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## Article

# Multiple strategic orientations and strategic flexibility in product innovation

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# Multiple strategic orientations and strategic flexibility in product innovation

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## ABSTRACT

This research investigates how multiple strategic orientations and strategic flexibility collectively influence firm product innovation. A chain multiple mediation model with moderation is constructed that links two types of strategic orientation (entrepreneurial orientation and learning orientation) and two dimensions of strategic flexibility (resource flexibility and coordination flexibility) to product innovation. The model is tested by analysing paired survey responses collected from 303 Chinese firms with SPSS PROCESS Macro. The results show that entrepreneurial orientation stimulates firm product innovation through three parallel routes. First, entrepreneurial orientation improves product innovation by enhancing learning orientation. Second, entrepreneurial orientation positively influences product innovation by boosting coordination flexibility. Third, entrepreneurial orientation strengthens product innovation through the chain mediating effects of learning orientation and coordination flexibility. Moreover, the chain multiple mediation model is positively moderated by resource flexibility.

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## 1. Introduction

New products that are highly innovative offer firms precious opportunities for growth and competitive advantages. Innovation researchers have increasingly emphasised the importance of product innovation to firm performance, with a particular focus on the critical factors of successful product innovation. Two recent research streams, based on the resource-based logic and dynamic capability perspective, focus on strategic orientation and strategic flexibility as the antecedents of product innovation. The strategic orientation literature argues that strategic orientation is the set of principles that guides the strategic activities and behaviours of firms to guarantee their innovation, viability and performance (Gatignon & Xuereb, 1997). Strategic flexibility is a firm capacity for smooth risk management to facilitate a proactive reaction to external turbulence, opportunities and threats (Grewal & Tansuhaj, 2001). However, existing research on the impact of strategic orientations and strategic flexibility on firm product innovation has two shortcomings.

First, the historical development of the strategic orientation literature has led to an imbalance in scholarly attention to different types of strategic orientation. Market orientation was the

first type of strategic orientation to attract the attention of new product development researchers, and remains by far the best understood (Esteban, Millán, Molina, & Martín-Consuegra, 2002; Gupta, Atav, & Dutta, 2019; Roberts, 1990). Most studies focus on a particular type of strategic orientation, such as market orientation, entrepreneurial orientation, learning orientation, or technology orientation (Hakala, 2011). Evidence for the relationship between multiple strategic orientations and firm innovation is highly fragmented (Hakala, 2011; Ho, Plewa, & Lu, 2016). However, a firm's strategies and innovations are often driven by multiple strategic orientations, and it is crucial to incorporate multiple strategic orientations into product innovation (Alvarez & Busenitz, 2001; Grinstein, 2008; Hakala, 2011). This study focuses on entrepreneurial orientation and learning orientation to analyse how they contribute to product innovation.

Second, the link between multiple strategic orientations and firm product innovation is influenced by strategic flexibility. Sanchez (1995) decomposes strategic flexibility into resource flexibility and coordination flexibility to account for both the flexibility of firm resources per se and the flexibility in coordinating these resources. This study investigates the roles of resource and coordination flexibility in relation to multiple strategic orientations and firm product innovation.

This study fills the two research gaps outlined above by examining the relationship between multiple strategic orientations, strategic flexibility and product innovation. It first establishes

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the overarching role of entrepreneurial orientation in new product development. Next, it demonstrates the mediating role of learning orientation and coordination flexibility in facilitating the link between entrepreneurial orientation and product innovation. It then looks at the relationship between learning orientation and coordination flexibility by building a chain mediation model. Finally, the moderating effect of resource flexibility is discussed. The overall research model is thus a chain multiple mediation model with moderation.

## 2. Theoretical framework and hypotheses

### 2.1. Multiple strategic orientations and product innovation: three approaches

Hakala (2011) synthesises three approaches to understanding the influence of multiple strategic orientations on firm performance: sequential, alternative and complementary. The sequential approach holds that a single orientation is dominant, and posits that some strategic orientations develop into others. The alternative approach takes strategic orientations as alternatives. One type of strategic orientation is perceived to be a better alternative if it is more useful in a given environment, or achieves the same objective more effectively. The complementary approach recognises that different strategic orientations coexist and support one another. This approach usually follows the logic of 'the more, the better', which means that simultaneously focusing on several strategic orientations fosters higher firm performance because of the synergies generated.

The three approaches each have their particular value. No single approach completely explains the relationship between multiple strategic orientations and firm performance. The approach used is a matter of choice that depends on the research question and the researchers' preference. In this study, we utilise the sequential approach to draw connections between entrepreneurial orientation and learning orientation. Specifically, we hypothesise that entrepreneurial orientation precedes and leads to learning orientation.

### 2.2. Entrepreneurial orientation, learning orientation and product innovation

Venkatraman (1989) proposes that strategic orientations are competitive attitudes and corporate strategy implementation behaviours that pervade the entire enterprise. Two important types of strategic orientation are entrepreneurial orientation and learning orientation. Lumpkin and Dess (1996) define entrepreneurial orientation as the inclination to favour new entry. Firms with a strong entrepreneurial orientation are more prone to initiate exploratory, innovative, proactive and potentially risky corporate activities and behaviours. In the context of China's transitional economy, entrepreneurial orientation stimulates firm product innovation (Rauch, Wiklund, Lumpkin, & Frese, 2009). Entrepreneurial orientation enhances firms' environmental scanning behaviours, so that they can identify and create opportunities for innovation (Covin & Miles, 1999), develop novel technologies and products, capture market opportunities, occupy market shares earlier and faster, and tolerate higher risks of failure. Thus, we believe that entrepreneurial orientation contributes to product innovation.

Learning orientation involves an organisational culture that values organisational learning (Sinkula, Baker, & Noordewier, 1997). Firms with a strong learning orientation are more likely to commit to learning, develop a shared vision and maintain an open mindset.

Firms with a strong entrepreneurial orientation may exhibit a greater learning orientation. First, highly entrepreneurial-oriented firms are risk-takers that are innovative and aggressive. Thus, they break present organisational forms, patterns and routines more quickly. Entrepreneurial orientation also ensures that the organisational climate favours creativity, organisational learning and knowledge exchange (Kuratko, Ireland, & Hornsby, 2001). Second, entrepreneurial orientation enables firms with a proactive and aggressive attitude to devote resources to organisational learning, including learning and knowledge absorption from competitors or collaborators (Wales, 2015; Zahra, Jennings, & Kuratko, 1999).

Learning orientation contributes to product innovation because it enhances the firm's information exchange with the external environment and the absorption, understanding and application of valuable information (Sinkula et al., 1997).

We believe that companies with a high level of entrepreneurial orientation enrich their knowledge base by fostering an organisational climate and culture of learning and innovation. The acquisition, understanding and application of knowledge facilitates the creation of new knowledge and technologies. Thus, such firms will be more likely to introduce product innovations.

**Hypothesis 1.** Learning orientation positively mediates the relationship between entrepreneurial orientation and product innovation.

### 2.3. Entrepreneurial orientation, coordination flexibility and product innovation

Strategic flexibility involves the inherent flexibility of a firm's disposable resources (resource flexibility) and the firm's ability to utilise these resources (coordination flexibility) (Sanchez, 1995). Resource flexibility is characterised by the multi-purpose, shareability and transformability of a firm's resources. Coordination flexibility is the ability of organisations to share and transform their internal resources.

We posit that coordination flexibility also mediates the link between entrepreneurial orientation and product innovation. Entrepreneurial-oriented firms can identify, seize, utilise and respond to market and technology opportunities. They also have better responsiveness to environmental changes and can reduce the feedback time and response costs (Alvarez & Busenitz, 2001). Such firms also allocate and utilise resources efficiently, increase the value of resources, and eliminate obstacles to developing breakthrough technologies and products (Li, Liu, Duan, & Li, 2008). The speed, efficiency and flexibility of problem-solving in these firms are significantly increased (Sanchez, 1995) and product innovation is promoted. To summarise, entrepreneurial orientation enhances coordination flexibility, and coordination flexibility contributes to product innovation activities.

**Hypothesis 2.** Coordination flexibility positively mediates the relationship between entrepreneurial orientation and product innovation.

### 2.4. Towards a chain multiple mediation model

Because learning orientation and coordination flexibility both mediate the link between entrepreneurial orientation and product innovation, it is worth considering the relationship between these two paths. First, learning orientation creates a learning-oriented organisational culture and atmosphere by increasing the firm's attention to organisational learning activities (Sinkula et al., 1997), thereby enhancing its resource allocation, configuration and deployment. Second, learning orientation allows firms to improve their information processing and strategic learning abilities (Anderson, Covin, & Slevin, 2009), which enables them to adapt

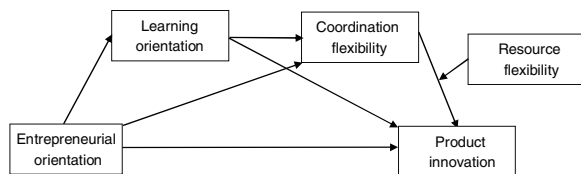


Fig. 1. Conceptual model.

to environmental changes and dynamics through resynthesising resources. Therefore, learning orientation promotes coordination flexibility.

When considering the effect of entrepreneurial orientation, learning orientation and coordination flexibility on product innovation, we expect entrepreneurial orientation to promote product innovation through a serial mediation link of learning orientation and coordination flexibility. Entrepreneurial orientation leads to organisational learning activities by fostering an organisational culture that is conducive to organisational learning. Learning activities enhance the acquisition and utilisation of new knowledge and technologies, thus improving the firm's resource allocation, configuration and deployment and product innovation capacity.

**Hypothesis 3.** Entrepreneurial orientation promotes coordination flexibility through learning orientation, thus enhancing product innovation. There is a chain multiple mediation effect in the relationship between entrepreneurial orientation and product innovation, with learning orientation and coordination flexibility as serial mediators.

### 2.5. Moderating effect of resource flexibility

We posit that the positive impact of coordination flexibility on firm product innovation is elevated by resource flexibility. Resource flexibility and coordination flexibility can overcome organisational inertia (Sanchez, 1995). Firms with better resource flexibility apply their resources to a broader range of alternative uses, with lower costs and time involved in switching from one application to another. Coordination flexibility helps firms to configure and deploy resources through organisational systems and processes. Resource flexibility reduces resource rigidity, expands the use of resources, and facilitates organisational changes and adjustments. Coordination flexibility enables firms to quickly adapt to and integrate existing resources according to environmental changes and strategic needs, thus promoting continuous innovation to overcome organisational inertia and strategic rigidity. The combination of resource flexibility and coordination flexibility not only fosters an organisation's change and renewal, but also creates a positive organisational atmosphere conducive to product innovation (Brozovic, 2018). Because resource flexibility enhances the positive effect of coordination flexibility on product innovation, the mediation effect of coordination flexibility in the link between entrepreneurial orientation and product innovation is also intensified.

**Hypothesis 4.** Resource flexibility enhances the positive impact of coordination flexibility on product innovation, thus increasing the mediating effect of coordination flexibility and the chain mediating effect of learning orientation and coordination flexibility.

We present the conceptual model in Fig. 1.

## 3. Methods

### 3.1. Data collection

We collected questionnaires from firms in 31 provinces in China to test the proposed hypotheses. Because our research focuses on firm product innovation, our samples were from manufacturing companies possessing a certain level of R&D and innovation capability.

The data collection process had four steps. First, we selected the measures of the core variables from the literature and made appropriate adjustments to accommodate the Chinese context. Second, we asked a translator to translate the original English-language questionnaire into Chinese, and had another translator translate it back into English. We then compared the two English questionnaires and made adjustments to improve the items' accuracy and clarity. Third, a pilot study was conducted among 10 randomly selected firms located in the Xi'an High-tech Zone. Two top managers from each firm were requested to read and assess the questionnaires in terms of (1) technical issues such as format and layout, and (2) language issues related to coherence, clarity and unity. The questionnaire was revised according to their feedback. Fourth, data collection took place between August 2010 and January 2011. We distributed 1500 questionnaires to the three regions in China (500 questionnaires for each region) according to a GDP equidistance grouping method using the GDP of each province in 2009 (the most recent year with available GDP rankings when the survey was conducted).

To avoid common method bias and improve data reliability, we distributed two identical questionnaires to each firm, which were independently filled in by two top managers. We obtained 303 valid paired questionnaires, with a response rate of 20.2% (303 out of 1500). The sample firms were from various manufacturing industries, such as the machinery manufacturing, automotive, chemical, electronics and energy industries. The sample covered (1) large, medium and small enterprises; and (2) state-owned enterprises, private enterprises, collective partnerships, Sino-foreign joint ventures, wholly foreign-owned enterprises and other enterprises.

We tested the non-response bias according to the method proposed by Armstrong and Overton (1977). A *t*-test was conducted to compare the characteristics of our respondents (303) and the population (1500). We found no significant statistical differences in terms of firm age, firm size or ownership type. Therefore, non-response bias did not affect the results of this study severely.

### 3.2. Measures

Unless otherwise stated, the variables are based on a 7-point Likert scale, with '1' denoting 'completely disagree' and '7' denoting 'completely agree'.

#### 3.2.1. Independent variable

The conceptualisation and operationalisation of entrepreneurial orientation remains a matter of much debate. It is still unclear whether entrepreneurial orientation is a unidimensional or multidimensional construct (Wales, Gupta, & Mousa, 2011). Scholars who agree with the unidimensional approach generally follow Covin and Slevin's (1989) view that innovativeness, risk-taking and proactiveness combine to form an aggregated unidimensional entrepreneurial orientation. Multidimensional research on entrepreneurial orientation examines its characteristics (i.e., autonomy, competitive aggressiveness, innovativeness, proactiveness and risk-taking) as separate dimensions that are not strongly correlated and can vary independently (Lumpkin & Dess, 1996). Wales et al. (2011) suggest that 80% of the studies on entrepreneurial orientation adopt the unidimensional perspective.



tive despite varying dimensional combinations. In line with the predominant unidimensional approach, we used Wang's (2008) 10-item measure of entrepreneurial orientation.

### 3.2.2. Dependent variable

Product innovation was measured using four items taken from Li and Atuahene-Gima (2001). The respondents were asked to evaluate the extent to which their firm (1) made breakthroughs in core technologies, (2) produced key technologies through internal R&D, (3) conducted revolutionary scientific research and made technological inventions, and (4) produced highly original and innovative products.

### 3.2.3. Mediating variables

Consistent with the framework of Sinkula et al. (1997), learning orientation was measured by 12 items describing the firm's commitment to learning, shared vision and open-mindedness.

Coordination flexibility refers to a firm's ability to build new resource combinations creatively and effectively through internal coordination processes (Sanchez, 1995). Based on this conceptualisation, we used Sanchez's (1995) four indicators to measure coordination flexibility.

### 3.2.4. Moderating variable

Resource flexibility is the inherent flexibility of an organisation's resources, which means that they can be applied to a large range of uses at lower cost in a short time. Similar to coordination flexibility, resource flexibility was measured with four items adopted from Sanchez (1995).

### 3.2.5. Control variables

To eliminate interference from other unrelated variables, we controlled four variables: firm age, firm size, firm ownership, and whether a firm was a hi-tech firm. Firm age and size were measured by the natural logarithm of the years since the firm's founding and the natural logarithm of the number of employees, respectively. Firm ownership and hi-tech firm were dummy variables: state-owned firms and hi-tech firms were coded as 1, and non-state-owned firms and non-hi-tech firms were coded as 0.

## 4. Analyses

### 4.1. Construct reliability and validity

As Table 1 shows, the Cronbach  $\alpha$  values of all of the variables were larger than 0.8, most of the standardised factor loadings were greater than 0.7 and the average variance explained (AVE) exceeded 0.5, indicating that the items successfully converged to their respective latent variables. The AVE of each variable in Table 2 was larger than the Pearson correlation coefficients with the other variables, indicating good discriminant validity. The variance inflation factors were lower than the threshold level of 10, indicating that there was no multicollinearity problem (O'Brien, 2007).

### 4.2. Common method bias

We used paired survey samples, which allowed us to choose endogenous and exogenous variables from different questionnaires. Several post-hoc statistical tests were also performed. First, using Harman's single factor test with an unrotated exploratory factor analysis (EFA), four factors were extracted; 35.706% of the variance was explained by the largest factor. No single factor explained most of the variance, demonstrating that common method bias was not a severe problem (Podsakoff & Organ, 1986). Second, Harman's single-factor analysis was conducted through confirmatory factor analysis (CFA). The single-factor model loading

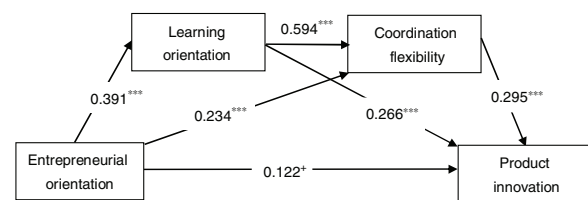


Fig. 2. Chain multiple mediation model.

Notes: \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ ; \*\*\*\* $p < 0.001$  (two-tailed significance).

all items to one construct showed a poor fit, indicating that common method bias was not an issue for our study. Third, a common latent factor (CLF) was added to the measurement model to compare the standardised loadings of all of the items for models with and without the CLF (Serrano Archimi, Reynaud, Yasin, & Bhatti, 2018). The small differences ( $<0.200$ ) (Gaski, 2017) suggested that our results were not affected by common method bias.

### 4.3. Hypothesis tests

#### 4.3.1. Mediation tests

Process Macro version 3.00 for SPSS version 22.0 was used throughout the tests of the hypotheses (Hayes, 2013). We first tested the mediation effects in Hypotheses 1–3. The regression coefficients are shown in Fig. 2 and Table 3. The direct, indirect and total effects and effect size are given in Table 4.

Table 4 shows that the total effect of entrepreneurial orientation on firm product innovation was 0.364 with a 95% bias-corrected confidence interval (BCCI) ranging from 0.231 to 0.496, demonstrating that entrepreneurial orientation benefits firm product innovation. The mediation effect of learning orientation (route 1) and coordination flexibility (route 2) and the serial mediation effect of learning orientation and coordination flexibility (route 3) were 0.104, 0.069 and 0.069, respectively (95% BCCIs excluding zero). Thus, the mediation effect of learning orientation (Hypothesis 1), coordination flexibility (Hypothesis 2) and the chain multiple mediation effect of learning orientation and coordination flexibility (Hypothesis 3) received empirical support ( $p < 0.05$ ).

The total indirect effect was 0.242 with a 95% BCCI of [0.162, 0.333], and the direct effect of entrepreneurial orientation was 0.122 ( $p = 0.079$ ), indicating that the chain multiple mediation effects were partial mediations ( $p < 0.1$ ).

We employed three effect size indicators: partially standardised indirect effect ( $ab_{ps}$ ), completely standardised indirect effect ( $ab_{cs}$ ) and percent mediation ( $P_M$ ). The  $ab_{ps}$  of mediation routes 1, 2 and 3 was 0.088, 0.058 and 0.058, respectively (BCCIs excluding zero). Similarly, the  $ab_{cs}$  of the three mediation routes was 0.082, 0.054 and 0.054, respectively (BCCIs above zero).  $P_M$  (ratio of indirect to total effect) was 0.286, 0.190 and 0.190 for routes 1, 2 and 3 respectively, and 0.665 for the total indirect effect, indicating that learning orientation and coordination flexibility accounted for 66.5% of the total effect linking entrepreneurial orientation with firm product innovation.

#### 4.3.2. Moderated mediation tests

Fig. 3 and Table 5 depict the regression coefficients of the moderated mediation tests. The conditional and unconditional indirect effects and index of moderated mediation are shown in Table 6.

We standardised coordination flexibility and resource flexibility to examine their interaction. The interaction term was positively regressed to product innovation ( $\beta = 0.083$ ,  $p = 0.079$ ), showing that resource flexibility positively moderated the impact of coordination flexibility on product innovation ( $p < 0.1$ ).

The conditional indirect effect via coordination flexibility (entrepreneurial orientation  $\rightarrow$  coordination flexibility  $\rightarrow$  product

**Table 1**  
Reliability and convergent validity.

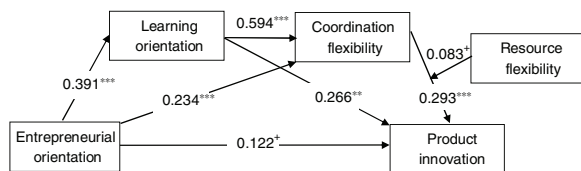
Variables	Items	SFL	AVE	Cronbach's $\alpha$
Entrepreneurial orientation	In general, the top managers of our organisation favour research & development, technological leadership and innovations.	0.661	0.531	0.900
	In the past 3 years, our organisation has marketed a large variety of new lines of products or services.	0.714		
	In the past 3 years, changes in our products or service lines have been mostly of a major nature.	0.722		
	In dealing with competitors, our organisation often leads the competition and initiates actions to which our competitors have to respond.	0.748		
	In dealing with competitors, our organisation typically adopts a very competitive posture aiming at overtaking the competitors.	0.766		
	In general, the top managers of my organisation have a strong propensity for high-risk projects with chances of very high return.	0.653		
	The top managers believe, owing to the nature of the environment, that bold and wide-ranging acts are necessary to achieve our organisational objectives.	0.767		
	When there is uncertainty, our organisation typically adopts an 'aggressive' posture.	0.768		
	Management actively responds to the adoption of 'new ways of doing things' by main competitors.	0.778		
	We encourage people to think and behave in novel ways.	0.699		
Learning orientation	Managers agree that our organisation's ability to learn is the key to our competitive advantage.	0.757	0.577	0.931
	The basic values of this organisation include learning as key to improvement.	0.809		
	The sense around here is that employee learning is an investment not an expense.	0.774		
	Learning in my organisation is seen as a key commodity necessary to guarantee organisational survival.	0.808		
	We are not afraid to reflect critically on the shared assumptions we have made about our customers.	0.744		
	Personnel in this enterprise realize that the very way they perceive the marketplace must be continually questioned.	0.683		
	We often collectively question our own biases about the way we interpret customer information.	0.566		
	Innovative ideas are cherished in this enterprise.	0.747		
	There is a commonality of purpose in my organisation.	0.775		
	There is total agreement on our organisational vision across all levels, functions and divisions.	0.782		
Coordination flexibility	All employees are committed to the goals of this organisation.	0.823	0.631	0.803
	Employees view themselves as partners in charting the direction of the organisation.	0.812		
	Our firm allows each unit to break normal procedures in order to maintain flexibility and dynamics.	0.807		
	Our firm's ways of management can be adapted according to different employees and circumstances.	0.841		
	We have a very smooth communication mechanism within our firm.	0.778		
	We actively change our strategies and structures to respond to external environments.	0.747		
	The breakthrough of core technologies is made by the firm.	0.867		
	Key technologies in new products originate from internal R&D efforts.	0.865		
	Our firm conducts revolutionary scientific research and technological inventions.	0.838		
	Our firm produces highly original and innovative products.	0.841		
Product innovation	There is a large range of alternative uses to which our major resources can be applied.	0.810	0.727	0.873
	The major resources can be allocated to develop, manufacture and deliver a diverse line of products.	0.866		
	The costs of switching from one use of our major resources to an alternative use are low.	0.834		
	The time required to switch to an alternative resource use is short.	0.844		
Resource flexibility			0.704	0.858

Notes: SFL = Standardized factor loading; AVE = Average variance extracted.

**Table 2**  
Descriptive statistics, correlations and discriminant validity.

Variables	Mean	SD	1	2	3	4	5	6	7	8	9
1. Firm age	2.575	0.951	1								
2. Firm size	6.457	1.971	0.498**	1							
3. Ownership	0.386	0.488	0.315**	0.213**	1						
4. Hitech	0.452	0.499	-0.042	0.042	-0.230**	1					
5. Entrepreneurial orientation	4.785	0.933	-0.009	0.061	-0.061	0.170**	<b>0.729</b>				
6. Learning orientation	5.069	0.938	-0.055	0.097	-0.023	0.124*	0.406**	<b>0.760</b>			
7. Coordination flexibility	4.632	1.032	-0.135*	-0.025	-0.199**	0.137*	0.438**	0.628**	<b>0.794</b>		
8. Product innovation	4.650	1.186	-0.070	0.095	-0.163**	0.300**	0.339**	0.450**	0.475**	<b>0.853</b>	
9. Resource flexibility	4.633	0.983	-0.097	0.063	-0.156**	0.110	0.342**	0.566**	0.546**	0.349**	<b>0.839</b>

Notes: Square roots of AVE values are the diagonal elements (in bold) and correlations of the variables are below the diagonal. \*p &lt; 0.05, \*\*p &lt; 0.01 (two-tailed).

**Fig. 3.** Moderated mediation regression model.

Notes: \*p &lt; 0.1, \*p &lt; 0.05, \*\*p &lt; 0.01, \*\*\*p &lt; 0.001 (two-tailed significance).

innovation) was 0.050, 0.069 and 0.088 for firms with low, medium and high resource flexibility, respectively (all significant at 95% BCCI). The index of moderated mediation was 0.019

(95% BCCI [0.001, 0.043]), lending support to the moderated mediation effect of resource flexibility via coordination flexibility. Similarly, for the mediation route via learning orientation and coordination flexibility (entrepreneurial orientation → learning orientation → coordination flexibility → product innovation), the conditional indirect effect continued to accelerate with the enhancement of resource flexibility (0.049 for low resource flexibility, 0.068 for medium resource flexibility and 0.087 for high resource flexibility). The index of moderated mediation was positive and significant ( $\beta = 0.019$ , BCCI = [0.001, 0.041]). In short, the moderated mediation effect proposed in Hypothesis 4 was confirmed.

**Table 3**  
Chain multiple mediation regression results.

	Coefficient	SE	t value	p value	LLCI (95%)	ULCI (95%)
Dependent variable: learning orientation						
Constant	3.053	0.304	10.032	0.000	2.454	3.652
Entrepreneurial orientation	0.391	0.054	7.290	0.000	0.285	0.496
$R^2 = 0.183$ , $F = 13.274$						
Dependent variable: coordination flexibility						
Constant	0.858	0.313	2.740	0.007	0.242	1.473
Entrepreneurial orientation	0.234	0.052	4.527	0.000	0.132	0.336
Learning orientation	0.594	0.052	11.525	0.000	0.493	0.696
$R^2 = 0.468$ , $F = 43.450$						
Dependent variable: product innovation						
Constant	0.941	0.409	2.301	0.022	0.136	1.745
Entrepreneurial orientation	0.122	0.069	1.765	0.079	-0.014	0.258
Learning orientation	0.266	0.080	3.323	0.001	0.108	0.424
Coordination flexibility	0.295	0.075	3.938	0.001	0.148	0.443
$R^2 = 0.333$ , $F = 21.018$						
Dependent variable: product innovation						
Constant	2.542	0.381	6.668	0.000	1.792	3.293
Entrepreneurial orientation	0.364	0.067	5.414	0.000	0.231	0.496
$R^2 = 0.198$ , $F = 14.668$						

Notes: Control variables are omitted for parsimony; LLCI = Lower Limit of Confidence Interval; ULCI = Upper Limit of Confidence Interval.

**Table 4**  
Direct, indirect and total effects and effect size.

	Coefficient	SE	LLCI (95%)	ULCI (95%)
Total effect	0.364	0.067	0.231	0.496
Direct effect	0.122	0.069	-0.014	0.258
Indirect effects				
Total indirect effect	0.242	0.044	0.162	0.333
Route 1: via learning orientation	0.104	0.038	0.038	0.184
Route 2: via coordination flexibility	0.069	0.024	0.029	0.122
Route 3: via learning orientation and coordination flexibility	0.069	0.020	0.033	0.113
Partially standardised indirect effect ( $ab_{ps}$ )				
Total indirect effect	0.204	0.034	0.142	0.273
Route 1: via learning orientation	0.088	0.031	0.033	0.152
Route 2: via coordination flexibility	0.058	0.020	0.024	0.102
Route 3: via learning orientation and coordination flexibility	0.058	0.017	0.028	0.094
Completely standardised indirect effect ( $ab_{cs}$ )				
Total indirect effect	0.190	0.032	0.132	0.256
Route 1: via learning orientation	0.082	0.029	0.030	0.142
Route 2: via coordination flexibility	0.054	0.019	0.022	0.095
Route 3: via learning orientation and coordination flexibility	0.054	0.016	0.026	0.087
Percent mediation ( $P_M$ )				
Total indirect effect	0.665	0.170	0.430	1.094
Route 1: via learning orientation	0.286	0.109	0.113	0.549
Route 2: via coordination flexibility	0.190	0.084	0.080	0.421
Route 3: via learning orientation and coordination flexibility	0.190	0.068	0.095	0.364

Notes: LLCI = Lower Limit of Confidence Interval; ULCI = Upper Limit of Confidence Interval.

**Table 5**  
Moderated mediation regression results.

	Coefficient	SE	t value	p value	LLCI (95%)	ULCI (95%)
Mediator variable model: learning orientation as the outcome variable						
Constant	3.053	0.304	10.032	0.000	2.454	3.652
Entrepreneurial orientation	0.391	0.054	7.290	0.000	0.285	0.496
$R^2 = 0.183$ , $F = 13.274$						
Mediator variable model: coordination flexibility as the outcome variable						
Constant	-3.774	0.313	-12.060	0.000	-4.390	-3.158
Entrepreneurial orientation	0.234	0.052	4.527	0.000	0.132	0.336
Learning orientation	0.594	0.052	11.525	0.000	0.493	0.696
$R^2 = 0.468$ , $F = 43.450$						
Dependent variable model: product innovation as the outcome variable						
Constant	2.237	0.526	4.254	0.000	1.202	3.272
Entrepreneurial orientation	0.121	0.069	1.746	0.082	-0.015	0.257
Learning orientation	0.266	0.085	3.141	0.002	0.099	0.433
Coordination flexibility	0.293	0.077	3.795	0.000	0.141	0.445
Resource flexibility	-0.009	0.077	-0.115	0.908	-0.160	0.142
Coordination flexibility $\times$ resource flexibility	0.083	0.047	1.761	0.079	-0.010	0.175
$R^2 = 0.340$ , $F = 16.777$						

Notes: Control variables are omitted for parsimony; LLCI = Lower Limit of Confidence Interval; ULCI = Upper Limit of Confidence Interval.

**Table 6**

Conditional and unconditional indirect effects and index of moderated mediation.

Indirect effect	Effect	SE	LLCI (95%)	ULCI (95%)
<i>via learning orientation</i>	0.104	0.036	0.039	0.181
<i>via coordination flexibility</i>				
−0.983 (−1SD)	0.050	0.022	0.010	0.096
0 (Mean)	0.069	0.024	0.026	0.120
0.983 (+1SD)	0.088	0.031	0.035	0.154
index of moderated mediation	0.019	0.011	0.001	0.043
<i>via learning orientation and coordination flexibility</i>				
−0.983 (−1SD)	0.049	0.021	0.011	0.092
0 (Mean)	0.068	0.022	0.030	0.116
0.983 (+1SD)	0.087	0.027	0.041	0.147
index of moderated mediation	0.019	0.010	0.001	0.041

Notes: LLCI = Lower Limit of Confidence Interval; ULCI = Upper Limit of Confidence Interval.

## 5. Conclusions and contributions

### 5.1. Conclusions

We constructed a conceptual model to investigate the impact of multiple strategic orientations and strategic flexibility on firm product innovation. The influence of entrepreneurial orientation on firm product innovation, which is mediated by learning orientation and coordination flexibility and moderated by resource flexibility, was theoretically proposed and empirically examined with 303 paired survey responses from China. Our findings confirmed that entrepreneurial orientation enhances firm product innovation via three routes: (1) the mediation effect of learning orientation; (2) the mediation effect of coordination flexibility; (3) the chain multiple mediation effect of learning orientation and coordination flexibility. Furthermore, resource flexibility positively moderates the impact of coordination flexibility on product innovation, thus strengthening the positive mediation effect of coordination flexibility and the chain mediating effect of learning orientation and coordination flexibility.

### 5.2. Theoretical contributions

These results reveal that entrepreneurial orientation is an overarching strategic orientation that triggers firm product innovation by facilitating learning orientation and coordination flexibility. This confirms the positive effect of entrepreneurial orientation, learning orientation and strategic flexibility on firm innovation previously identified in the literature (Boso, Cadogan, & Story, 2012; Covin & Wales, 2018; Li et al., 2008; Sheng & Chien, 2016; Zhou, Yim, & Tse, 2005). We go one step further by demonstrating the mediation effect of learning orientation and coordination flexibility in bridging entrepreneurial orientation and product innovation, which enriches the literature on strategic orientation, strategic flexibility and firm innovation in two ways.

First, our study responds to Hakala's (2011) call for more in-depth research on multiple strategic orientations by investigating the influence of multiple strategic orientations on firm product innovation. Specifically, we find that entrepreneurial orientation stimulates learning orientation to enhance firm product innovation, i.e., the mediating effect of learning orientation in the relationship between entrepreneurial orientation and product innovation.

Second, we identify the role of strategic flexibility in relation to multiple strategic orientations and product innovation. Our results show that coordination flexibility acts as a mediator, whereas resource flexibility is a moderator. This finding departs from extant research that only recognises the direct effect of resource flexibility on firm innovation (Brozovic, 2018; Sanchez, 1995), by revealing the moderating effect of resource

flexibility on the coordination flexibility–firm innovation relationship.

### 5.3. Managerial implications

This research has significant managerial implications. Although China is a latecomer in innovation and R&D (Mok & Kan, 2013) compared to other developed economies, it has recently undergone an economic boom. China's remarkable growth has mostly been achieved by innovation and entrepreneurship, as demonstrated by the Global Entrepreneurship Monitor Report (2019–2020).<sup>1</sup> Several pivotal government policies call on Chinese firms to be entrepreneurial and innovative.<sup>2</sup> Against this background, managers undoubtedly wonder whether an entrepreneurial orientation is indeed beneficial to firms and how such an orientation is actualised into real innovation outcomes. This study attempts to provide a clear-cut model to facilitate an understanding of this issue. First, our empirical results show that an entrepreneurial orientation indeed has a positive impact on Chinese firms' product innovation. Therefore, managers need to vigorously cultivate entrepreneurial orientation to enhance product innovation. Second, we reveal that the positive influence of entrepreneurial orientation on product innovation is transmitted through learning orientation and coordination flexibility. Thus, managers need to elevate the bridging role of learning orientation and coordination flexibility within the firm to maintain product innovation. Third, this study reveals that resource flexibility leverages the positive influence of coordination flexibility on product innovation. Thus, managers should use the synergy generated from the two types of strategic flexibility (i.e., resource flexibility and coordination flexibility) to implement innovation strategies. In short, the integration of multiple strategic orientations and strategic flexibility can greatly enhance firm innovation in the context of China's transitional economy.

## 6. Limitations and future research directions

This study has several limitations that future research should address. First, we only consider the role of entrepreneurial orientation and learning orientation. Future researchers may take other types of strategic orientation into consideration to further explicate the influence of multiple strategic orientations on

<sup>1</sup> GEM Global Entrepreneurship Monitor. (2020). Retrieved 27 August 2020, from <https://www.gemconsortium.org/report/gem-2019-2020-global-report>.

<sup>2</sup> Examples of such government policies include the Torch Program initiated by the Chinese Ministry of Science and Technology in 1988, the National Medium and Long-Term Plan for Science and Technology Development (2006–2020) promulgated by the State Council in 2006, the G20 entrepreneurship action plan proposed by China and the other G20 members at the 2016 G20 Hangzhou summit, and the continuing mass entrepreneurship and innovation strategy since 2014.



firm product innovation. For example, market orientation, technology orientation and employee orientation are important for new product development and R&D. Second, we construct our theoretical model according to the sequential approach of multiple strategic orientations. Future researchers could undertake analyses of the relationship between entrepreneurial orientation, learning orientation and product innovation using the alternative approach or complementary approach. All three approaches have their advantages, allowing for diverse understandings of how multiple strategic orientations contribute to product innovation. Third, entrepreneurial orientation is treated as a unidimensional construct in our study. One promising research direction is to utilise the multidimensional approach to explore the particular contributions that the subdimensions of entrepreneurial orientation make to learning orientation, strategic flexibility and product innovation.<sup>3</sup> Fourth, the data used in this study are cross-sectional in nature, making it difficult to test the causal relationships among multiple strategic orientations, strategic flexibility and product innovation. Our causal relationships are based on theory, and we also took measures to control common method bias in the processes of questionnaire design, data collection and statistical analysis. However, it might be better to use time-series data to verify our model. Finally, this study analyses the relationships among multiple strategic orientations, strategic flexibility and firm innovation using large-scale survey data. This method limits our ability to understand the nature and complexity of the process through which firms foster innovation. To answer the question of 'how', future studies could use the case study method to offer more in-depth insights into how firms can foster innovation (Eisenhardt & Graebner, 2007; Eisenhardt, 1989).

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<sup>3</sup> It is still debatable whether entrepreneurial orientation is unidimensional or multidimensional. Scholars who agree with the unidimensional conceptualisation of entrepreneurial orientation adopt Covin and Slevin's view (1989) that innovativeness, proactiveness and risk-taking combine to form a unified conceptual entity of entrepreneurial orientation. Other researchers follow Lumpkin and Dess (1996), who hold that entrepreneurial orientation is a multidimensional construct. The sub-dimensions are not closely related, and can vary independently of each other. It is quite possible that firms are high in some dimensions but low in others. The unidimensional conceptualisation is the predominant approach in current entrepreneurial research, but the multidimensional perspective has recently grown in popularity.

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