

# YOUNG TECHNOLOGY VENTURES IN EUROPE: ASPECTS OF MARKET ORIENTATION AND ENTREPRENEURIAL ORIENTATION

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## ABSTRACT

The constructs of market orientation and entrepreneurial orientation have been widely researched over the last decade. Critics increasingly demand the simultaneous testing of several orientations to increase the evidence of the results of the respective studies and clarify their interrelations. First empirical studies indicate that the two orientations considered here do not represent the same underlying business behaviour, although they seem to be interrelated (Miles and Arnold 1991). However the application of both constructs simultaneously for young ventures has not been conducted at all. An online single-industry study investigated the constructs on a factor, dimensional and full measurement level as well as clarifying the inter-construct relation. Using reviewed measures from the works of Kohli and Jaworski (Kohli, Jaworski et al. 1993), as well as Covin and Slevin (Covin and Slevin 1986; Covin and Slevin 1991) and Lumpkin and Dess (Lumpkin and Dess 1996) a total of 282 wireless application developers in Europe and Israel were surveyed.

It can be concluded that entrepreneurial orientation is a multidimensional construct comprising of four distinct constructs, namely "Proactiveness," "Risk-Taking," "Competitive Aggressiveness," and "Innovativeness of the Company." Market orientation was found as a unidimensional construct comprising of five distinct dimensions, namely "Intelligence Generation on Macro Environment," "Intelligence Generation on Micro Environment," "Intelligence Generation on Customers," "Intelligence Dissemination," and "Responsiveness." As Entrepreneurial Orientation has proven to be a multidimensional construct, its interrelationship with market orientation needed to be reviewed for each single dimension. Risk-taking is negatively related to market orientation, while the other dimensions influence market orientation positively. That is, the more entrepreneurial a new venture is, the more emphasis it puts on understanding the market and responding to those insights.

## INTRODUCTION

For the domain of entrepreneurship research, this study focuses on the construct of entrepreneurial orientation, following the definition path based on the work of Miller (1983) and developed by Covin and Slevin (1986, 1991) and Lumpkin and Dess (1996; 2001).

The research in entrepreneurial orientation was mostly concerned with testing the construct for the case of established companies, and much of the evidence is anecdotal in nature (Zahra, 1991 p.260; Lee and Pennings, 2001). Testing an entrepreneurial orientation for the case of new ventures, which are often by default assumed to be entrepreneurial, will bring insights into the effect of entrepreneurial orientation in young companies. As for the case of market orientation, verifying past study results for the special case of new ventures is an explicit research goal.

For the field of marketing and market orientation, this research aims at exploring the construct of market orientation for new ventures within the specific industry of wireless application development. By this it attempts to contribute to the overall research in marketing and market orientation by verifying former studies and measures.

The emphasis is on the company itself as a research object rather than on the entrepreneur's behaviour as a single actor (Gartner, 1988; Shapero, 1982 p. 77). Having defined entrepreneurial orientation as firm behaviour, the comparison with market orientation (which is also seen as firm behaviour) can be realized much more straightforwardly.

However, the focus is not only on the independent-testing of the market and entrepreneurial orientation constructs. Alongside this there is a focus on the interaction of the constructs. Academic critics increasingly demand this simultaneous testing of several orientations to increase the credibility of the results of a study of a particular orientation (Henderson 1998; Grover 1996). The present researchers have not found simultaneous research of the two constructs for new ventures in the literature, and only one study (Tzokas, 2001) has targeted the topic for small companies.

## KEY PROPOSITIONS

### Entrepreneurial Orientation

Gartner (1988) is often cited as being among the first in shifting the focus of entrepreneurship to the firm level, interpreting entrepreneurship as the creation of new organizations. Szyperski and Nathusius (1999, p.25), Klandt (1984, p. 25), as well as Low and MacMillan (1988) also define entrepreneurship as the creation of new enterprises. The term entrepreneurship is distinguished from entrepreneurial orientation. Entrepreneurial orientation represents key entrepreneurial processes that answer the question of how new entry is undertaken, whereas the term entrepreneurship refers to the content of entrepreneurial decisions by addressing what is undertaken (Lumpkin and Dess 1996). Hills and LaForge (1992) argue that research on the interface of entrepreneurship and marketing must regard entrepreneurship as a process, and must not concentrate on the individual entrepreneur.

Covin and Slevin (1991) emphasized entrepreneurship as firm behaviour in their pioneering empirical works on entrepreneurial orientation and suggested it as a behavioural model, making it comparable with market orientation from a conceptual perspective. Accordingly, Miller (1983 p. 771) writes "An entrepreneurial firm is one that engages in product-market innovation, undertakes somewhat risky ventures, and is first [emphasis in original] to come up with 'proactive' innovations, beating competitors to the punch." Miller (1983 p. 779ff) also finds that hostile and dynamic environments require a more entrepreneurial orientation than static and benign environments, which makes the study of the wireless communications industry more attractive.

Following this path, Covin and Slevin (1986, p. 630) describe entrepreneurial orientation as managerial proclivity, stressing the aspects of risk-taking, innovation, and proactiveness. In their definition, "...firms with entrepreneurial posture [or orientation (comment added by present authors)] are risk taking, innovative, and proactive. They are willing to take on high-risk projects with chances of very high returns, and are bold and aggressive in pursuing opportunities. Entrepreneurial organizations often initiate actions to which competitors then respond, and are frequently first-to-market with new product offerings." Several other authors (Wiklund, 1999; Lee, 2001; Zahra and Covin, 1995 p. 44) agree on the three central dimensions of entrepreneurial orientation: innovation, proactiveness, and risk-taking. Lumpkin and Dess (1996, p. 140; 2001) stress the distinction between competitive aggressiveness and proactiveness. They also add autonomy as explicit dimension, but do not investigate it further, neither theoretically nor empirically. For this study entrepreneurial orientation is defined as the degree to which the orientation of a new venture is proactive, risk-taking, competitive aggressive, and innovative.

Risk-taking is rooted in early entrepreneurship literature such as Cantillon (1734). Taking risk to the firm-level, Baird and Thomas (1985, p. 230) classified strategic risk into three types: "venturing into the unknown," "committing a relatively large proportion of assets", and "borrowing heavily." While the first risk type of the three reflects the typical risk associated with entrepreneurship and is comparable with the personal risk of the entrepreneur, the two latter represent the typical relationship of high risk and high return in an investing context. Lumpkin and Dess (1996, p. 144) identify similar definitions of risk in Miller and Friesen's (1978) work on strategic entrepreneurship. They point out that any business is naturally associated with risk but that risk taken may vary significantly in degree, e.g. from depositing assets in bonds to borrowing heavily and investing in an unknown technology, a more likely scenario when dealing with new ventures in the industry under present discussion.

Innovativeness is a central dimension of entrepreneurial orientation, and the recognition of this dates back to works by Schumpeter (1934), stressing "creative destruction." "Innovativeness reflects a firm's tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes" (Lumpkin and Dess 1996, p. 142). Innovativeness is a means for companies to realize new opportunities. Following the classical school of entrepreneurship, the exploitation of opportunities is the central entrepreneurial act.

Proactiveness refers to behavior aimed at anticipating and foreseeing future needs and developments by "seeking new opportunities which may or may not be related to the present line of operations, introduction of new products and brands ahead of competition, strategically eliminating operations which are in the mature or declining stages of life cycle" (Venkataraman, 1989; cited at Lumpkin and Dess 1996, p. 146). Thus, taking initiative by anticipating new opportunities and participating in emerging markets has become widely acknowledged as associated with entrepreneurship (Lumpkin and Dess 1996). Proactiveness is also linked to Miller's (1983 p. 771) "... to come up with proactive innovations" and Miles and Snow's (1978, p. 55ff) definition of a prospector type, who creates change in his or her industry.

Competitive Aggressiveness refers to "a firm's propensity to directly and intensively challenge its competitors to achieve entry or improve position, that is to outperform competitors in the

marketplace” (Lumpkin and Dess 1996 p. 148) and is stressed as an independent dimension by these authors.. It is linked to Miller’s (1983 p. 771) statement of “beating competitors to the punch.” The distinction to proactiveness that Lumpkin and Dess (1996, 2001) stress, is that proactiveness refers to the firm’s relationship to market opportunities, whereas competitive aggressiveness refers to the firm’s relationship to competitors.

The evolving questions here are whether the conducting of a single industry study with a relatively high homogeneity of the sample influences the interrelationship of the dimensions of entrepreneurial orientation, creating an unidimensional construct, or whether the differences in environmental perception and organizational differences are sufficient to approve Lumpkin and Dess’s propositions. Therefore the first research question is: Are the dimensions of entrepreneurial orientation unidimensional in a new venture context?

### **Market Orientation**

Market orientation traces back to the concept of marketing developed in the 1950s and 1960s and is considered by many as a measure of the concept of marketing (Varadarajan, 1999, p. 133 and the there cited literature). Research in market orientation evolved from the notion that the long discussed impact of the concept of marketing has not been empirically studied (Jaworski and Kohli, 1993).

Narver and Slater (1990 p. 21) define market orientation as “the organization culture [...] that most effectively and efficiently creates the necessary behaviors for the creation of superior value for buyers, and, thus continuous superior performance for the business.” But the term organizational culture is not found in their further operationalization and discussion of the concept. Instead, only organizational behavior is taken into consideration. In terms of content, the definitions of Kohli and Jaworski (1990) and Narver and Slater (1990) are concurrent to a large extent. Kohli and Jaworski use the term market orientation as implementation of the concept of marketing. A market-oriented company is one whose “actions are consistent with the marketing concept.” (Kohli and Jaworski 1990 p. 1)

The authors define market orientation on the basis of organizational behavior as: “[...] the organizationwide generation of market intelligence pertaining to current and future customer needs, dissemination of the intelligence across departments, and organizationwide responsiveness to it [emphasis added by original authors].” (Kohli and Jaworski 1990 p. 6) The definition is developed on the basis of focus group interviews as well as research in the literature. In later reviews of the definition, Jaworski and Kohli (2000, 1996) stress the more proactive attributes of the three dimensions.<sup>1</sup> The approach of Kohli and Jaworski is used in this study because its focus on organizational behavior overcomes the principal problem of the connection between organizational culture and de facto actions. This facilitates eased comparison to entrepreneurial behavior. Further, the concept has been widely accepted and tested empirically. So, for this study market orientation is defined as:

The extent to which new ventures generate market intelligence, disseminate it among the members of the organization, and respond across the organization to this information.

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<sup>1</sup> An insight that Slater and Narver share for their construct. (Slater and Narver 1998)

The dimensions of market orientation as defined by Kohli and Jaworski (1990) are the generation of market intelligence, dissemination of market intelligence, and responsiveness. The development of the construct rests on an extensive marketing literature review on the topic, works in related disciplines and 62 field interviews with managers. The corresponding market orientation scale was named MARKETORientated (Kohli et al. 1993).

Intelligence generation is the starting point of market orientation. It is conceptualized as a broader concept that goes beyond the verbalized needs and preferences of customers. It includes an analysis of exogenous factors that affect customers' needs and preferences (Kohli and Jaworski 1990). Further, intelligence generation includes monitoring competitors' actions and their effect on customer preferences, as well as other factors, such as government regulation, technology, and further environmental factors (Kohli and Jaworski 1990). Effective market intelligence generation does not only involve actual customer needs but also future needs, and organizations must anticipate these needs (Kohli and Jaworski 1990).

Intelligence Dissemination is concerned with how market intelligence is communicated and disseminated within an organization (Kohli and Jaworski 1990). The direction of the information is not set a priori from marketing functions to the remaining organization but may as well flow vice versa, depending on the locus of its generation (Kohli and Jaworski 1990). Effective intelligence dissemination is important for building a shared basis to coordinated concerted actions (Kohli and Jaworski 1990). Intelligence dissemination can be formal, e.g. by written reports, frequent newsletters, or informal "hall talk," which proved to be a powerful tool in the review of the focus group interviews but was sparsely represented in marketing literature (Kohli and Jaworski 1990).

The third step in a market orientation is the responsiveness to market intelligence. "Responsiveness is the action taken in response to intelligence that is generated and disseminated" (Kohli and Jaworski 1990 p. 6). Unless an organization responds to the identified market needs, the other two elements do not provide any value (Kohli and Jaworski 1990). Responsiveness can take the form of selecting target markets, designing and offering products or services that fit customer needs, and producing, distributing, and promoting the offerings in a way that appears favorable to end-customers (Kohli and Jaworski 1990).

Matsuno et al. (2000, p. 533) could find no study that assesses the unidimensionality of the MARKOR scale. In their findings, the original 32 item MARKOR scale was not unidimensional as the second order path coefficients for intelligence dissemination were not significant. Their testing of the 20-item MARKOR scale unveiled an identification problem. The original scale was not tenable. In the improved scale by Matsuno et al. (2000, p. 534), all path estimates between market orientation and the three sub-constructs were significant as were all first-factor item path estimates.

Deshpandé and Farley (1998) point out the predominance of customer orientation as a dimension of market orientation in a meta-study of the most frequent market orientation scales, including MARKOR. Kohli et al. (1993, pp. 471-473) needed to collapse the intelligence dissemination and responsiveness dimension in their final conceptualization of market orientation. Obviously the distinctiveness and the relationship of the dimensions are not ultimately clarified.

Therefore another research question to be explored in this research is: Are the dimensions of market orientation unidimensional in a new venture context?

### **The Relationship of Entrepreneurial Orientation and Market Orientation**

Various authors have discussed the interrelationship of the constructs. Zeithaml and Zeithaml (1984) were among those who believed that market-oriented firms should adopt a proactive entrepreneurial philosophy in order to deal with both macro environmental and task environments. In fact, they posited the belief that the two orientations, in reality, represent the same underlying business philosophy.

Davis et al. (1991, p. 46) stressed that the common link between entrepreneurship and marketing is value creation. They explained that entrepreneurs create new, unique values where none existed before, and assemble resources to capitalize on the market opportunity present. Marketing, on the other hand, represents a very similar set of customer value-creating activities, which are directed at identifying and satisfying customer needs. Smart and Conant (1994, p. 5) underlined this value-creation relationship.

Hisrich (1992, p. 44-45) explained that marketing and entrepreneurship share a great deal in common, primarily on a conceptual, as opposed to operational, basis. These similarities include the belief that marketing is one of the most important business functions in terms of the success of new ventures that many entrepreneurs and entrepreneurial organizations suffer from a lack of marketing expertise and that both marketing and entrepreneurship share a strong customer orientation.

In the most comprehensive review of the interface, Hills and LaForge (1992, p. 33) state that marketing behaviour and entrepreneurial behaviour are similar in nature: "they are both boundary spanning, involve extensive interplay with the environment, [and] require the assumption of risk and uncertainty." The attitudes and behaviours which constitute market orientation are an indispensable part of entrepreneurship, but the two are not coterminous (Foxall, 1984, p. 71). Stevenson and Gumpert (1985, p. 87) state that market orientation is a necessary first step in entrepreneurship toward identifying the entrepreneurial opportunity.

According to Barrett and Weinstein (1998), market orientation is the direct linkage between the implementation of the concept of marketing and entrepreneurial orientation and represents the basis for a sustainable competitive advantage. The pursuit of a marketing strategy may be supported when management has an entrepreneurial orientation (Dess et al., 1997). More recent approaches (Atuahene-Gima and Ko 2001) tested the influence of both orientations simultaneously found that their impact is complementary and can be integrated by an orientation that can be described as entrepreneurial marketing. Morris et al. (2001) described the construct of entrepreneurial marketing as an innovative, risk-taking, proactive area of managerial responsibility.

The conceptual closeness of the two business orientations argued for here leaves room for speculation as to whether they are distinct or interrelated, if not the identical. This leads us to an additional research question: Are Entrepreneurial Orientation and Market Orientation interrelated?

## METHODOLOGY

### Identification of the Population

The approach used in this study was to try to cover the full population and carry out a census rather than a sample survey. An internet survey was set up and invitations have been sent to the senior management of identified companies. Many authors (e.g. Dillman and Bowker 2001; Ilieva et al. 2002; Best et al. 2001) have pointed at the coverage error as a major obstacle in Internet-based surveys due to the technological entry barriers.

The targeted population as described below can be assumed to have Internet access as well as sufficient technological knowledge as the members of the population are themselves involved in the development of wireless Internet applications or are involved with it in another capacity on an everyday basis.

### Development of Selection Criteria

Research in entrepreneurial firms poses a challenge to conventional statistical techniques that do not adequately describe the stochastic processes of entrepreneurs' firms and their environments (Alonso 1991). Industry-specific studies are a way to alleviate the bias and prevent inconsistent findings (Schwartz and Tech 2000 p. 77). A single industry study is expected to homogenize context-specific variables, such as environmental influences.

Single industry studies are characteristic of a large body of research in the strategy literature because they provide some degree of control over environmental idiosyncrasies. To identify applicable companies, the emerging industry of Wireless Application Developers has been selected. A focus on this emerging industry promises to create a sufficient degree of homogeneity among the researched companies. Europe and Israel were selected to narrow the scope. They were also chosen in recognition of their leading position in wireless application development.

Only companies that were founded 1997 or later have been included. As the "data collection" was conducted in 2002, this is equivalent to companies within their first five years of business since formal foundation.

#### Summary of Company Selection Criteria (Sampling Frame)

- Single industry: Wireless Application Development.
- Headquarter or representative office in Europe or Israel.
- Formally founded in 1997 or later.

The structured identification process consisted of three main phases. First, the collection of knowledge for a suitable starting point; Second, the evaluation of sources, the identification of the most promising source, and consequent company website scanning; And third, the identification of new sources by results from website scanning. Phases two and three were repeated to a point where the identification of new sources slowed down and finally to a point where very few or no new sources were identified. A sign of the approximate completion of the identification of the population was the steep decline of new companies identified through a new source. In the late

stages of the research this number fell to the 1% level of all companies in a list, even for sources with several hundred companies.

In the course of this study a total of 248 single sources were scanned. Out of these, 84 sources provided information that led directly to adding matching companies. The remaining sources did not contain any additional companies or, in a few cases, any applicable companies at all. The sources consisted in total of 173 wireless associations and forums, 23 national associations of venture capital companies, 26 developer communities of wireless operators or device manufacturers, 23 trade fairs or exhibitions, and three professional vendors of company address databases. The top five sources cover 52.62% of all companies and 81.08% of all companies could be identified with 17 sources. Stated differently, 6.59% of total sources were sufficient to identify over 80% of the companies.

### Statistical Analysis

To test the main hypothesis of the study, multivariate analysis is used, namely linear structural relationship analysis using the software LISREL 8.53 published by SSI Inc (Jöreskog, 2001).

## RESULTS AND IMPLICATIONS

### Exploring the Entrepreneurial Orientation Construct

Principal component factor analysis with the all entrepreneurial orientation variables with pair wise deletion and varimax rotation converged in three iterations and resulted in a five factor solution explaining 50.91% of the variance. The variables PROACT1, PROACT4 and RISK4 did not load high on any factor with relatively high cross loadings. These variables were removed from the analysis. A second analysis, resulting in four factors explaining 49.82% of the variance, indicated that PROACT7 did not load high on any of the factors and was consequently removed. After the reduction of these four variables, the final factor solution resulted in four factors explaining 52.13% of the variance and a mediocre MSA of 0.605. The rotated factor solution is given in table 1.

**Table 1: Results from Factor Analysis of Entrepreneurial Orientation**

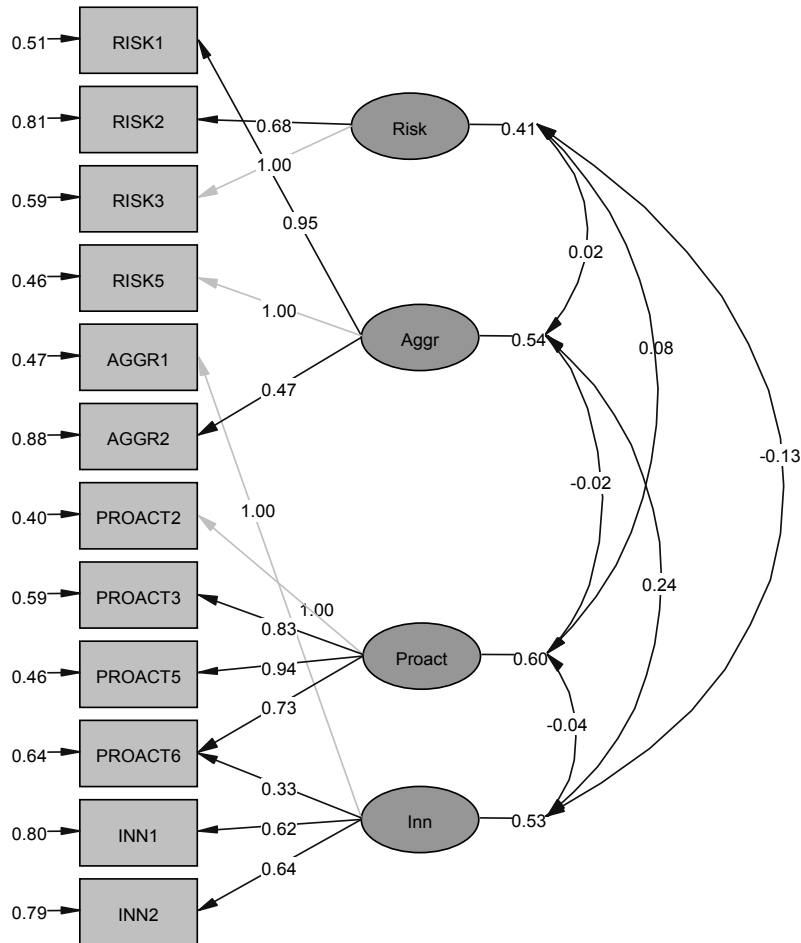
	Component			
	1	2	3	4
PROACT2 (Discover New Needs)	,732	-,106		-,118
PROACT5 (Discover New Opportunities)	,690	,164	-,179	
PROACT3 (Incorporate Unarticulated Needs)	,681	-,188		
PROACT6 (Extrapolate Key Trends)	,651	,130	,135	
RISK1 (Rely on External Funding)		,741	,107	,113
AGGR2 (Undo Competitors)		,672		-,211
RISK5 (Risky Investments for High Returns)		,627	,235	,315
AGGR2 (Generate First-Mover-Advantage)		,138	,695	-,212
INN1 (Type of New Products)			,653	,128
INN2 (Technological Leadership)		,130	,640	
RISK2 (Bold Moves)			,121	,759
RISK3 (Grow, Realize Profits later)			-,146	,710

All remaining Proactiveness variables loaded on the first factor, which made its interpretation uncomplicated and the factor could be labeled “Proactiveness.” The variables that loaded on factor three can be interpreted as “Innovativeness of the New Venture,” since the two innovativeness variables loaded on this factor along with the variable AGGR1, which was intended to measure a first-mover advantage. The variables in the second factor reflect elements of risk-taking (external funding, risky investments) and the posture to “undo the competitors.” This behavior can be interpreted as competitive aggressiveness, if one agrees that the reliance on external financing and risky returns are means to assure dominance of the future market. The last factor, with only two variables remaining, can be interpreted as risk-taking.

Although the variables did not load on the factors as planned, their interpretation was mostly in accordance with the underlying theory. Close attention to factor cross loadings shows that some of the variables have negative cross-loadings on other factors, nurturing a suspicion of a multidimensional construct. For the remainder of the study these four factors will be regarded as underlying dimensions of entrepreneurial orientation, whose goodness of fit and unidimensionality will now be evaluated. Confirmatory factor analysis can be used to assess the fit of the proposed dimensions of entrepreneurial orientation to the data. Polychoric correlations and an asymptotic covariance matrix were used to calculate the model in which 274 cases without missing values could be used. Underlying bivariate normality was not violated for all variables. The evolving path model confirms the dimensions (see figure 1). Model fit improvement suggested adding a relationship between Innovativeness of the company and PROACT6, which is also theoretically sound as the Innovativeness of the entrepreneurial orientation model to the data can now be assessed by the outlined criteria.

Global fit statistics were very good to excellent (see table 2), as are the internal consistency and the discriminate validity. Compared with the fit statistics of company success, the construct of entrepreneurial orientation in its application to new ventures shows weaker partial criteria, indicating a more ambiguous construct. The convergence validity in particular does not always fulfill the required values. Therefore influences that are only weakly significant or ambiguous must be treated with greatest caution.

If these constructs form the underlying construct entrepreneurial orientation, then they must load on the second order factor entrepreneurial orientation. Second order factor analysis for the model did not converge in LISREL. This means that the matrix between the latent variables was underdefined. Rindskopf and Rose (1988 p. 54) point out that a model with one second-order factor is theoretically identified from three first-order factors upward, which is obviously given with four first-order factors in the model. They discover that a reason for underidentification in second order factor analysis is one or more first-order factors that have nothing in common with the other first-order factors, which supposedly measure the same second-order factor. Given that the model cannot converge because of a near-zero effect from the second-order factor entrepreneurial orientation on at least two first-order factors, unidimensionality cannot be validated. To countercheck the finding, an explorative factor analysis in SPSS was conducted with a solution in which all variables are forced onto one factor. This approach was commonly used to test unidimensionality from previous authors (Covin and Slevin, 1986; Miles and Arnold, 1991). The result clearly underlined the findings of a multidimensional construct as five variables load

**Figure 1: Confirmatory Factor Analysis for Entrepreneurial Orientation Constructs**

lower than 0.1 on the factor and another two show negative factor loadings. It can be concluded that entrepreneurial orientation represents a multidimensional construct, constituted by “Risk-Taking,” “Innovativeness,” “Proactiveness,” and “Competitive Aggressiveness.” These dimensions will be used in further analysis rather than the single construct “entrepreneurial orientation.”

In summary, it can be concluded that entrepreneurial orientation is a multidimensional construct comprising of four distinct constructs, namely “Proactiveness,” “Risk-Taking,” “Competitive Aggressiveness,” and “Innovativeness of the Company.” Therefore, theoretical models that claim the independence of these constructs (Lumpkin and Dess 1997) have proven applicable for the case of new ventures. The global fit criteria for all constructs demonstrate very good values on the discussed indicators. It must further be noted that the discriminant validity of the constructs has to be regarded as excellent, which underlines the independence of the dimensions. However, the internal consistency and convergence validity demonstrate only satisfactory values for the construct in a new venture context.

**Table 2: Fit Criteria for Entrepreneurial Orientation**

Global Criteria: Degree of fulfilment: 100%						
$\chi^2$	= 76.05	GFI	= 0.98	RMSEA	= 0.048	
Df	= 47	AGFI	= 0.97	IFI	= 0.94	
$\chi^2/df$	= 1.62	SRMR	= 0.0067	CFI	= 0.94	
Partial criteria: Degree of fulfilment >50%						
Construct	Indica- tor	Internal consistency		Convergence validity		Discriminate validity $ACV > R_{\xi_i, \eta_j}^2$
		SMC	T-value	CR	ACV	
$\xi_1 =$ Risk	X <sub>2</sub>	0.49	1.89*	0.45	0.30	0.30 > 0.08
	X <sub>3</sub>	0.19	---			
$\xi_2 =$ Aggr.	X <sub>1</sub>	0.49	5.53**	0.63	0.38	0.38 > 0.20
	X <sub>4</sub>	0.54	---			
	X <sub>6</sub>	0.12	4.15**			
$\xi_3 =$ Proact	X <sub>7</sub>	0.60	---	0.77	0.47	0.47 > 0.002
	X <sub>8</sub>	0.41	10.21**			
	X <sub>9</sub>	0.54	9.51**			
	X <sub>10</sub>	0.36	8.25**			
$\xi_5 =$ Inn.	X <sub>5</sub>	0.53	---	0.56	0.27	0.27 > 0.20
	X <sub>10</sub>	0.36	3.24*			
	X <sub>11</sub>	0.20	5.69**			
	X <sub>12</sub>	0.21	5.89**			

\*p&lt;0.05, \*\*p&lt;0.01

### Exploring the Market Orientation Construct

Principal component factor analysis with the all market orientation variables with pair wise deletion and varimax rotation converged in ten iterations and resulted in a nine factor solution explaining 56.87% of the variance. After stepwise deletion of variables with low factor loadings or high cross-loadings, the variables InGen2, InGen5, InGen6, InDis1, InDis5, InDis6, Resp1, Resp3, Resp10, and Resp11 were removed from the analysis. A final factor solution converged in six iterations and resulted in six factors explaining 57.11% of the variance and a middling MSA of 0.708. The rotated factor solution is given in table 3.

Instead of loading on three distinct factors as theoretically assumed, a solution of six factors was found. A close look at the single factors shows that in none of the factors variables from different constructs is mixed. It appears to be more the case that the constructs intelligence generation and responsiveness consist of several underlying behaviors, while intelligence dissemination loads on a single factor. Therefore factor two can be labeled "Intelligence Dissemination." The intelligence generation variables load on different factors according to the object of intelligence generation. The first factor captures macro environmental objects; the fifth factor directs customer interaction and the sixth factor micro environmental objects. A closer look

**Table 3: Exploratory Factor Solution for Market Orientation**

	Component					
	1	2	3	4	5	6
INTELGEN9 (Social Trends)	.786					
INTELGEN8 (Officials)	.748				.160	.164
INTELGEN7 (Macro Economic)	.711	.177				.105
INTELDIS3 (Marketing spends time)		.807		.107	.270	
INTELDIS2 (Interdep. Meetings)		.783		.176		.170
INTELDIS4 (Circulate Documents)	.220	.602	.235	-.162	.103	
RESP6 (Customer Complaints)			.688			
RESP2 (Ignore Changes in Preferences)	-.108		.681		.202	
RESP7 (Ability to Implement)	.124		.541	.278	-.156	-.138
RESP4 (Competitor Orientation)		.198	.506	.116	-.119	
RESP9 (Modify Changes Quick)			.115	.712	.144	
RESP8 (Sensitivity to Price Changes)	.180			.674	-.213	.305
RESP5 (Functions Coordinated)		.147	.241	.584	.296	
INTELGEN3 (Direct Customer Interaction)	.157			.180	.809	
INTELGEN1 (Meet Customers Quarterly)	.157	.225	.113		.621	.232
INTELGEN4 (3rd Party Talks)					.130	.781
INTELGEN10 (Suppliers)	.358		.112		.108	.682

at the full formulation of the responsiveness items prompted the researcher to interpret factor three as the “Willingness to Respond” and factor four as the “Speed of Response.”

This compares with a seven factor solution for a market orientation scale found by Dobni and Luffmann (2000, p. 905) based on measures from Kohli et al. (1993), Narver and Slater (1990), and Deng and Dart (1994). In their solution, intelligence generation was also split into three factors, one factor for intelligence dissemination and a single factor for response design and implementation. Although they do not exactly match, both solutions may direct the researcher at the fact that the intelligence generation construct differs by objects.

Second order factor analysis was conducted for the market orientation construct. To assess the best model fit to the data, several competing models were evaluated. Besides the six-construct solution from the exploratory factor analysis, the theoretically based three-construct solution was evaluated. Additionally, after a first screening of the results a third, five-construct solution was introduced. This was suggested by the fact that the two constructs for responsiveness in the six-construct solution proved problematical in terms of convergence validity, while the single construct responsiveness solution in the three-construct model partly overcame this weakness. The resulting five-construct solution proved to be best fitting in terms of global and partial criteria. During the analysis it also became obvious that the variable Resp4 was difficult in terms of internal consistency and reliability in all models and has been excluded. The negative side effect of this was a reduction of the convergence validity of the overall market orientation second order factor, while this measure for the first-order construct “Responsiveness” increased. A comparison of the different models and the respective fit indices is given in tables 4 and 5.

**Table 4: Market Orientation Models Global Fit Criteria Comparison**

Global Fit Criteria			
	3 Construct Model	<b>5 Construct Model</b>	6 Construct Model
GFI	0.96	<b>0.97</b>	0.96
AGFI	0.95	<b>0.95</b>	0.95
RMSEA	0.066	<b>0.061</b>	0.070
SRMR	0.100	<b>0.083</b>	0.097
IFI/CFI	0.92/0.92	<b>0.92/0.92</b>	0.90/0.90

**Table 5: Market Orientation Partial Fit Criteria in Comparison**

Partial Fit Criteria: Convergence Validity						
Sub Construct	3 Construct Model		<b>5 Construct Model</b>		6 Construct Model	
	CR	ACV	CR	ACV	CR	ACV
InGen (7 items)	0.84	0.43	---	---	---	---
InDis (3 items)	0.82	0.61	<b>0.82</b>	<b>0.61</b>	0.82	0.61
Resp. (6 items)	0.71	0.27	<b>0.71</b>	<b>0.30</b>	---	---
IG Macro (3 items)	---	---	<b>0.79</b>	<b>0.55</b>	0.79	0.55
IG Cust. (2 items)	---	---	<b>0.65</b>	<b>0.48</b>	0.65	0.48
IG Micro (2 items)	---	---	<b>0.66</b>	<b>0.52</b>	0.66	0.52
Resp. Will. (3 items)	---	---	---	---	0.53	0.23
Resp. Speed (3 items)	---	---	---	---	0.50	0.34
MO (2 <sup>nd</sup> order)	0.59	0.34	<b>0.74</b>	<b>0.40</b>	0.85	0.49

It becomes obvious that the only criterion in which the five-construct model is inferior to the six-construct model is the convergence validity for the second-order factor. For completeness, the internal consistency of the constructs and the discriminate validity are given in table 6.

All paths from the second-order factor “Market Orientation” (MO) to the five sub-constructs are highly significant ( $p=0.000$ ), indicating that the construct “Market Orientation” is indeed unidimensional. Counterchecking with an exploratory factor analysis in SPSS with a single factor solution showed that all variables load on a single factor. It can be concluded that market orientation is a unidimensional construct. In their original study, Kohli et al. (1993, p. 470) used a similar construct, but only three underlying first-order factors. Only global fit criteria were given. Their reduced 20-item scale gave a  $GFI = 0.875$ , which compares with 0.97 for the model developed in this study. In the light of this, the five construct solution can be seen to be superior.

In respect to market orientation it can be concluded that it is a unidimensional construct comprising of five distinct dimensions, namely “Intelligence Generation on Marco Environment,”

**Table 6: Internal Consistency and Discriminate Validity for Market Orientation Construct**

Partial Criteria: Degree of Fulfillment >50%				
Construct	Indicator	Internal Consistency		Discriminate Validity $ACV > R_{\xi_i, \eta_j}^2$
		SMC	T-value	
$\eta_1 =$ IG Macro	X <sub>4</sub>	0.46	---	0.55>0.41
	X <sub>5</sub>	0.76	12.76*	
	X <sub>6</sub>	0.47	13.25*	
$\eta_2 =$ IG Cust.	X <sub>1</sub>	0.56	---	0.48<0.50
	X <sub>2</sub>	0.35	9.15*	
$\eta_3 =$ IG Micro	X <sub>3</sub>	0.14	---	0.52>0.50
	X <sub>7</sub>	1.00	4.10*	
$\eta_4 =$ In Dis.	X <sub>8</sub>	0.63	---	0.61>0.10
	X <sub>19</sub>	0.92	10.17*	
	X <sub>10</sub>	0.25	9.83*	
$\eta_5 =$ Resp.	X <sub>11</sub>	0.15	---	0.3>0.15
	X <sub>12</sub>	0.53	6.53*	
	X <sub>13</sub>	0.21	5.58*	
	X <sub>14</sub>	0.19	5.43*	
	X <sub>15</sub>	0.20	5.40*	
	X <sub>16</sub>	0.38	6.54*	
$\xi_1 =$ MO (2 <sup>nd</sup> order)	$\eta_1$	0.53	10.03*	
	$\eta_2$	0.80	13.83*	
	$\eta_3$	0.47	3.85*	
	$\eta_4$	0.09	4.79*	
	$\eta_5$	0.13	4.38*	

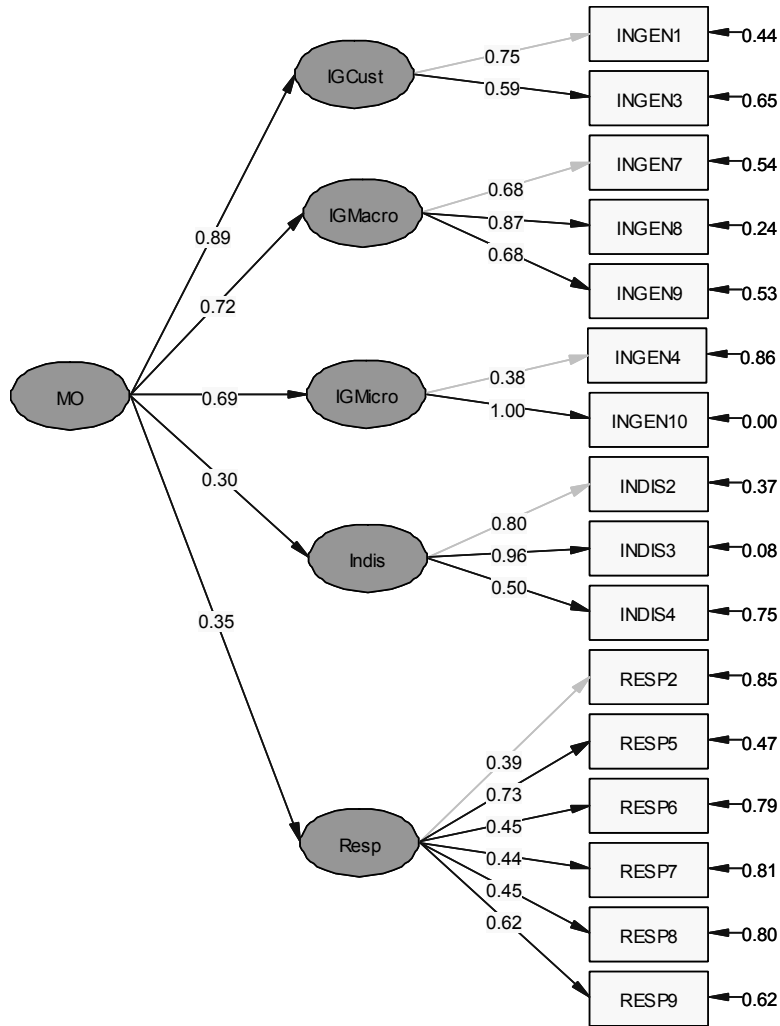
\* p&lt;0.01

“Intelligence Generation on Micro Environment,” “Intelligence Generation on Customers,” “Intelligence Dissemination,” and “Responsiveness.” This five-dimensional model nonconforms with the theorized three dimensions from its origins for large companies (Kohli and Jaworski 1990), but is in line with later validations of the construct. Another finding is that the “Intelligence Dissemination” dimension is applicable for the context of new ventures. It proved meaningful in qualitative interviews as well as in quantitative analysis.

### The Relationship of Market Orientation and Entrepreneurial Orientation

Entrepreneurial orientation proved to be a multi-dimensional construct with the four underlying dimensions: Proactiveness, Risk-Taking, Competitive Aggressiveness, and Innovativeness. Therefore the relationship needed to be tested in a model that investigated the influence of each of the orientations on new ventures success variables (for details please refer to Roskos 2004). Within one success variable analysis for the four models, the variable for entrepreneurial orientation was altered, while all other variables remained the same. For each success variable, all four models with altering entrepreneurial orientation dimensions were tested.

Figure 2: Second-Order Factor Solution for Market Orientation



This led to a total of twenty analyses in combining five different success dimensions with four dimensions each (Roskos 2004).

The influence of proactiveness on market orientation was found to be strongly positive in all five tested models. A proactive orientation of the new venture will strengthen its market orientation. New ventures trying to discover additional needs of customers of which customers are currently unaware or to search for opportunities in areas in which customers are having a difficult time expressing their needs do so by gathering more information about customers. So instead of searching for key trends internally, frequent customer interaction is used to gain insight into what customers in a future market will need.

**Table 7: Path Coefficients for Market Orientation and Dimensions of Entrepreneurial Orientation**

Success Factor	Proactiveness	Risk Taking	Competitive Aggressiveness	Innovativeness
Model 1: Market Share	<b>0.45**</b>	<b>-0.17**</b>	0.11	<b>0.37**</b>
Model 2: Growth	<b>0.48**</b>	-0.10	<b>0.29**</b>	<b>0.29**</b>
Model 3: Size in Employees	<b>0.41**</b>	<b>-0.19**</b>	----	<b>0.18**</b>
Model 4: Size in Revenue	<b>0.49**</b>	<b>-0.35**</b>	<b>0.19*</b>	<b>0.34**</b>
Model 5: Profit Generation	<b>0.54**</b>	<b>-0.19*</b>	0.06	<b>0.31**</b>

**\*\* p < 0.01; \* p < 0.05**

In four out of five models, risk-taking influences market orientation negatively. New ventures favoring bold decisions despite the uncertainties of their outcomes tend to countercheck their assumptions less with current customers. Market orientation gets more important if decisions are based on a step-by-step approach and a pragmatic way of dealing with new opportunities. Moreover, new ventures trying to grow with big and risky opportunities are also not using customer information as an early validation of their plans.

The relationship of competitive aggressiveness and market orientation is not as robust as for the other three dimensions. Only in two models could a significant positive relationship be found. However, no evidence for a negative relationship is indicated. There is reason to believe that competitive aggressiveness is not strongly related to the market orientation. More aggressive new ventures prefer competitive clashes over a “live and let live” approach. These tend to be more market-oriented, to stick closer to their customers, and to monitor their competitors more closely.

More innovative new ventures are clearly more market-oriented, as a positive relationship was found in all models. This finding is somewhat surprising. More innovative new ventures attempt to generate a first-mover advantage rather than react to competitors’ moves. If they did not emphasize the reaction to competitors’ behavior, they would not need to be well informed about their competitors in the market. However, those that put strong emphasis on technological leadership are more market-oriented. Obviously, the offering of tested solutions lets a market orientation appear unnecessary.

In summary, it can be said that risk-taking is negatively related to market orientation, while the other dimensions influence market orientation positively. That is, the more entrepreneurial a new venture is, the more emphasis it puts on understanding the market and responding to those insights. Market orientation is therefore an important element in a successful entrepreneurial strategy.

Finally it can be said that new ventures can benefit from an entrepreneurial posture that emphasizes the development of new technological solutions. It is critical that these new developments do not require a shift in customer behaviour or planning. To translate a proactive, innovative, and risk-embracing orientation into market success, new ideas and developments need to go through the filter of customer judgment. While customers are overemployed with the development of new solutions, they can give very valuable feedback on new ideas and developments. The belief that customers are not immediately able to see the benefits of a new development but will soon learn about them is a dangerous one.

## LIMITATIONS

### **Limitations Related to the Theoretical Foundations**

Neither market orientation nor entrepreneurial orientation rests on well established theories. Most researchers circumnavigate this fact by borrowing from other fields, such as the strategy literature. Even worse, some simply ignore theoretical issues. Research in marketing and entrepreneurship has not yet reached a stage of development at which one can expect a fully established theoretical model. Nevertheless, a common ground for what is distinct about entrepreneurship and which parameters influence new venture management and performance needs to be found.

### **Limitations Related to the Validity of the Statistical Assumptions**

The application of quantitative measures to transformed ordinal variables does not meet strict statistical standards. This study used polychoric correlations and transformed variables to address the problem. However, the basic problem may be alleviated but not finally solved. Additionally, only linear relationships between the variables were assumed. An investigation into possible non-linear relationships did not come into consideration.

### **Limitations Related to the Measurement Model**

The modification of the constructs used for market and entrepreneurial orientation may hinder the comparability with other studies that use more established measures. Although growth appears to be an attractive measure for company performance, better insights would come from the financial analysis of new ventures. Due to the sensitive nature of such data, it cannot be expected that this data was willingly and correctly reported. Market orientation and entrepreneurial orientation are conceptually problematical with regard to what they really measure. The proposed application of the established operationalizations rests on self-perception. Furthermore, the relationship between orientation and de facto behavior has not been finally clarified.

### **Limitations Related to the Sample**

The generalization of the findings for new ventures in any high-tech industry may be doubtful due to the narrowness of the chosen industry. In some respects the sample diverges from the population. New ventures from Scandinavian countries are overrepresented in the sample, while too few UK new ventures are represented. Additionally, the estimated year of creation was six months less for new ventures in the sample than the new ventures in the population. Time

limitations did not allow any longer study period and the attempt to generate longitudinal data by measuring the business orientations at an earlier point of time and their impact later may require a longer time period than one year to show results. The effect of entrepreneurial orientation may take longer to improve new venture performance (Lee et al. 2001). Lastly, the relatively low number of cases may not allow for the most powerful statistical tests or lead to LISREL model misspecifications.

### CONCLUDING REMARKS

This study is the first to apply the constructs of entrepreneurial orientation and market orientation to the special case of new ventures. The validity of the findings was increased by narrowing down the industrial and regional scope. The antecedents of successfully implementing an entrepreneurial orientation or market orientation were not in scope. Future research should focus on ways to implement both and give new ventures concrete management implications to realize the benefit in a properly implemented market and entrepreneurial orientation. Furthermore, the investigation into non-linear relationships between the variables offers an excellent opportunity for future research. Finally, there is more than sufficient room for additional variables to be entered into the model in the future. An extension and refinement of the given reference frame may provide a suitable starting point for future research.

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