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# Management Teams' Regulatory Foci and Organizational Units' Exploratory Innovation: The Mediating Role of Coordination Mechanisms

## Abstract

We further current understanding about the role of management teams in driving exploratory innovation by proposing that the regulatory focus of an organizational unit's management team is a key antecedent of the unit's level of exploratory innovation, and by clarifying the organizational coordination mechanisms through which this antecedent generates the unit's exploratory innovation. Our results, based on a survey of 748 managers from 69 organizational units of a large multinational semiconductor company, indicate that the promotion focus of a unit's management team relates positively to the unit's exploratory innovation. In contrast, prevention focus has a marginal negative effect. These effects are mediated by the management team's use of decentralization and connectedness. Our research advances theory development regarding the micro-foundations of organizational innovation and increases our understanding of how the views of a unit's management team are reflected in the unit's level of exploratory innovation and therefore impact the unit's chances of survival.

**Keywords:** *Exploratory innovation, management team, organizational coordination, regulatory focus*

## INTRODUCTION

Exploratory innovation builds on new organizational knowledge and requires a departure from existing skills and capabilities (Alexiev, Jansen, van den Bosch and Volberda, 2010; Benner and Tushman, 2003; Sidhu, Volberda and Commandeur, 2004). In changing environments, exploratory innovation is an essential means to increase organizations' performance and chances of survival (Govindarajan, Kopalle and Danneels, 2011; Nerkar, 2003; Phelps, 2010; Smith, Binns and Tushman, 2010). However, for a variety of reasons, management teams may be reluctant to let their organizational units engage in high levels of exploratory innovation. For instance, they may dislike the uncertainty of its returns (Zhang, Baden-Fuller and Pool, 2011), they may be subject to short-term efficiency pressures from financial analysts (Benner and Ranganathan, 2012), or they may not be willing to face the difficulties required for developing the new knowledge and capabilities (Dougherty and Hardy, 1996). As a result, the impact of the management team on the pursuit of exploratory innovation has emerged as an important research theme (Alexiev et al., 2010; Kristinsson, Candi and Saemundsson, 2016).

Current studies in the upper-echelon literature (Hambrick, 2007; Hambrick and Mason, 1984) that seek to explain the impact of senior management teams on innovation have typically focused on their demographic attributes (Daellenbach, McCarthy and Schoenecker, 1999; Papadakis and Barwise, 2002; Talke, Salomo and Kock, 2011). However, recently, scholars have argued that psychological attributes of managerial decision makers may have a more profound impact on firm action as they are more directly linked to human behavior and decision-making (Antonakis, Day and Schyns, 2012; Carpenter, Geletkanycz and Sanders, 2004; Gamache, McNamara, Mannor and Johnson, 2015). In line with this, studies have started to examine senior managements' psychological characteristics may relate to organizational outcomes. Examples include the effect of senior managers' personality traits on organizational

adaptation (Arnulf, 2012), the impact of CEO narcissism on takeover processes (Aktas, de Bodt, Bollaert and Roll, 2016), and the influence of top management team reflexivity on new product performance (MacCurtain, Flood, Ramamoorthy, West and Dawson, 2010).

Yet, theory development regarding how psychological attributes of a management team can drive exploratory innovation is scarce. Research typically argues that increasing market or technological discontinuities require the management team of an organizational unit to decide to increase exploratory innovation (Dowell and Swaminathan, 2006; Govindarajan et al., 2011; Nerkar, 2003). However, some studies have indicated that some management teams fail to do so, and consequently, put their units' chances of survival at risk (Jansen, Vera and Crossan, 2009; Kaplan, Murray and Henderson, 2003). Therefore, a better understanding of the upper-echelon-level psychological antecedents of exploratory innovation is necessary. In this paper, we argue that regulatory focus theory (Higgins, 1997, 1998) may be a powerful theory for better explaining why a management team increases exploratory innovation. By building upon the regulatory focus theory, we contribute by advancing theory development about how the management team of an organizational unit impacts the level of exploratory innovation of the unit, and provide new insights about why some management teams may decide to increase exploratory innovation, while others may not, or even decide to decrease it, despite being a part of the same industry or firm.

Regulatory focus is a motivational theory of goal pursuit, rapidly becoming prominent in the management and organization literatures (e.g., Das and Kumar, 2010; Kark and van Dijk, 2007; McMullen, Shepherd and Patzelt, 2009; Spanjol, Tam, Qualls and Bohlmann, 2011; Weber, Mayer and Macher, 2011). Regulatory focus shapes people's decision making and how they then act; it is, for instance, a powerful antecedent of strategic inclinations (Crowe and Higgins, 1997), preferences (Wang and Lee, 2006), and behavioral change (i.e. Zhao and Pechmann, 2007). Prior research suggests that engagement in exploratory behaviors is

determined by the forces of attraction to novelty and fear of threat (Bergman and Kitchen, 2009; Berlyne, 1966; Brown and Nemes, 2008). According to regulatory focus theory, receptiveness to novelty, risk-taking and change are regulated by the promotion focus, the mechanism for maximizing gains and seeking pleasure (Crowe and Higgins, 1997; Herzstein, Posavac and Brakus, 2007; Liberman, Idson, Camacho and Higgins, 1999; McMullen et al., 2009). In contrast, prevention focus, the mechanism for minimizing losses and avoiding pain, emphasizes risk-avoidance and stability and favors what has been previously tried over novelty (ibid.).

To date, research on regulatory focus concentrates on individual-level outcomes. Hence, an understanding of the mechanisms by which managers' regulatory foci may affect higher-level outcomes, such as a unit's exploratory innovation, is limited (Gamache et al., 2015; Kark and Van Dijk, 2007). We contribute to enriching such understanding by investigating the mediating role of coordination mechanisms. Studies on innovation argue that an important way by which senior managers may exert influence on organizational innovation is by putting in place coordination mechanisms (Cardinal, 2001). Traditionally, this literature highlights the importance of formal structural mechanisms (Damanpour, 1991), most notably centralization (Boumgarden, Nickerson and Zenger, 2012; Miller and Dröge, 1986; Tsai, 2002; Zmud, 1982), by which a management team can coordinate the development of different levels and types of innovation. More recently, others have pointed to the value of more informal and voluntary modes of coordination, such as personal relationships between people, which cut through hierarchical levels and functions (Jansen, van den Bosch and Volberda, 2006; Tsai, 2002). However, whether and how a management team can exert influence on such informal and voluntary personal connections remains unclear (Adler, Know and Heckscher, 2008; Mom, van den Bosch and Volberda, 2009). Moreover, empirically validated insights into how the different types of coordination mechanisms, i.e., formal and informal, foster exploratory innovation are

scarce (Lawson, Petersen, Cousins and Handfield, 2009; Jansen et al., 2006). Hence, to advance current insights into why and how a management team affects exploratory innovation, we contribute not only by introducing the regulatory focus of the unit's management team as a new antecedent of the unit's exploratory innovation but also by investigating the mediating roles of two different types of coordination mechanisms, namely through formal coordination mechanisms, such as centralization, and through connectedness, such as the informal lateral relationships among the members of the unit.

Finally, in the regulatory focus literature, there have been numerous studies showing the effect of organizational context on the individual or group (i.e. Brockner and Higgins, 2001; Rietzschel, 2011). In contrast, we extend the recent dialogue by suggesting that, when the group possesses sufficient power or authority, such as the power and authority a management team has in its organizational unit, it can shape the organizational context, and in particular, the coordination mechanisms of the unit in line with its regulatory foci. This finding is particularly useful for the emerging stream of literature aiming to better understand the diffusion of a particular regulatory focus throughout the organization (e.g. McMullen et al., 2009).

The remainder of this paper is structured as follows. First, we introduce the regulatory focus theory and develop the hypotheses. After that, we outline data collection and scales, following which we present the results from a survey of 748 managers from 69 organizational units of a large multinational semiconductor company. Finally, we discuss the implications of our study, and point towards areas of future research.

## **THEORETICAL FRAMEWORK**

### **Regulatory Focus Theory and Exploratory Innovation**

In the psychology literature, there are two kinds of ends an individual may struggle to attain; avoiding pain and seeking pleasure, and “this principle underlies motivational models

across all levels of analysis in psychology, from the biological to the social” (Higgins 1998: 1). On the other hand, the regulatory focus theory differs from its predecessors as it posits that avoiding pain and seeking pleasure are not the two extremes of a continuum, but are two separate mechanisms (i.e. orthogonal). According to this theory, all individuals try to both avoid pain and seek pleasure, although to differing extents (Tuncdogan, van den Bosch & Volberda, 2015). When individuals are focused more on prevention, they try to minimize mistakes by concentrating in detail on the threats in the environment, and becoming 'appropriate' within the norms (Förster and Higgins, 2005; Friedman and Förster, 2001; Pennington and Roese, 2003; Semin, Higgins, Gil, Estourget and Valencia, 2005). In contrast, when they are focused more on promotion, they try to maximize gains by seizing opportunities in the environment (ibid.). Regulatory focus literature discusses the various factors surrounding this essential principle, which has crucial effects on behavioral, emotional and decision-making tendencies (*cf.* Brockner and Higgins, 2001; Wang and Lee, 2006; Zhao and Pechmann, 2007).

A few years ago, using insights from the social identity and social categorization theories (i.e. Hogg and Terry, 2000), Faddegon, Ellemers and Scheepers (2008) have extended the regulatory focus theory beyond the individual level of analysis. In particular, they used the idea of multiple selves (i.e. the individual self and the collective self) in order to show that not only individuals, but collective bodies such as teams can have a regulatory focus as well. Indeed, through a series of experiments, they were able to show that individuals are quite cognizant of the regulatory focus of their group, and act accordingly. More recently, a number of papers have examined the impacts of regulatory focus at different levels of analyses, such as the team or organization levels (e.g. Das and Kumar, 2010; Rietzschel, 2011; Spanjol et al. 2011). In this paper, we are interested in the regulatory focus of the management team of an organizational unit, and the associations with the unit's level of exploratory innovation.

Exploratory innovation is a high-risk activity that builds on new knowledge and can

produce radical change, maximizing gains in the long-term (Alexiev et al., 2010; Benner and Tushman, 2003; Nerkar, 2003; Tushman and O'Reilly, 1996). Engagement in exploratory activities is governed by the attraction to novelty and the fear of threat (i.e. Bergman and Kitchen, 2009; Berlyne, 1966; Brown and Nemes, 2008). The promotion focus – the novelty and eagerness components of regulatory focus – of a unit's management team may increase the unit's tendency towards exploratory innovation as it can be expected to increase the management team's willingness to take risk (Crowe and Higgins, 1997; Hamstra, Bolderdijk and Veldstra, 2011), enlarge its preference for novelty (Herzenstein et al., 2007), change (Liberman et al., 1999), and new knowledge creation (Friedman and Förster, 2001; Rietzschel, 2011) and foster a forward-looking orientation (Pennington and Roese, 2003). On the other hand, the prevention focus – the fear and vigilance components of regulatory focus – of a unit's management team may inhibit exploratory innovation by the unit as it tries to protect the group from potential threats by keeping the risks down (Crowe and Higgins, 1997; Hamstra et al., 2011), and as it can be expected to increase the management team's willingness to maintain the status quo and to keep stability (Liberman et al., 1999) and also its preference for reliable and known outcomes (Hamstra et al. 2011). Based on this, we propose the following hypothesis:

*Hypothesis 1: (a) The promotion focus of the unit's management team is positively related to the unit's exploratory innovation, and (b) the prevention focus of the unit's management team is negatively related to the unit's exploratory innovation.*

### **Management Team Regulatory Focus and Organizational Antecedents of Exploratory Innovation**

Connectedness is the extent to which members of the organizational unit, regardless of their hierarchical level or function, are accessible to and interlinked with each other through direct personal contacts. Prevention-focused individuals are detail-oriented and concentrate



mainly on minimizing losses (Crowe and Higgins, 1997; Förster and Higgins, 2005). Furthermore, they tend to be task-oriented in their supervisions of others (Kark and van Dijk, 2007). Moreover, because they value concrete goals (ibid.) and focus on short-term performance (i.e. Pennington and Roese, 2003), prevention-focused management teams may perceive the essential elements of connectedness, such as informal hall talk, as time-wasting, and may take precautions against it. Therefore, prevention-focused management teams<sup>1</sup> are more likely to assign to members of the organizational unit specific tasks, the boundaries of which are clear. In contrast, promotion-focused management teams, in line with their cognitive processing styles (i.e. Förster and Higgins, 2005; Semin et al., 2005), are more likely to assign abstract, general tasks with unclear boundaries, which require employees to work together and consult each other informally. Therefore, we expect a management team's promotion focus to have a positive association with levels of connectedness in the organizational unit, and prevention focus to have a negative association with it.

Connectedness has a positive association with the exploratory innovation of the organizational unit, especially because it helps unit members combine knowledge and develop new knowledge that underlies exploratory innovation (Björk and Magnusson, 2009; Jansen et al., 2006; Obstfeld, 2005). An increased level of information sharing resulting from a well-connected organizational unit is likely to increase exploratory innovation in at least two ways. First, information sharing among group members is associated with creativity and new idea generation (e.g., Mom, van den Bosch and Volberda, 2007; Paulus and Yang, 2000; Wu and Fang, 2010). Second, it is likely to increase the implementation success of the generated ideas. For instance, a new idea engendered at the lower levels of the organization is more likely to be adopted if the individuals at these levels already have links with or are at least allowed to easily

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<sup>1</sup> Within the context of this text, the phrases 'promotion-focused management teams' and 'prevention-focused management teams' will be used interchangeably with the phrases 'management teams in a promotion focus' and 'management teams in a prevention focus'.

reach the ones at higher hierarchical levels (Floyd and Lane, 2000). By contrast, when connectedness within the organizational unit is lacking, individuals are limited mainly to their own knowledge and capacity to generate new ideas, not to mention that their lack of networking may mean that the novel ideas they find may not necessarily fit the needs of the organizational unit. Moreover, even if they happen to find a useful idea, they may fail to mobilize enough people to actually develop it further.

*Hypothesis 2: (a) The promotion focus of the unit's management team is positively related to the level of connectedness in the organizational unit, and (b) the prevention focus of the unit's management team is negatively related to the level of connectedness in the organizational unit, where (c) the level of connectedness is positively related to the level of exploratory innovation.*

Centralization/decentralization refers to the extent to which the management team delegates decision making authority to other individuals in the organizational unit, i.e. to employees and managers lower down the hierarchy. Decentralization gives management teams the opportunity to focus their limited attention on broader issues (i.e. Ocasio, 1997; Raisch, 2008; Welch, 1984), by handing other issues over to expert and specialized employees (i.e. Colombo and Delmastro, 2004). On the other hand, as in any agency problem, decentralization comes with the risk that, intentionally or unintentionally, the agent may not act in the preferred manner (e.g., Eisenhardt, 1989). For instance, unethical pro-self behavior in mixed-motive situations (i.e. De Cremer and van Knippenberg, 2002), ranging from basic cases of free-riding (i.e. Kerr, 1983) to organized corruption (i.e. Celentani and Ganuza, 2002), is known to have detrimental effects on organizational performance. In other words, when employees are given more power for them to engage in innovative activities, management has relatively less control regarding whether those innovative activities will be targeted for the benefit of the organization or the employee's own benefit. We expect the regulatory focus of the management team to

influence the extent to which the management team is willing to take the risk of delegating a task, in exchange for potential benefits. Crowe and Higgins explain that “the promotion focus inclination is to insure hits and insure against errors of omission, whereas the prevention focus inclination is to insure correct rejections and insure against errors of commission” (1997, p. 117). Therefore, because they concentrate more on the gains side of the equation, we anticipate promotion-focused management teams to have a higher likelihood of delegating tasks and authority to other individuals. In contrast, in an effort to minimize mistakes and unexpected behavior, prevention-focused management teams are more likely to keep the decision making authority central to themselves.

In turn, the influence of a management team’s regulatory focus on (de)centralization is likely to affect the exploratory innovation level of the organizational unit. More specifically, for at least three reasons, the level of centralization is likely to be negatively associated with exploratory innovation. First, exploratory innovation requires non-routine problem solving and deviation from existing knowledge (Benner and Tushman, 2003; Jansen et al., 2006). By contrast, in centralized decision making, the number and quality of solutions to the problems faced by the organization are reduced (Sheremata, 2000), and so too is the likelihood that unit members will seek new knowledge and come up with new ideas (Damanpour, 1991). Second, in a centralized environment, the speed of decision making at lower levels is greatly reduced, not only because every decision has to go higher up the ranks, but also because the flow of so much information keeps top management under constant information overload (e.g., Hitt and Brynjolfsson, 1997; Graham, Harvey and Puri, 2015). As a result, the total number of exploratory innovative activities that the unit can engage in is decreased; innovation opportunities are also regularly missed because of changes in the external environment (e.g., Zehir and Özşahin, 2008). Finally, a decreased perceived ability to accomplish a task is known to be associated with a lower intention to engage in that task (e.g., Ajzen, 1991). Therefore, in

a centralized environment, individuals who are at lower levels of the organizational hierarchy may less likely attempt to innovate because they have less of a say (i.e. discretion) on whether their innovative ideas will actually be appreciated and adopted.

*Hypothesis 3: (a) The promotion focus of the unit's management team is negatively related to the level of centralization in the organizational unit, and (b) the prevention focus of the unit's management team is positively related to the level of centralization in the organizational unit, where (c) the level of centralization is negatively related to the level of exploratory innovation.*

According to upper-echelons theory, the management team reflects its strategic inclinations, intentions, and preferences upon the organization and its outcomes through organizational design decisions (Hambrick, 2007; Hambrick and Mason, 1984). Centralization is considered by many as the most important formal organizational coordination mechanism, whereas connectedness is considered one of the most important informal mechanisms (i.e., Tsai, 2002). Hence, we expect that the regulatory focus of the managing team of the organizational unit is, to some extent, reflected upon the exploratory innovation of the organizational unit through these two organizational coordination mechanisms. Furthermore, considering that in upper-echelons theory, organization design is a key activity of the managing team, we expect that the two key organizational coordination mechanisms will capture most of the effect of the managing team's regulatory focus on the organizational unit's exploratory innovation.

*Hypothesis 4: As key organizational coordination mechanisms, centralization and connectedness mediate the relation between the regulatory focus of a management team and the organizational unit's exploratory innovation.*

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Insert Figure 1 about here

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## **METHODOLOGY**

### **Data Collection and Validation**

Exploratory innovation is particularly important for organizational units that are based in fast-changing, dynamic environments, such as high-tech industries. In line with this, we decided to collect our data at a large, multi-unit, multinational semiconductor company. The company employs approximately 25,000 people and is headquartered in Europe. The company has 43 product lines, some of which consist of up to three organizational units in different geographical regions, resulting in a total of 95 organizational units. Each product line's management team is responsible for the organizational units associated with them. The survey was sent to all 2,275 managers – i.e. to those who belonged to the product lines' management teams as well as to all those in the levels below the team – of all organizational units. Of the responses we received from all 43 units, each of which had up to three organizational units in different geographical regions, resulting in a total of 95 organizational units. Next, we removed the responses with missing variables and, for reliability purposes, the 24 organizational units which had only one respondent. This brought us to our net sample size of 748 managers from 69 organizational units. Then, to rate the management team's promotion and prevention foci, we used responses from the top managers, who are either part of a management team or are in closest contact with the team, and therefore, have a realistic opinion of the team's regulatory focus. Only when data from these top managers was not available, we used middle-managers' responses. We used all managers' responses in rating the coordination mechanisms and exploratory innovation. Using a relatively different set of respondents for the independent and dependent variable was also beneficial because doing so is known to help reduce potential

issues pertaining to common method bias.

We conducted convergent and discriminant validity checks as well as reliability checks on all the items and scales within the study. The items of each scale showed high levels of reliability (reported below), which allowed us to aggregate the items to form the variables. We also checked the average deviance (AD) averages to see whether the managers were in agreement on the levels of the variables. These scores were lower than 1.2 for each scale, showing a sufficient level of agreement between the raters (Brown and Hauenstein, 2005; Burke and Dunlap, 2002), so we aggregated the data for the individual managers to the corresponding 69 organizational units. Following that we conducted an exploratory factor analysis (Principle Components Analysis, Varimax rotation with Kaiser Normalization) in which we included all items of this study's constructs, i.e. those measuring exploratory innovation, promotion focus, prevention focus, decentralization, and connectedness. Keiser-Meyer-Olkin measure was larger than .5 (KMO = .763) and Bartlett's test of sphericity was significant ( $\chi^2 = 962.04$ ;  $p < .001$ ), showing that the sample was appropriate for exploratory factor analysis. Five distinct factors emerged with eigenvalues greater than 1. Only the item 'Show a firm belief in "if it ain't broke, don't fix it"' loaded lower than 0.6 on its corresponding factor and was removed from further analysis. The items of the scales and the rotated component matrix of the exploratory factor analysis with the model variables are presented in Table 1.

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Insert Table 1 about here  
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Next, we conducted a series of factor analyses to see which one best fits the structure

of our data. The first model assumed that the five factors are all distinct from each other, the second one combined promotion and prevention foci, the third one also combined connectedness and centralization, the fourth combined all except exploratory innovation and the fifth combined all five factors (See Table 2). Of these five models, both in terms of more absolute measures such as  $\chi^2 / \text{d.f.}$ , TLI and CFI and in terms of comparative measures such as AIC, BIC and SABIC, the five-factor model fared better than all other alternatives, and showed satisfactory fit.

After that, we tested a sixth model, where we employed item-parcels. CFA models tend to show lower fit when there are relatively many items and the sample size is small (e.g.,  $n = 69$ ). One technique commonly employed in management research to reduce this problem is the use of item-parcels (e.g., Liu, Hui, Lee and Chen, 2013; Wu, Kwan, Wei and Liu, 2013). In this technique, the highest and lowest loading items of each factor are averaged, followed by the next highest and lowest, to decrease the total number of items (See Liu, Hui, Lee and Chen, 2013, p. 1002 for a more elaborate discussion). While the fit of five-factor model was adequate without the use of item-parcels, after using them, all of the fit indices improved further (See Table 2 below).

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Insert Table 2 about here  
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## **Scales and Measurement**

*Dependent Variable.* For the dependent variable, exploratory innovation, we used the scale devised and used by Jansen et al. (2006), which has also been applied by others such as Alexiev et al., (2010). The scale ( $\alpha = .91$ ) captures the extent to which the organizational unit

departs from existing knowledge and pursues innovations for new customers or markets.

*Independent Variable.* Scales for assessing the regulatory foci of management teams are not yet available in the literature. Based on studies which integrate theories on leadership behavior with regulatory focus theory, we constructed an initial management team regulatory focus scale based on items relating to the leadership behaviors of the management team that indicated promotion and prevention focus (cf. Bass, 1997; Bass, Avolio, Jung and Berson, 2003; Ho, Fie, Ching, and Boon, 2009; Kark and Van Dijk, 2007; Neubert, Kacmar, Carison, Chonko and Roberts, 2008; Phipps and Hayashi, 2005). During subsequent interviews, managers were asked to evaluate the survey items and suggest improvements. To allow further enhancement of the reliability, unidimensionality, and convergent and discriminant validity of the promotion and prevention scales, we tested the scales quantitatively, drawing on data we obtained from a test version of the survey with 34 managers from the semiconductor company. Following reliability and validity analyses, ambiguous items were identified and excluded, a process that resulted in the final version of the scales.

In line with regulatory focus theory, the promotion dimension of the regulatory focus scale captures the behavioral manifestations of the unit's management teams in terms of their receptiveness to change and novelty, as well as their orientation towards the future and to achieving gains (e.g. Friedman and Förster, 2001; Higgins, 2001; Kark and van Dijk, 2007; Liberman et al., 1999). In particular, the item "Suggest new ways of looking at how to complete assignments" is an indicator of promotion focus, as it shows willingness towards change (Liberman et al., 1999), creativity (Friedman and Förster, 2001) and novelty (Herzenstein et al., 2007). Likewise, "Seek differing perspectives when solving problems" is an indicator of promotion focus as well, for the very same reasons. The item "Talk enthusiastically about what needs to be accomplished" indicates promotion focus, as cheerfulness, enthusiasm and eagerness feelings are associated with making gains and promotion focus (Brockner and



Higgins, 2001; Higgins, 2001). “Articulate a compelling vision of the future” measures the future orientation of the management team, which is again a characteristic of promotion focus (Mogilner, Aaker and Pennington, 2008; Pennington and Roese, 2003).

In line with regulatory focus theory, the prevention dimension of the regulatory focus scale captures the behavioral manifestations of the unit management teams, showing any orientation towards suppressing change and deviations as well as towards preserving the status quo and minimizing mistakes and losses (e.g. Friedman and Förster, 2001; Higgins, 2001; Kark and van Dijk, 2007; Liberman et al., 1999). The items “Concentrate their attention on dealing with mistakes, complaints and failures” and “Focus attention on irregularities, mistakes, exceptions, and deviations from standards” are typical prevention focus items, as the core characteristic of prevention focus is minimizing losses (Higgins, 1997; Crowe and Higgins, 1997) and preserving the status quo through suppressing deviations from the standards (Liberman et al., 1999). “Do not hesitate to interfere until problems become serious” is a prevention focused item, as one marking feature of prevention focus is quickly realizing impending threats in the environment, and taking preventative action (Friedman and Förster, 2001; Higgins, 1997). For instance, individuals in a prevention focus are found to use brakes much faster when driving (Werth and Förster, 2007). Finally, “Show a firm belief in ‘if it ain’t broke, don’t fix it’” is a prevention focused item, as individuals in a prevention focus concentrate on minimizing losses (Crowe and Higgins, 1997), and thus, if an issue or object is not particularly causing problems, prevention focused individuals will not be easily motivated to make changes to it. On the other hand, the prospects of making gains from deviations from standard motivate individuals in a promotion focus, as their primary strategic inclination is maximizing gains. For instance, Liberman and colleagues (1999) found that prevention focused individuals are much less likely than promotion focused individuals to engage in endowment or task substitution. However, as mentioned previously, the factor analysis suggested that the

loading of this item on prevention focus dimension was not high enough (Table 1), and this item was removed from further analysis.

Both the promotion and prevention dimensions of the regulatory focus scale showed high levels of reliability: promotion  $\alpha = .86$ ; prevention  $\alpha = .82$ . Exploratory factor analyses (Table 1) and confirmatory factor analyses (Table 2) indicate good convergent and discriminant validity of the promotion and prevention scales and their items.

Finally, to further examine post-hoc the validity of the regulatory focus scale, we compared it to a number of related variables. In particular, we compared our scale to the five dimensions of the Big-Five personality scale (Gosling, Rentfrow and Swann, 2003) and to the two dimensions of the BIS/BAS scale (Carver and White, 1994) for positive and negative affectivity. To do so, we collected data by distributing questionnaires to the 77 executive education students of a prominent European business school, and 67 were willing to participate (87%). The results (see Table 3) of this analysis strongly paralleled the expectations of our theory as well as the findings of the prior studies conducted by means of other scales of regulatory focus (e.g., Gorman et al., 2012; Lanaj, Chang and Johnson, 2012). In particular, prevention focus was positively associated with behavioral inhibition and conscientiousness ( $p < .05$ ) and neuroticism ( $p < .10$ ), and it was negatively associated with extraversion ( $p < .05$ ), agreeableness and openness to experience ( $p < .10$ ). Likewise, promotion focus was positively associated with behavioral activation, extraversion, and openness to experience ( $p < .05$ ) and agreeableness ( $p < .10$ ). These results support further the validity of our regulatory focus scale.

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Insert Table 3 about here

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*Mediating Variables.* Centralization items are based on the Hage and Aiken (1967) and Dewar, Whetten and Boje (1980) studies. The centralization scale examines the extent to which the members of an organizational unit can act autonomously from their managers, particularly when those managers are higher up in the hierarchy ( $\alpha = .95$ ). The connectedness scale is based on the Jaworski and Kohli (1993) study, and is used to analyze the extent to which members of an organizational unit are accessible regardless of their hierarchical level or position, and the extent to which informal communication is used in the organizational unit ( $\alpha = .86$ ).

*Control Variables.* We used a variety of control variables in order to rule out a number of potential alternative explanations to the effects observed in this study. First of all, we controlled for the median age, median tenure in firm and the median level of education in the organizational units. We used the median average of age, tenure in firm and education rather than the mean because the measurements were taken at the ordinal level of measurement (Stevens, 1951). Level of education tends to have a positive relationship with higher levels of cognitive abilities (Papadakis, Lioukas and Chambers, 1998), which may have an effect on the tendency towards exploratory innovation. Likewise, we controlled for age and tenure in firm for their potential effects on exploratory innovation through increased experience and familiarity with the context (e.g., Tushman and O'Reilly, 1996). Furthermore, using a prevalent heterogeneity measure based on Allison (1978), we also controlled for the diversity-related differences among the organizational units for median age, education and tenure. In other words, for instance, we did not only control for the effect of the median age in an organization unit, but also controlled for the effect of the organization being homogeneous or heterogeneous with respect to age. Indeed, diversity is known to be a primary factor affecting strategic decisions and tendencies (e.g., Frey, Lüthje and Haag, 2011; Yoo and Reed, 2015). We also controlled for the number of responding managers as an approximate indicator of size. Finally, the organizational units resided in one of three geographical locations. Hence, using two

dummy variables, we controlled for the region of the organizational unit. The third dummy variable was left out of the model as the benchmark variable.

## ANALYSIS AND RESULTS

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Insert Table 4 about here

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The correlation matrix is presented above. The correlations within the variables were for the most part in line with our expectations and with prior research. Promotion focus was positively correlated with connectedness ( $r = .30$ ;  $p < .05$ ) and exploratory innovation ( $r = .21$ ;  $p < .10$ ), and its correlation with centralization was negative ( $r = -.29$ ;  $p < .05$ ). Likewise, exploratory innovation was positively correlated with connectedness ( $r = .33$ ;  $p < .01$ ) and negatively correlated with centralization ( $r = -.35$ ;  $p < .01$ ). The correlations of prevention focus with these variables were not significant. Like the other studies which applied the regulatory focus theory in the context of organizations (Neubert et al., 2008; Wallace, Johnson and Frazier, 2009), we also found a positive significant correlation between promotion and prevention focus ( $r = .43$ ;  $p < .01$ ). In sum, the correlation matrix suggests that the correlations among the variables mostly conform to those reported in prior studies.

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Insert Table 5 about here

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Table 5 above shows the hierarchical OLS regression analyses we conducted on the exploratory innovation variable. We first checked the variance inflation factors (VIF) against

possible multicollinearity issues. The highest VIF value in our regression models was 3.67, which is well below the suggested cut-off point of 10 (Neter, Wasserman and Kutner, 1990), indicating that multicollinearity is not a problem in our analyses. Next, we went on to test the hypotheses. Model 2 of Table 5 demonstrates the significant positive effect of promotion focus ( $\beta = .32$ ;  $p < .05$ ) and the marginally significant negative effect of prevention focus ( $\beta = -.21$ ;  $p = .11$ ) of the management team on exploratory innovation of the organizational unit, *supporting Hypothesis 1a and suggesting marginal support for Hypothesis 1b*.

Regarding Hypothesis 2, Model 3 shows that promotion focus of the management team had a positive effect on connectedness within the department ( $\beta = .37$ ;  $p < .01$ ) and that prevention focus had a negative effect ( $\beta = -.24$ ;  $p < .05$ ), verifying our predictions. Furthermore, in line with our expectations, Model 5 showed that the effect of connectedness on exploratory innovation was positive and significant ( $\beta = .34$ ;  $p < .05$ ), *supporting Hypotheses 2a, 2b and 2c*. Regarding Hypothesis 3, Model 4 shows that promotion focus has a negative relationship with centralization ( $\beta = -.37$ ;  $p < .01$ ), *supporting Hypothesis 3a*. In contrast, the effect of prevention focus on centralization was not significant ( $\beta = .18$ ;  $p = .16$ ). Therefore, *Hypothesis 3b is not supported*. Moreover, Model 5 shows that, in line with our predictions, centralization has a negative relationship to exploratory innovation of the organizational unit ( $\beta = -.28$ ;  $p < .05$ ). Therefore, *Hypothesis 3c is supported*.

After that, we decided to test whether centralization and connectedness mediate the relationships between the regulatory focus of a management team and the organizational unit's exploratory innovation (Hypothesis 4). We did so by using the bootstrapping method (Shrout and Bolger, 2002), which is a powerful technique for testing mediation models (i.e. Hayes, 2009; MacKinnon, Lockwood, Hoffman, West and Sheets, 2002). Recently, mediation with bootstrapping technique has also been used in management journals (e.g., Hmieleski, Cole and Baron, 2012; Walker, Bauer, Cole, Bernerth, Field and Short, 2012). In line with this, we used

a tool developed by Hayes (2009), which makes use of the bootstrapping technique. The mediation test with bootstrap analysis (1,000 samples; 95% confidence interval). Please see Table 6 below.

In line with the structure of our model and the results pertaining to the first three hypotheses, we examined three mediation paths: the indirect effect of promotion focus through connectedness, of promotion focus through centralization and of prevention focus through connectedness on exploratory innovation. Prevention focus through centralization was not a potential mediation path, as the main effect of prevention focus on centralization was found to be not significant.

Regarding the first two of these mediation paths, the indirect effect of promotion focus through connectedness ( $Z = 2.02$ ;  $p < .05$ ) was significant, and by itself was sufficient to cause the direct effect of promotion focus on exploratory innovation to disappear ( $p = .18$ ), implying full mediation. The indirect effect of promotion focus through centralization was also significant, although at a lower level of significance ( $Z = 1.88$ ;  $p < .10$ ). Still, it was sufficient to cause the direct effect to disappear ( $p = .14$ ). Both variables individually being sufficient to mediate the relationship suggests that part of the effect was shared. In line with this, adding both mediators simultaneously into the equation decreased the level of significance of the indirect effect of promotion focus through both connectedness ( $Z = 1.71$ ;  $p < .10$ ) and centralization ( $Z = 1.56$ ;  $p = .12$ ), as the effect is shared to some extent. As expected, in this case the direct effect of promotion focus also disappeared ( $p = .38$ ). In other words, connectedness and centralization not only individually, but also together fully mediated the relationship between promotion focus and exploratory innovation.

Next, we moved on to examine the indirect negative effect of prevention focus on exploratory innovation. As explained previously we examined connectedness only as a potential mediator of this relationship. Because the direct effect of prevention focus on

exploratory innovation was marginally significant, its indirect effect was also marginally significant through connectedness ( $Z = -1.58$ ;  $p = .11$ ). However, when connectedness is added into the model, the marginally significant direct effect of prevention focus on exploratory innovation disappeared completely ( $p = .37$ ). In other words, the marginally significant effect of prevention focus on exploratory innovation was mediated through connectedness.

In sum, regarding Hypothesis 4, the significant positive effect of a management team's promotion focus on its organizational unit's exploratory innovation runs through the effects on centralization and connectedness. However, the negative effect of prevention focus runs through its effects on connectedness only. Therefore, together, these results suggest *partial support for Hypothesis 4*.

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Insert Table 6 about here  
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### **Post-hoc Analyses**

To better understand whether promotion focus is tied to exploratory types of innovation only, we conducted a post-hoc analysis examining exploitative innovation as a separate independent variable. Exploitative innovations build on existing knowledge and extend existing products and services for existing customers (Benner and Tushman 2003). Results indicate that the direct effect of promotion focus on exploitative innovation was significant, also when both centralization and connectedness were added into the model ( $p < .05$ ). While decentralization and connectedness mediate the relationship between promotion focus and exploration, they did not do so between promotion focus and exploitation. In other words, while promotion focus seems to affect positively both exploratory and exploitative innovation, the

relationship between promotion focus and exploitative innovation runs through different mechanisms that we do not yet understand, which suggests an important area of future research.

## **DISCUSSION AND CONCLUSION**

The impact of the management team on the pursuit of exploratory innovation has emerged as an important research theme in the exploratory innovation and upper-echelon literatures (e.g. Alexiev et al., 2010; O'Reilly and Tushman, 2011; Papadakis and Barwise, 2002; Talke et al., 2011). Particularly pressing are the questions as to why and how some management teams in the same firm increase the level of exploratory innovation, while others do not (Jansen et al., 2009; Keegan and Turner, 2002; Loufrani-Fedida and Saglietto, 2014; McDermott and O'Connor, 2002). In this paper, our contribution has been to examine these questions in new and important ways; using regulatory focus theory from the field of psychology (Higgins, 1997, 1998) has enabled us both to further conceptual understanding and to present empirically validated findings.

More precisely, firstly we have contributed to the literatures on exploratory innovation (e.g. Alexiev et al., 2010; Benner and Tushman, 2003; Govindarajan et al., 2011), upper-echelon (e.g. Hambrick, 2007; Carpenter et al, 2004) and regulatory focus (e.g. Gamache et al., 2015; Kark and Van Dijk, 2007) by explaining and demonstrating the relationship between management team regulatory focus and exploratory innovation of the organizational units associated with the team. Our results indicate that the promotion focus of a unit's management team positively relates to the unit's exploratory innovation while the prevention focus has a marginally significant negative relationship to it. Secondly, contributing to the literatures mentioned above, we have explained and demonstrated how the regulatory focus of the management team of an organizational unit is reflected in the level of exploratory innovation within that unit, through the use of associated organizational coordination mechanisms. More



specifically, centralization and connectedness, considered to be two of the most important coordination mechanisms within an organization (i.e. Tsai, 2002), are found to act as mediators of the effects of the management team regulatory focus on the exploratory innovation of the associated organizational units.

These two related contributions have a number of implications for theory and practice. First, while current innovation and upper-echelon studies have focused on demographic differences across management teams (e.g. Papadakis and Barwise, 2002; Talke et al., 2011) or have referred to concepts such as ‘gut feeling’ in managerial decision making (Sadler-Smith and Shefy, 2004) to explain differences across management teams, we have introduced a concept from the field of psychology which appears to offer a powerful explanation of why management teams from the same firm may differ in the extent to which they pursue exploratory innovations and in how they use organizational coordination mechanisms to bring about such innovations. In that sense, our study underlines for the upper-echelon and innovation literatures the importance of underlying psychological characteristics for understanding differences across management teams and associated outcomes (Bell, 2007; Miron-Spektor et al., 2011). In doing so, we also contribute to a recent study by Spanjol and colleagues (2011), which examines different types of product decisions in two-person teams. We might complement their study both theoretically and empirically. Theoretically, rather than touching upon various different types of product decisions, we focus on a specific aspect of product decisions – the level of exploratory innovation, and do so at the organizational unit level of analysis. Doing so allows us to examine not only the antecedent role of the management team’s regulatory focus, but also the factors mediating this relationship within the context of a large organization. Empirically, the study conducted by Spanjol et al (2011) was a business simulation with 124 undergraduate seniors. Although it was well-executed, the authors of that study argue that using undergraduate students in place of real managers may give rise to

limitations. In that sense, our study may be complementary as we conducted the study using 748 managers of a multinational company. Moreover, this research was not conducted with dyadic teams formed with the purpose of a business study, but with larger management teams that have already been operational for a long time. All in all, one implication of this study is confirming, extending and providing external validity to the results of the study by Spanjol and colleagues (2011).

Second, this study provides new and useful insights into the nature of the mediation path between the regulatory focus of a management team and exploratory innovation. In particular, this research shows that connectedness and centralization can fully explain the positive effect of promotion focus on exploratory innovation at the organizational unit level. Likewise, connectedness can also explain the marginally significant negative effect of prevention focus on exploratory innovation. Furthermore, of these two organizational coordination mechanisms, connectedness does not only better account for the effects of promotion focus on exploratory innovation, but is the only one that can account for the effects of both regulatory focus dimensions. In other words, our study brings connectedness forward as possibly the foremost mechanism in explaining the effects of a management team's regulatory focus on its organizational unit's exploratory innovation.

Third, our findings also have implications for top or corporate management in terms of how they can influence the level of exploratory innovation in the organization's units. During times of change and uncertainty, attempts by top management to exercise power in order to directly influence or change the strategic outcomes of units – such as their level of exploratory innovation – may be prone to failure because of resistance at the unit level, for example, or a lack of adequate internal and external contextual understanding at the top (e.g., Alexiev et al. 2010; Damanpour, 1991; Keegan and Turner, 2002). In this sense, our study may provide insights into how the top management can influence such strategic outcomes in a more indirect

way, thereby avoiding the potentially negative effects of direct top-down interventions. That is, by shifting the regulatory focus of an organizational unit's management team the actual locus of strategic decision making, as well as the execution of such decisions, remains with the units' management teams. The top management may shift a unit's management team's regulatory focus by deliberately changing the composition of the team, by framing their communication (i.e. written documents, vision, etc.) with the team in a particular regulatory focus (i.e. Weber and Mayer, 2011; Weber et al., 2011) or by implementing carefully selected incentive mechanisms (Brockner and Higgins, 2001; Shah, Higgins and Fridman, 1998). When the regulatory focus of an organizational unit's management team is changed, the team can then be expected to change its level of exploratory innovation accordingly, and the associated organizational coordination mechanisms.

Fourth, while some research indicates that many of the exploratory innovations intended by a unit's management team will fail to come about (e.g., Jansen et al., 2009; Keegan and Turner, 2002; Loufrani-Fedida and Saglietto, 2014; McDermott and O'Connor, 2002), our research show that one main reason for this may be because the management team does not take into account the organizational coordination required. In this sense, our study underlines that both the formal hierarchical structure, most notably the level of centralization of decision making, and the more informal development of densely connected social relationships within the units matter for changing the levels of exploratory innovation (Lawson et al., 2009; Jansen et al., 2006). Moreover, our results suggest another explanation for the managerial problem of trying to generate exploratory innovation but being unable to do so. That is, where the top management tries to increase a unit's exploratory innovation whilst imposing a prevention focus on the management team of the unit, they are unlikely to achieve higher levels of exploratory innovations. Based on the results of this study, we suggest the top management teams need to be consistent with their cues and messages. For instance, if a top management

team is asking the management team of an organizational unit to engage in more exploratory innovation, they should preferably frame this in a promotion-focused manner, stressing the potential gains and opportunities involved, rather than in a prevention-focused manner that stresses the potential failures and threats of not doing so (e.g. Weber and Mayer, 2011).

Fifth, our study provides an answer to the earlier calls in both the management and regulatory focus literatures for more research, particularly empirically validated, which uses the concept of regulatory focus within the domain of organizational behavior (i.e. Brockner and Higgins, 2001; Das and Kumar, 2010; Kark and Van Dijk, 2007; McMullen et al., 2009). In this sense, we have taken a step forward in advancing understanding of the interrelationships between the construct of regulatory focus and the organizational context. While there have been numerous studies in the regulatory focus literature that show the effect of organizational context on the individual or group (e.g., Brockner and Higgins, 2001; Rietzschel, 2011; Tuncdogan, van den Bosch and Volberda, 2015), our research has shown that the regulatory focus of a unit's management team has an important influence on the unit's organizational context, i.e. the extent to which the decision making structure is centralized and the extent to which the unit members are connected to each other by direct personal contacts. This finding is particularly useful for the emerging stream of literature that is aimed at better understanding the diffusion of a particular regulatory focus throughout the organization (e.g. McMullen et al., 2009). Moreover, by incorporating regulatory focus theory into the literatures on exploratory innovation, we bring in a variable that can act as a bridge between different kinds of literatures. That is, because regulatory focus is a core psychological variable with many other psychological antecedents (i.e., Higgins, 1997), this study may provide an important step in creating greater understanding of how various aspects of human psychology affect organizational behavior and outcomes, namely those related to innovation and, consequently, to organizational performance.

Finally, we expand research on regulatory focus theory by testing whether management team regulatory focus affects the proclivity of units to undertake major strategic actions (Gamache et al., 2015), in this case exploratory innovation. We further theory and research on the impact of leader regulatory focus (Kark and Van Dijk, 2007); to date, empirical work on this topic has primarily considered non-executive leaders and individual outcomes as opposed to firm out-comes (Neubert, Kacmar, Carlson, Chonko, and Roberts, 2008).

### **Limitations and Future Research**

The findings of our study should be considered in light of the following limitations, which are also indicators of potential areas for future research. First, our data were collected at one company. The company is active in a dynamic and uncertain industry, the management teams of the units have decision-making autonomy regarding their unit's level of exploratory innovation, and the firm is sufficiently large and internally diverse. These factors may indicate the potential of the generalizability of our results, as well as the boundary conditions. Hence, we propose that our research be complemented by future studies that focus more on breadth rather than depth for a complete view of the picture; such studies can sample many firms but fewer units from each firm.

A second limitation concerns the cross-sectional nature of our data which limits its claims about causality. One long-standing puzzle within the strategic management literature is the interplay between the organizational unit and the environment (i.e. Chandler, 1962); for instance, how should management teams of organizational units adjust their units to the environmental conditions so as to increase performance. Hence, future researchers could consider collecting longitudinal data to examine the interplay between changes in the environment and the regulatory focus of the management team which affects the organizational coordination mechanisms. Such research could clarify the extent to which regulatory focus

helps a management team adapt its organizational unit or organization to the surrounding environment, and the conditions under which it may start becoming detrimental to performance.

Thirdly, we focused in this paper on exploitative innovation. The post-hoc analysis suggests that promotion focus may also impact exploitative innovation, but through different mediating mechanisms. Investigating these issues further may offer interesting insights into how organization units may balance both types of innovation (Benner and Tushman, 2003; Raisch, 2008).

Finally, to measure management team regulatory focus we constructed a new scale. In so doing, we took several steps to assess the scale's validity and reliability. Future empirical research may improve the scale and further test its validity.

To recap, in this study we examined how the regulatory focus of an organizational unit's management team affected the unit's exploratory innovation. Furthermore, we demonstrated the importance of decentralization and connectedness – two primary coordination mechanisms of the organizational unit – in mediating this relationship. By so doing, we took a further step to illuminate the micro-foundations of exploratory innovation from the perspectives of upper-echelons and regulatory focus theories.

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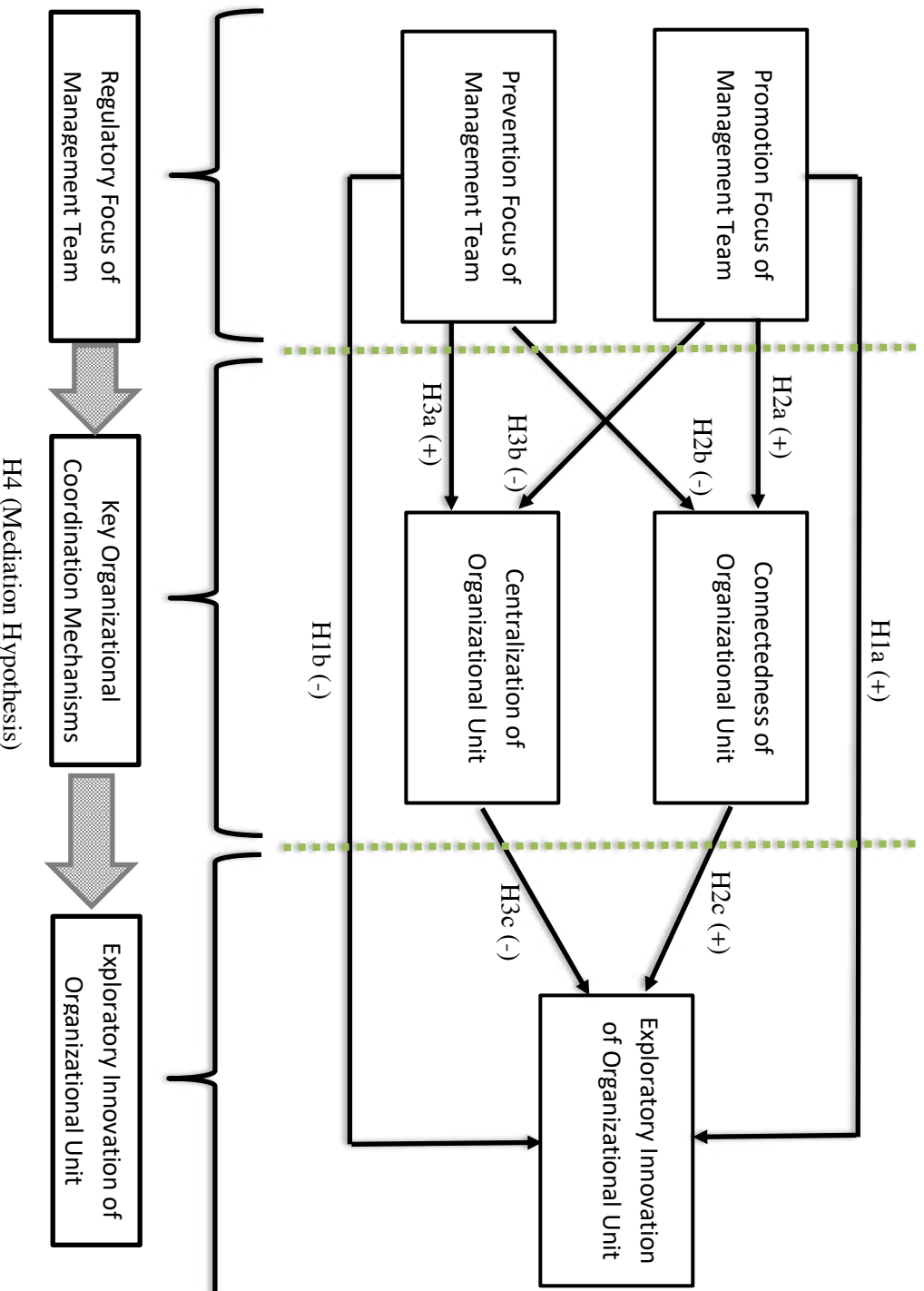
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**FIGURE 1**  
**Conceptual Model**



**Table 1**Items and Factor Analysis of the Scales<sup>a</sup>

	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<b>Exploratory Innovation (<math>\alpha = .91</math>)</b>					
In our unit, we invent products and services for new markets	<b>.84</b>	.05	.15	-.19	-.03
In our unit, we experiment with new products and services in our markets.	<b>.88</b>	.09	.03	-.19	.15
In our unit, we experiment with products and services that are completely new to our unit.	<b>.82</b>	.30	.04	-.07	.28
In our unit, we frequently utilize opportunities in new markets.	<b>.79</b>	.29	-.09	.01	.10
<b>Promotion Focus (<math>\alpha = .86</math>)</b>					
Talk enthusiastically about what needs to be accomplished	.14	<b>.84</b>	.15	-.05	.02
Articulate a compelling vision of the future	.23	<b>.82</b>	.00	-.15	.12
Suggest new ways of looking at how to complete assignments	.20	<b>.71</b>	.40	-.14	.15
Seek differing perspectives when solving problems	.14	<b>.70</b>	.21	-.15	.22
<b>Prevention Focus (<math>\alpha = .82</math>)</b>					
Concentrate their attention on dealing with mistakes, complaints and failures	.06	.19	<b>.88</b>	.01	-.04
Focus attention on irregularities, mistakes, exceptions, and deviations from standards	.02	.22	<b>.79</b>	.08	-.15
Do not hesitate to interfere until problems become serious	.00	.34	<b>.70</b>	-.09	-.18
Show a firm belief in "if it ain't broke, don't fix it."	.03	-.17	<b>.45</b>	.07	.28
<b>Centralization (<math>\alpha = .95</math>)</b>					
A person in our unit who wants to make his own decisions would be quickly discouraged.	-.07	-.13	-.07	<b>.88</b>	-.17
Even small matters in our unit have to be referred to someone higher up for a final decision.	-.04	-.15	-.02	<b>.92</b>	-.14
Unit members need to ask their manager before they do almost anything.	-.20	-.03	.07	<b>.92</b>	-.07

Most decisions people make here have to have their manager's approval.	-0.12	-0.12	0.09	<b>.91</b>	-0.08
<b>Connectedness (<math>\alpha = .86</math>)</b>					
In our unit, there is ample opportunity for informal "hall talk" among employees.	.20	.02	-.15	-.01	<b>.80</b>
In our unit, employees from different departments feel comfortable calling each other when the need arises.	.06	.13	-.13	-.07	<b>.86</b>
People in our unit are quite accessible to each other.	-.03	.16	.16	-.22	<b>.87</b>
In our unit, it is easy to talk with virtually anyone you need to, regardless of rank or position.	.25	.18	-.01	-.30	<b>.75</b>

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Notes: <sup>a</sup> Principle Components Analysis with Varimax Rotation.

**Table 2**

## Confirmatory Factor Analysis Results

	$\chi^2$	d.f.	$\chi^2 / \text{d.f.}$	TLI <sup>a</sup>	CFI <sup>b</sup>	AIC <sup>c</sup>	BIC <sup>d</sup>	SABIC <sup>e</sup>
	<i>Recommended values:</i>			$\leq 3$	$\geq .90$	$\geq .90$	<i>The model with the lowest AIC / BIC / SABIC value has the best fit</i>	
1. Five-factor model (with item parcels)	36.14	25	1.45	.95	.97	1158.66	1225.69	1131.20
2. Five-factor model (without item parcels)	213.87	142	1.51	.91	.92	2283.90	2391.14	2239.97
3. Four-factor model (Promotion and Prevention foci are combined together)	275.54	146	1.89	.83	.86	2337.57	2435.88	2297.30
2. Three-factor model (Promotion and Prevention foci are combined, Centralization and Connectedness are combined)	408.98	149	2.74	.67	.71	2465.01	2556.61	2427.48
5. Two-factor model (Promotion focus, Prevention focus, Centralization and Connectedness are combined)	724.53	152	4.77	.29	.37	2774.56	2859.46	2739.78
6. One-factor model (Everything is combined)	556.58	151	3.69	.49	.55	2608.61	2695.74	2572.91

Note: <sup>a</sup> TLI = Tucker-Lewis Index, <sup>b</sup> CFI = Comparative Fit Index, <sup>c</sup> AIC = Akaike, <sup>d</sup> BIC = Bayesian, <sup>e</sup> SABIC = Sample-Adjusted Bayesian

**Table 3**

Correlations between the Developed Regulatory Focus Scale and Other Conceptually-Linked Variables

	<i>Mean</i>	<i>Std. Dev.</i>	1	2	3	4	5	6	7	8
1. Promotion Focus	5.57	.76								
2. Prevention Focus	3.91	1.04	-.02							
3. BIS	3.50	1.12	-.20†	.35***						
4. BAS	5.11	.86	.35***	-.13	-.38***					
5. Extraversion	4.89	1.48	.46***	-.38***	-.35***	.39***				
6. Agreeableness	4.25	1.03	.23*	-.23*	-.06	.16	.29**			
7. Neuroticism	2.59	1.12	-.07	.21*	.34***	-.21*	-.06	-.19†		
8. Conscientiousness	5.37	.93	.17	.35***	-.10	.12	-.13	-.19†	-.20†	
9. Openness to Experience	5.61	.87	.55***	-.23*	-.11	.22*	.33***	.25**	-.01	-.11

Notes: N = 67; † p &lt; .15; \* p &lt; .10; \*\* p &lt; .05; \*\*\* p &lt; .01



**Table 4**

Correlation Matrix		Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Exploratory Innovation	4.61	.76	(.91)													
2. Promotion Focus	4.90	.62	.21*	(.86)												
3. Prevention Focus	4.27	.64	-.07	.43***	(.82)											
4. Centralization	3.43	.92	-.35***	-.29**	-.01	(.95)										
5. Connectedness	5.38	.55	.33***	.30***	-.12	-.30***	(.86)									
6. Median Age	4.02	.93	.02	.06	.03	-.14	.26**									
7. Median Level of Education	3.66	.55	.25**	-.10	-.05	-.02	-.02	-.42***								
8. Median Tenure in Firm	4.20	.94	-.10	.06	.11	-.17	.19†	.56***	-.09							
9. Heterogeneity (Age)	.34	.16	-.00	.08	.08	-.28**	-.17	-.38***	.04	-.06						
10. Heterogeneity (Education)	.24	.17	-.18†	-.05	.01	-.05	.06	.40***	-.72***	.06	-.06					
11. Heterogeneity (Tenure)	.19	.17	.18†	-.07	.06	.20†	-.28**	-.38***	-.02	-.54***	.08	.00				
12. Size	10.84	10.34	-.14	-.15	.05	.97	-.09	.09	.23*	.26**	-.01	-.02	-.10			
13. Region 1	.29	.46	-.07	-.05	.10	.07	-.43***	-.38***	-.22†	-.34***	.15	.01	.39***	-.29**		
14. Region 2	.57	.50	.10	.02	-.05	-.12	.16	.23*	.36***	.45***	-.08	-.18†	-.28**	.39***	-.73***	

Notes: N = 69; † p < .15; \* p < .10; \*\* p < .05; \*\*\* p < .01; Cronbach's  $\alpha$  values of the scales are given in parentheses.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>Dependent Variable:</b>	<i>Exploratory Innovation</i>	<i>Exploratory Innovation</i>	<i>Connectedness</i>	<i>Centralization</i>	<i>Exploratory Innovation</i>	<i>Exploratory Innovation</i>
<b>Independent Variables</b>						
Promotion Focus		.32**	.37***	-.37***		.12
Prevention Focus		-.21†	-.24**	.18		-.09
<b>Mediating Variables</b>						
Centralization					-.28**	-.26**
Connectedness					.34**	.30**
<b>Control Variables</b>						
Median Age	.41**	.41**	-.03	-.36*	.32*	.33*
Median Tenure in Firm	-.09	-.05	.18	.03	-.12	-.10
Median Level of Education	.45**	.54***	.11	-.36*	.37**	.42**
Heterogeneity (Age)	.11	.09	-.13	-.38***	.03	.03
Heterogeneity (Tenure)	.28*	.31**	-.03	.14	.35***	.36***
Heterogeneity (Education)	-.01	.07	.09	-.23	-.05	-.02
Size	-.25*	-.19†	-.12	.02	-.17	-.15
Region 1	.01	.07	-.57***	-.27	.17	.17
Region 2	.07	.05	-.34*	-.15	.13	.11
R-squared	.22	.30	.40	.30	.42	.43
Adjusted R-squared	.10	.16	.28	.17	.31	.29
ANOVA F	1.85*	2.20**	3.46***	2.26**	3.72***	3.15***

Notes: Standardized coefficients reported; N = 69; † p < .15; \* p < .10; \*\* p < .05; \*\*\* p < .01

**Table 6**  
Indirect Effects with Bootstrapping

	Effect	Boot SE	Boot LCI	Boot ULCI	Z	p (Model)	Boot
							p (Direct Effect) <sup>a</sup>
Prevention focus through connectedness	-.11	.08	-.31	.001	-1.58	.11 <sup>†</sup>	.11 <sup>†</sup> /.37
Promotion focus through connectedness	.17	.10	.03	.38	2.02	.04**	.02**/.18
Promotion focus through centralization	.15	.09	.03	.37	1.88	.06*	.02**/.14 <sup>†</sup>
Promotion focus through connectedness and centralization (simultaneously) <sup>b</sup>	.14/.12	.09/.07	.01/.01	.31/.29	1.71/1.56	.09*/.12 <sup>†</sup>	.02**/.38

N = 69, based on 1000 bootstrap samples. † p < .15; \* p < .10; \*\* p < .05

<sup>a</sup> Direct effect before/after the mediator variables are added

<sup>b</sup> Result for connectedness / Result for centralization