Validation of an Inventory Measuring Competencies Required from Senior Management to Pilot Change Successfully: An Exploratory Study in SMEs

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Abstract

Roles played by managers have been pointed out as one of the factors explaining the success of organizational change projects. However, the competencies required to perform these roles have not been previously examined. This article develops an instrument intended to measure the competencies that senior managers need to master to successfully manage organizational change. Drawing on Churchill's (1979) approach to develop a questionnaire we followed these stages: a literature review to identify the construct to measure and develop a preliminary model of aspects to consider; a first validation of the preliminary model throughout a Delphi study; a quantitative study composed of an exploratory factor analysis of the answers provided by senior managers to a questionnaire, and an analysis of the results by confirmatory factor analysis. The results of the latter are in line with the preliminary ones: a model combining the behavioral manifestations of competencies based on seven items.

Keywords: change management, competencies, organizational change, leadership, SME

Introduction

In the wake of managerial changes, the notion of competence has become increasingly important. It has even earned a central place in human resource management, according to Van der Klind and Boon (2003). Furthermore, various changes occurring in the environment, such as increased competition generated by globalization, has made it challenging for businesses to adjust their choices and efforts in order to remain competitive. Thus, change has become a reality that most businesses are facing. However, taking advantage of change has proven to be more difficult as indicated by the high rate of failed experiments in this matter, which fluctuate, according to various empirical data, between 20% and 80% depending on the type of change (Appelbaum & al. 2008; Wellins and Murphy, 95, in Bareil, 2004; Beer and Nohria, 2000).

The following two types of factors are often cited to explain these failures. The first relates to individuals, particularly those who resist change. The second targets managers, specifically the roles they perform to design and implement change. According to several authors (Appelbaum & al. 2008; Pinto, 2005; Kotter, 2003), these roles are key success in organizational change projects. Cereste & al. (2003, in Appelbaum & al., 2008) suggest that the failures are due mainly to the following two factors: neglect of involving key partners in the decision making process and choice of an adequate leadership style.

However, the competencies required to manage change are likely to vary depending on various factors, particularly the manager's position. Thus, guiding change may mean executing tasks that vary according to the hierarchical level occupied, which impacts the competencies to deploy. For example, senior managers are more concerned with the conception of change while middle managers are more involved in providing support to their staff. Due to the number of employees and the distribution of responsibilities, it is the senior manager's duty to perform all tasks related to the implementation of change. Therefore, they are expected to master a wide range and relatively similar set of competencies in this regard. This is the first reason that led us to examine which competencies senior managers of SMEs have to master in order to manage change. The second reason is the importance of SMEs. SMEs are widely acknowledged as businesses that often contribute to the development of the economy and create the most jobs (Julien, St-Pierre & Beaudoin, 1996). In Canada, they generate nearly half of the GDP and employ 57% of the labor (Debus, 2007). Moreover, the uncertainty of the current environment and vulnerability to competition of SMEs create both an imposing need to implement changes.

This article is divided into four parts. The first is devoted to an analysis of the literature pertaining to the concept of competencies and change management. This allows us to outline the main choices that have been made to develop the questionnaire measuring the competencies required to effectively manage an organizational change in an SME. These choices are namely the approach adopted to measure the competencies, the definitions of these competencies, the type of change taken into account, and the source of the competencies that we initially submitted to the judgment of experts. The second part of this article describes the qualitative and quantitative methodologies used to construct the questionnaire. This description includes information on the techniques used and the sample. The third part of this article provides information on test results validating the questionnaire and on the competency model that our data collection has yielded. The fourth part of this article discusses the results, which relates to the contributions of our research and its limitations, and suggests avenues for future research.

Literature Review and Operational Framework

In order to determine which competencies are needed to manage change in SMEs, two types of literature must be taken into account: one on the competencies and the other on managing change. The review of the first type of literature aims to define a competency and to clarify how it can be identified. As for the second type of literature, it aims at identifying the competencies that can be measured. The consultation of these two types of literature corresponds to the first step of the process suggested by Churchill (1979) in developing a questionnaire, namely the definition of the field under investigation.

Defining and Measuring the Concept of Competence

There is a vast literature on competencies which comes from different praxis as demonstrated by several authors (Janjua & al., 2012; Bouteiller and Gilbert, 2005; Berman Brown, 1994). For example, after analyzing the trends of thought in four different countries (Canada, United States, France and Great Britain), Foucher and Naji (2010) distinguished three ways of approaching individual competencies, where each impacts the way competencies are defined and measured.

The first school of thought was initiated in the United States by McClelland (1973), Boyatsis (1982) and Spencer and Spencer (1993). According to these authors, competencies comprise of four distinctive interrelated features. Firstly, they refer to characteristics discriminating between superior and adequate performance. Secondly, they are identified through critical incidents, a method designed to differentiate top performers from others. Thirdly, they target behaviors. Finally, they cut across a range of positions. For example, the dictionary proposed by Spencer and Spencer (1993) comprises of eight groups of competencies such as action and achievement, support and service to others, and personal effectiveness.

The second school of thought has profoundly influenced British literature and is also manifested in the United States. This is characterized in the work undertaken by the United States Office of Personnel Management (Rodriguez & al., 2002). According to the first school of thought, competency is inferred from behavioral manifestations demonstrated through action and superior performance. For the second school, competencies are a prerequisite that can be expressed through behavior in order to achieve adequate performance. This perspective underlies the work of the National Council for Vocational Qualifications in England and the Scottish Council for Vocational Qualifications in Scotland. They conceive competencies as a requirement for various jobs; they identify them by a method of task analysis, namely the functional job analysis; they record benchmarks for each job considered.

The third school of thought was developed in France. It views competencies as combinations of resources that are constructed in specific contexts. Therefore, they are closely related to the tasks and the context in which they are imbedded. This is the reason why French organizations tend to develop competency frameworks for specific positions. Finally, competencies are perceived more as a pre-requisite for an adequate performance than as a characteristic of top performers.

The conception of competence that we retain for the purposes of our research has four characteristics: 1. competencies are requirements to succeed, 2. they are transversal or applicable to various situations, 3. they are manifested in behavior, and 4. these manifestations can be regrouped into a cluster at a deeper or broader level. Among the definitions listed, the following two help account for the conception we have chosen. The first, which we have already mentioned (Management Charter Initiative, Berman Brown, 94, p. 90), sees competency as a requirement to execute the task successfully. The second, formulated by Klein (1996), explains the other aspects we have chosen to characterize competencies: "Competencies are those behaviors that exhibit excellent performers much more consistently than average performers. Competencies are not a psychological construct; they are a collection of observable behaviours that require no inference, assumption, or interpretation. These behaviors, typically referred to as 'behavioural indicators', are grouped according to a central message or theme, which becomes the title of the competency '' (1996).

Specifying the Requirements of Change Management

Not all organizational changes refer to the same reality, as revealed by the typology proposed by Autissier, Vandangeon and Vas (2010) which helps situate the changes in which we are interested in. These authors distribute the changes on two axes, with two opposite poles. On the first axis, the poles are defined by continuity versus rupture with the present situation. On the second axis, the poles are defined by emergence from the bottom line versus imposition by the senior management. From the crossing of these two axes originate four quadrants in which they classify the contributions of 50 authors on change. These quadrants refer to four types of changes: directed, proposed, organized and continuous. Our research focuses on measuring the competencies required to conduct directed changes, which have two characteristics. Firstly, they present a disruption with the existing state; consequently, they are often managed as change projects. Secondly, they originate from senior management.

However, there is scarce empirical data relating directly to the competencies required for managing change projects successfully. Therefore, in order to elaborate a preliminary model of these competencies, we decided to rely upon four types of literature relating to change management. The first literature relates to the planning and conduct of change projects. It provided information concerning the steps and tasks to be performed to carry them out. The second literature delivers research results pertaining to the impact of various factors on the successful implementation of changes. These results indirectly provide information on competencies to master in order to properly manage these factors when implementing a change. The third literature is related to the exercise of leadership in order to transform an organization. It is taken into account because of its links to the management of change. The fourth literature focuses on management success factors. These factors provide indirect information on competencies relevant for managing change projects.

Several authors (Austin & Bartunek, 2006; Gallos, 2006; Pichault, 2009) have identified and classified the theories of change management. Austin and Bartunek (2006) propose two classifications of the theories. The first classification is based on the underlying generative mechanisms (or motor) that emphasizes change theories. The motor most frequently taken into account is the teleological motor and is most relevant to the type of change studied in our research. The others are the dialectic, the evolution and the life cycle motors. The second classification embraces the following four types of theories: participation, self-reflection, action research, and narrative rhetoric. Those that focus on participation are most relevant to the type of change we are studying. In regards to Gallos (2006), she classifies the theories of change according to four perspectives from which organizations can be studied: the structural framework, the human resources framework, the symbolic framework and the political framework. In connection with each of these, Gallos identifies the objectives and roles to perform. For example, the human resources framework, whose raison d'être is to facilitate the harmonization between the needs of the individual and those of the organization, requires the facilitator, trainer and coach to exercise their roles so that motivation, satisfaction and productivity is enhanced as desired. Given that our research aims to identify competencies applicable to a large scope of organizational changes, attention should be paid to the roles associated with each of Gallos' frameworks and therefore, the competencies they require.

Finally, Pichault (2009) identifies five approaches to manage change: rational (planned change), political, contingent, interpretative and incremental. Since these changes are the focus of our research, the contributions of rational and political approaches must be taken into account.

On the one hand, theories of change are important sources of information to identify the competencies to master for a successfully planned and directed change project. On the other hand, special attention should be paid to normative models, mainly because they were specifically designed to carry out the type of change our research focuses on. This is depicted by the five models which provide a view of the tasks required to properly steer organizational change. These tasks can be classified according to two sets of criteria. The first criteria refers to the tasks that are necessary to complete a project, such as studying the need for change, planning of change, developing and disseminating a vision, and conducting change. The second criteria relates to the three step model proposed by Lewin (1951), which includes unfreezing, transition and refreezing. Tasks such as establishing the need for change and creating a sense of urgency contribute to unfreezing. At the other extreme of the process, refreezing is carried out by tasks which have communalities beyond their different wordings: strengthen and refine the new state, consolidate and institutionalize the new state, and anchor the new approaches in the culture. These models also provide advice on strategies and tactics to be deployed to drive the change, such as starting at the periphery, making quick profits and focusing on results rather than activities. The analysis of these tasks and strategies is another source of information on competencies to master for the successful conduct of a planned change.

Information on competencies also emerges from research showing the importance of human factors in the conduct of change projects. Firstly, we will begin with studies that target the recipients of change (Prado-del-Val & al., 2012; Armenakis & al., 2007; Bareil, 2004). Bareil (2004) addresses the concerns expressed by the recipients of change. Armenakis and his colleagues (2007) measure their beliefs about the change. Both of these studies deserve special attention for two reasons: they help to better understand the framework of the recipients of change and they highlight certain links, including commitment to change. Secondly, other studies measure how management practices expressed during the change process, such as communications (Merrell, 2012; Allen & al., 2007), participation (Lines & al., 2005) and fairness (Berneth & al., 2007) influence commitment to change.

Another source for providing information on the competencies needed to conduct change projects is the literature pertaining to leadership, especially in relation to transformational leadership (Bass, 1985). According to a survey by the American Management Association (AMA) comprising of some of the most prestigious companies, the key to success in managing change is leadership (Gill, 2003). Before presenting the work dealing specifically with competencies that leaders are expected to master, it is necessary to clarify their roles.

Some authors have specifically addressed the competencies that the leader must master to perform these roles, as shown by the four following contributions. The first is the literature review of Handford and Coetsee (2003) which summarizes the studies of 18 authors by considering three categories of information: the roles and activities that leaders have pursued successfully, their competencies; and their personal characteristics. From this exercise, three competencies arise as critical for the emergence of a transformational leadership: establish a direction, build a commitment to specific goals, and create a climate stimulating motivation. These three critical competencies consist of 14 competencies labeled as "essential". The second contribution is the typology developed by Dulewicz and Higgs (2005), which consists of three sets of competencies displayed through 15 behaviors. These three sets of competencies are related to the intellectual, managerial and emotional domains.

Literature in project management, specifically studies dealing with project success factors, is the fourth input considered for mapping out competencies needed to manage change projects efficiently. .For instance, Pinto and Slevin (1988) developed a questionnaire which was used by Mika (2008) in the context of change management. Her research aimed at determining what factors differentiate, according to the recipients of change, change projects they perceive as successful from those they see as failures. The most discriminating factor is communications. This is another evidence based result showing the importance of mastering competencies in this matter.

A Preliminary Model of Competencies Required for Managing Change Successfully

Information gathered from the four literatures consulted was used as the basis of a two step job analysis method. Step one consisted in targeting the tasks judged as essential to manage a change project. Step two consisted in determining what competencies are required to carry out these tasks. This methodology was chosen because the application of a similar approach in studies aiming to develop a competency model has previously provided relevant and valid information (Catano & al, 2001; Foucher & Naji, 2010).

The task analysis we conducted was twofold. On the one hand, attention focused on identifying broad dimensions encompassing more or less explicitly a body of tasks considered as necessary to manage change, such as developing a vision guiding change. These dimensions were considered has resulting from the display of competencies that match up with them. On the other hand, attention focused on behaviors through which each of these competencies unfolds. Mapping of these behaviors was inspired by studies highlighting aspects such as taking into account political issues and individual concerns about the change project.

A list of 54 statements resulted from this process. In accordance with the definition proposed by Klein (1996), each measured a behavioral manifestation of a competence. These statements were grouped into six dimensions or competencies providing a title and common sense to each grouping. These competencies and their behavioral manifestations constitute the first draft of the competency model we tested through our exploratory research.

Methodology

The methodology chosen to test this preliminary model is based on Churchill's (1979) recommendations. To satisfy this requirement, complementary and interdependent methods were chosen. Some are qualitative, others quantitative. Using qualitative methods, mainly a Delphi study, was based on the following reasons: 1. consolidate the conceptual framework, which refers to a task that can be included in the first stage proposed by Churchill; 2. pursue item analysis, particularly in order to refine the model, which corresponds to the second stage mentioned by Churchill. The revised competency model was then tested by a questionnaire administered to a sample big enough to allow studies of reliability and validity, and thus conducive to further refinement of .the competency model. Because these tests were applied to a single sample, the study remains exploratory and the third step of the process suggested by Churchill remains incomplete.

Qualitative Stage: Delphi Study and judges rating

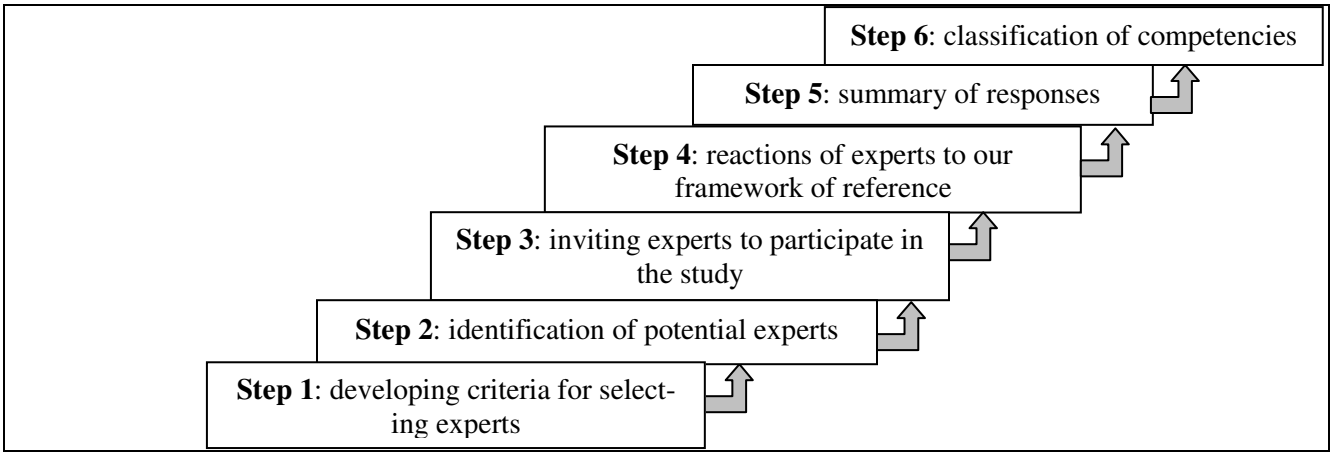
Due to the exploratory nature of our research, we initially used qualitative methods. The first is the Delphi study. The second is the *judges rating (*Pansu, 2006; Weiner and Kukla, 1970).

The Delphi study aimed to test the clarity and relevance of the behavioral manifestations of competencies included in the preliminary competency model resulting from our literature review and, if necessary, to supplement it.

The Delphi study required going through various steps (figure 1), three of which being dedicated to the choice of participants. Those selected for the Delphi study had to be academics or practitioners who had published peer-reviewed books or articles on organizational change and whose expertise was acknowledged by the scientific community. To assess this expertise, at least two peers were asked if they perceived these persons as experts. Of the seven people chosen, five agreed to cooperate, provided that the iterations could be done by e-mail for reasons of efficiency and time saving. Since a Delphi study does not provide direct contact between the persons consulted, we opted for this approach.

Experts were prompted to express their opinions regarding each of the competencies included in the model. To facilitate the specific answers were asked. Relevancy; assess if each competency was relevant; following which has conducted to three iterations during a one month period.

Figure 1: Implementation strategy of the Delphi method



At the end of the consultation process using the Delphi method, experts had developed a common ground that, when they were not subject to a unanimous decision, they showed strong enough similarities to be accepted. Thus, the six initial competencies were retained by the experts participating in the Delphi method. However, the component statements varied and can be classified into four categories: 1. those which were retained as is, 2. those which content have been rewritten, 3. those which were eliminated, and 4. those which were replaced by new ones.

Given the changes to the initial model, we used a complementary method (method of judges) to verify the statements' belongings (behavioral manifestations) in each grouping (competency). With five people, this jury was composed of one professor, two managers and three doctoral students. Initially, each juror had to rank each statement in one of the groups that had been proposed. Afterwards, the group discussed the statements that were not the subject of a unanimous classification. The criterion of the consensus prevailed, except in rare cases where some people remained in their position, and then the criterion of the majority was used. The final classification was very similar to that of the experts of the Delphi method. However, some statements were not classified in any of the six competencies; after having analyzed their contents, we classified them, with the agreement of the judges and the consulted experts, in a new competence named 'to provide support for change.'

Both qualitative methods allowed us to obtain a model composed of seven competencies for the following titles: 1. to develop a vision for change, 2. to provide support for change, 3. to share the vision for change, 4. to plan the implementation of change, 5. to implement change, 6. to assess and measure change, and 7. to manage themselves through change. Each construct refers implicitly to the capacity to do something. However, we did not mention the term capacity in the titles because of the different positions on the relationship between capacity and competence.

Quantitative Stage

The quantitative research stage was also conducted in two phases with a dual objective: 1. Verify up to what point the prior model is found in the empirical data, 2. Purify the questionnaire by keeping only the most robust dimensions and statements. The first phase gives rise to the application of factor analysis by the method of principal components followed by varimax orthogonal rotation. Cronbach's alpha is used to verify the homogeneity of the factors identified. The second phase involves the application of confirmatory factor analysis according to the procedure suggested by Jöreskog (1979).

Before providing details on each of these phases, it is worth mentioning that the model questionnaire measuring the seven competencies was administered to a convenience sample of 170 Canadian small and medium businesses believed to have implemented an organizational change within three years preceding our survey. The leaders of these SMEs were asked to assess the importance of these competencies against a change they had piloted during this period of time.

Of the 170 directors contacted, 144 reported having led and completed the implementation of changes during the three years preceding the administering the questionnaire, which means that the other 26 respondents did not continue to respond. After eliminating the respondents with incomplete responses, 118 questionnaires were retained to perform statistical analysis, representing a response rate of approximately 6% based on 2000 questionnaires sent. The number of employees of an SME is an average of 69 and an average turnover of approximately $ 6.3 million.

Exploratory Factor Analysis

To assess the factorial structure, we used a principal component analysis followed by varimax orthogonal rotation using the following criteria: 1. retention factors whose eigenvalue is greater than 1.00, 2. retention of factors explaining a higher percentage of variance at the inflection point of the scree test, 3. conservation of statements whose saturation factor is greater than 0.60 while being less than 0.40 on the other. The results of this analysis are presented in Table 1. It shows that six of the seven factors are composed of three statements and one is defined by two. The percentage of variance explained by the statements of each factor varies from 65 to 75%.

Table 1 also reports the alphas of each factor, which are spread out between 0787 and 0831. The high alpha values indicate good internal consistency between items within each dimension.

Table 1: Competencies required for successful management of organizational change in SMEs

Dimensions	Item	Loading	Variance explained	alpha
Sharing the vision of the change	Convincing employees of the need for change	.901	75.00%	0.827
	Ensuring that the beliefs and values associated with the vision are shared by employees	.853		
	To be attentive with the employees' reactions with regards to the vision suggested	.843		
Managing yourself through the change	Ensuring that time and energy to change interferes as little as possible to his/her duties or his/her personal life	.902	71.16%	0.787
	Managing stress in difficult situations that occurred during the conception and implementation stage	.822		
	Grasp the appropriate lessons from problems occurring during the change	.803		
Evaluate and measure the change	Celebrate achievements and successes through the progress of change	.875	70.26%	0.786
	Develop reliable and valid success indicators to make an assessment of the project	.831		
	Evaluate the process and results of the change taking into account the views of all those concerned	.807		
Develop a vision for the change	Diagnose the internal and external environment to see if a new vision is needed	.845	65.26%	0.785
	Justify the rationale for the change from the current and future orientation of the organization	.842		
	Propose a vision that is both realistic and capable of encouraging the mobilization of all those concerned	.731		
Implement the change	Be attentive to the concerns of employees facing the change and contribute to their expression	.866	70.93%	0.728
	Encourage continuous training so that employees can benefit from difficulties, mistakes and successes	.836		
	Know how to interpret the complaints, concerns, and needs that are susceptible to change and react appropriately	.824		
Plan the implementation of the change	Predict and identify the time required to manage change	.864	74.72%	0.831
	Anticipate the resources needed to implement change	.864		
Ensure the support for the change	Ensure that the management team understands the stakes associated with change	.907	74.19%	0.814
	Ensure adherence to the management team to the proposed vision	.868		
	Ensure the support of the "key players" of the organization	.806		

Confirmatory Factor Analysis

The confirmatory factor analysis that we conducted did not meet the requirements of the third phase of Churchill's paradigm, but rather consolidates the previous exploratory factor analysis by verifying if the structure in seven dimensions can be maintained. This analysis was performed using the procedure suggested by Jöreskog (1979).

Figure 2 presents the confirmatory factor analysis model of the 20 statements and the seven latent dimensions. The analyses are performed to examine the quality of the fit of the seven factors model. Various indices were used to verify the fit of the model, that is to say, the adequacy of the measurement model specified with the empirical data (see Table 3). Besides the χ^2 test, which indicates the ability of the data to produce the theoretical model, the selected fit indices are GFI, the RMSEA, TLI and the IFI.

Examination of the two indices measuring absolute χ^2 and RMSEA show that they comply with the recommended critical thresholds (p value of χ^2 test is 0.000, and an acceptable threshold of 0.08 for RMSEA). Analysis of the incremental indices, namely the CFI, IFI and TLI show they are superior to the index 0.9. As for the parsimony normalized χ^2 (χ^2 / df), its value also meets the critical threshold (χ^2 / df inferior to 2).

Figure 2: Confirmatory model for the seven competencies required for a successful change

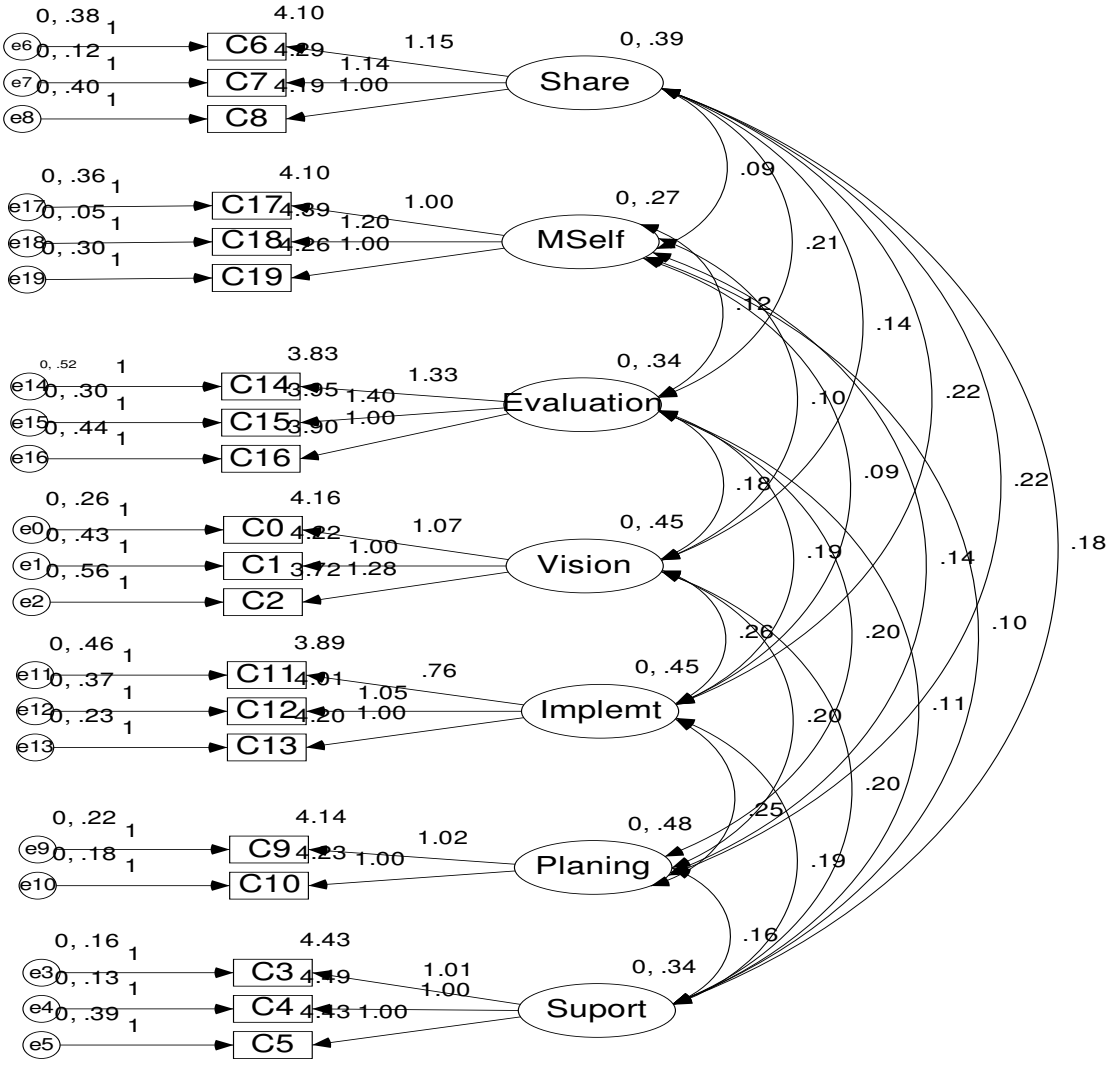


Table 2: Adjustment indices of the model with seven dimensions of the competencies scale to manage the change

Indices	Desired Value	Found Value
χ^2/df **p**	+ smallest possible significant	1.468 p=0.000
CFI	> 0.90	0.930
TLI	> 0.90	0.901
IFI	> 0.90	0.934
RMSEA	< .08 better if < .05	0.053

In conclusion, the indices taken into account clearly indicate that the theoretical model with seven factors that had been defined as a priori correctly reproduces the empirical data. The other type of analysis relates to the validity of the model, which is evaluated in light of three criteria: reliability, convergent validity and discriminant validity of the constructs.

The reliability of the constructs is verified by calculating Jöreskog's ρ which must exceed 0.7 (Fornell and Lark, 1981).Table 3 shows that Jöreskog's ρ of the seven competencies varies between 0844 and 0919, indicating that the measurement reliability of the seven competencies is good. Recall that the formula for calculating this coefficient is:

$$\rho_X = \frac{\left(\sum_{i=1}^{n} \lambda_i\right)^2}{\left(\sum_{i=1}^{n} \lambda_i\right)^2 + \sum_{i=1}^{n} \text{var}(\varepsilon_i)}$$

λ: Loadings associated with construct X.

ε: Variance error indicators of the construct X.

Table 3: Examination of the reliability and the convergent validity of the 7 competencies

Dimensions	Item	Loading	ρ of Jöreskog	ρ_{VC}
Sharing	C6	0.866**	0.918	0.789
	C7	0.875**		
	C8	0.921**		
Self Management	C17	0.804**	0.887	0.723
	C18	0.902**		
	C19	0.842**		
Evaluation	C14	0.819**	0.846	0.648
	C15	0.871**		
	C16	0.718**		
Vision	C0	0.849**	0.844	0.643
	C1	0.797**		
	C2	0.757**		
Implementation	C11	0.738**	0.844	0.644
	C12	0.823**		
	C13	0.843**		
Planning	C9	0.925**	0.919	0.789
	C10	0.919**		
Support	C3	0.856**	0.891	0.732
	C4	0.885**		
	C5	0.825**		

** Significant threshold at $p < 0.05$

Convergent validity can check if: different indicators that are supposed to measure the same phenomena are correlated. Fornell and Larcker (1981) propose two criteria to assess the convergent validity: 1) λ, represents the coefficients linking each item to its construct, must be significantly non-zero, and 2) the variance of the construct should be further explained items that measured by the error. This condition is verified by calculating the coefficient ρ_{VC} that must be greater than 0.5 (Fornell and Lark, 1981). This coefficient is calculated using the following formula:

$$\rho_{VC\ X} = \frac{\sum_{i=1}^{n} (\lambda^2{}_i)}{\sum_{i=1}^{n} (\lambda^2{}_i) + \sum_{i=1}^{n} \text{var}\ (\varepsilon_i)}$$

λ: Loadings associated with construct X.

ε: Variance error indicators of the construct X.

The examination of Table 3 shows that the values of ρ_{VC} are all constructed above the minimum threshold of 0.5 established by Fornell and Larcker (1981). Similarly, the loadings, which represent the coefficients linking each item to its construct, are all significantly non-zero (the t values are much greater than 2). Therefore, the convergent validity criteria recommended by Fornell and Larcker (1981) are satisfied.

The discriminant validity indicates the degree to which the measure of a construct differs from other constructs (Barclay, Higgins and Thompson, 1995). Specifically, discriminant validity means that two latent variables that are theoretically different are also distinct in practice. For this requirement to be satisfied, a construct should share more variance with items embodying other constructs. Practically, we must ensure that the ρ_{VC} coefficient of each construct is greater than the squared correlations it shares with other constructs (Fornell and Larcker, 1981).

Table 4: Correlation matrix and the square root of the ρ_{VC} coefficient

	Evaluation	M. yourself	Implement.	Shared	Planning	Support	Vision
Evaluation	(0.805)						
M. yourself	0.376	(0.851)					
Implement.	0.449	0.243	(0.802)				
Shared	0.433	0.252	0.483	(0.888)			
Planning	0.324	0.236	0.432	0.418	(0.922)		
Support	0.351	0.233	0.449	0.459	0.384	(0.856)	
Vision	0.337	0.232	0.5163	0.27	0.343	0.520	(0.802)

The data reported in Table 4 show that the variance shared between the latent constructs (measured by the correlations between constructs) is less than the variance shared by a construct with indicators. Consequently, the discriminant validity of all seven competencies is good (Fornell and Larker, 1981).

In conclusion, the results regarding the reliability, convergent validity and divergent validity can justify the validity of the competency model that was measured.

Discussion

The construction of a scale measuring the competencies required for organizational change management in SMEs is relevant both theoretically and practically. On the theoretical side, it fills a void for the release, by both exploratory and confirmatory analysis at the same time, a robust model of seven competencies with 20 behavioral manifestations. These seven competencies are as follows: 1. to develop a vision for change, 2. to plan the implementation of change, 3. to share the vision for change, 4. to implement change, 5. to provide support for change, 6. to manage themselves through change, and 7. to evaluate and measure change. In addition to relying on the evidence of the statistical validity of indices, this model is the foundation in various schools of thought on organizational change, mostly to the transformational leadership and success factors of change. It also highlights a competency that the literature on change does not seem to stress enough, which is to manage yourself during the change. For these reasons, the measurement scale was developed in a manner that may in turn help to stimulate reflection and research, both on change management and the competencies required to manage change. In practical terms, the scale measuring the competencies needed to manage organizational change in SMEs can be used to guide the training of managers of such organizations that are often unprepared to manage changes that could bring prosperity that is so necessary for the survival of their business.

Limitations and Future Research

Despite our contributions, this research has limitations. Some limitations relate to the respondents and others to the design of the research. Concerning the respondents, the first limitation is the number of people who responded to our questionnaire. A larger number of subjects would have probably increased the reliability of responses. A second limitation relates to the origin of the respondents because they are all from the same geographical context, a Canadian province. Future research should check whether the resulting model can be replicated in another medium. A third limitation is due to only a single data collection was performed. According to the approach suggested by Churchill (1979), it would be appropriate to make another collection of information to verify the stability of the found model.

The other type of limit comes from the design of the research. This aimed to measure the skills required to manage the change from an approach based on job analysis. The results do not mean, however, that mastery of these skills would make it possible to discriminate between successful change projects and projects leading to failure. Research comparing the competencies expressed by managers of change who have opposite results should be provided with the necessary knowledge that is required to carry out successful organizational changes.

This research also opens the door to at least three types of work. Firstly, it should be investigated to what extent the competency model which has been identified is modulated according to different types of changes. Secondly, it would be interesting to measure the competencies that managers must master at different hierarchical levels to manage change successfully. Thirdly, it would be useful to check what should be made to determine how those who master the skills required are received. This information would be particularly useful for the design of training activities.

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