



Work for Interest or Utility? Research on the Effects of Intrinsic and Extrinsic Motivations on Individual Employees' Ambidextrous Behavior

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Abstract

Drawing on motivation theory and the perspective of organizational ambidexterity, this paper focuses on individual ambidextrous behavior as its core research theme, and it delves in the relationship between intrinsic motivation, extrinsic motivation, and individual ambidextrous behavior, as well as the moderating role played by task complexity. Based on the data collected from 482 questionnaires from 102 small and medium-sized enterprises of high-tech industries in China, the paper reaches the following research conclusions: On one hand, intrinsic motivation has a positive effect on individual exploratory behavior, and task complexity could positively moderate this effect; On the other hand, extrinsic motivation has a positive effect on individual exploitative behavior, and task complexity could negatively moderate this effect. This research is beneficial for broadening and deepening the extant research on the driving force of ambidextrous behavior at the individual level. It also could provide critical theoretical support for enterprises in terms of how they could efficiently and flexibly adjust their incentives to activate and guide individual employees' ambidextrous behaviors.

Keywords

Intrinsic Motivation, Extrinsic Motivation, Exploration, Exploitation, Task Complexity

1. Introduction

Making full use of the existing capabilities that have been accumulated to efficiently improve short-term performance and continuously exploring new technologies, developing new markets, and forming new capabilities in order to become market leaders in the long run has become a paradoxical and a practical problem that needs to be solved urgently. Extant studies have shown that an ambidextrous organization that conducts both exploratory and exploitative activities is more likely to survive in the fierce market competition and achieve long-term stable development while showing higher market value and profit margins (Birkinshaw et al., 2016; Birkinshaw & Gupta, 2013). However, the tension that develops between exploratory and exploitative activities makes it difficult to pursue both. To solve this tension, previous literature have suggested that organizations should be structured to separate exploration and exploitation activities, with separate business units engaged in both activities (Fang et al., 2010; Tushman & O'Reilly Iii, 1996) ; or temporally decouple exploration and exploitation activities and carry out the two activities in separate time periods (Gulati & Puranam, 2009). According to contextual ambidexterity theory there is a third option: making use of the autonomy and adaptability of individuals and allow them to flexibly master their own exploratory and exploitative behaviors (Cattani, 2006; Eisenhardt et al., 2010; Gibson & Birkinshaw, 2004). However, less re-

search has been done on the drivers of ambidextrous behavior at the individual level and how organizations can take advantage of individual ambidextrous behaviors. This is partly due to the lack of data collection at the individual level, and partly due to the theoretical assumptions widely adopted in the existing literature that it is often difficult for individuals to form a behavior pattern to do well in both exploration and development at the same time (Lee & Meyer-Doyle, 2017) or switch freely between the two (Gupta et al., 2006). In recent years, however, some studies have shown empirical evidence that individuals can indeed engage in both exploration and exploitation activities (Mom et al., 2007; Mom et al., 2009; Rogan & Mors, 2014). And individuals' ambidextrous behavior can also contribute to higher organizational performance (Gibson & Birkinshaw, 2004). So what exactly drives ambidextrous behavior at the individual level? Research in this area is insufficient (O'Reilly III & Tushman, 2013). This paper explores the driving forces of individuals' ambidextrous behavior from the perspective of motivation theory. Specifically, we explore how intrinsic motivation promotes exploratory behavior, how extrinsic motivation promotes developmental behavior, and examine the moderating role of task complexity in the relationship between intrinsic motivation and individual exploratory behavior, as well as extrinsic motivation and individual exploitative behavior. Our empirical research results show that: Individuals driven by intrinsic motivation generate more exploratory behaviors; Individuals driven by extrinsic motivation engender more developmental behaviors; The more complex the task, the greater the driving force of intrinsic motivation on individual exploratory behaviors; The stronger the extrinsic motivation, the weaker the drive for developmental behavior.

This study has the following three contributions. First of all, this paper expands the research on ambidextrous organizations. Ambidextrous organization includes three levels of "ambidexterity"—organizational level, group level and individual level. The ambidexterity at the individual level is the basis of group and organizational ambidexterity. From the perspective of motivation theory, this paper explores the motivation of ambidextrous behavior at the individual level and discovers the driving force of exploratory and exploitative behaviors. Second, this study also finds a new field of application for motivation theory. Numerous literatures have deeply studied the effects of intrinsic and extrinsic motivation on creativity and innovation. However, studies that apply motivation theory to ambidextrous behavior at the individual level are relatively rare. This paper introduces motivation theory into the study of ambidextrous behavior and examines the different effects of two motivations on two elements of ambidextrous behaviors—exploratory and exploitative behavior. Finally, this paper takes task complexity in the task attribute as a moderating variable and studies the contingency condition. Findings in this aspect reveal when motivational theory is most powerful and when it is attenuated.

2. Literature review

2.1 Intrinsic and extrinsic motivation

Intrinsic motivation refers to the fact that a person engages in an activity for the sake of the activity, and that pleasure and satisfaction can be obtained by participating in the activity. Extrinsic motivation is when a person engages in an activity as a means to an end, not for intrinsic pleasure but for obtaining positive outcomes or avoiding negative consequences (Amabile, 1993; Deci & Ryan, 2000; Lepper et al., 1973; Wong-On-Wing et al., 2010). Lindenberg (2001) further divided intrinsic motivation into normative and hedonistic motivations. The former arises because people want to conform to personal, social, or organizational norms; the latter arises because people find the task itself challenging, exciting, and enjoyable. Self-Determination Theory (SDT) further distinguishes different types of extrinsic motivation based on relative autonomy and self-determination. An extrinsic motivation is autonomous when someone chooses to do an action voluntarily because he thinks it has merit. An extrinsic motivation is controlling (ie, involuntary) when someone acts out of an extrinsic demand or reward, or to avoid guilt or anxiety (Ryan & Deci, 2000). People are more creative when they have hedonic intrinsic motivation because they are more likely to explore diverse paths and alternatives (Amabile, 1993). Intrinsic and autonomous extrinsic motivation have positive effects on performance while controlling extrinsic motivation has negative effects, especially when the task is more complex (Gagné & Deci, 2005; Wong-On-Wing et al., 2010).

2.2 Individual ambidextrous behavior

Individual ambidextrous behaviors are those in which employees perform both exploratory and exploitative activities in their job roles (Bledow & Frese, 2009; Kaupilla & Tempelaar, 2016). Exploratory behaviors include behaviors aimed at acquiring broader knowledge and advancing new or other alternative opportunities, while exploitative behaviors include refinement behaviors and behaviors that expand existing assets, capabilities, and knowledge bases

(Benner & Tushman, 2003; Gupta et al., 2006). Exploration and exploitation are two distinct dimensions, but they are mutually reinforcing. As individuals explore, they also generate new opportunities for exploitation; as individuals exploit, they increase the expertise and depth of knowledge that can facilitate exploration (Farjoun, 2010). It is inappropriate to focus solely on exploratory or exploitative goals, as doing so drives individuals to use their conventional thinking and prevents them from identifying complementarities between activities of the opposite nature (Miron-Spektor et al., 2011). However, ambiguity at the individual level is perhaps the most difficult of all to achieve “ambidexterity” (Gupta et al., 2006). The main challenge in capturing ambidexterity is that factors that enhance exploration tend to weaken exploitation, and vice versa. Organizations and groups can overcome this challenge by assigning exploratory and exploitative activities to separate work units (Jansen et al., 2009), but individuals must face many challenges arising from conflicting agendas and conflicting needs. In addition to organizational factors, individual ambidexterity is also deeply affected by individual characteristics including proactiveness, intrinsic motivation, and extrinsic motivation (Amabile, 1993; Raisch et al., 2009).

2.3 Task complexity

In the existing literature on decision support, an important task characteristic is task complexity. Task complexity includes different concepts such as: subjective complexity, objective complexity, and the interaction between someone and a task (Campbell, 1988). Task complexity has three dimensions: componential, coordinative, and dynamic. Compositional complexity is determined by the number of behaviors required to perform a task and the number of information threads processed; coordination complexity refers to the type and number of relationships between task inputs and task outputs; dynamic complexity refers to external changes that can affect task inputs and outputs. relationship (Wood, 1986). Although many researchers have focused on the objective complexity of the task (Wood, 1986) and demonstrated its effect on motivation and performance, in fact the subjective complexity of the task can sometimes have a more profound effect. Campbell (1988) believes that different individuals who complete the same task will experience different task difficulty. Therefore, the task difficulty experienced by an individual depends not only on the objective characteristics of the task but also on certain subjective factors, including familiarity with the task, cognitive resources, and the availability of tools and time. In this paper, task complexity referred to subjective complexity and follows the definition of previous scholars (Campbell, 1988; Mangos & Steele-Johnson, 2001): the subjective complexity of a task refers to how complex an individual perceives a task is.

3. Research hypothesis

3.1 Intrinsic motivation and individual exploratory behavior

Intrinsic motivation makes employees willing to explore at work (Doran & Ryan, 2017). Intrinsically motivated employees do their jobs because they find the job itself interesting, exciting, satisfying, or personally challenging (Deci & Ryan, 2000). Jobs with these characteristics usually include more exploratory activities. There are two kinds of intrinsic motivation: one is normative and the other is hedonic (Lindenberg, 2001). When employees' own job responsibilities are to engage in exploratory activities, normative intrinsic motivation can prompt them to produce exploratory behaviors; and when employees' own job responsibilities do not require them to explore, employees with hedonic intrinsic motivation will also explore. Exploratory behavior arises from the pursuit of the excitement and fun brought about by the content of exploratory work itself. Second, intrinsic motivation makes employees competent for exploratory work (Kuvaas et al., 2017). Intrinsic motivation allows people to mobilize their full energy and exert the highest level of effort, and can lead to positive emotions and therefore energy and persistence (Meyer et al., 2004). In the process of engaging in exploratory activities, the time and energy consumed is much higher than that of regular work. And exploratory activities are likely to see no hope and positive feedback in the short term. Success in exploratory activities is possible only engendered by persistent and consistent enthusiasm and energy (Kashdan et al., 2004). Employees with strong intrinsic motivation have these characteristics and competencies, which are conducive to their exploratory behaviors. Therefore, this study proposes the following hypothesis:

H1: There is a positive relationship between intrinsic motivation and individual exploratory behavior.

3.2 Extrinsic motivation and individual exploitative behavior

First of all, the nature of exploitative behavior determines that it can be better driven by extrinsic motivation. Extrinsic motivation is more likely to improve performance when work is well measured and it is clear who is credited with the work (Kuvaas et al., 2017). Exploitative behaviors focus on what is already known, thereby increasing the

certainty of work outcomes (Holmqvist, 2004) and allowing each employee to perform his/her role with a clear division of labor. Therefore, the results of exploitative behaviors can be better measured, and the attribution of the results can be easily found, so that they can be more driven by extrinsic motivation. Second, the time and efficiency requirements of extrinsic motivation to achieve work results also determine that it will prompt employees to form exploitative behaviors. Employees with strong extrinsic motivation expect immediate results from productive, shorter-time work (Lee & Meyer-Doyle, 2017). In order to achieve this goal, employees with strong extrinsic motivation focus on processes or products they already know well, making micro-improvements and incremental innovations based on existing knowledge. The result is that they improve an existing process or product to qualify for recognition and reward from the organization, without paying too much time or too much labor over time. Third, extrinsic motivation makes employees highly focused and narrow their vision, and they can only do exploitative things. As extrinsically motivated employees exert their efforts on responding to the stimuli most relevant to them at the moment, ignoring new and potentially disruptive information, they automatically filter out ground-breaking and discontinuous innovations' potential information (Lustig et al., 2001). Employees with strong extrinsic motivation can be limited by the existing thinking mode and existing processes and products and continue to engage in exploitative activities. Therefore, this study proposes the following hypothesis:

H2: There is a positive relationship between extrinsic motivation and employee exploitative behavior.

3.3 The moderating roles of task complexity

This study suggests that task complexity can positively moderate the positive relationship between intrinsic motivation and individual exploratory behavior. First, complex tasks can prompt individuals with strong intrinsic motivation to have a strong learning goal orientation. Employees with strong intrinsic motivation will form a learning goal orientation out of curiosity and love for the work task itself and can face high-level challenges with high-intensity continuous efforts. The more complex and difficult the task, the stronger this learning goal orientation, making them more interested in the task itself, resulting in more exploratory behavior (Mangos & Steele-Johnson, 2001). Second, complex tasks cause intrinsically motivated employees to develop a higher sense of achievement and to feel that they have self-determined competence (Cellar et al., 1993). One of the motivations for intrinsically motivated employees to engage in exploratory behavior is to gain a sense of satisfaction after completing a task, which increases with the complexity of the task. Third, employees with strong intrinsic motivation will actively seek help in the process of completing highly complex tasks. They rely more on external knowledge and information, and can better form a collaborative relationship with external subjects and communicate with each other (Parkes, 2017). These knowledge and information from the outside will help employees to broaden their knowledge base, so that they not only have internal driving force but also have matching vision, ability, and knowledge reserve. Therefore, this study proposes the following hypothesis:

H3: Task complexity positively moderates the positive relationship between intrinsic motivation and exploratory behavior in that the same intrinsic motivation promotes a higher degree of exploratory behavior when task complexity is high.

This study also suggests that task complexity negatively moderates the positive relationship between extrinsic motivation and individual exploitative behavior. First, when the task complexity is high, the degree of difficulty in completing exploitative tasks is high, which weakens the effort of those employees who are motivated by extrinsic motivation. Complex tasks include a large number of "building blocks", require more "coordination" activities, and are more "dynamic" than relatively simple tasks (Wood, 1986). Completing a complex task properly requires complex and task-specific strategies (Bonner & Sprinkle, 2002). The more complex the task, the more time and energy it takes to engage in exploitative activities, and the more difficult it is to complete the task. However, extrinsically motivated employees are more likely to get discouraged and give in when faced with difficult problems and seemingly insurmountable obstacles. This directly results in a lack of overall employee effort to complete difficult exploitative tasks. Second, complex tasks usually require employees to have tacit knowledge to successfully complete, and the mastery of tacit knowledge will not be significantly improved due to the enhancement of extrinsic motivation. This makes extrinsic motivation ineffective in driving complex exploitative behaviors. Besides, completing complex tasks often requires employees to have an open mind (Bailey & Fessler, 2011), proactively seek help and obtain as many external resources as possible. But outside help and resources do not come unsolicited, and it is more difficult to obtain them without any cost. This means that employees who complete complex tasks have to share a piece of the pie with those who help them or exchange some of their own money from external incentives in exchange for external

resources. Because extrinsically motivated employees are often reluctant to pay such a price, they often do not perform well in exploitative activities when faced with complex tasks.

H4: Task complexity negatively moderates the positive relationship between extrinsic motivation and exploitative behavior in that when task complexity is high, the same extrinsic motivations are less likely to promote exploitative behaviors.

The conceptual model of this paper is shown in Figure 1

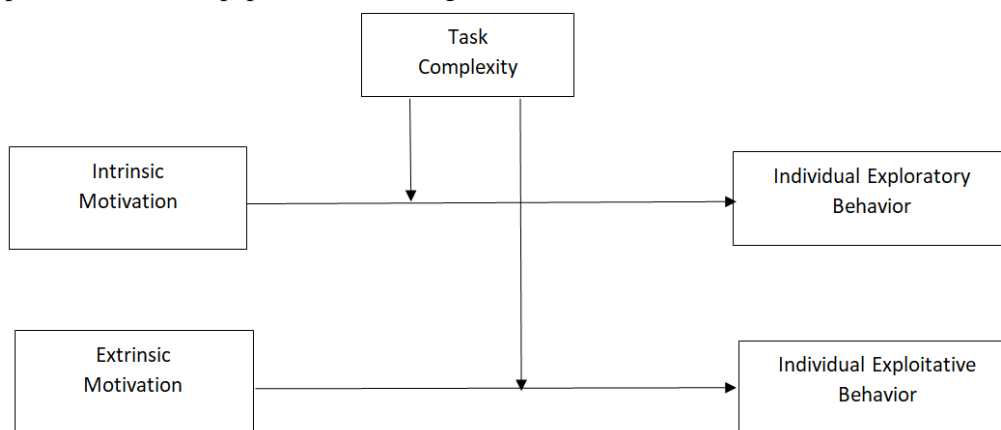


Figure 1. Conceptual model.

4. Research methods

4.1 Data and samples

This research uses a questionnaire survey method to collect data. All the empirical research data come from the results of questionnaires sent to 102 small and medium-sized enterprises (SMEs) in high-tech manufacturing industry located in China. We define SMEs as those with no more than 500 employees, as defined by previous research (Arend, 2006; Herrmann & Nadkarni, 2014). According to the "High-tech Industry (Manufacturing) Classification (2013)" issued by the National Bureau of Statistics of China, "High-tech industry (manufacturing) refers to the manufacturing industries whose R&D input intensity (that is, the proportion of R&D expenditure in the main business income) is relatively high in the national economic industries. Such kind of industries include industries that manufacture pharmaceuticals, aviation, spacecraft and equipment, electronic and communication equipment, computer and office equipment, medical equipment and instrument, information chemicals, and other six categories". The selection of the survey samples is divided into two steps: the first step is to use stratified sampling to select 17 small and medium-sized enterprises in each of the above six categories of industries, totalling 102 enterprises; the second step is to randomly select 4-6 enterprises from these enterprises. Employees from the R&D department answered the questionnaires. This study finally collected 482 valid questionnaires.

4.2 Measurement

Since the scales used in this study are adopted from English literature, in order to ensure the comprehensibility and accuracy of the questionnaire items, we adopted the back-translation method: first ask some members of the research group to translate the English questionnaire into XXX language, then ask another The group members who had not read the English questionnaire back-translated the XXX language questionnaire into English, and then compared it with the original English questionnaire and revised it repeatedly until there was no significant difference between the two versions of the English questionnaire (Brislin, 1980). The research group also conducted a preliminary survey of 10 executives in 4 small and medium-sized high-tech industries and revised the questionnaire according to their opinions. In the measurement of independent variables, dependent variables, and moderating variables, this paper uses a seven-point Likert scale.

4.3 Intrinsic and extrinsic motivation

Drawing on the scale developed by Kuvaas et al. (2017), this study uses six items to measure intrinsic motivation and four items to measure extrinsic motivation. The Cronbach's α for intrinsic motivation is 0.94, and the Cron-

bach's α for extrinsic motivation is 0.92.

4.4 Individual ambidextrous behavior

Drawing on the scale developed by Mom et al. (2009), this study uses seven items to measure the exploratory behavior of individuals, and seven items to measure the individual's developmental behavior.

The Cronbach's α for exploratory behavior is 0.93, and the Cronbach's α for exploitative behavior is 0.94.

4.5 Task complexity

Drawing on the scale developed by Mangos and Steele-Johnson (2001), this study uses four items to measure task complexity. The task complexity referred to in this paper refers to the subjectively perceived task complexity of employees, not the objective complexity of the task. The Cronbach's α for task complexity is 0.92.

4.6 Control variables

Since age, tenure and education level of employees affect the ambidextrous behavior at the individual level, this study uses the above variables as control variables. Among them, education level was set as a dummy variable. The educational level is first coded, with 1 for high school and below, 2 for undergraduate, 3 for master's degree, and 4 for doctorate degree. Then we set up three dummy variables D1, D2, D3. If the code is 1, then D1=0, D2=0, D3=0; if the code is 2, then D1=1, D2=0, D3=0; if the code is 3, then D1=0, D2=1, D3=0 ; if the code is 4 then D1=0, D2=0, D3=1 (Kauppila and Tempelaar, 2016).

5. Results

5.1 Descriptive statistics and correlation coefficients

Descriptive statistics and correlation coefficients between variables are shown in Table 1. From the results of correlation coefficient, we could see that exploratory behavior was positively correlated with intrinsic motivation and task complexity, while exploitative behavior was negatively correlated with task complexity. It can be seen that the preliminary analysis results are consistent with the basic logic of the theoretical hypothesis. In addition, the data results also show that exploratory behavior is negatively related to age and tenure, and that exploitative behavior is positively related to age and tenure. This is basically consistent with practice and theory. As employees' age and their tenure increases, their enthusiasm and ability to explore new and uncharted territories declines. At the same time, older employees and senior employees often have a richer accumulation of knowledge, which provides the basis for their exploitative behaviors. The preliminary analysis results of the data show that exploratory behavior has a positive correlation with educational level, and exploitative behavior has a negative correlation with the educational level. This is also consistent with practice and theory. Employees with higher education levels are generally more willing to take on challenges and have strong research skills, so they are more willing and able to engage in exploratory activities. Therefore, it is reasonable to choose age, tenure, and education level as control variables.

Table 1. Correlation Table and Descriptive Statistics

	Variable	Mean	S.D.	1	2	3	4	5	6	7	8
1	Age	32.86	2.832	1							
2	Tenure	8.79	3.359	0.081**	1						
3	Education	2.44	0.560	0.073	0.013	1					
4	Intrinsic motivation	4.076	0.933	-0.021	0.023	-0.034	1				
5	Extrinsic motivation	4.019	1.006	-0.033	-0.082	-0.024	-0.023	1			
6	Task complexity	4.036	1.021	-0.070	-0.066	0.057	0.011	0.014	1		
7	Exploratory behavior	5.362	0.954	-0.089	-0.049	0.129*	0.597**	-0.001	0.597**	1	
8	Exploitative behavior	2.520	0.894	0.070	0.073	-0.151	-0.013	-0.446**	-0.684**	-0.469**	1

Note. N=482. *p<.05. **p<0.01.

5.2 Reliability and validity test

In this study, SPSS 26.0 was used to test the reliability and validity of the scales of intrinsic and extrinsic motivation, individual ambidextrous behavior, and task complexity. The factor loading of all items exceeds 0.6, and the cumulative contribution rate exceeds 50%, which indicates that the scale has high validity. All of the α coefficients of each dimension are higher than 0.7, so the scale has good reliability. In addition, this paper uses Harman's one-factor Test and finds that the contribution rate of the first principal component factor of all items is only 26.345%, so there is no phenomenon that the contribution rate of a single factor variance accounts for more than 40%. This shows that the common method bias of the questionnaire is not serious.

5.3 Multiple linear regression analysis

In order to verify the research hypothesis, this paper conducted a multiple linear regression analysis on the sample data, as shown in Table 2. A total of 6 multiple regression models are constructed in this paper, among which Model 1 and Model 4 are the benchmark models, which reflect the relationship between the control variable and the dependent variable. Model 2 and Model 5 reflect the influence of independent variables (intrinsic motivation, extrinsic motivation) on dependent variables (individual exploratory behavior, individual exploitative behavior). In order to analyze the moderating effect of task complexity (moderating variable), based on models 2 and 5, models 3 and 6 were constructed by adding interaction terms. In Model 3, the regression coefficient of the interaction term is positive and has the same sign as the regression coefficient of the independent variable intrinsic motivation, which indicates that task complexity can positively moderate the influence of intrinsic motivation on individual exploratory behavior. In Model 6, the regression coefficient of the interaction term is negative and has the opposite sign as the regression coefficient of the independent variable extrinsic motivation, which indicates that task complexity negatively moderates the effect of extrinsic motivation on individual exploitative behavior. Figure 2 and Figure 3 depict the moderating effects. The VIF (variance inflation factor) of all regression models is less than 1.957 indicating that there is no multicollinearity problem. As shown in Table 2, Model 2 shows that intrinsic motivation has a positive effect on individual exploratory behavior ($b=0.703$, $p<0.01$). Hypothesis 1 is supported. Model 5 showed that extrinsic motivation had a positive effect on individual developmental behavior ($b=0.394$, $p<0.01$). Hypothesis 2 is supported. Model 3 showed that the interaction between intrinsic motivation and task complexity has a positive effect on individual exploratory behavior ($b=0.137$, $p<0.01$). Hypothesis 3 is supported. The corresponding moderating effect diagram of Model 3 is shown in Figure 2. Model 6 shows that the interaction of extrinsic motivation and task complexity has a negative impact on individual exploitative behavior ($b=-0.142$, $p<0.01$). Hypothesis 4 is supported. The moderating effect diagram corresponding to Model 6 is shown in Figure 3.

Table 2. Regression results

		Individual exploratory behavior			Individual exploitative behavior		
		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
1	Age	-0.058	-0.011	-0.014	0.012	0.012	.012
2	Tenure	0.024	-0.004	0.001	0.013	-0.005	-0.006
3	Education	0.278***	0.193***	0.210**	-0.113*	-0.036	-0.059
4	Intrinsic motivation		0.703***	0.166*			
5	Extrinsic motivation					0.394***	0.161*
6	Task complexity		0.619***	0.069		-0.637***	-0.076
7	Intrinsic motivation X task complexity			0.137***			
8	Extrinsic motivation X task complexity						-0.142**
	R ²	0.027	0.783	0.800	0.01	0.706	0.735
	ΔR^2		0.755	0.017		0.696	0.029

* $p\leq 0.5$, ** $p\leq 0.05$, *** $p\leq 0.01$.

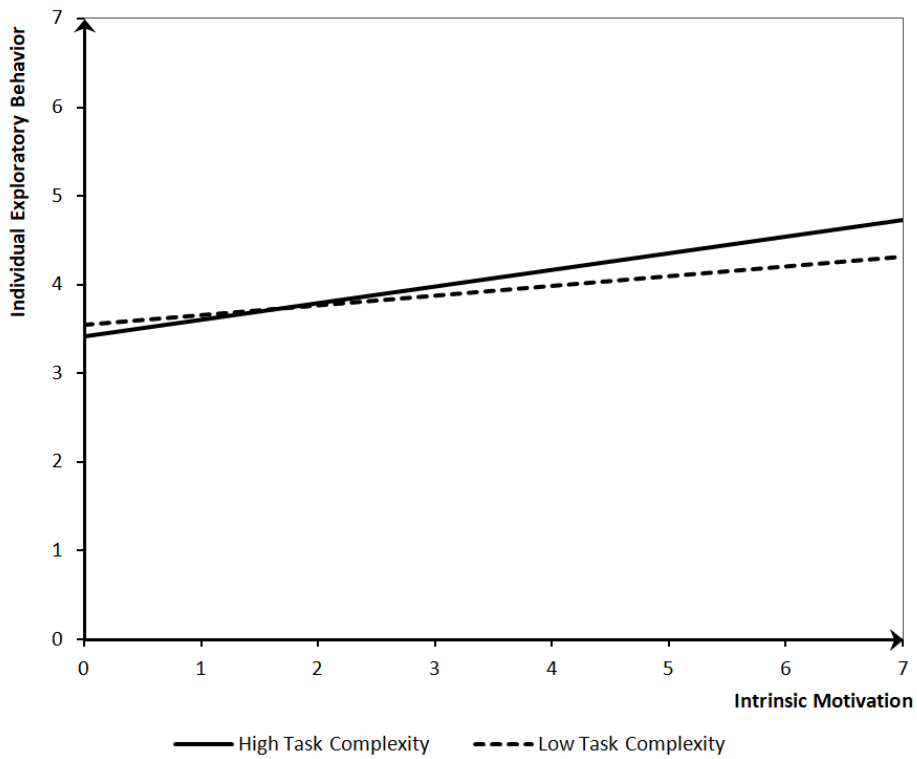


Figure 2. Moderating effect of task complexity on the relationship between intrinsic motivation and individual exploratory behavior

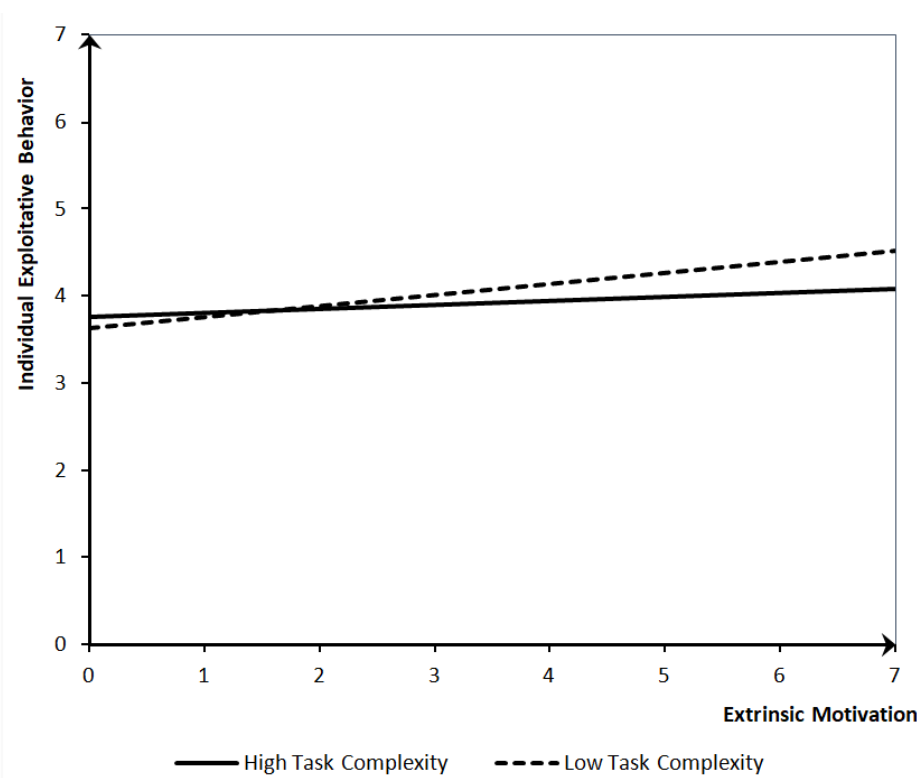


Figure 3. Moderating effect of task complexity on the relationship between extrinsic motivation and individual exploitative behavior

5.4 Conclusions and Implications

Early related research tends to regard "exploration" and "exploitation" as the two poles of a "continuum", and there is a trade-off relationship between one and the other in that if one is at a higher level, the other must be at a lower level. However, recently more and more scholars believe that these two variables should be regarded as two independent and "orthogonal" variables, they can be at a high level or a low level at the same time, or one high and one low, but they are independent of each other (Gupta et al., 2006). This shift provides a theoretical basis for exploring the respective drivers of exploratory and exploitative behaviors. Existing research on exploration and exploitation is generally divided into two schools: One is concerned with the tension between exploration and exploitation and how to balance them, that is, research on organizational ambidexterity, including the balanced dimension of ambidexterity and the combined dimension of ambidexterity (Heirati et al., 2017). The second is to focus on the research on the antecedents and outcomes of exploration and exploitation respectively. Different scholars have slightly different connotations of exploration and exploitation due to different perspectives, mainly covering the following perspectives: knowledge (Amponsah & Adams, 2017), capability (Hsiao et al., 2017), strategy (Colombelli et al., 2014), organizational learning (Lee & Widener, 2016.; March, 1991; Weng a& Huang, 2017), networking (Temizkan & Kumar, 2015), etc.

The commonality of the above studies is that they all discuss exploration and exploitation and their balance at the organizational level. Birkinshaw and Gupta (2013) pointed out that "ambidexterity" is a multilevel construct, including not only the ambidextrous behavior at the organizational level, but also at the inter-organization level (between organizations, within a strategic alliance, between company branches), at the business unit level or team level, and at the individual level. Even if the scope of the study is limited to the individual level, the ambidextrous behavior of different types of individuals is significantly different. Existing research either surveys all employees indiscriminately (Kauppila & Tempelaar, 2016) or focuses on managers (Mom et al., 2015), salespeople (Lee & Meyer-Doyle, 2017), and studies specifically for R&D employees are relatively few. In fact, the authors and the research team found through interviews and questionnaires that ambidextrous behavior is very common among employees in the R&D department of firms, and these employees are indeed faced with the dilemma between "exploration" and "exploitation". Therefore, the research selecting employees of the R&D department as subjects and conducting the study at the individual level has strong theoretical and practical significance. The findings of this study are briefly summarized and discussed as follows.

First of all, intrinsic motivation has a positive impact on individual exploratory behavior, and extrinsic motivation has a positive impact on individual exploitative behavior. The reason why individual exploratory and exploitative behaviors have different driving forces is that the nature and focus of individual exploratory and exploitative behaviors are different. Individual exploratory behaviors focus on developing new fields of knowledge and cultivating abilities that they do not have. The result is highly uncertain and lacks existing models and paths. The possibility of failure is high, and it takes a long time. Therefore, exploratory behavior requires intrinsic motivation, which is not utilitarian, and is driven by inner needs and personal preferences. In contrast, individual exploitative behaviors focus on making full use of existing knowledge reserves and one's own abilities. The results are more deterministic and can be based on one's previous experience, with a high probability of success and usually immediate results. However, individual exploitative behaviors are highly repetitive with previous activities, which can easily lead to employee boredom. Therefore, the generation of this behavior needs to improve the extrinsic motivation of employees through stimuli such as wealth, reputation, and status. On the one hand, extrinsic motivation can quickly motivate employees in a short period of time, and on the other hand, it can offset and compensate employees' burnout when they engage in developmental activities.

(2) Task complexity positively moderates the positive relationship between intrinsic motivation and individual exploratory behavior, and negatively moderates the positive relationship between extrinsic motivation and individual exploitative behavior. The reasons why task complexity produces the above two different moderating effects are as follows. First, intrinsic motivation activates learning goal orientation. The more complex the task, the stronger the learning goal orientation, because complex tasks represent more and deeper knowledge and abilities that need to be acquired. However, extrinsic motivation activates performance goal orientation. The more complex the task, the more difficult it is to accomplish this goal, because complex tasks represent a lower probability of achieving high performance in the short term. Second, intrinsically motivated and extrinsically motivated employees perceive complex tasks differently. Intrinsically motivated employees genuinely enjoy engaging in exploratory activities. Regardless of success or failure, their inward interest is hard to shake, and even the more complex the task and the more

failures, the more excited they become. But extrinsically motivated employees often don't enjoy the exploitative activities they do. Even if they successfully complete complex tasks, they are not very pleasantly surprised, because they have done similar things before; if the task fails, their frustration will be stronger, and it will be difficult for them to have lasting motivation to continue to complete complex tasks. They had expected that they would be more proficient at this not-so-unfamiliar task, but instead, it took a toll on their self-confidence. Finally, high-complexity exploratory tasks will prompt employees who are motivated by intrinsic motivation to actively seek advice from others and acquire the knowledge and tools necessary for their exploratory activities from the outside world. And they'll feel right to ask others for advice, since they're not experts in it themselves. These external supports enhance the ability of employees engaged in exploratory activities to more effectively complete complex exploratory tasks. In contrast, employees driven by extrinsic motivation tend to complete complex exploitative tasks on their own, even if their abilities and knowledge are no longer adequate. On the one hand, it is because they are regarded as experts in completing these exploitation-oriented tasks. If they easily ask others to teach them, they will lose their "face". On the other hand, External resources and knowledge cannot be obtained for free. When these employees seek advice from others, they have to give others some of the external incentives they deserve, which is inconsistent with their goal of maximizing their own interests.

5.5 Theoretical contributions

The theoretical contribution of this study is mainly reflected in the following aspects. First, this study uses motivation theory to explore the driving forces of individual ambidextrous behavior in firms, which helps to deepen and expand the theory of ambidextrous behavior at the individual level. Although previous studies have shown that individual ambidextrous behavior is a necessity for organizational ambidexterity, and some scholars have also studied the impact of certain individual characteristics on individual ambidextrous behavior (Gibson & Birkinshaw, 2004; Kauppila & Tempelaar, 2016), the research on the motivation of individual ambidextrous behavior from the perspective of motivation theory is relatively scarce. This study combines the theory of ambidextrous organization with the theory of motivation, which makes up for the shortcomings of the extant works. Second, this study introduced task complexity as a contingency factor to verify its different moderating effects on the relationship between intrinsic motivation and individual exploratory behavior and between extrinsic motivation and individual exploitative behavior. Although task complexity is a common moderator variable in the fields of project management and innovation management (HÆRem et al., 2015), few scholars have deeply analyzed the impact of task complexity on individual ambidextrous behavior, and even less research involves the moderating effect of task complexity on the relationship between intrinsic motivation, extrinsic motivation and individual ambidextrous behavior. This study not only explores the motivation of individuals' ambidextrous behavior from the subjective perspective of "people", intrinsic and extrinsic motivation, but also explores related contingency factors from the objective perspective of "object", which is task complexity.

5.6 Managerial implications

This study has several managerial implications for the ambidextrous behavior at the individual and enterprise levels. On the one hand, individuals can more clearly examine their own motivations and contingency factors for exploratory and exploitative behaviors and regulate these behaviors. On the other hand, and more importantly, companies can better manage and control individual ambidextrous behaviors. When a company needs a large number of people to engage in high-intensity exploratory behaviors, it can select employees with strong intrinsic motivation, provide them with intrinsic incentives, and assign them tasks with high complexity; When it comes to exploitative behaviors, employees with high extrinsic motivation can be selected and motivated by extrinsic incentives, while assigned tasks of less complexity.

5.7 Limitations and future directions

There are some limitations of this study, but it also provides directions for future research. The limitation mainly includes the following points: First, this study only collects cross-sectional data for empirical analysis, and future research can use longitudinal case studies to explore whether individuals' ambidextrous behavior will change over time, especially with the lengthening of employees' working years. Second, the sample data used in this study are all from questionnaires filled out by employees of R&D departments of high-tech enterprises. In fact, employees of other types of enterprises (such as high-end service industries) and other departments (such as marketing and Human

Resource Management departments) also exhibit ambidextrous behaviors. Future research can broaden the scope of the research subjects. Third, this study only discusses the direct influence of intrinsic and extrinsic motivation on individual ambidextrous behavior and does not involve its underlying mechanism. Future research can introduce corresponding mediating variables to deeply explore the mechanism for the effects of intrinsic motivation and extrinsic motivation on individual exploratory and exploitative behavior.

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