-.048)
Age (<24 = 1; 25-44 = 2; >45 = 3)	-.174 (-.044)	.083 (.025)	-.082 (-.021)	.145 (.047)	.020 (.008)	-.018 (-.009)
	-.041 (-.014)	-.226 (-.088)	-.042 (-.015)	-.033 (-.014)	.113 (.058)	-.102 (-.062)
Company experiences	-.203 (-.091)	.063 (.025)	.427* (.197)	-.206 (-.086)	-.309 (-.210)	-.002 (-.001)



(1= <2; 2 = >2-10, 3 = >10 years)	-.331 (-.148)	.079 (.035)	.317 (.147)	-.211 (-.101)	-.281 (-.193)	.122 (.085)
Highest education level (1=Primary /Secondary education 2= Middle-level applied education 3=Higher professional education)	-.152 (-.068)	.008 (.003)	.089 (.041)	-.060 (-.026)	.077 (.053)	.069 (.044)
Sector / SME (1=Construction, 2=ICT, 3=Transportation, 4=Aircraft parts supplier)	-.056 (-.021)	-.102 (-.033)	-.054 (-.020)	-.101 (-.035)	.040 (.022)	-.244 (-.123)
Group size categories (1= < 10, 2=11-20, 3=>21)	.064 (.011)	-.351 (-.053)	.042 (.007)	-.076 (-.012)	-.040 (-.011)	-.599** (-.142)
	.318 (.098)	-.552** (-.175)	.523* (.167)	.094 (.032)	-.356 (-.169)	-.340** (-.168)
	-.195 (-.080)	-.590*** (-.262)	-.361 (-.152)	-.363 (-.173)**	-.462** (-.289)	-.163 (-.113)
	-.164 (-.088)	.184 (.078)	-.038 (-.021)	-.111 (-.050)	-.122 (-.101)	.067 (.044)
<b>R Square</b>	.368	.333	.546	.444	.199	.144
<b>Adjusted R Square</b>	.305	.281	.501	.401	.119	.077
<b>F</b>	5.834***	6.442***	12.047***	10.326***	2.487***	2.169**

Significance codes: \*\*\*=p<.01, \*\*=p<.05, \*=p<.1.

**Table 3** Descriptive Statistics and Bivariate Pearson Correlations of the different groups

Whole group assessment (N=301)	Mean	SD	Firm EO	Group EO	Individual EO	Firm performance
Firm EO	4.8450	1.05928	1			
Group EO	4.8296	1.11722	.648**	1		
Individual EO	5.0117	.98848	.414**	.539**	1	
Firm performance	3.5972	.72364	.300**	.254**	.208**	1
<b>Work group leader assessment (N=133)</b>						
Firm EO	4.8432	1.07364	1			
Group EO	4.8249	1.10819	.679**	1		
Individual EO	5.0367	1.05666	.412**	.576**	1	
Firm performance	3.5357	.72505	.337**	.194*	0.079	1
<b>Work group member assessment (N=168)</b>						
Firm EO	4.8465	1.05099	1			
Group EO	4.8333	1.12762	.624**	1		
Individual EO	4.9919	.93373	.417**	.509**	1	
Firm performance	3.6458	.72095	.271**	.302**	.329**	1

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

**Table 4** Comparing the Fit ( $R^2$  values) of the two models

		Model 1 (n=133)	Model 2 (n=168)	Results
<b>H1</b>	R	.305	.281	
	Fisher-Z (1)		0.321	not significant
	Fisher-Z (2)		0.288	
	Z-Wert		-0.280	
<b>H2</b>	R	.501	.401	
	Fisher-Z (1)		0.550	not significant
	Fisher-Z (2)		0.424	
	Z-Wert		-1.071	
<b>H3</b>	R	.119	.077	
	Fisher-Z (1)		0.121	not significant
	Fisher-Z (2)		0.080	
	Z-Wert		-0.345	

**Figure 2** Research model with results

