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# Entrepreneurial orientation and firm performance: an updated meta-analysis

Firm  
performance:  
an updated  
meta-analysis

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## Abstract

**Purpose** – The purpose of this paper is to analyze the relationship between entrepreneurial orientation (EO) and organizational performance through an updated and extended meta-analytic review that includes EO, mediators, moderators and performance results.

**Design/methodology/approach** – Using Pearson correlations as effect size statistics, and based on 80 independent samples from 78 studies, with a total sample size of 19,514 cases, the meta-analysis consolidates the empirical findings of this field of research.

**Findings** – The results reveal that there is a direct and positive impact of EO on organizational performance, and this effect is stronger for multi-item measures of performance and for revenue-based performance measures. In addition, the authors found partial mediation effects of learning orientation and innovativeness on the relationship between EO and firm performance.

**Originality/value** – The work contributes to the literature by demonstrating the importance of EO to organizational performance with a meta-analysis, reporting the partially mediating variables in this relationship and seeking to explain the observed inconsistencies in preceding results, also examining methodological moderating variables. Hence, the research extends previous meta-analytic studies done in the area.

**Keywords** Organizational performance, Entrepreneurial orientation, Meta-analysis, Mediators, Moderators

**Paper type** Research paper

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## 1. Introduction

Since the 1980s, entrepreneurial orientation (EO) has received growing conceptual and empirical attention in the literature on strategic management and entrepreneurship (Rauch, Wiklund, Lumpkin, & Frese, 2009; Shan, Song, & Ju, 2016). The relationship between EO and performance is one of the most researched topics in this field (Saeed, Yousafzai, & Engelen, 2014). Despite the impressive collection about EO-performance relationship, the results remain inconclusive and contradictory (Su, Xie, and Wang, 2015). Some researchers from the predominant view argue that EO is positively linked to performance (Wiklund & Shepherd, 2003). Others claim that the effects of this relationship are either negative or not significant (Renko, Carsrud, & Brännback, 2009; Slater & Narver, 2000). As such, there is no unanimous conclusion or consensus on this matter.

This inconsistency has led researchers to investigate the role of mediators and moderators that may influence the relationship between EO and performance (Schepers, Voordeckers, Steijvers, & Laveren, 2014). The mediating factors most frequently studied were learning orientation (Hakala, 2013; Wang, 2008) and innovativeness (Hult, Hurley, & Knight, 2004). The disparate results may also be due to methodological moderators associated with measurement and sample characteristics that could affect the relationship between EO and organizational performance (Song, Podoyntsina, Van der Bij, & Halman, 2008). For example, differences in the operationalization of EO were found (Wales, Gupta, & Mousa, 2013). While some authors conceptualized the phenomenon based on Miller (1983), others supported the definition of Lumpkin and Dess (1996).

To address the inconsistencies in previous research, we applied a meta-analytical review about the empirical findings on the EO-organizational performance relationship in the field. We also assessed potential mediating and moderating effects in this relationship.

Past efforts to consolidate research results in the EO literature were the studies conducted by Rauch et al. (2009) and Wales et al. (2013). The first explored the existing knowledge on the relationship between EO and performance, without analyzing certain moderations and mediations (Rauch et al., 2009). Wales et al. (2013) developed a comprehensive qualitative review to identify the most frequently examined antecedents, moderators, mediators and consequences of EO.

Therefore, the main goal of the present study is to provide an updated and extended meta-analytic investigation to evaluate a conceptual framework that includes EO, mediators, methodological moderators, and performance results. It contributes to literature by analyzing the sources of inconsistencies in the findings and by providing a better understanding of the role of EO in organizations.

The article is structured as follows. Section 2 develops the theoretical framework and the hypotheses. Section 3 describes the study identification process, coding and operationalization of variables, as well as the meta-analytical procedures used. Section 4 reports the main results. The last section presents the article's conclusions, academic and managerial implications, limitations and suggestions for future studies.

## 2. Theoretical background and hypotheses

### 2.1 Entrepreneurial orientation and performance

According to Miller (2011), the performance implications of EO are the largest stream of research within the field of entrepreneurship. The predominant argument is that EO plays an important role in enhancing a firm's performance (Rauch et al., 2009). Li, Liu, and Zhao (2006) found that EO motivates companies to aggressively launch product innovations, exploring opportunities and favoring new product development activities. Wong (2014)

noted that EO contributes to the success of new products by allowing firms to identify and proactively take advantage of new business opportunities.

Although these theoretical considerations delineate the positive effects of EO, it must be pointed that the literature also mentions negative effects that could result from EO. Naldi, Nordqvist, Sjöberg, and Wiklund (2007) revealed the negative implications to performance caused by the risk-taking dimension of EO. Such dimension shows a negative effect on financial performance in family organizations (Naldi et al., 2007). Yet, Renko et al. (2009) found that the EO construct is not a significant predictor of product innovation. These findings revealed that EO is not necessarily beneficial and viable (Renko et al., 2009).

Regardless the contradictories results, the main stream in literature sustains that the relationship between EO and organizational performance tend to be positive (Li et al., 2006; Wong, 2014). Thus:

*H1.* The EO-organizational performance relationship is direct and positive.

## *2.2 Mediators of the entrepreneurial orientation-performance relationship*

*2.2.1 Learning orientation.* Sinkula, Baker, and Noordewier (1997, p. 309) conceptualize learning orientation as a “set of organizational values (commitment to learning, open-mindedness, and shared vision) that influence the propensity of the firm to create and use knowledge”. Learning orientation is proposed as a mediator in the relationship between EO and organizational performance (Hakala, 2013; Liu, Luo, & Shi, 2002; Wang, 2008). In this regard, Liu et al. (2002) noted that an entrepreneurial culture encourages values related to learning that ultimately enhance an organization’s performance. Based on these arguments, it is suggested that learning orientation is a mechanism through which a company can maximize the impact of EO on performance (Wang, 2008). Entrepreneurial firms that seek to generate effects on performance are more prone to investing in open-mindedness, commitment to learning and shared vision (Wang, 2008).

Therefore, and considering the direct link between the constructs (*H1*), it is expected that the relationship between EO and performance is partially mediated by learning orientation. Thus:

*H2.* The EO-organizational performance relationship is partially mediated by learning orientation.

*2.2.2 Innovativeness.* Innovativeness, according to Hurley and Hult (1998), is the notion of openness to innovative ideas as an aspect of a firm’s culture. It is interesting to note that there is a difference between innovativeness and EO. While EO is an attitude-based construct toward certain behaviors, such as proactiveness, innovativeness is a behavior-based construct designed to achieve results (Hult et al., 2004; Rhee, Park, & Lee, 2010).

In this sense, the literature establishes that EO can be considered an antecedent of innovativeness (Rhee et al., 2010). Hult et al. (2004) argue that innovativeness acts as a partial mediator in the EO-business performance relationship. When EO incorporates proactiveness and initiative, it may increase the creation of innovation projects to improve performance (Hult et al., 2004). Therefore, it is expected that innovativeness is a partial mediating variable in the EO-performance relationship. Thus:

*H3.* The EO-organizational performance relationship is partially mediated by innovativeness.

*2.3 Methodological moderators of the entrepreneurial orientation-performance relationship*  
*2.3.1 Manufacturing vs service firms.* In literature, it is argued that services are less tangible, less separable in production and consumption, more heterogeneous, and more perishable (Zeithaml, Parasuraman, & Berry, 1985). In this regard, Kraus (2013) points that EO can provide greater flexibility and more opportunities for adapting services to the preferences of customers. However, higher levels of customization in services can result in higher costs that can ultimately reduce a firm's performance (Kirca, Jayachandran, & Bearden, 2005). Therefore, it can be suggested that in manufacturing companies there is a higher positive impact of EO on performance, since the organization's efforts in the market can be less costly than in the services sector, where constant revisions are required to ensure performance and quality standards. Thus:

*H4.* The EO-organizational performance relationship is stronger in manufacturing firms than in service firms.

*2.3.2 Country: Western vs Asian countries.* Hofstede (1983) describes national culture in four dimensions: power distance, uncertainty avoidance, individualism and masculinity. The first dimension, power distance, is based on the idea that "all societies are unequal, but some are more unequal than others" (Hofstede, 1983, p. 81). Power distance, within organizations, is associated with the degree of autocratic leadership. Uncertainty avoidance is related to the way in which societies deal with unknown aspects of the future. Low uncertainty avoidance societies tend to be more open and receptive to new ideas (Efrat, 2014). Individualism refers to the degree to which individual interests prevails over those of the group (Calantone, Harmancioglu, & Droge, 2010; Efrat, 2014). In high individualistic countries, each individual is expected to take care of him/herself and his/her immediate family (Efrat, 2014). Masculinity involves the division of roles in society according to gender (Hofstede, 1983). Masculine societies emphasize achievement, wealth, mission, and performance (Calantone et al., 2010).

According to Mueller and Thomas (2000), EO might be strongly encouraged in an individualistic country, with low uncertainty avoidance. This would be a typical characteristic of Western countries according to Hofstede's (1983) approach. Therefore, it is proposed that EO leads to better performance in Western countries, where high individualism and low uncertainty avoidance prevail. Thus:

*H5.* The EO-organizational performance relationship is stronger in Western than Asian countries.

*2.3.3 Objective vs subjective performance measures.* Previous investigations in literature reports that different performance measures (objective vs subjective) can produce different correlations with dependent variables (Evanschitzky, Eisend, Calantone, & Jiang, 2012; Kirca et al., 2005). Objective performance measures, as sales data or return on assets, are impartially quantified (González-Benito & González-Benito, 2005). Subjective measures of performance, made by judgmental assessment of respondents, as brand equity or customer satisfaction, appear to be more flexible and reliable than objective ones, facilitating comparisons between firms (González-Benito & González-Benito, 2005). Therefore, it can be hypothesized that the strength of the relationship between EO and performance is greater when subjective performance criteria are evaluated. Thus:

*H6.* The EO-organizational performance relationship is stronger for subjective measures of performance than for objective measures of performance.

*2.3.4 Single vs multi-item performance measures.* Past research demonstrated the importance of multi-item measures of performance. It is claimed that the constructs' measurement tends to be better and more precise when more than one indicator is used (Murphy, Traylor, & Hill, 1996; Venkatraman & Ramanujam, 1986). Based on this assumption, it is expected that stronger correlations between EO and business performance are associated with the use of multi-item measures of performance. Thus:

H7. The EO-organizational performance relationship is stronger for multi-item measures of performance than for single item measures of performance.

*2.3.5 Cost-based vs revenue-based performance measures.* Performance can also be evaluated based on costs *vs* revenue measures (e.g. profitability *vs* sales and market share) (Kirca et al., 2005; Song et al., 2008). In this sense, Covin, Green, & Slevin (2006) noted that EO is more consistent with performance criteria that emphasize the effectiveness and success of an organization, since they examine the translation of entrepreneurial activities into a firm's trajectory of growth and expansion. Therefore, it can be proposed that the impact of EO on revenue-based performance measures is stronger. Thus:

H8. The EO-organizational performance relationship is stronger for revenue-based performance measures than for cost-based performance measures.

*2.3.6 Entrepreneurial orientation scales.* The approach introduced by Miller (1983) and developed by Covin and Slevin (1989) states that the three components of EO – innovativeness, risk-taking and proactiveness – must be present for a firm to be considered entrepreneurial (Miller, 1983). Lumpkin and Dess (1996) identified another two dimensions – competitive aggressiveness and autonomy. For Lumpkin and Dess (1996), organizations with EO can manifest traits from the five characteristics, but the presence of only one may be sufficient for a new entry into the market to be successful.

Several recent publications applied Miller/Covin and Slevin (1989) scale. The scale is in congruence with the definition of EO that recognizes the construct as a business attribute identified through sustainable standards of entrepreneurial behavior (Miller, 2011). Therefore, it is suggested that, when EO is linked to the Miller/Covin and Slevin (1989) scale, the effect of EO on performance is greater than when the Lumpkin and Dess (1996) scale is used. Thus:

H9. The EO-organizational performance relationship is stronger for EO measures based on the Miller/Covin and Slevin (1989) scale than for the Lumpkin and Dess (1996) scale.

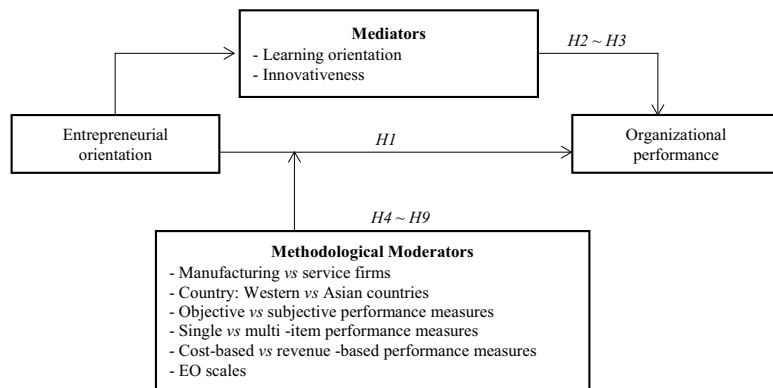
Figure 1 shows the conceptual framework of this meta-analysis.

### 3. Method

#### 3.1 Study identification process

To ensure the representativeness of the empirical studies selected, a search was first performed in the electronic databases of ABI/INFORM Global (ProQuest), Electronic Journals (EBSCO), Emerald Journals, JSTOR, ScienceDirect, SCOPUS and Web of Science. Previous meta-analytic studies (Evanschitzky et al., 2012; Rubera & Kirca, 2012) searched some of these databases, but we investigated all the above-mentioned in order to identify and comprehend the most relevant studies. The keywords examined were “entrepreneurial orientation”, “entrepreneurial proclivity”, “entrepreneurial posture”, “entrepreneurial disposition” and “entrepreneurial intensity”. These terms, chosen as variations of the EO

**Figure 1.**  
Conceptual  
framework for meta-  
analysis



expressions commonly used in literature, were searched in the titles, abstracts and keywords of papers published from 1983 to 2014.

In order to supplement the electronic search, we conducted an issue-by-issue search in the most important journals, according to the [ISI Web of Knowledge \(2014\)](#) – Journal Citation Reports, in management, strategy, innovation, marketing and entrepreneurship: *Journal of Management*, *Academy of Management Journal*, *Administrative Science Quarterly*, *Journal of Marketing*, *Strategic Management Journal*, *Organization Science*, *Journal of International Business Studies*, *Journal of Business Venturing*, *Journal of the Academy of Marketing Science*, *Journal of Marketing Research*, *Entrepreneurship Theory and Practice*, *Industrial Marketing Management*, *Management Science*, *International Journal of Research in Marketing*, *Journal of Product Innovation Management*, *Journal of Business Research* and *Journal of Small Business Management*.

Next, we examined references and citations from relevant publications to locate additional studies ([Evanschitzky et al., 2012](#); [Rauch et al., 2009](#)). To obtain unpublished work, we used Google Scholar and databases of theses and dissertations (e.g. The DART-Europe E-theses Portal, ProQuest Dissertations and Theses, Open Access Theses and Dissertations – OATD) ([Matos, 2009](#); [Moher, Liberati, Tetzlaff, & Altman, 2009](#)).

After that, following the common approach of previous meta-analytic reviews to evaluate the appropriateness of each study identified ([Rosenbusch, Brinckmann, & Bausch, 2011](#); [Rubera & Kirca, 2012](#)), we developed a few guiding rules to determine the studies that would be retained for the meta-analysis. The studies needed to:

- address the EO-performance relationship as a major topic of investigation;
- measure both EO and performance at the organizational level; and
- provide the Pearson's correlation coefficient (or variants that can be converted) for the EO-performance relationship.

Some potentially relevant manuscripts were not included in the meta-analysis because they measured EO and/or performance at another level of analysis (ten studies); they did not report the statistics needed to calculate the effect size (six studies); they investigated specific relationships that could not be integrated with other studies (five studies); and, their results were based on samples used in other publications from the data set (six studies). In this regard, it was decided to use the sample only once in the calculations to avoid excessive representation of specific samples ([Rosenbusch et al., 2011](#)).



These procedures resulted in 78 studies, with 80 independent samples and 149 effect sizes, with 137 of these for the EO-organizational performance relationship and 12 for the relationship between EO and the mediators.

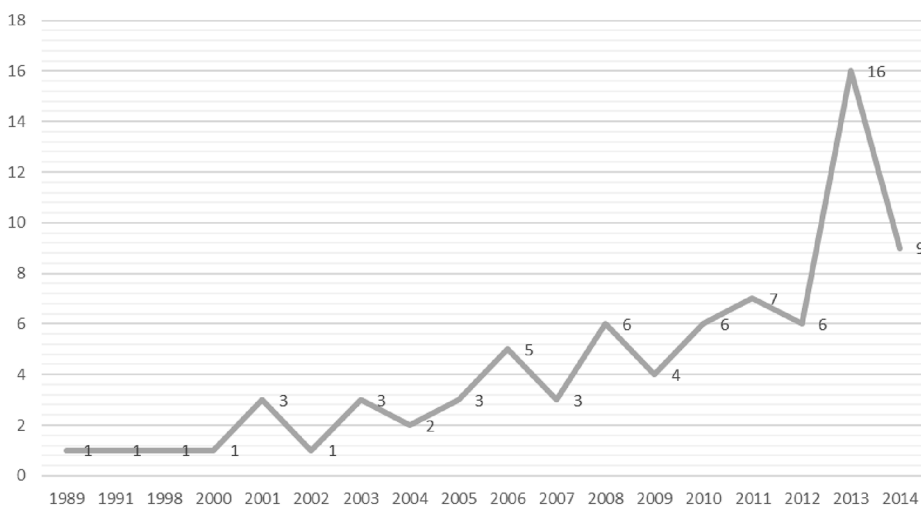
### 3.2 Coding and operationalization of variables

A coding scheme was prepared with the information to be extracted from each paper. To facilitate the analysis, the following data was coded: author(s), title, journal, publication date, country and industry of the sample, sample size, descriptions of the respondents, scales and dimensions used in the constructs from the model and statistical information of the relationships studied.

About the EO measurement, it is worth noting that most articles operationalized the construct with the Miller/Covin and Slevin (1989) scale (63 studies). The sub-dimensions most commonly used were: innovativeness, risk-taking and proactiveness (60 studies); innovativeness, risk-taking, proactiveness, competitive aggressiveness, and autonomy (8 studies); risk-taking and proactiveness (2 studies); and, other variations (8 studies) (Calantone et al., 2010; Saeed et al., 2014).

The overall profile of the 78 studies selected according to their year of publication can be seen in Figure 2. In fact, it is possible to infer that there is a greater concentration of studies from 2013 (16 studies) and 2014 (9 studies). This demonstrates a predominance of work conducted on the theme of EO and organizational performance in a more recent period, reflecting the growing importance of the topic for researchers.

Regarding the country factor, the database shows that the country most frequently represented in the studies was the USA (20.0 per cent). Subsequently, approximately 12.5 per cent of the analyzed samples used China as background. The UK (6.3 per cent), Holland (5.0 per cent) and Sweden (5.0 per cent) were also configurations observed in a representative volume of cases. Considering the classifications of Western *vs* Asian countries, a concentration of 75.0 per cent was found in Western cultures.



**Figure 2.**  
Evolution of scientific  
production by year



### 3.3 Meta-analytic procedures

First, the statistics from the studies were converted into  $r$  correlation coefficients. 16 studies, representing 28 effect sizes (out of a total of 78 and 149 respectively), did not provide the metrics, producing standardized regression (beta) coefficients. Then, following [Peterson and Brown's \(2005\)](#) suggestions, the correlations were estimated from the beta coefficients, using the formula:  $r = 0.98\beta + 0.05\gamma$ , where  $\gamma$  is a variable equal to 1 when  $\beta$  is non-negative and 0 when  $\beta$  is negative. No significant difference was found between studies that had correlation coefficients and those where the coefficients were derived from the beta (mean  $r = 0.249$ ; mean converted  $r = 0.288$ ;  $F = 0.976$ ;  $p > 0.10$ ).

Subsequently, the correlations were corrected for measurement error by dividing the correlation coefficients by the product of the square root of the reliabilities of the two constructs (e.g. EO and organizational performance) ([Hunter & Schmidt, 2004](#)). When a study did not indicate its reliability, we computed the average reliability for that construct across the sample and used it for correction purposes ([Kirca et al., 2005](#); [Saeed et al., 2014](#)).

With Comprehensive Meta-Analysis®, the corrected correlations were transformed into Fisher's  $z$ -coefficients ([Rubera & Kirca, 2012](#)). To show the direct effect and confidence intervals results, for example, these Fisher's  $z$ -estimates were reconverted into revised correlation coefficients, as proposed by [Borenstein, Hedges, Higgins, and Rothstein \(2009\)](#). The correlations were then weighted by the sample size of each study for correction of sampling error ([Rosenbusch et al., 2011](#)).

A 95 per cent confidence interval was calculated to examine the significance of the relationship among the variables (the interval cannot include zero) ([Borenstein et al., 2009](#); [Lipsey & Wilson, 2001](#)). Once the significance was determined, the publication bias was evaluated by calculating the fail-safe number (FSN), to indicate the number of studies with non-significant results needed to reduce the cumulative effect size to a level of nonsignificance ([Lipsey & Wilson, 2001](#)).

Homogeneity of the effect size distribution was tested by the  $Q$  statistics ([Borenstein et al., 2009](#); [Lipsey & Wilson, 2001](#)). If there was a result that contradicted the null hypothesis of homogeneity of the relationship (e.g. EO and organizational performance), the correlations would be considered heterogeneous, and this variation could be attributed to potential moderators ([Hunter & Schmidt, 2004](#)).

To verify the existence of mediators, a multivariate analysis was conducted with structural equations modeling ([Hair, Black, Babin, Anderson, & Tatham, 2009](#)). To examine possible methodological moderations, a multiple regression model was developed ([Card, 2012](#)).

We performed the meta-analysis with the random-effects perspective. This approach, unlike the fixed-effects model, does not assume that the studies included in the meta-analysis are identical, i.e. present the same effect size ([Borenstein et al., 2009](#)). Therefore, the random-effects approach for calculating the mean values is more reasonable, because it produces more realistic estimates and indicates the real variability of the effect sizes between studies ([Borenstein et al., 2009](#); [Saeed et al., 2014](#)).

## 4. Results

### 4.1 Entrepreneurial orientation-performance relationship

[Table I](#) summarizes the meta-analytical results for the relationship between EO and organizational performance.

A total of 137 effect sizes were considered, taken from 78 studies, with an accumulated sample of 19,514 participants. The correlations recovered ranged from  $-0.330$  to  $0.690$ , with a mean of  $0.240$ . The results revealed a positive association between EO and organizational

performance ( $r = 0.299$ ), which is consistent with the findings of Rauch et al. (2009). Table I also shows that there is a significant relationship among the constructs, since the 95 per cent confidence interval did not include zero.

The  $Q$  statistic produced a significant result ( $Q = 1,592.06$ ;  $df = 136$ ;  $p < 0.001$ ). It indicates a heterogeneous distribution of effect sizes and suggests that this variability may be due to the existence of moderating variables. The fail-safe number was 684. Consequently, new or unpublished studies not included in the meta-analysis did not threaten the validity of the findings (Lipsey & Wilson, 2001). Therefore, *H1 is supported*.

#### 4.2 Mediation analysis

Following Iacobucci (2010), structural equations modeling was used to test the mediations. First, the model was estimated to verify the mediation of learning orientation. Then, a new analysis with innovativeness was processed. It was decided to assess the two mediating factors separately due to insufficient studies using the constructs at the same time. To address these mediations in AMOS®, a correlation matrix was developed and used as input (Kirca et al., 2005).

Table II shows the correlation matrix designed to investigate the direct and indirect effects (through learning orientation) of EO on organizational performance. To generate the matrix, the mean correlations among constructs were calculated, adjusted by sample size for each pair of factors of the model (Viswesvaran & Ones, 1995).

The model was based on the Maximum Likelihood approach, with the use of bootstrapping (Byrne, 2010). Bootstrapping enables the correction of problems associated with non-normal data, and may increase the statistical power for identification of mediation effects (Wood, Goodman, Beckmann, & Cook, 2008). The results of the mediation of learning orientation are shown in Figure 3.

The results reveal a direct, positive and significant effect of EO on learning orientation ( $\beta = 0.55$ ,  $p < 0.01$ ) and of learning orientation on performance ( $\beta = 0.29$ ,  $p < 0.01$ ). As predicted, there is a direct and positive impact of EO on performance ( $\beta = 0.33$ ,  $p < 0.01$ ). In addition, there is a significant indirect effect of EO on organizational performance through learning orientation ( $\beta = 0.16$ ,  $p < 0.01$ ). These findings provide *support for H2*.

	E	N	Range of $r$		Mean $r$	Corrected Mean $r^a$	95% Confidence Interval		$Q$	Significance	FSN <sup>b</sup>
Organizational performance	137	19,514	-0.330	0.690	0.240	0.299	0.262	0.335	1,592.06	0.000	684

**Notes:** <sup>a</sup>Sample-size-weighted, reliability-corrected coefficient. <sup>b</sup>Orwin's method. The Rosenthal's fail-safe number was 87,187

**Table I.**

Bivariate meta-  
analytical results

	1	2	3
1. EO	<i>0.828</i>		
2. Organizational performance	0.443	<i>0.845</i>	
3. Learning orientation	0.522	0.430	<i>0.832</i>

**Notes:** Italic values represent sample-size-weighted mean reliabilities. Other values reflect the average sample-size-weighted correlation coefficients

**Table II.**

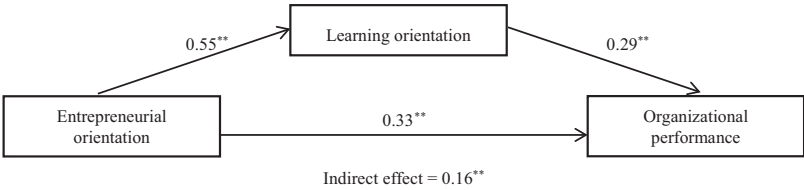
Meta-analytic  
correlation matrix:  
learning orientation

Based on the assumption that organizations oriented toward entrepreneurship are more inclined to encourage a fertile learning atmosphere, as pointed out by Hakala (2013), it was expected that this environment could have beneficial effects on performance. The EO-performance link was also recapitulated herein, which corroborates the partial mediating of learning orientation in this relationship.

Next, we created the correlation matrix summarized in Table III to examine the possible mediation of innovativeness.

The results obtained are shown in Figure 4. The analysis reveals that the effects between EO and innovativeness ( $\beta = 0.55, p < 0.01$ ), innovativeness and organizational performance ( $\beta = 0.07, p < 0.01$ ) and EO and performance ( $\beta = 0.35, p < 0.01$ ) are direct, positive and significant. The indirect effect of EO on performance through innovativeness also had an adequate level of significance ( $\beta = 0.04, p < 0.01$ ). Although it is worth noting the lower magnitude of this effect.

Hence, *H3 is supported*. EO, through proactiveness and risk-taking, positively influences innovativeness that, subsequently, has a positive impact on the development of advantages that contribute to organizational performance (Rhee et al., 2010). Here, the partial mediation of innovativeness can be seen, which coincides with Hult et al. (2004).



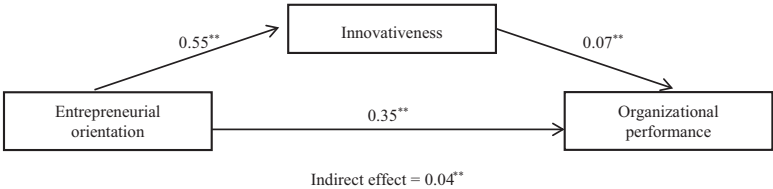
**Figure 3.**  
Mediation results of  
learning orientation

**Note:** \*\* $p < 0.01$

**Table III.**  
Meta-analytic  
correlation matrix:  
innovativeness

	1	2	3
1. EO	<i>0.850</i>		
2. Organizational performance	0.429	<i>0.846</i>	
3. Innovativeness	0.583	0.300	<i>0.858</i>

**Notes:** Italic values represent sample-size-weighted mean reliabilities. Other values reflect the average sample-size-weighted correlation coefficients



**Figure 4.**  
Mediation results of  
innovativeness

**Note:** \*\* $p < 0.01$

#### 4.3 Moderation analysis

To examine the moderating effects of the sample and measurement characteristics of the studies, a multiple regression model was used. The moderators were coded and added into the analysis as independent variables. The dependent variable was the *z*-score of the reliability-corrected correlations between EO and organizational performance. The regression model was processed with 100 effects from 63 studies, which provided information on all the moderating and control variables (year of publication and journal scope). Table IV reports the results.

The model was significant ( $F_{(8,91)} = 6.067, p < 0.001$ ) and the methodological moderators are responsible for 34.8 per cent of the variation in the correlations between EO and performance. The regression model is free of multicollinearity, since the maximum value of the variance inflation factor (VIF) was 2.038, below the limit recommended by Hair et al. (2009).

The results demonstrate that the strength of the EO-performance relationship does not vary between manufacturing and service firms, *not supporting H4* ( $\beta = -0.082, p > 0.1$ ). This discovery has implications for the literature on strategic orientation because it goes against the findings of Kirca et al. (2005), in which industry context (i.e. manufacturing and service) is relevant when investigating the relationship between market orientation and performance.

H5, which predicted that the impact of EO on performance would be stronger in a Western country, was *not supported* ( $\beta = 0.052, p > 0.1$ ). Based on the Hofstede (1983) classification, it is reasonable to suppose that the magnitude of the EO-performance relationship can, in fact, be separately influenced by each dimension of the national culture (power distance, uncertainty avoidance, individualism and masculinity).

Methodological moderators	Organizational performance	
	$\beta$	Sig.
Manufacturing <i>vs</i> service firms	-0.082	0.393
Country: Western <i>vs</i> Asian countries	0.052	0.567
Objective <i>vs</i> subjective performance measures	0.013	0.906
Single <i>vs</i> multi-item performance measures	0.248	0.043
Cost-based <i>vs</i> revenue-based performance measures	0.221	0.040
EO scales	-0.038	0.679
Year of publication	0.290	0.009
Journal scope	-0.036	0.676
$R^2$	0.348	
<i>F</i> -statistic	6.067	
Degrees of freedom	8, 91	
Sig.	0.000	
Max variance inflation factor (VIF)	2.038	

**Notes:** The categorical moderator variables are coded as follows: manufacturing firm = 0, service firm = 1, manufacturing and service firm = 2; Western countries = 0, Asian countries = 1; objective performance measure = 0, subjective = 1, objective and subjective = 2; single item performance measure = 0, multi-item = 1; cost-based performance measure = 0, revenue-based = 1, cost and revenue-based measure = 2; EO measure based on the Miller/Covin and Slevin (1989) scale = 0, based on the Lumpkin and Dess (1996) scale = 1. We control the effects of year of publication (1989-1997 = 0, 1998-2006 = 1, 2007-2014 = 2) and journal scope (marketing = 0, management = 1, international business = 2).  $\beta$  = standardized beta coefficient; Sig. = significance

**Table IV.**  
Meta-analytic  
regression results on  
methodological  
moderators

Likewise, the use of objective *vs* subjective performance measures did not affect the relationship between EO and organizational performance ( $\beta = 0.013, p > 0.1$ ). Thus, *H6* was also *not supported*. This result corroborates previous strategic management papers that found a positive and significant correlation between objective and subjective measures of business performance (Perin & Sampaio, 1999; Venkatraman & Ramanujam, 1987).

Two methodological moderators, consistent with our expectations, demonstrated significance. It was observed that the relationship between EO and performance is stronger for multi-item performance measures ( $\beta = 0.248, p < 0.05$ ). This result provides *support* for *H7*. It also strengthens Murphy et al. (1996) statement that measuring performance through more than one item is more appropriate.

Additionally, the effect of EO on revenue-based performance measures is stronger than those based on cost, which *supports H8* ( $\beta = 0.221, p < 0.05$ ). This finding confirms the conclusions by Covin et al. (2006) that EO is a construct focused on the growth of the company. Hence, it is more adequate using indicators that reflect this evolution, such as sales growth and market share.

The results also reveal that the EO-performance relationship is not influenced by the EO scale ( $\beta = -0.038, p > 0.1$ ). Therefore, we found *no support for H9*. This is consistent with the meta-analysis by Rauch et al. (2009), which reported that the Covin and Slevin (1989) scale produced a similar correlation to other EO scales for EO-performance relationship.

About the control variables, the model showed that only year of publication ( $\beta = 0.290, p < 0.01$ ) significantly moderates the relationship between EO and performance. It was identified that more recent publications present stronger effects.

In conclusion, the analysis from the multiple regression model demonstrate that the variance in the EO-organizational performance relationship can be partially attributed to the methodological differences associated with certain performance measurement characteristics (number of items and revenue or cost-based). Table V includes an overview of the findings.

In summary, the EO-performance relationship was supported (*H1*). The partial mediations of learning orientation (*H2*) and innovativeness (*H3*) were also empirically

**Table V.**  
Overview of the  
findings

Hypotheses	Findings
<i>H1</i> The EO-organizational performance relationship is direct and positive	Supported
<i>H2</i> The EO-organizational performance relationship is partially mediated by learning orientation	Supported
<i>H3</i> The EO-organizational performance relationship is partially mediated by innovativeness	Supported
<i>H4</i> The EO-organizational performance relationship is stronger in manufacturing firms than in service firms	Not supported
<i>H5</i> The EO-organizational performance relationship is stronger in Western than Asian countries	Not supported
<i>H6</i> The EO-organizational performance relationship is stronger for subjective measures of performance than for objective measures of performance	Not supported
<i>H7</i> The EO-organizational performance relationship is stronger for multi-item measures of performance than for single item measures of performance	Supported
<i>H8</i> The EO-organizational performance relationship is stronger for revenue-based performance measures than for cost-based performance measures	Supported
<i>H9</i> The EO-organizational performance relationship is stronger for EO measures based on the Miller/Covin and Slevin (1989) scale than for the Lumpkin and Dess (1996) scale	Not supported

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supported. Importantly, the moderation analysis supported the effect of multi-item performance measures (*H7*) and revenue-based performance measures (*H8*).

## 5. Discussion and conclusion

This study contributes to literature in several ways. First, the meta-analysis enabled to summarize and assess the current state of EO research. The paper provided an updated and extended meta-analytic investigation on the subject, since previous works did not include quantitative data from moderating or mediating variables. The results benefit both practice and research, establishing empirical generalizations and identifying sources of inconsistencies in the findings of the EO-performance relationship.

Second, the meta-analysis reported the magnitude of the effect between EO and organizational performance. It was found that the corrected mean  $r$  for the direct association between the two constructs is moderate in intensity ( $r = 0.299$ ). It was shown that this effect is positive and significant, consistent with a representative percentage of studies that claim that firms strongly oriented by entrepreneurship achieve better performance than firms that do not adopt EO (Rauch et al., 2009; Wiklund & Shepherd, 2003). Consequently, we recommend executives to encourage and stimulate their employees to participate in activities that involve creativity, proactivity, experimentation and propensity to assume risks.

Our study also produced evidences about the mediators in the EO-performance relationship by testing and confirming the partial mediation of learning orientation and innovativeness. Although the indirect paths showed significance, it is notable the small magnitude of these effects ( $\beta = 0.16$  for learning orientation and  $\beta = 0.04$  for innovativeness). It is reasonable to argue the probable influence of the approaches used for the performance construct, known for its complex and multidimensional nature.

In addition, it can be assumed that there is a moderating effect, where the mediated relationship between EO and organizational performance may vary among the levels of a moderator. Wang (2008), for example, studied the moderating role of strategy types (prospectors, analyzers, defenders, and reactors) in the EO, learning orientation and performance relationship. Lin, Peng, and Kao (2008), on the other hand, examined the moderation of organizational structures (formalization and decentralization) in the innovativeness-performance relationship. Hence, the small size of the path coefficients may be due to multiple moderators.

The multiple regression analysis provided robust evidence that the link between EO and organizational performance is stronger for multi-item (*vs* single-item) performance measures. The results also demonstrated that the impact of EO on revenue-based performance measures is stronger than on cost-based measures. These findings contribute to literature, emphasizing the importance of the appropriate definition and measurement of performance, since distinct aspects of the construct, such as the number and diversity of items, can influence its relationship with EO.

The moderator hypotheses of industry context (manufacturing *vs* service firms), national culture (Western *vs* Asian countries), performance measure (objective *vs* subjective) and EO measure (based on Miller/ Covin & Slevin, 1989 *vs* Lumpkin & Dess, 1996) were not supported. From a practical perspective, this result shows the importance of EO for performance. It means that the strength of the association is sustained in companies from different segments and in different national regions.

In sum, this meta-analysis certified that EO positively and directly affects performance, providing concrete and updated evidence, obtained from numerous studies, with transparency and rigor in the application method. The article uses a synthesized model that



includes mediators (learning orientation and innovativeness) along with moderating variables. Therefore, the major contribution of the current research is the recognition of the constructs that truly affect the EO-performance relationship.

For managers and policymakers, this study provides some relevant implications. The explication of the routes through which EO influences performance deserves a few comments. Specifically, our findings suggest that learning orientation and innovativeness are mechanisms partially intervening in the relationship between EO and organizational performance. This suggests that managers should stimulate firm's values as commitment to learning, open-mindedness, and shared vision (Wang, 2008). Similarly, managers should also encourage the development of a culture that fosters openness to innovation, new process, product, or new ideas within the organization (Hult et al., 2004).

Based on the evidence from this meta-analysis, policy makers should invest in programs that effectively implement and increase the level of EO in firms, emphasizing this strategy as a critical element to achieve superior performance (Su et al., 2015). In particular, we recommend that policy makers facilitate access to financial assistance for organizations involved in introducing new business ideas, also providing support for training activities, and motivating employees to innovate and carrying out risky initiatives.

### 5.1 Limitations and further research directions

As with all meta-analytic reviews, a few limitations must be addressed. First, we could not include in the database all studies and constructs in the EO literature, especially because of the determined inclusion criteria. This paper attempted to avoid a publication bias. Unfortunately, we had difficulties in accessing the gray literature, even without restricting the identification process to peer-reviewed journal articles.

Our research provides some directions for future research. It might be productive to assess the individual effects of the Hofstede's (1983) dimensions of national culture (power distance, uncertainty avoidance, individualism, and masculinity) in the EO-performance relationship, to determine if the results vary based on the distinct factors. While uncertainty avoidance and individualism may influence the magnitude of the EO-performance link in one way, power distance and masculinity may perform another kind of impact (Efrat, 2014).

In conclusion, the article contributes to literature by demonstrating the importance of EO to organizational performance with a meta-analysis, reporting the partially mediating variables in this relationship, and seeking to explain the observed inconsistencies, also examining methodological moderating variables. Furthermore, the present research may instigate academics and practitioners to advance the knowledge about the topic, by producing new theoretical and empirical insights.

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