ABSTRACT
Integrating insights from recent entrepreneurship literature (Haynie, Shapherd and colleagues, 2009, 2010, and 2012) with upper echelons perspective (Hambrick & Mason, 1984) this study introduces the concepts of TMT (top management team) metacognitive knowledge and experience diversity and develops theoretical propositions regarding their role in a firm’s entrepreneurial orientation dimensions (innovativeness, proactiveness, and risk taking). A contingency approach is adopted to propose that diversity in TMT members’ metacognitive knowledge and experience is likely to enhance a firm’s entrepreneurial orientation if team members seek to create an atmosphere where different abilities can be understood and acted upon. The theoretical and managerial implications are presented.

Keywords: top management team, metacognition, diversity, entrepreneurial orientation, behavioural integration

INTRODUCTION
It has long been argued that a firm’s operation and performance can be explained by managerial cognition (Nadkarni & Barr, 2008). In particular, the cognitive attributes of top managers as a team, rather than individual CEO’s, has been argued to yield a more complete picture of a firm’s decision-making and actions (Hambrick & Mason, 1984; Olson, Parayitam, & Bao, 2007). The importance of TMT (top management team) and their combined cognition came from the theoretical perspective known as “upper echelons” (Hambrick & Mason, 1984). Hambrick and Mason (1984) highlighted the role of top managers and the importance of their cognitive base and values as a team in shaping organizational outcomes. Since this theory was published there has been a surge of interest in applying its assumptions. Such interest has made a significant contribution to the management literature by providing evidence on the important role of TMT and their combined capacity (Certo, Lester, Dalton, & Dalton, 2006). Entrepreneurship literature has also paid attention to the entrepreneurs’ cognitive attributes in understanding and performing entrepreneurial activities (e.g.
Dutta & Thornhill, 2008). However, it has been mainly limited to the individual level of analysis (West, 2007).

Recently entrepreneurship scholars (Haynie, Shepherd, & colleagues, 2009, 2010, & 2012) have focused on the concept of metacognition. Metacognition refers to individuals’ understanding and knowledge of their own cognitive process and performance (Baron & Henry, 2010). It differs from cognition in the way that it describes the higher-order cognitive process through which individuals recognize multiple ways of framing a problem or decision task, and consciously consider the alternatives to address a decision task (Haynie & Shepherd, 2009; Haynie, Shepherd, & Patzelt, 2012). Individuals vary in their metacognitive abilities. One source of such differences can be presented through capturing the variability between individuals with respect to their metacognitive resources; metacognitive knowledge and metacognitive experience (Flavell, 1979, 1987; Haynie et al., 2012).

Given that each manager brings his/her own cognitive ability to contribute to the firm’s decision-making and actions, it is expected that there would be different levels of metacognitive knowledge and experience in a team of top managers or entrepreneurs. Understanding this diversity is important in both strategic management and entrepreneurship contexts as a firm’s decisions and actions involve all managers at the top level (Qian, Cao, & Takeuchi, 2013; West, 2007). It is this aspect that forms the core of this study, the TMT diverse metacognitive knowledge and experience and its impacts on a firm’s entrepreneurial behavior. However, for the effects of such diversity to be better materialized, team members need to share their differences and value them by joint decision-making, or in other words, exhibit behavioral integration (Boone & Hendriks, 2009; Buyl, Boone, Hendriks & MatthysSENS, 2011). Accordingly, this study proposes the moderating role of TMT behavioral integration.

The discussion in this paper is organized into the following sections. First, a brief review of the upper echelon perspective, the concepts of metacognition (metacognitive diversity), entrepreneurial orientation, and behaviourial integration are presented. Then, we propose some potential effects of TMT metacognitive diversity on a firm’s entrepreneurial orientation while
considering the TMT behavioural integration. This section is then concluded by discussing some theoretical and managerial implications.

**UPPER ECHELON THEORY**

Strategic management scholars have long taken it for granted that managers influence a firm’s behaviour. While some researchers have focused on the role of individual CEOs (e.g. Nadkarni & Herrmann, 2010), others have drawn attention to top managers as a team (e.g. Wei & Wu, 2013). Until the 1980s, research on strategic leadership was mainly concentrated with the behaviour of organization’s strategic leader (Carmeli, Schaubroeck, & Tishler, 2011). In the 1980’s the term "top management team" or TMT was introduced to the management literature (Hambrick, 1995). The theoretical work of Hambrick and Mason (1984), known as “upper echelons”, drew attention to top managers and their characteristics as a team. They argued that focus on an entire team yields stronger explanations of a firm’s decision and outcomes as top managers share tasks and to some extent power with each other. They further underlined the importance of the TMT cognitive base and values in their interpretation of the situations they confront and their choice making (Hambrick, 2007).

Given the uncertain, dynamic and often complex nature of the entrepreneurial activities managers may need to have access to different cognitive resources (Talke, Salomo, & Kock, 2011; Olson et al., 2007). It is their combined cognition which directs their firm’s entrepreneurial decision-making and activities (West, 2007). So, applying the upper echelons assumptions into entrepreneurship research would yield a more complete picture of a firm’s entrepreneurial behaviour. In this regard, the concept of metacognition could be promising as it is an important factor in understanding and interpreting entrepreneurial tasks (Haynie & Shepherd, 2009; Haynie et al., 2012).

The next section briefly describes the concept of metacognition (and metacognitive knowledge and experience). Then the concept of TMT metacognitive diversity is elaborated.

**METACOGNITION AND METACOGNITIVE DIVERSITY**

Metacognition refers to individuals’ knowledge of, and control over, their own cognitive processes (Baron, Hmieleski, Fox & Casper, 2013; Flavell, 1979; Nambisan & Baron, 2013). The concept of metacognition has roots in the cognitive psychology of learning and education in the 1970s (Flavell, 1976, 1979). The essence of this stream of research is that individuals can develop a
cognitive mechanism, in the form of self-controlling and self-monitoring abilities which has influence over their cognitive functioning (i.e. information processing) (Kholodnaya, 2002).

Metacognition is believed to influence a broad range of individual’s activities (Baron, 2007; Nambisan & Baron, 2013). Given its conscious and flexible functioning, metacognition plays a key role in individuals’ adaptability (Haynie & Shepherd, 2009), that is, it mediates the relationship between an individual and his or her environment (Kozhevnikov, 2007, p.477). Individuals have two primary cognitive resources namely ‘knowledge’ and ‘experience’, which are used in their information processing. Similarly, metacognition has been divided to the self-controlling and self-monitoring of knowledge and experience (Flavell, 1987). Metacognitive knowledge refers to “one's conscious and cognitive understanding of 1) people, 2) tasks, and 3) strategy” (Haynie, Shepherd, Mosakowski, & Earley, 2010, p.222). Metacognitive experience is a conscious experiences that is both cognitive (thinking) and affective (feeling) (Flavell 1979; Mitchell, Shepherd, & Sharfman, 2011) and what makes them a metacognitive experience is that they have some cognitive endeavour or enterprise as a focus, most often a current ongoing focus (Flavell, 1987). This focus is an affective or cognitive conscious experience that is pertinent to the conduct of intellectual life. Therefore, metacognition plays a critical role in everyday cognitive life (Flavell, 1979). Individuals draw upon these two metacognitive resources in selecting the most effective cognitive strategies to employ in a given situation (Flavell, 1987; Nambisan & Baron, 2013).

Based on the upper echelon theory, TMT refers to the relatively small group of powerful and important executives at the top of an organization (Hambrick, 1995; Wei & Lau, 2012). The team usually consists of the CEO and several of his or her most senior managers (Finkelstein, 1992). TMT diversity refers to the distributional differences among top management team members with respect to a common attribute such as age (Harrison & Klein, 2007; Bell, Villado, Lukasik, Belau, & Briggs, 2011). In relation to metacognitive knowledge and metacognitive experiences, diversity reflects the degree to which top managers differ from each other in respect to their metacognitive knowledge and experience. This diversity will see differences in the types and processes used by team members to make decision, solve problem, and carry out tasks (Haynie & Shepherd, 2009; Haynie et al., 2010;
Mitchell et al., 2011). Specifically, it reflects differences in top managers’ ability to solve the complex problems and effectively regulate their behaviour to cope with environmental changes (Nambisan & Baron, 2013). As a significant differentiator amongst managers it could be expected to be entrepreneurially consequential.

The focus on entrepreneurial orientation is appropriate because it captures a top-management’s tendency towards entrepreneurial activities (Zhao, Li, Lee, Hoon & Bo, 2011). So, it could be explained from the upper echelon perspective. Similarly, the uncertain and dynamic nature of entrepreneurial activities may also be a reflection of manager’s metacognitive ability (Haynie et al., 2012).

ENTREPRENEURIAL ORIENTATION
While different definitions of entrepreneurial orientation exist in the literature, this study defines entrepreneurial orientation as a tendency of a firm’s top management towards risk-taking, innovativeness, and proactiveness (Covin & Slevin, 1989; Zhao et al., 2011). Given these three dimensions, some entrepreneurship scholars have considered entrepreneurial orientation as a unidimensional construct and argue that those dimensions could be combined together in order to evaluate the overall level of a firm’s entrepreneurial orientation (e.g. Alegre & Chiva, 2013). Authors taking the multidimensional view suggested that although related, the dimensions can be treated independently (e.g. Kreiser, Marino, Kuratko, & Weaver, 2013). Consistent with the multidimensional view this paper draws on the multidimensional view and hypothesize that innovativeness, risk taking, and proactiveness are positively influenced by TMT metacognitive knowledge and experience diversity when the team is behaviourally integrated.

Innovativeness indicates a firm’s strong pledge to introduce new product offerings (Kreiser, 2011). It reflects a firm’s willingness to move and embrace new ideas (Baker & Sinkula, 2009), and support new products and radical product changes (Wales, Parida, & Patel, 2013). Risk taking captures a firm’s tendency towards bold and high risk projects (Wales et al., 2013), and accordingly reflects its acceptance of uncertainty and risky activities (Grande, Madsenb & Borch, 2011).
Proactiveness refers to a firm’s efforts to discover and seize opportunities (Lumpkin, Brigham, &
Moss, 2010) and the tendency to initiate new products, services, and technologies ahead of its competitors (Wales et al., 2013).

TEAM BEHAVIOURAL INTEGRATION

TMT behavioural integration reflects the extent to which TMT members engage in mutual and collective interaction (Hambrick, 2007). It captures three interrelated aspects of the TMT process: (a) information exchange, (b) collaborative behaviour and, (c) the joint decision making (Hambrick, 1994; Zahra & Wiklund, 2010). This meta-construct comprises one social dimension (collaborative behaviour) and two task dimensions (information exchange and joint decision making) (Lubatkin, Simsek, Ling, & Veiga, 2006). Taken together these three inter-related processes better capture a TMT’s level of unity and working as a team than do other process constructs such as, cohesion, social integration, and communication quality (Hambrick, 1994; Ling, Simsek, Lubatkin, Lyon, & Veiga, 2008).

TMT behavioural integration is both relevant and important in the context of entrepreneurship. The dynamic and uncertain nature of the entrepreneurial environment places an emphasis on the need for team members to interact and collaborate in order to facilitate the gathering and transfer of information to complete a task (Lubatkin et al., 2006). Such behaviour helps them to lessen the time needed for understanding the environmental changes and responding to them (Ling et al., 2008). In particular, team member’s wholeness and unity of effort (Lubatkin et al., 2006) enhances their beliefs regarding their different abilities (Carmeli, Schaubroeck, & Tishler, 2011). Having constructive beliefs about each other’s metacognitive ability means that team members can more effectively utilize them and respond more effectively to the environment in undertaking entrepreneurial initiatives. The next section presents the study propositions.

PROPOSITIONS

Diversity in cognitive attributes of TMT has been argued to provide the team with different information, perspectives and to open the range of options, decisions, and solutions (e.g. Olson et al., 2007; Barkema & Shvyrkov, 2007). A wide range of options and alternatives, in turn increases the team’s ability to generate creative solutions (Bantel & Jackson, 1989; Talke, Salomo, & Rost, 2010).
and make better decisions (e.g. Barkema & Shvyrkov, 2007; Olson et al., 2007). Despite this positive side, diversity could negatively impact the team such as a delay in decision making (Wei & Lau, 2012; Wei & Wu, 2013; Hambrick, Cho, & Chen, 1996). Such mixed impacts have suggested that diversity does not necessarily result in team effectiveness or ineffectiveness. Rather, its potential benefits and costs are contingent, for example, on the team condition or internal processes, one of which is behavioural integration (Hambrick, 2007; Boone & Hendriks, 2009; Ling & Kellermanns, 2010).

Metacognitive knowledge and experience refer to individuals’ knowledge and experience about their own cognition and performance (Baron & Henry, 2010; Mitchell et al., 2011). They reflect individuals’ ability to direct their own performance, specifically in complex domains (Blume & Covin, 2011). Such knowledge and experience are important in solving complex problems and adapting to environmental changes (Nambisan & Baron, 2013). Managers vary in their metacognitive knowledge and experience. Such diversity implies differences in team member’s ability to solve the firm’s problems and help it to deal effectively with environmental challenges. It could also reflect the differences’ in team member’s understating of and knowledge about their firm’s strengths and weaknesses (Nambisan & Baron, 2013). Although, different understanding and knowledge could provide the team with a wide range of options and solutions, this study proposes that the potential benefits could be unleashed if team members are committed to share and collaborate. Recognizing each other’s understanding and knowledge, stemming from their different metacognitive ability, could not be truly achieved unless team members value each other’s differences and accept them accordingly (Raes, Bruch, & De Jong, 2012). This is particularly so for the entrepreneurial context where ‘teamness’ has been shown to make the team more alert to entrepreneurial opportunities based on their differences in understating and knowledge of the opportunity (Zahra & Wiklund, 2010). Thus, the focus in this study is on entrepreneurial orientation dimensions.

Innovativeness reflects a firm’s inclination towards new ideas (Lumpkin, Brigham, & Moss, 2010), new product offerings (Kreiser, 2011), technological leadership and dramatic product changes (Wales, et al., 2013). Given the role of metacognition in recognizing and interpreting innovative
opportunities (Nambisan & Baron, 2013; Haynie et al., 2010), diversity would afford the team different opportunity recognitions and interpretations. To effectively act upon these recognitions teams need to be behaviourally integrated (Lubatkin et al., 2006). Team members with a spirit of sharing, collaboration, and joint decision making are more likely to embrace their differences and act upon the most promising opportunities (Carmeli, 2008). Embracing different interpretations allows the team to create a deeper understating and a broader view on innovate projects. A behaviourally integrated TMT is expected to benefit more from their different interpretations and recognitions in order to identify opportunities and pursue product innovation (Zahra & Wiklund, 2010; Li & Zhang, 2002). Therefore, we would expect that:

**Proposition 1.** TMT metacognitive diversity (knowledge and experience) is more likely to enhance innovativeness if the team is behaviourally integrated.

Risk taking captures a firm’s propensity to commit resources to projects whose outcomes are uncertain (Kreiser, 2011; Wiklund & Shepherd, 2005). It demands that manager’s have a tolerance to risk as well as the potential for mistakes (Garrett, Covin, & Slevin, 2009; Wang, 2008). Metacognitive knowledge and experience have been argued to be important in the ability to effectively adjust to changing environmental conditions (Nambisan & Baron, 2013; Haynie & Shepherd, 2009). Different metacognitive abilities provide the team with different understandings of the environment and impacts on their ability to adapt to the uncertainty. These different understanding of the potential of risk could be useful if team members share their ideas and develop collaborative, undertaking joint decision making. This approach to teamwork may give rise to more practical discussion among team members regarding their different understandings and perceptions of the situation (Carmeli & Schaubroeck, 2006). It affords the team a more complete picture of the risk in order to accept, reject or mediate the risk. The team would be expected to be more confident in their ability to deal with situation (Carmiel et al., 2011). Therefore, we propose that:

**Proposition 2.** TMT metacognitive diversity (knowledge and experience) is more likely to enhance risk taking if the team is behaviourally integrated.
Proactiveness reflects a firm’s tendency to predict opportunities, launch new product, services, and technologies ahead of its competitors (Wales et al., 2013; Grande, Madsen, & Borch, 2011). Different assessments and interpretations of opportunities, stemming from different metacognitive abilities, could provide the team with a broader view of the issues, however, it may also engender slowness in the decision making (Hambrick, Cho, & Chen, 1996). The more behaviourally integrated the team the greater the potential benefit in the reduction of time for the team to understand environmental changes (Ling et al., 2008; Magni, Proserpio, Hoegl, & Provera, 2009). Working as an integrated team helps in the integration of the different perspectives in regards to opportunities and the assessments of investment strategies in a timely manner. Therefore, we would expect that:

**Proposition 3.** TMT metacognitive diversity (knowledge and experience) is more likely to enhance firm’s proactiveness if the team is behaviourally integrated.

**THEORETICAL AND MANAGERIAL IMPLICATIONS**

Drawing on upper echelon perspective and recent entrepreneurship research, this study argues for the importance of examining metacognition at the team level. Each top manager brings his/her metacognitive ability to engage in a team’s decision making and actions, as it is the combined abilities of top managers which determine firm’s direction. This is particularly true for entrepreneurial activities in which more resources (here metacognitive resources) are needed to deal with uncertainty (Miller & Breton-Miller, 2011). Having multiple metacognitive resources, which are diverse in nature, requires top managers need to communicate with each other in order to bring these into consideration. Working as a ‘real’ team which is reflected in member’s exchanging information, collaborating, and jointly making decisions (Raes et al., 2012), could help the team to transfer their abilities and act upon them (Lubatkin et al., 2006).

We made the case that behavioural integration would make the team more confident in relying on each other’s metacognitive abilities to pursue innovative activities, take risk, and proactively deal with competition. A behaviourally integrated team is expected to be able to make sense of complex information (Carmeli et al., 2011) and shorten the time required for collectively understanding environmental changes (Ling et al., 2008). Accordingly, innovativeness, risk taking,
and proactiveness are more likely to succeed in a climate where managers could have access to
different interpretations and understanding of the environment. As pointed out by Wales, Monsen, and
McKelvie (2011, p.899) “top managers develop their firm’s entrepreneurial strategy, communicate it
within their organization, and watch as entrepreneurial behaviour begins to blossom throughout their
firm”. Hence, mutual interaction and collaboration allows managers to leverage their metacognitive
ability to realize which actions are more effective and communicate these and develop entrepreneurial
orientation within the firm.

This study is an attempt to bring together upper echelon perspective and entrepreneurship
literature to argue the importance of teams and their behaviour in a firm’s entrepreneurial activities.
Unlike existing entrepreneurship research which has mainly focused on an individual-level of analysis
(Mukherji, Mukherji, & Hurtado, 2011), this study focused on the team level. Furthermore, upper
echelon research has emphasized the importance of considering the nature of interaction among TMT
members, known as team process (Ling et al., 2008), in the understanding of the TMT and their
impact on the firm. Entrepreneurship research, however, seems to have not paid adequate attention to
this matter. This study underlines this issue by focusing on TMT behavioural integration as one of the
major TMT processes (Buly et al., 2011). This study also provided new insights into upper echelon
research by focusing on the concept of metacognition as a psychological concept which carries with it
the ability to measure an individual’s cognitive process (Haynie & Shepherd, 2009).

This study also presents some managerial implications. Top managers should be aware of
how their interactions and collaborations impact task performance (Carmeil, 2008), especially
entrepreneurial ones. CEOs should actively encourage his/her fellow managers to effectively
exchange information and perform collaboratively. They should facilitate a co-operative climate
which is favourable to the sharing of task-relevant information, where team members do not feel
threatened or annoyed by diversity (Kearney, Gebert, & Voelpel, 2009).

Top manager’s metacognition, as their ability to perform tasks successfully, could be
important factors in the TMT development. Given that metacognition could be developed though
training (Schmidt & Ford, 2003; Nambisan & Baron, 2013), firms may need to instil such training in their managerial practices in order to build a competent, high performing team.

Entrepreneurial orientation is an important factor of firm’s ability to compete and perform effectively (Simsek, Heavey, & Veiga, 2010). Examining it from a metacognitive perspective, which could be developed through training, and team behavioural integration, which could be managed (Magni et al., 2009), brings about important practical implications for firm’s survival and success. From a diversity management perspective, if we could realize the influences of diversity in TMT members’ underlying attributes, such as metacognition, and the conditions under which it is beneficial or otherwise, we would provide important implications for diversity management to consider (van Knippenberg, Haslam, & Platow, 2007).

CONCLUSION

This study proposes the importance of metacognitive ability of top managers as members of a team, as well as their behavioural integration in a firm’s entrepreneurial orientation. It has been argued that, to understand firm’s entrepreneurial behaviour it is useful to focus on the key decision makers of the firm, their metacognitive abilities and their collaborative behaviour. Indeed, using only top managers’ cognitive abilities may not be sufficient to realize firm’s entrepreneurial behaviour; rather it is combination of team’s cognitive abilities and their behaviour which directly impacts a firm’s entrepreneurship.

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**Metacognition and Entrepreneurial Orientation: Insights from Upper Echelons Perspective**

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