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Managers' Regulatory Focus, Temporal Focus and Exploration-Exploitation Activities

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**Managers’ Regulatory Focus, Temporal Focus and
Exploration-Exploitation Activities**

Abstract

Purpose – The purpose of this study was to examine and gain further insight into the potential link between regulatory focus and exploration-exploitation at the individual manager level. More specifically, we hypothesized that temporal focus would act as a mediator of the relationship between managers’ regulatory foci and exploration-exploitation activities.

Design/methodology/approach – A survey was conducted with 541 managers from the United States. The model was tested using OLS regression models, followed by bootstrapped multiple-mediation analyses.

Findings – Managers’ promotion and prevention foci is associated with the extent to which they focus on the past, the present and the future, which is related to managers’ exploration and exploitation activities.

Research limitations/implications – The findings rely on self-report data.

Practical implications – This paper examines the chronic strategic tendencies of managers with different levels of promotion and prevention focus – in particular, the time-frames they are likely to focus on and exploration-exploitation levels they are likely to engage in. In doing so, this paper provides managers a way to detect and overcome their chronic strategic shortcomings.

Originality/value – This paper not only examines the link between regulatory focus and exploration-exploitation at the individual level, but also provides further insights regarding the nature of this relationship. More specifically, by putting forward temporal focus as a

mediator of this relationship, this study contributes to the on-going discussion about the potential link between regulatory focus and exploration-exploitation, and poses new questions for future research.

Keywords Exploration and exploitation, regulatory focus, temporal focus

Paper type Research paper

INTRODUCTION

In research on innovation and strategic renewal significant attention has been devoted to the concepts of exploration and exploitation, both because these two key types of strategic activities have important effects on the performance and survival of an entity (e.g., a team, business unit or organization) and because they are the main precursors of other strategic outcomes such as ambidexterity (Lavie, Stettner and Tushman, 2010; Mom, Fourné and Jansen, 2015; Simsek, 2009; Tuncdogan, van den Bosch and Volberda, 2015; Tzabbar, Silverman and Aharonson, 2015). In the last decade, alongside growing interest in micro-foundations (e.g., Felin, Foss and Ployhart, 2015; Powell, 2017), there has also been interest in understanding exploration and exploitation at the level of the individual manager (e.g., Mom, van den Bosch and Volberda, 2007, 2009; Tuncdogan et al., 2015). Understanding more about these two types of activity at the manager level is important for at least three reasons; managers' exploration-exploitation activities determine their own performance (Mom et al., 2015; Schultz, Schreyoegg, and von Reitzenstein, 2013), they also determine the performance of their subordinates (e.g., Jansen, Vera and Crossan, 2009; Tushman, Smith and Binns, 2011), and exploration-exploitation at the individual manager level is a precursor of ambidexterity at higher levels of analysis, such as that of the organization (e.g., Simsek, 2009).

More recently, research has focused on elucidating the psychological antecedents of managers' exploration-exploitation activities. Notably, a couple of recent studies have employed regulatory focus – a motivational theory of goal attainment – to understand exploration and exploitation at different levels of analysis (Ahmadi, Khanagha and Jansen, 2017; Kammerlander, Burger, Fust and Fueglistaller, 2015; Tuncdogan, Boon, Mom, van den Bosch and Volberda, 2017; Tuncdogan, van den Bosch and Volberda, 2015). In particular, Tuncdogan, van den Bosch and Volberda (2015) have conceptually proposed a link between

individual managers' regulatory focus and exploration-exploitation; Kammerlander, Burger, Fust and Fueglistaller (2015) shown a link between CEOs' regulatory focus and the exploration-exploitation tendencies of their companies; Ahmadi, Khanagha and Jansen (2017) have examined the link between managers' regulatory focus and exploration; Tuncdogan and colleagues (2017) have demonstrated the link between the regulatory focus of management teams and the exploration of their business units.

However, despite this growing effort to determine the precise nature of this important relationship, there are still several unanswered questions. For example, we still know very little about how this relationship works at the most basic level of analysis – that of the individual manager – as there are very few studies at this level, and almost no empirical studies. Even the one notable exception, namely the experimental empirical study by Ahmadi and colleagues (2017), focuses only on exploration, and so does not examine the nature of the relationship between regulatory focus and exploitation. In other words, there is a need for more research, especially empirical research, examining the relationship between managers' regulatory focus and their exploration-exploitation activities. However, even more importantly from a conceptual standpoint, the detailed mechanics of this relationship are not yet fully understood. In other words, it is necessary not only to demonstrate empirically that there is a link between managers' regulatory focus and their exploration-exploitation activities, but also to investigate the factors that mediate this link.

This paper contributes in three ways to the stream of literature on the psychological antecedents of managers' exploration and exploitation activities. First, this study suggests that temporal focus serves to mediate the relationship between regulatory focus and exploration-exploitation at the individual manager level, and it provides a more detailed understanding of the mechanics of this relationship. Second, extending this first contribution, the study elucidates temporal focus as a new psychological antecedent of exploration-exploitation at the

individual manager level, showing us a different way in which individuals' tendencies towards exploration or exploitation might be predicted or shaped. Finally, the study provides an empirical test of the link between regulatory focus and exploration-exploitation at the individual manager level of analysis. The contributions and implications of this paper are elaborated further in the discussion section.

THEORY AND HYPOTHESES

Conceptualization of Exploration-Exploitation Activities

James G. March defined exploration as “things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, innovation” and exploitation as “refinement, choice, production, efficiency, selection, implementation, execution” (1991, p. 71). These two concepts were originally conceptualised as two mutually exclusive ends of a continuum. However, several scholars have pointed out that the synergies between the two concepts allow them to be at high levels simulatenously and thus reconceptualised them as distinct but related concepts (e.g. Koryak, Lockett, Hayton, Nicolaou and Mole, 2018; also see discussion in Tuncdogan et al., 2015, p.839). Empirical research has also found that different organisational structures and processes are associated with exploration and exploitation, providing support for the theoretical claim that exploration and exploitation are interrelated but distinct (e.g. Koryak et al., 2018; Mom et al., 2007, 2009, 2015; Tuncdogan et al., 2017).

Managers’ Regulatory Foci and Exploration-Exploitation Activities

According to regulatory focus theory (Higgins, 1997; Shah, Higgins and Friedman, 1998; also see Johnson, Smith, Wallace, Hill and Baron, 2015 and Scholer, Cornwell and Higgins, 2019), individuals have two fundamentally distinct self-regulatory mechanisms. Promotion focus urges an individual to frame situations in terms of gains versus non-gains

(Scholer and Higgins, 2009). That is, it approaches gains/rewards/pleasure and avoids situations that do not involve gains (non-gains). By contrast, prevention focus urges an individual to frame situations in terms of losses versus non-losses. That is, it approaches situations that do not involve losses (non-losses) and avoids losses/pain/punishment. Approaching non-losses (e.g. 'I will excel in my managerial career by minimising the number of failed projects') and approaching gains (e.g. 'I will excel in my managerial career by maximising the number of successful projects') aim to achieve the same goal but through different ways. These two means tend to have different behavioural effects and task-related outcomes. For instance, while focusing on maximising the number of successful projects, a manager is also likely to increase the number of failed projects. Therefore, promotion focus takes a risk concerning the number of failed attempts. By contrast, prevention focus takes a risk concerning the number of missed opportunities.

As the component that regulates the extent to which individuals approach non-losses, prevention focus is mainly concerned with safety and fulfilling obligations. Next, as the component that regulates the extent to which individuals approach gains, promotion focus is concerned with growth and advancement (e.g. Ahmadi et al., 2017; Gino and Margolis, 2011; Shah et al., 1998). Therefore, for instance, maintaining the status quo (no loss, no gain) is a success condition from the prevention focus perspective (achieving safety) but a failure condition from the promotion focus perspective (no advancement). Regulatory focus stems, to an extent, from an individual's upbringing (whether one's parents focused more on giving/retracting rewards versus administering/ending punishment) and is considered to be quite a stable variable over one's lifetime (see brief review in Tuncdogan, Acar and Stam, 2017, p.51). In summary, regulatory focus represents the chronic differences individuals have in their level of sensitivity to gain/non-gain conditions and loss/non-loss conditions.

Regulatory focus has a wide range of effects on managers' psychological tendencies (Delegach, Kark, Katz-Navon and Van Dijk, 2017; Johnson et al., 2015; van Beek, Taris, Schaufeli and Brenninkmeijer, 2013). For instance, promotion focus is associated with increased risk-taking behaviours (Hamstra, Bolderdijk and Veldstra, 2011; Tuncdogan et al., 2015), 'maximal goals' (e.g., Idson, Liberman and Higgins, 2000) and searching for new alternatives (sometimes to the point of breaking rules – e.g., Gino and Margolis, 2011; Liberman, Idson, Camacho and Higgins, 1999). Although exploration involves experimentation, risk and unclear outcomes (March, 1991; Mom et al., 2015), because long-term maximization of gains is dependent on the engagement in the exploration activities (e.g., O'Reilly and Tushman, 2013), we propose that promotion-focused managers have a strong tendency to engage in exploration activities. In line with this, prior research has found a positive relationship between promotion focus and exploration at different levels of analysis (Ahmadi et al., 2017; Kammerlander et al., 2015; Tuncdogan et al., 2017). There is less empirical evidence regarding the relationship between regulatory focus and exploitation at the individual manager level. However, we know that prevention focus is associated with decreased risk-taking behaviours (e.g., Hamstra et al., 2011), setting 'minimal' goals or 'satisficing' (Idson et al., 2000) and executing the task at hand without mistakes through following relevant rules and orders (Gino and Margolis, 2011; Lanaj, Chang and Johnson, 2012; Liberman et al., 1999). In contrast to exploration, which involves venturing into new lines of thinking, exploitation entails executing tasks carefully and correctly to achieve a clear yield and other outcomes in the short term, which allow individuals to fulfil obligations, such as satisfying quarterly quotas (March, 1991; Mom et al., 2009). As a result, prevention-focused individuals, who often concentrate on obligations, minimal goals and safety (e.g., Delegach et al., 2017; Scholer and Higgins, 2009; Shah et al., 1998) are likely to devote significant attention to exploitation activities.

Hypothesis 1: (a) Promotion focus has a positive relationship with exploration, and (b) it has a relatively stronger relationship with exploration than does prevention focus. (c) Prevention focus has a positive relationship with exploitation, and (d) it has a relatively stronger relationship with exploitation than does promotion focus.

Conceptualization of Temporal Focus

Shipp, Edwards and Lambert (2009, p.2) define temporal focus as ‘the allocation of attention to the past, present, and future’. In other words, life consists of three consecutive timeframes (past, present and future), and temporal focus theory suggests that individuals differ in terms of the attention they give to each timeframe (Gamache and McNamara, 2019; Schipp et al., 2019). Temporal focus is conceptually linked with but different from a number of other temporal constructs, such as time attitude, time perspective and temporal distance (see Shipp et al., 2009, p.4, Table 1 for a review). Temporal focus is conceptualised as an orthogonal construct in which the dimensions of past focus, current focus and future focus are not mutually exclusive (Gamache and MacNamara, 2019; Nadkarni and Chen, 2014; Shipp et al., 2009). This allows it to account for the fact that individuals can concurrently relate to different timeframes (Chishima, McKay and Cole, 2017). Individuals with high levels of past focus reflect upon past memories and use them regularly for purposes of decision making (Nadkarni and Chen, 2014, p.1812). Current focus is associated with focusing on the present moment and on ongoing tasks at hand. Finally, future focus is associated with envisioning what the future is likely to bring.

As previously discussed, promotion focus is the regulatory focus component that concentrates on approach goals, such as maximising pleasure, reaching ideals and achieving advancement (Idson et al., 2000; Shah et al., 1998). Opportunities for the largest gains, such as the outcomes of risky large-scale projects, are in the future. Likewise, reaching one’s ideal self is also a future (or sometimes never-ending) goal. Thus, we expect promotion focus to

have a very strong relationship with future focus. By contrast, prevention focus is the regulatory focus component that concentrates on avoidance goals, such as minimising pain, inhibiting potential threats and protecting from harm (Delegach et al., 2017; Idson et al., 2000; Shah et al., 1998). Minimising mistakes requires learning from past experiences by reflecting on them and refining current actions accordingly (Pardowitz, Knoop, Dillmann and Zollner, 2007). As a result, we expect prevention-focused managers to place greater emphasis on the past than do promotion-focused managers, who are less concerned with minimising mistakes and are instead more concerned with maximising the potential for gain. With current focus, we expect both dimensions of regulatory focus to have a positive relationship. More specifically, we expect that both an increased sensitivity to rewards (i.e. promotion focus) and an increased sensitivity to punishment (i.e. prevention focus) are likely to increase one's current focus, as both the goals of achieving success and avoiding failure depend on one's actions in the present. Hence, we expect an increase in either regulatory focus dimension to be associated with an increase in current focus.

Hypothesis 2: (a) Promotion focus has a relatively stronger relationship with future focus than does prevention focus. (b) Prevention focus has a relatively stronger relationship with past focus than does promotion focus. Both (c) promotion focus and (d) prevention focus are positively related to current focus.

Exploration is a long-term activity with unclear outcomes in the distant future (e.g., Mom et al., 2009; Tuncdogan et al., 2017). Individuals with a future focus aim to optimize their gains and prevent negative scenarios in the distant future. In this respect, we expect to find a positive relationship between future focus and exploration. By contrast, exploitation involves implementation, knowledge application and refinement (e.g., March, 1991; Mom et al., 2009), which are shorter term in nature and provide a clearer yield. For this reason, individuals with a current focus are likely to show attention to exploitation activities. The

relationship of past focus is relatively more complicated – retrospective thinking entails reflecting upon past occurrences to consider alternative paths in terms of opportunities and threats (e.g., Jordan, Messner and Becker, 2009; Kolb and Kolb, 2005). In contrast to future possibilities, past experiences entail concepts one has already encountered that are part of one's knowledge base. Reconsidering and reflecting on these past experiences allows for incremental refinement of one's knowledge and behaviours; therefore, they are likely to have an association with exploitation.

Hypothesis 3: (a) Future focus is positively related to exploration, (b) current focus is positively related to exploitation, and (c) past focus is positively related to exploitation.

[Insert Figure 1 About Here]

METHOD

Data and Measurement

We recruited 541 managers in the United States through a panel data firm (Qualtrics) to complete our online questionnaire. The sample was quite balanced in terms of the gender ratio (52.7% male/47.3% female). On average, managers in this sample were 41.3 years old and had been working for 12.9 years within the organization (median: 10 years). The vast majority (84.5%) had completed some kind of university education; of these, 19.6% had an associate degree, 39% had a bachelor's degree and 25.9% had a masters degree or PhD. Eleven respondents were list-wise removed due to missing responses, bringing the sample to a total of 530 managers.

Exploration and exploitation activities. We measured exploration and exploitation activities at the individual level using a scale developed by Mom, van den Bosch and Volberda (2007) which consists of five items about exploration activities and six items about exploitation activities, preceded by the phrase "I focus on". The reliability levels for both the

exploration and exploitation subscales were very high (respectively, Cronbach’s $\alpha = .87$, McDonald’s $\Omega = .87$ and $\alpha = .85$, $\Omega = .86$).

Regulatory Focus. We used the ten-item regulatory focus composite scale to measure promotion and prevention foci (Bearden, Netemeyer and Haws, 2011, p.231). One item on the promotion scale was not significant in the confirmatory factor analysis, and one item on the prevention focus scale was problematic in terms of reliability, so these were not included in subsequent analyses¹. In line with prior research, the reliability score for the promotion focus scale was very high ($\alpha = .86$). Also, in line with most prior research (e.g., Bearden, Netemeyer and Haws, 2011, p.230; De Cremer, Mayer, Van Dijke, Schouten and Bardes, 2009; Haws, Dholakia and Bearden, 2010), the reliability score for the prevention focus scale was lower than .70 but higher than .60 ($\alpha = .62$, $\Omega = .61$).

Temporal Focus. The past focus, current focus and future focus were measured using a twelve-item scale developed by Shipp, Edwards and Lambert (2009). Like the dimensions of exploration-exploitation and regulatory focus, the temporal focus dimensions are also conceptualized as orthogonal variables (Shipp et al., 2009) – that is, different dimensions can be simultaneously high or low. All three subscales had very high levels of reliability (respectively, α and $\Omega = .92$; α and $\Omega = .82$; α and $\Omega = .92$).

Control variables. Our sample was a diverse set of managers, so we used several control variables to eliminate alternative explanations. First, we used the demographic variables of age and gender, as these are known to be linked to several psychological tendencies. Experience within the organization may affect tendencies towards exploration and exploitation activities (March, 1991; Tuncdogan et al., 2017). Likewise, the level of education may also affect exploration and exploitation activities, due to its association with higher

¹ On testing the hypotheses with these items included, we reached the same conclusions.

cognitive capabilities (Mom et al., 2007). Finally, we controlled for the size and age of the organization, which are key demographic variables at the organizational level.

Validation

To ensure the face and content validity of our research instruments, we used well-known reflective scales from prior studies. We examined the convergent and divergent validity of the scales through a series of confirmatory factor analysis models, again following recent studies (see Liu, Hui, Lee and Chen, 2013; Tuncdogan et al., 2017). The confirmatory factor analyses were conducted using the *lavaan* package of R. The model with seven distinct variables showed a very good fit to the data ($\chi^2 = 1011.28$; d.f. = 413; $\chi^2 / \text{d.f.} = 2.45$; TLI = .93; CFI = .94; RMSEA = .05; SRMR = .05; AIC = 46857.71; BIC = 47212.36; SABIC = 46948.90). Moreover, it fitted better than alternative models with fewer variables, both with respect to objective (e.g., TLI, CFI, RMSEA) and relative (e.g., AIC, BIC, SABIC) measures of fit (see Table 1 below).

[Insert Table 1 About Here]

To check for possible common method bias, we conducted three tests: a Harman's single-factor test using principal component analysis, another single-factor test using confirmatory factor analysis (e.g. Liu et al., 2013, p.1029), and a common latent factor test (Podsakoff, MacKenzie, Lee and Podsakoff, 2003). The confirmatory factor analysis model with a single factor showed a very poor fit to the data ($\chi^2 = 4528.90$; d.f. = 434; $\chi^2 / \text{d.f.} = 10.43$; TLI = .54; CFI = .57; RMSEA = .13; SRMR = .10; AIC = 50333.33; BIC = 50598.25; SABIC = 50401.45), while the single-factor principal component analysis and the common latent factor test explained less than 50% of the variation (35.4% and 46.9%, respectively), suggesting that common method bias is unlikely to be a major issue in this study.

RESULTS AND ANALYSIS

The correlations observed in the dataset were in line with our expectations as well as the findings of past research, showing that our dataset was usual and ordinary (Table 2). For instance, in line with prior research, there was a positive correlation between the related but orthogonal constructs of promotion focus and prevention focus (e.g., Neubert, Kacmar, Carlson, Chonko, and Roberts, 2008; Tuncdogan et al., 2017; Wallace, Johnson and Frazier, 2009) and between exploration and exploitation activities (e.g., Kostopoulos and Bozionelos, 2011; Torres, Drago and Aquevenque, 2015) and between current focus and future focus (Shipp et al., 2009). We had one correlation above .60 in our correlation matrix – the current focus and future focus variables, which were strongly correlated also in prior studies (Chishima et al., 2017; Shipp et al., 2009), had a correlation of .61. As a result, we had to examine the variance inflation factor (VIF) values of our regression models to investigate the potential threat of multicollinearity. The highest Variance Inflation Factor (VIF) value observed in the regressions (2.01) was well below the suggested threshold of 10, indicating that multicollinearity is not a major issue in this study (Neter, Kutner, Nachtsheim and Wasserman, 1996). Likewise, in the CFA analyses, current focus and future focus (as well as each of the other scales) emerged as distinct factors (see the previous section). In other words, while in this study we are trying to unravel the specific relationships between closely-related psychological constructs, the CFA analyses provide strong evidence to the divergent validity of our model.

[Insert Table 2 About Here]

The OLS regression analyses we conducted are presented below (Table 3). Next, we moved on to testing our hypotheses. Regarding the relation of regulatory focus to managers' exploration and exploitation activities, in line with our predictions promotion focus had a positive relation to exploration (Model 1: $\beta = .28$; $p < .001$), supporting hypothesis 1a. The

relation of prevention focus to exploration was smaller (Model 1: $\beta = .12$; $p < .01$). We also conducted tests of dependent correlations (Steiger, 1980), which confirmed that the relation of promotion focus with exploration was stronger than that of prevention focus (Steiger $z = 3.14$; $p < .01$), *supporting hypothesis 1b*. Again in line with our expectations, prevention focus had a positive relation to exploitation (Model 3: $\beta = .18$; $p < .001$), but it was not larger than that of promotion focus (Steiger $z = -1.83$; $p = \text{n.s.}$), *supporting hypothesis 1c, but not 1d*.

After that we examined the effects of regulatory focus on temporal focus and the effects of temporal focus on managers' exploration and exploitation activities. Again, in line with our predictions, with promotion focus the positive relation to future focus (Model 7: $\beta = .24$; $p < .001$) was stronger than with prevention focus (Model 7: $\beta = .11$; $p < .01$ and Steiger $z = 2.34$; $p < .05$), and with prevention focus the positive relation to past focus (Model 5: $\beta = .33$; $p < .001$) was stronger than with promotion focus (Model 5: $\beta = -.05$; $p = \text{n.s.}$ and Steiger $z = 4.74$; $p < .001$), *supporting hypotheses 2a and 2b*. The relation of promotion focus (Model 6: $\beta = .19$; $p < .001$) but not of prevention focus (Model 6: $\beta = .05$; $p = \text{n.s.}$) to current focus was significant, *supporting hypothesis 2c, but not 2d*.

Finally, future focus had a positive relation to exploration (Model 2: $\beta = .11$; $p < .001$), *supporting hypothesis 3a*. Its effect on exploitation was non-significant (Model 4: $\beta = .06$; $p < \text{n.s.}$). The relation of current focus to exploitation was positive (Model 4: $\beta = .20$; $p < .001$), *supporting hypothesis 3b*. Its relation to exploration was also positive (Model 2: $\beta = .17$; $p < .001$), suggesting that current focus may play a role in increasing one's overall engagement in work-related tasks. Interestingly, past focus had no relation to either exploration or exploitation (Model 2: $\beta = .06$, $p < \text{n.s.}$ for exploration and Model: 4 $\beta = .03$; $p < \text{n.s.}$ for exploitation), *not supporting hypothesis 3c*.

[Insert Table 3 About Here]

We then investigated whether these relationships result in statistically significant indirect links (mediation effects). For this purpose, we employed bootstrapped mediation analysis (Hayes, 2018), a contemporary and robust technique that has become quite widely used in recent years (e.g. Bentein, Guerrero, Jourdain and Chênevert, 2017; Kroon, van Woerkom and Menting, 2017). The bootstrapped mediation analyses (50,000 samples) suggested that, in line with the results above, the indirect link between promotion focus and exploration runs through future focus (coefficient = .04; boot SE = .02; boot LLCI = .01; boot ULCI = .09; $Z = 2.40$; $p < .05$) and current focus (coefficient = .05; boot SE = .02; boot LLCI = .02; boot ULCI = .09; $Z = 3.19$; $p < .01$). Again, prevention focus has a weaker link with exploration than does promotion focus, which runs through future focus (coefficient = .02; boot SE = .01; boot LLCI = .01; boot ULCI = .05; $Z = 2.15$; $p < .05$). Promotion focus also has a positive indirect link with exploitation through current focus (coefficient = .04; boot SE = .02; boot LLCI = .02; boot ULCI = .08; $Z = 3.38$; $p < .001$). Although prevention focus has a significant positive relation to exploitation, it does not have a significant indirect link with exploitation through the temporal focus dimensions. Instead, it has only a marginally significant effect through current focus (coefficient = .02; $p < .06$). That is, there is a strong relationship between prevention focus and exploitation, but that relationship cannot be explained by the mechanisms we examine in this paper and thus poses a question for future research.

DISCUSSION

There has been a recent dialogue in the literature regarding the potential link between regulatory focus and exploration–exploitation at different levels of analysis. In this study, we add to the discussion by investigating such a relationship at the individual manager level and by shedding light on the role of temporal focus in this relationship. More specifically, the findings of this study suggest that managers' promotion and prevention foci are associated

with the extent to which they focus on the past, present and future, and with the extent to which managers are oriented towards exploration and exploitation. Promotion focus has a stronger relation to exploration than prevention focus has, and this relation seems to result, to an extent, from the higher levels of future and current foci associated with promotion focus. On the other hand, both promotion and prevention foci have positive effects on exploitation, but the effect of prevention focus does not run through temporal focus but another mechanism. All in all, this study has theoretical, empirical and practical contributions and implications.

First, this study provides an in-depth look at the relationship between managers' regulatory focus and their exploration–exploitation activities, thereby extending our theoretical understanding of this relationship. In particular, the introduction of temporal focus as a potential mediator of the relationship between regulatory focus and exploration–exploitation at the individual manager level provides us with several new insights. To begin with, the notion that temporal focus is a potential mediator of this relationship increases our understanding of how a manager's exploration–exploitation activities can be predicted or shaped, which is important for purposes of manager selection and organisational design. Moreover, temporal focus seems to play a mediatory role in the relationship between regulatory focus and exploration–exploitation, but it is not a full mediator. That is, we observe that the relationship between regulatory focus and exploration–exploitation is significantly more complex than what has been assumed in previous studies. This study has given us insight into one type of mediator, but what has also become evident is that when this relationship is modelled in its entirety, there will be other mediating paths. Overall, this study extends our theoretical understanding of the relationship between regulatory focus and exploration/exploitation, and it likewise develops our ability to build more detailed theories in this area.

Second, this study has implications for temporal focus research. In particular, we have a limited understanding of the (1) chronic psychological antecedents and (2) managerial outcomes of temporal focus. This paper takes a step in both directions. First, exploration and exploitation are key constructs within the innovation and strategic renewal literature (e.g. Tuncdogan et al., 2015; Tzabbar et al., 2015). Showing how temporal focus affects exploration and exploitation activities provides further insight into its managerial outcomes, which are largely unknown. In fact, exploration–exploitation is not only an important managerial outcome on its own but is also a precursor of several other managerial outcomes, such as ambidexterity and performance (e.g. Mom et al., 2015). Second, regulatory focus is one of the most popular theories of goal attainment and has quite a well-developed literature, unlike temporal focus which is still in its infancy. That is, there is significant research on the antecedents of regulatory focus (e.g. Lanaj et al., 2012), so by putting forward regulatory focus as an antecedent of temporal focus, we are adding to the understanding of the potential antecedents of temporal focus. For instance, regulatory focus stems at least partially from personality traits (Lanaj et al., 2012; Tuncdogan et al., 2015; Tuncdogan and Ar, 2018). This may possibly mean that temporal focus may come from such traits, as well. In sum, our study contributes to the limited understanding of the chronic psychological antecedents and managerial outcomes of temporal focus by proposing one key antecedent (regulatory focus) and one key managerial outcome (exploration–exploitation). Both of these are highly researched concepts, which means that by linking temporal focus to these constructs, we gain valuable insight into the broader nomological network of temporal focus.

Finally, this study also makes an empirical contribution. Empirical research on the relationship between regulatory focus and exploration–exploitation activities at the individual manager level is scarce. One notable empirical study that examines this relationship is that of Ahmadi, Khanagha and Jansen (2017), but even their work focuses only on exploration and

leaves out exploitation. Moreover, the concept of regulatory focus originates from experimental psychology, so most studies investigate regulatory focus-based models by using experiments. However, there is value in complementing experimental research, which has high internal validity, with survey research to increase external validity further. Our study, which is based on data from a diverse sample of 541 managers in the United States, helps address these empirical gaps by investigating both exploration and exploitation (rather than exploration only) and by using survey as the method (instead of experiment).

Practical Implications

The theoretical and empirical contributions of this study also have practical implications. First, by demonstrating the relationship of regulatory focus with both exploration and exploitation variables (rather than exploration only), we help develop an understanding of how organisations may achieve a certain level of exploration and/or exploitation. For instance, one way of increasing exploratory activities within an organization or part of an organization is assigning promotion-focused managers. On the other hand, if a part of an organization needs to focus mainly on their existing tasks (e.g., an exploitation-oriented unit in a structurally ambidextrous organization – e.g., O'Reilly and Tushman, 2013), prevention-focused managers may be more advantageous. Second, by introducing temporal focus as an antecedent of exploration and exploitation, this study highlights a second key variable that organisations should keep in mind when selecting managers. Finally, regulatory focus is not only an individual-level construct, but collectives (e.g. group, organisation, nation) can also have regulatory focus, which is known as collective regulatory focus (e.g. Johnson et al., 2015). Therefore, our model also lays the foundation and presents opportunities for future studies at higher units of analysis. For instance, future research can examine whether changes in the collective regulatory focus of a nation, culture or subculture

influence the timeframes that society focuses on and therefore affects their exploration and exploitation activities (e.g. risky voting choices, such as Brexit vs. preserving the status quo).

Limitations and Future Research

The limitations of this study present a number of areas for future research. First, we collected cross-sectional data from single respondents. While this research design has the benefit of being able to incorporate data from a diverse range of managers working at different firms (thus increasing generalizability), it also limits our ability to make causal claims. This is because, in a cross-sectional study, it is not possible to demonstrate temporal precedence, which is a necessary condition for making causal claims (e.g., Rosopa and Stone-Romero, 2008; Stone-Romero and Rosopa, 2010). Future studies may complement our dataset by focusing on managers from a single firm (or a small number of firms), which would allow the collection of longitudinal 360-degree feedback data. This way, triangulating some of the findings, eliminating the threat of single respondent bias and making causal claims may be possible. Neurological techniques (e.g. fMRI and EEG) may also be helpful for triangulating the findings and clarifying relationships, especially that between regulatory focus and temporal focus. Second, we examined regulatory focus as a chronic individual difference. However, regulatory focus can also be induced temporarily, creating what is known as situational regulatory focus. Future studies should use experimental methods to investigate whether leading an individual to engage temporarily in more exploration and/or exploitation activities by using the mechanisms described in this study is possible. This would be an interesting avenue to explore, particularly from the perspective of the sequential ambidexterity literature. Finally, following previous researchers, we have focused in this research on the amount of exploration and exploitation. However, regulatory focus and temporal focus may also have an effect on other properties of exploration and exploitation. For example, exploration performance and exploitation performance—that is, the extent to

which exploration and exploitation efforts result in successful outcomes—may also vary for people with different regulatory and temporal foci.

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Table 1. Comparative CFA Results

	χ^2	d.f.	$\chi^2 / \text{d.f.}$	RMSEA ^a	TLI ^b	CFI ^c	SRMR ^d	AIC ^e	BIC ^f	SABIC ^g
<i>Recommended values:</i>			≤ 3	$\leq .08$	$\geq .90$	$\geq .90$	$\leq .08$	<i>The model with the lowest AIC / BIC / SABIC value has the best fit</i>		
1 . Seven-factor model	1011.28	413	2.45	.05	.93	.94	.05	46857.71	47121.36	46948.90
2 . Six-factor model (Exploration and exploitation combined together)	1668.26	419	3.98	.08	.85	.87	.06	47502.70	47831.71	47587.29
3. Five-factor model (Current focus and future focus also combined together)	1976.38	424	4.66	.08	.82	.84	.07	47800.81	48108.46	47879.91
4. Four-factor model (All three temporal foci combined together)	3280.04	428	7.66	.11	.67	.70	.09	49096.47	49387.03	49171.18
5. Three-factor model (Promotion focus and Prevention focus also combined together)	3404.62	431	7.89	.11	.66	.69	.10	49215.06	49492.80	49286.47
6. Two-factor model (Temporal focus dimensions and regulatory focus dimensions combined together)	3990.24	433	9.22	.13	.60	.62	.10	49796.67	50065.86	49865.88
7. One-factor model (All variables combined together)	4528.90	434	10.43	.13	.54	.57	.10	50333.33	50598.25	50401.45

Note: ^aRMSEA = Root Mean Squared Error of Approximation ^bTLI = Tucker-Lewis Index, ^cCFI = Comparative Fit Index, ^dSRMR = Standardized Root Mean Residual, ^eAIC = Akaike, ^fBIC = Bayesian, ^gSABIC = Sample-Adjusted Bayesian

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Table 2. Matrix of Partial Correlations^a

	1	2	3	4	5	6
1. Promotion focus						
2. Prevention focus	.46					
3. Future focus	.51	.42				
4. Current focus	.46	.34	.61			
5. Past focus	.20	.40	.31	.19		
6. Exploration activities	.53	.41	.50	.51	.26	
7. Exploitation activities	.51	.44	.48	.51	.25	.57

Notes: N = 530; Partial correlations significant at $p < .001$

^a Control variables: Gender, age, education, tenure in firm, organizational age, organizational size

Table 3. OLS Regression Models

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Dependent Variable:	<i>Exploration</i>	<i>Exploration</i>	<i>Exploitation</i>	<i>Exploitation</i>	<i>Past Focus</i>	<i>Current Focus</i>	<i>Future Focus</i>
Key Variables of the Model							
Promotion focus	.28***	.20***	.23***	.17***	-.05	.19***	.24***
Prevention focus	.12**	.06	.18***	.14***	.33***	.06	.11*
Future focus		.11*		.06	.20***	.49***	
Current Focus		.17***		.20***	-.03		.43***
Past Focus		.06		.03		-.02	.14***
Exploration			.39***	.29***			
Exploitation	.37***	.27***					
Control Variables							
Gender	-.05†	-.04	.04	.04	-.06	-.04	.02
Age	-.09*	-.06†	.06	.06†	-.24***	.03	-.05
Education	.06†	.03	-.07*	-.08*	.04	.07*	-.02
Years of Experience in Company	.06†	.06	.00	.00	.05	-.02	.04
Organizational Size	-.18***	-.16***	.14***	.14***	-.04	-.03	.02
Organizational Age	.04	.02	-.02	-.03	.07†	.04	-.00
F-Statistic	47.09***	41.41***	41.87***	36.12***	20.94***	37.69***	36.63***
R-squared	.45	.49	.42	.46	.29	.42	.49
Adjusted R-squared	.44	.48	.41	.44	.27	.41	.48

Notes: Standardized coefficients reported; N = 530; † p < .10; * p < .05; ** p < .01; *** p < .001