The impact of organizational support on employee performance: Evidence from the automotive industry with flexible manufacturing in China

Abstract

Purpose – Building on organizational support theory and social exchange theory, this paper studies the impact of organizational support on employee performance in the context of flexible manufacturing. In particular, we aimed to investigate the mediating role of employee attitude between organizational support and employee performance, and the moderating role of organizational justice.

Design/methodology/approach – A total of 180 participants from 36 work teams employed in 7 large automotive manufacturing enterprises in China were surveyed using a questionnaire designed by the authors. Multiple linear regressions was were used to test the proposed hypotheses.

Findings – The results revealed four new performance indicators of frontline workers in the context of flexible manufacturing: , i.e. continuous learning, teamwork, problem solving, and active work. Organizational support can be divided into reinforcing support and inhibitive support. Reinforcing organizational support has a positive effect on the new new performance of frontline workers, and a sense of belonging plays a strong mediating role between them. Inhibitive organizational support plays an important role in the sense of awe of employees, but the sense of awe has no influence on the new performance of frontline workers. Organizational justice plays a strong moderating role between organizational support and employee attitudes.

Originality/value –This study is one of the first attempts to explore the performance of frontline workers in the context of flexible manufacturing and contributes to the existing literature on the relationships between organizational support and employee performance.

Keywords: employees, Oorganizational support, Organizational justice, Employee attitudes, Employee performance, fFlexible manufacturing, fFrontline worker

Paper Ttype: Rresearch paper

Introduction

The "Made in China 2025" policy has changed the development of China's manufacturing industry. On the one hand, the rapid development of information, automation and digital manufacturing technologies has led to ~~a~~ the wide use of flexible manufacturing systems in various industries, accelerating the ~~flexible~~ application of ~~and~~ intelligent processes ~~of~~ to manufacturing enterprises. On the other hand, as China's economy developeds and consumers' personalization requirements increaseds (Yizhong et al., 2019), wider product lines and the rapid introduction of new products ~~introduction~~ have become key competitive levers where flexible manufacturing systems play an important role (Abu Qudeiri, 2017). A flexible manufacturing system (FMS) is defined as "an integrated group of processing CNC machines and material-handling equipment under computer control for the automatic processing of palletized parts" (ElMaraghy and Caggiano, 2016). Enterprises that cannot adopt flexible manufacturing are gradually losing their power ~~in the~~due to severe competition.

Manufacturing systems are human-machine systems composed of manufacturing equipment and personnel. In building flexible manufacturing systems, many researchers and professionals emphasize the flexibility of manufacturing equipment, paying less attention to employee flexibility and ~~impacts~~ the effects of ~~the~~ a transition from traditional manufacturing to flexible manufacturing on frontline workers~~.~~ (Maheso et al., 2018). Researchers believe that~~,~~ as highly intelligent individuals~~,~~ frontline workers can naturally cope with the challenges and can easily ~~realize~~ utilize their own capabilities to deal with flexible manufacturing (Birecikli et al., 2016). However, our practical experience and initial investigations suggest that flexible manufacturing puts new requirements on frontline workers~~,~~ ~~which~~ that ~~are~~ may be difficult for ~~frontline workers~~them to deal with independently.

In a traditional manufacturing system that produces a single product, frontline

work is mainly labor work, and the performance assessment is based on efficiency and quality (Kelly, 1982). However, frontline work in a flexible manufacturing system that produces a variety of products also requires ~~more~~ work activities (Adler, 1991) in which employees need to: ~~:~~ (1) pay more attention to deal with work differences introduced by product variety,~~;~~ (2) ~~need to~~ learn continuously to grasp specific information and operation standards to introduce new products,~~;~~ (3) cooperate with team members to solve ~~the~~ production problems brought on by product variety and the introduction of new products,~~;~~ (4) ~~need~~ develop ~~more~~ greater initiative to prevent problems occurring and engage in continuous improvement. It is not easy for frontline workers ~~who~~ accustomed to physical work to respond to the work requirements as mentioned above. Therefore, human resource management also needs to adapt to lift the skills level and work initiative of frontline workers (Prieto and Perez-Santana, 2014) to avoid the decline of production efficiency and product quality during the transition to flexible manufacturing.

According to social exchange theory (Liao et al., 2019) and organizational support theory (Rhoades and Eisenberger, 2002), companies need to give support to frontline workers, so that they obtain higher incentive to work hard and get better performance. Researchers have constructed "supportive human resource management", which states that enterprises should support employees ~~to form~~ by providing organizational recognition, ~~to~~ generate~~e~~ing endogenous motivation and good working results (Arthur, 1994). Although there ~~are many~~is much research ~~in~~on employees in the Chinese~~a~~ ~~A~~auto industry (Nichols and Zhao, 2010), there ~~are scarce researches~~have been few studies on the performance of frontline workers in the context of flexible manufacturing. Although the association of organizational support and employee performance is well studied (Rhoades and Eisenberger, 2002), the influence mechanisms and specific roles of organizational support on the performance of frontline workers are still unclear, and empirical evidence is lacking.

~~Under~~ Given the ~~background of~~ rapid development of flexible manufacturing in

China, this paper contributes to the literature by studying the relationship between organizational support and frontline worker performance based on social exchange and organizational support theories. Four new indicators for frontline worker performance ~~are~~ were identified. A conceptual model ~~is~~ was developed to ~~model~~ delineate the relationship between organizational support, sense of belonging, sense of awe, organizational justice and employee performance. By dividing organizational support into reinforcing support and inhibitive support, our results ~~show~~s that reinforcing organizational support ~~has~~ had a positive effect on the new performance of frontline workers, and that a sense of belonging plays a strong mediating role between them. Inhibitive organizational support plays an important role in the sense of awe of employees, but the sense of awe has no influence on the new performance of frontline workers. Organizational justice plays a strong moderating role between organizational support and employee attitudes.

Theoretical background and hypotheses

Organizational support and performance of frontline workers

Social ~~c~~Exchange ~~T~~theory (SET) states that "social exchange comprises actions contingent on the rewarding reactions of others, which over time provide for mutually ~~and~~ rewarding transactions and relationships" (Cropanzano and Mitchell, 2005). Within the ~~C~~context~~ualized~~ ~~in~~of organizations, ~~–~~Eisenberger et al. (1986) proposed a theory of organizational support stating that when employees sense organizational care, support and attachment, they will perform ~~have~~ better ~~performance~~. ~~Organizations~~ Companies that ~~give~~ care ~~to~~about their employees, improve ~~the perceived organizational support which is~~ the overall perception of support from ~~an~~ the organization (Eisenberger et al., 2001). According to the reciprocity rule of social exchange, organizational support encourages employees to work hard to repay the organization;~~,~~ so, perceived organizational support ~~will~~ should significantly ~~impact~~ increase employee performance. This has been ~~fully~~ confirmed by many empirical

studies (Zhong et al., 2016). Eisenberger et al. (1986) opened ~~the~~ a venue of research on the impact of organizational support on employee performance which provided new perspectives for enterprise managers to evolve employee performance management strategies. Armeli et al. (1998) found that the impact of organizational support on employee performance ~~was~~ increas~~eding~~ significantly. In HRM practices with high performance, perceived organizational support has~~d~~ a significant impact on employee innovative performance (Kehoe and Wright, 2013). Similarly, in a rapidly changing organizational context, employees' perceived organizational support can also have an impact on employee performance (Cullen et al., 2014). Skinner (1957) found that the use of different ~~use of~~ positive stimuli (things that bring pleasure) and negative stimuli (things that ~~can~~ produce pain) can reinforce or inhibit specific behavior of the subject~~, as shown in~~ (**Table 1**). Although giving the subject a negative stimulus~~i~~ is a form of punishment, its purpose is to suppress ~~the~~ wrong behavior ~~of the subject, so it~~and therefore may ~~is~~ also ~~a~~be considered a ~~n~~supportive ~~behavior per se~~action.~~, so t~~This paper proposes two modes of organizational support,~~:~~ r~~R~~einforcing organizational support (ROS) and i~~I~~nhibitive organizational support (IOS). ROS refers to providing positive stimuli or revoking negative stimuli imposed on employees in order to strengthen positive behaviors, usually by offering positive stimuli such as salary, welfare, care, etc. IOS refers to withdrawing positive stimuli or imposing negative stimuli to restrain negative behaviors, such as by salary reductions, fines, or criticism~~, etc.~~ (Rhoades and Eisenberger, 2002).

Table 1. Different ~~mode~~ types of intension and inhibition

	Implement stimulation	Eliminate stimulation
Positive stimulation	Intension 1	Inhibition 2
Negative stimulation	inhibition 1	Intension 2

Employee performance is the individual's work achievement after exerting

required effort on the job (Hellriegel et al., 1999). Although there are many frameworks in employee performance (Pradhan and Jena, 2017), few of them are suitable for frontline workers, especially in the flexible manufacturing setting. Our preliminary ~~survey of automakers with flexible manufacturing factories show~~survey of automakers with flexible manufacturing factories show~~s~~ed four new work contents of frontline workers. (1) Compared to traditional production, multi-variety production makes frontline work diversified. Workers need to identify different processing tools and parts and accurately distinguish standard operations to ensure correct processing. These intellectual works consume more energy; the more varieties of products that frontline workers deal with, the more energy they exert. (2) The introduction of new products has changed the work content for frontline workers. Evolving work processes might involve new tools, parts and processing techniques. Frontline workers must learn to fully grasp the production of new products and ensure efficiency and quality. Frequent introduction of new products requires continuous employee learning. (3) Multi-variety production makes the production line complicated. The introduction of new products and elimination of old products ~~cause~~ requires frequent adjustment of the production line. Due to the complexity and frequent adjustments, production lines may not be able to ~~keep their~~maintain optimal ~~states~~status; the ~~equipment~~ frequent equipment stops and problems ~~the~~ of quality ~~problems~~ could ~~be~~ affect more than just ~~of~~ a single product. The effectiveness of equipment management that reli~~es~~y ~~on~~ after-sale professional maintenance is decreasing. Preventive equipment management that requires deep involvement of frontline workers is receiving more and more attention, but this requires that frontline workers have certain skills and problem-solving capability. (4) Finding solutions to production problems is not easy, and the key is in discerning the real cause of the problems. Solutions are likely to encompass~~ing~~ many aspects, and require collaboration with frontline workers.

Based on the above discussion, this paper measure~~d~~s the performance of frontline workers in the context of flexible manufacturing using ~~another~~ four

indicators which ~~are~~ were continuous learning, problem solving, teamwork, and work initiative. Frontline workers in the context of flexible manufacturing ~~are in line with~~fulfill the definition of the general concept of employees, so organizational support has a positive impact on the new performance of frontline workers. In the course of their work, employees are affected by various internal and external conditions and, due to changes in their ~~situations,~~situation, ~~and~~ it is difficult to maintain organizational expectations. When employees exhibit negative behavior, inhibitory support activities are executed in a timely manner to eliminate such behavior, so ROS and IOS coexist~~ting~~ in daily activities. Therefore:

H1a: ROS has a positive impact on new performance of frontline workers.

H1b: IOS has a positive impact on new performance of frontline workers.

Organizational support and employee attitude

Under ROS, companies provide positive stimuli or eliminate negative stimuli so employees can obtain satisfaction (Anglin et al., 2017). When employees are satisfied, they can ~~take~~ adjust to the required work pressures and form a sense of organizational identity. However, in practice, even if employees have a sense of identity with a specific organization, it is possible that they may feel that other organizations might offer ~~more~~ greater recognition ~~by other organizations~~. That means employees compare senses of identity and accessibility of their current and potential work, and then form a sense of belonging to their organizations after some adjustments (Hagerty et al., 1992). In the field of psychology and organizational behavior, a sense of belonging is an important concept, which predicts many positive employee behaviors (Knapp et al., 2014). In the actual survey conducted in this study, it was found that the word “belonging” was more easily understood and accepted by frontline workers and frontline managers, and was mentioned more frequently than words such as “organization commitment” and “organization identity”. Therefore, ~~this study utilize~~this study utilize~~s~~d a sense of belonging to describe the frontline workers’

attitudes under ~~the~~ ROS.

Under IOS, negative stimuli are given or positive stimuli are eliminated by organizations, and the damage caused by ~~the~~ employee behavior follows the basic principles of fairness (Collins, 2017). When employee behavior ~~brings damage to~~has negative consequences on the organization and the punishment given by the organization is consistent with or lower than the expected level, the psychological state of employees should remain ~~in a~~ good ~~state~~; however, significant differences exist between this state and the state under positive stimulation. When employees lose work amenities that they valu~~able things~~, they feel pain inside, and the painful feeling will cause fear of further IOS behavior (Keltner and Haidt, 2003). The fear is essentially generated by ~~fear~~ the possibility of losing ~~valuable things~~work privileges, while employees can simultaneously recognize the legitimacy of this loss. The sense of awe can well describe this complex psychological state (Keltner and Haidt, 2003). As a complex and contradictory comprehensive emotion, the sense of awe has connotations of both "respect" and "dread". Compared to fear, awe is more accurate and comprehensive in expressing the impact of IOS on employee attitudes (Bai et al., 2017). When employees receive IOS such as fines and criticism, the sense of awe can help them proactively suppress their own harmful behaviors and accept organizational decisions with a good attitude through their own ethics, ~~which~~ while ~~can~~ maintaining organizational interests. Therefore, this study selecteds the sense of awe to describe the attitudes of frontline workers under inhibitory organization support.

The relationship between organizational support and employee attitudes has been widely validated (Choi, 2019). In terms of the general impact of organizational support on employee attitudes, this study believes that:

H2a: ROS has a positive effect on sense of belonging.

H2b: IOS has a positive effect on sense of awe.

The relationship between belonging, awe and new performance of frontline workers

~~The practice and r~~Research ~~of~~ into the practices of human resource management have shown that employee attitudes impact the new performance of employees (Cosenz, 2018). The sense of belonging and awe, as indicators of positive employee attitudes, are ubiquitous in organizations, and have important influence on employee performance (Kehoe and Wright, 2013). Employees with a sense of belonging will maintain a positive attitudes, showing strong initiative, investment and efficiency (Kim et al., 2014). The sense of awe will make employees consciously restrain their behaviors and guarantee work performance. The influence of employee attitudes on new performance should ~~be~~ also be applicable to frontline workers in flexible manufacturing. Therefore, the sense of awe and belonging of frontline workers should directly affect their behaviors and work performance.

The core purpose for organizations to support employees is to influence their behavior. A sense of organizational support enables employees to further influence their own behaviors to ensure stable development and improvement; an employee's behavior is ~~directly~~ directed by their internal attitudes, so the relationship between organizational support and employee behavior necessarily involves employee attitudes (Wang et al., 2014). Organizational support manifests itself in the psychological perceptions of employees, and affects the new performance of employees through their behavior. Combined with the above analysis, this study considers that employee attitudes play a mediating role between organizational support and new performance. Therefore:

H3a: sense of belonging has a positive impact on the new performance of frontline workers.

H3b: sense of awe has a positive impact on new performance of frontline workers.

H4a: sense of belonging plays a mediating role between ROS and new performance of frontline workers.

H4b: sense of awe plays a mediating role between IOS and new performance of

frontline workers.

The moderating effect of organizational justice

Organizational justice ~~which is~~refers to the people~~'~~s' feelings that the organization's system of policies and measures ~~of~~ treats them fairly and~~ness on the system, policies and measures in the organization,~~ is a subjective perception and psychological experience of the individual (Colquitt et al., 2001). E~~The e~~xisting research mainly evaluate~~d~~s the sense of organizational justice from four dimensions~~:,~~ ~~i.e.~~ distributive ~~justice~~, procedural ~~justice~~, interpersonal ~~justice~~ and informational ~~justice~~. Employees' perceptions of organizational fairness ha~~d~~s an impact on employees' attitudes toward the organization, which in turn affecte~~d~~s their ~~employee~~ behavior (Masterson, 2001). Different aspects of organizational fairness have different influences on employees' attitudes (Riggle et al., 2009). Usually, the exchange process cannot reach absolute fairness, and unfairness exists in more or less proportion; employees' perception of fairness has an important impact on attitudes (Jung and Ali, 2017).

Homans (1958) pointed out that social exchange followe~~d~~s the principle of fairness which ~~is~~ was that the exchanged parties must judge the reciprocity between pay and return in the social exchange, ~~and~~ such that no one will ~~voluntarily~~ suffer ~~and~~ long-term exchange of "loss". Therefore, fairness perception has an important impact on the attitudes and behavior of the ~~subject~~employees~~;~~, but it is not difficult to see that the perception of fairness is formed by a certain comparative analysis of the value of the exchanged content. Therefore, fairness is generated on the basis of the value of the exchange of content. From the perspective of employees, the strength of organizational support is used to express the value of the supported content that the organization gives to employees (Rhoades and Eisenberger, 2002). Organizational justice is formed based on the strength of organizational support. Intensity is the original attribute of organizational support, and fairness is a derivative attribute of

organizational support based on intensity to adjust the impact of organizational support intensity on employee attitudes (Rhoades and Eisenberger, 2002).

Given a certain level of support, under the high fairness perception scenario, employees can generate ~~a~~ positive attitudes ~~of~~ for matching ~~with~~ them, which in turn encourages ~~employees~~ them to work hard at a certain level, while in the low-fairness perception scenario, the positive level of employee attitudes will be reduced ~~to a certain extent,~~ and ~~the employee's~~their proclivity for hard work ~~behavior~~ will be reduced. Since the remuneration of first-line workers is generally at a low level, employees are more sensitive to changes in organizational support with remuneration as the core, and the role of organizational fairness is more significant.

Research on organizational support usually focuses on intensity attributes, with literature on organizational fairness mainly studying its direct effect (Rhoades and Eisenberger, 2002). There are few papers ~~on supporting~~considering strength and fairness, and their interaction effects. As a secondary attribute, fairness usually manifests as a moderating effect, which has been tested in the existing literature (Sora et al., 2010, Janssen, 2001). Perceptions of fairness can moderate the relationship between employee independence, organizational commitment and turnover intentions (Birecikli et al., 2016). Our experience in the automobile manufacturing industry ~~tell~~ showed us that frontline workers in this industry ~~are~~ were highly sensitive to organizational fairness because of low salary levels, and ~~thus~~ this attitude may ~~adjust~~ influence the impact of organizational support intensity on attitudes and behavior. Therefore:

H5a: organizational justice moderates the relationship between ROS and sense of belonging.

H5b: organizational justice moderates the relationship between IOS and sense of awe.

In summary, this study built~~ds~~ a supportive employee management model as shown ~~in Figure 1.~~below:

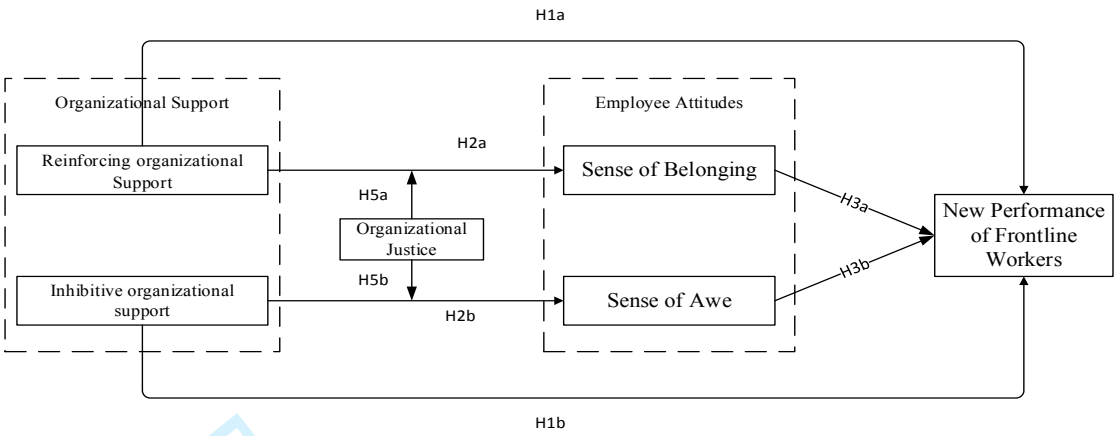

Figure 1. The conceptual model

Methodology

Samples and procedures

This study selected the China FAW Group as the research ~~object~~ base to ensure sample representativeness. The FAW g~~G~~roup is one of the biggest automotive manufacturing enterprises in China. It has formed joint ventures with famous worldwide ~~famous~~ a~~A~~uto companies, such as Audi, Volkswagen, Toyota and GM. The auto models produced by the FAW g~~G~~roup include trucks, buses, commercial vehicles, cars and other vehicles and its production plants are spread all over the country.

Due to the varieties of sub-companies in China's FAW group, this research covered both sole proprietorships and joint ventures, compromising commercial vehicle manufacturers, passenger car manufacturers, vehicle manufacturers and component manufacturers so that ~~we have~~there were balanced samples across the enterprises. The manufacturing process include~~d~~s assembly, painting, welding, stamping, logistics, and maintenance~~.~~, ~~etc.;~~ ~~c~~Considering that the flexibility of final assembly, welding and painting ~~is~~ was high, the frontline workers in these stages were ~~determined~~ selected as sampling targets. ~~After~~ We conducted a pre-study to come up

with an effective, we improved the questionnaire. In the formal investigation, seven sample sub-companies were selected to conduct the survey. 180A total of 180 questionnaires were were distributed and a total of 179 copies were collected. After screening, the number of final valid questionnaires available for data analysis were was 139, with a validation rate of 77.7%.

The distribution of samples is summarized in Table 2. We can see that most participants (76.3%) have worked in production for a long -time in production,-- defined as more than three3 years (76.3 percent). Most participants were between from 25-40 years old, with 35.3% the remaining under 25 years old of age (35.3 percent)and 18.7% or more than 40 years old. (18.7 percent). Education levels included "high school education level and below" (26.6 percent%), "secondary school education level" (19.4 percent%), and "college education level" (54 percent%). The average monthly salaries of surveyed employees were less than 2,500 yuan (11.5% percent), 2500 to 3,000 yuan (20.9% percent), 3,000 to 4,000 yuan (20.1% percent), and 4,000 yuan and above (18.7% percent)

:

Table 2. Descriptive statistics

	Classification	**Frequency**	**Percentage**
Age	below 25 years	49	35.3%
	26-30 years	35	25.2%
	31-35 years	11	7.9%
	36-40 years	18	12.9%
	41-50 years	26	18.7%
Education levels	below senior high school	37	26.6%
	secondary school	27	19.4%

	Classification	Frequency	Percentage
	college	75	54%
Average monthly salaries	below 2,500 yuan	16	11.5%
	2,501 to 3,000 yuan	29	20.9%
	3,001 to 4,000 yuan	68	20.1%
	above 4,000 yuan	26	18.7%
Length of service	less than 3 years	33	23.217%
	3-6 years	48	34.6%
	7-10 years	12	8.6%
	11-15 years	10	7.2%
	16-20 years	14	10.1%
	above 20 years	22	15.3%

Measures

This research attempted to use mature scales of similar research whenever possible, and adopted strict translatione and back-translatione to ensure the translation accuracy. Meanwhile, considering the reality of China's automobile industry and new practice of performance appraisal by production workers, some scales were modified to adapt to real practice.– Particularly, considering that the overall knowledge level of first-line production workers was low, the scales were simplified as much as possible, and all variables were measured using a 5-point Likert scale. After determining the first draft of the scales, two comparable and typical automobile manufacturers were selected to conduct a pre-study; problems in the pre-tested scale were corrected to form the final questionnaire.

ROS was assessed using 10 ten items (Eisenberger et al., 1986), containing three sub-dimensions: wWork Ttreatment (coded as WT), Lleadership Ccare (coded as LC), and Ccorporate Ccare (coded as CC). A sample item of WT reads “What level is your salary in?” The metrics for each item are were divided into five levels, from low to high. LC was assessed with a three-item scale; a sample of LC reads "How does your line manager care about your development", while a sample item of CC reads "How

does your line manager care about your life?"

The measurement of IOS consisted of one item (Eisenberger et al., 1986), “How severe does your company punish the employee for bad behavior.” The severity of punishment was divided into five levels, from ~~basically~~ no penalty to very strict penalty.

Four measurement items (Colquitt, 2001) were used to assess organizational justice (~~coded as~~ OJ): “From your perspective, how do you feel about the fairness of the company’s organizational system?”, “How is your line manager’s daily fairness?”, “How do you feel that the organization rate your contribution to the organization.”, and "Compared with your colleagues, how do you feel the fairness of the company's treatment of your work?" . ~~,~~ Each of the four items was accessed on a five-point scale (*very unfair to very fair*).

Employee attitudes were assessed with a six-item scale (Porter et al., 1974, Chait and Summers, 1998), containing two sub-dimensions: sense of belonging (~~coded as~~ SB) and sense of awe (~~coded as~~ SA). We designed four items to assess employees’ sense of belonging; a sample item reads, "How likely are you willing to work long-term in the company". Sample items of awe include "~~-~~How does the company’s work system relate to you " and “How is the binding force of work behavior?"

The metrics for employee performance (~~coded~~ as EP) were mainly derived from practical experience. The questionnaire about employee performance was filled out by the line manager of the production worker, consisting of four sub-dimensions, each corresponding to a measurement item: “How does the employee's learning meet job requirements?”, “How does the employee improve his/her production problem solving skills?”, “How is the employee’s teamwork in the work team?”, “How is the employee's work initiative?” ~~, 5~~Five scales were used from 1 (very unsatisfied) to 5 (very satisfied)

We also included control variables in order to isolate the test effects (Boselie et al., 2005) and followed the intentions of Anand et al.~~’s~~ (2010) ~~intention~~ to use

individual level control variables in testing the hypothesized organizational support–employee performance. Specifically, the tests were controlled by marriage status (0 = unmarried, 1 = married), age (1 = below 25 years, 2 = 26-30 years, 3 = 31-35 years, 4 = 36-40 years, 5 = 41-50 years);; average monthly salary (1 = below 2500 yuan, 2 = 2051-3000 yuan, 3 = 3001-3500 yuan, 4 = 3501- 4000 yuan, 5 = above 4000 yuan);; education level (1= below senior high school, 2 = secondary school, 3 = college); and length of service（1 = below 3 years, 2 = 3-6 years, 3 = 7-10 years, 4 = 11-15 years, 5 = 16-20 years, 6 = above 20 years).

Data analysis and results

Correlation analysis is was first conducted to explore the relationships between variables, which is presented in(**Table 3**). The correlation coefficient between ROS and employee's new performance is was 0.264 with $p<0.01$, so hypothesis H1a passeds the test; wWhile the correlation between inhibitory organization support and employee new performance is was 0.018 with $p>0.05$, so hypothesis H1b failedss the test.

The correlation coefficient between ROS and employee's sense of belonging reachesd 0.655 and is was significant at the 0.01 level, indicating that ROS hads a great influence on an employee's sense of belonging, so hypothesis H2a passes the testwas accepted. The correlation coefficient between IOS and employees' sense of awe is was 0.422 and is significant at the 0.01 level, so hypothesis H2b passeds the test.

Table 3. Correlation analysis results of research variables (n = 139)

	ROS	IOS	OJ	SB	SA	EP

ROS	1					
IOS	0.043	1				
OJ	0.723**	0.126	1			
SB	0.655**	-0.058	0.585**	1		
SA	0.150	0.422**	0.182*	0.094	1	
EP	0.264**	0.018	0.283**	0.261**	0.01	1

* represents a significant correlation at the 0.05 level (two-tailed test)~~Remarks: The sample size is 139~~

** represents a significant correlation at the 0.01 level (two-tailed test)*

~~represent a significant correlation at the 0.05 level (two-tailed test)~~

** ~~represent a significant correlation at the 0.01 level (two-tailed test)~~

The correlation coefficient between SB and EP ~~is~~ was 0.252 and significant at the 0.01 level, and the coefficient between SA and EP ~~is~~ was 0.023 but ~~it is~~was not significant ~~statistically~~., Therefore, H3a ~~is~~ was verified, while H3b ~~is~~ was not. This study calculated the correlation coefficients between the four performance indicators of employee~~'~~s' new performance and the SB and SA respectively~~,~~ (~~**which is shown in Table 4**~~). The results indicate that the SB ~~has~~ had a positive influence on the four new performance variables, while the SA ~~has~~ had no significant impact on EP. IOS also ~~has~~ had no effect on EP, so ~~the~~ SA ~~will~~ did not play a mediating role between IOS and EP; therefore, H4b ~~does~~ did not hold.

Table 4. Correlation coefficient matrix

	SB	SA
EP-1	.195*	-0.048
EP-2	.198*	0.026
EP-3	.229**	0.076
EP-4	.195*	-0.026
EP	.252*	0.023

~~The~~ A stepwise regression method ~~is~~ was used to analyze the relationship between the dependent variable and the independent variable and~~,~~ to test the related mediating and moderating effects~~.~~ (~~**The calculation results are presented in**~~ **Table 5**).

EP was used as the dependent variable, and ROS and SB were used as the independent variables in first step regression， ~~and~~ after which ~~then~~ the ROS variables were removed. Calculation results reveal that sense of belonging plays a full mediating role between ROS and EP, so H4a passeds the test.

Table 5. Calculation results ~~of the~~for multivariate linear regression equations

Dependent Vvariable / Independent Vvariable	**EP**	**SB**		**SA**
	Mmodel 1	**Mmodel 1**	**Mmodel 2**	**Mmodel 1**
constant	1.45***	1.344***	0.850***	1.449***
ROS	Removed	Removed	0.331**	-
IOS	-	-	-	Removed
OJ	-	Removed	Removed	Removed
ROS*OJ	-	0.142***	0.081**	-
IOS*OJ	-	-	-	0.093***
SB	0.276**	-	-	-

SA	-	-	-	-
R^2	0.068	0.437	0.467	0.227
Adj. R^2	0.061	0.433	0.459	0.222
F value	9.51^{**}	106.463^{***}	7.534^{**}	40.337^{***}
ΔR^2	0.068	0.437	0.030	0.227
Sig.ΔF	0.002	0.000	0.007	0.000

Note: *~~,~~, **~~,~~ and *** represent ~~–~~$p<0.05$, $p<0.01$, $p<0.001$ respectively~~.

Using SB as the dependent variable, and ROS, OJ and the product of the two as independent variables, we ~~have~~ created M~~m~~odel 1 and ~~m~~Model 2. Then, OJ and ROS were removed from Model 1, while only OJ was removed from ~~m~~Model 2. The R2 of Model 2 was significantly ~~bigger~~ larger than for ~~m~~Model 1. According to the calculation results, OJ had ~~as~~ strong moderating effect between ROS and sense of belonging. Therefore, H5a ~~passes the test~~was accepted. Using the SA as the dependent variable, and IOS, OJ and the product of the two as the independent variables, only one model was obtained. The independent variables in the model only retained the product of the two. The results show that OJ played~~s~~ a full moderating role between IOS and SA. Therefore, H5b ~~passes the test~~was verified.

Discussion

~~(1) The r~~Relationship between organizational support and employee performance

Through investigation of new work requirements for frontline workers, we identified four new performance indicators including continuous learning, teamwork, problem solving, and work initiative. Compared with the traditional performance indicators of work quality and work efficiency (Hellriegel et al., 1999), the new performance indictors reflect~~s~~ the new requirements of flexible manufacturing for

front-line workers. The above statistical analysis shows that the new performance indicators ~~are~~ were significantly affected by reinforcing organizational support (H1a). This is in line with the literature (Kurtessis et al., 2017)~~,~~. ~~B~~because employment is the trade of effort and loyalty by the employee for tangible benefits and social resources from the organization according to the social exchange theory (Cropanzano and Mitchell, 2005). Therefore, when frontline workers receive positive organizational support (~~e.g.~~ increased salary, bonuses, etc.), their feeling of obligation to help the organization will be ~~lifted~~enhanced. As a result, front–line workers with high reinforcing organization support should engage in greater efforts ~~(e.g. keep~~such as learning new skills and working~~,~~ proactively ~~work etc.),~~ resulting in enhanced performance (Kurtessis et al., 2017). However, inhibitory organizational support ~~has~~ had no significant impact on the new performance (H1b), which ~~is different~~differed from the current literature (Asadullah et al., 2018). ~~The~~ Ppossible reasons could be ~~due to the~~the implementation of a –new ~~context of~~ flexible manufacturing system during the transition period. During this transition period, inhibitive organizational support like fines or punishment may only make front–line workers correct the problems emerged. ~~and t~~The stimuli ~~is~~may not ~~not~~ be great~~big~~ enough to ~~engage~~ motivate them to greater team-work or to keep learning. Our result show~~s~~ed that the sense of belonging ha~~ds~~ a significant impact on employee performance (H3a). This is not surprisinge~~e~~ because the sense of belonging which is similar to the psychological ownership for the organization can ~~lift~~ increase employees' work commitment and job satisfaction which in turn improves their performance (Van Dyne and Pierce, 2004). But the sense of awe ~~has~~ had no effect on employee performance (H3b). This may because that sense of awe is an infrastructural and '~~"~~health~~"~~' ~~mentality~~perception, its active level is lower than sense of belonging~~;,~~ its main impact is on efficiency and quality indicators, and has little effect on new performance indicators. The above results suggest that for frontline workers, reinforcing support is needed to make them feel valued and create ~~their~~ a sense of belonging which in turn improves their

performance.

~~(2) The m~~Mediati~~ngon~~ role of sense of belonging

This paper proposes two modes of organizational support: r~~R~~einforcing organizational support (ROS) and i~~I~~nhibitive organizational support (IOS). Work treatment, company care and supervisor care, as contents of ROS, have a significant positive impact on employees' sense of belonging (H2a), while work punishment, as the main content of inhibitory organizational support, has a significant positive impact on employees' sense of awe (H2b). This is consistent with the literature (Kurtessis et al., 2017, Rhoades and Eisenberger, 2002). The explanation is straightforward. Reinforcing organizational support can ~~make~~ give employees ~~have~~ a positive attitude toward ~~to~~ the organization and ~~produce~~ enhnace their identity in the organization, which will increase their sense of belonging. ~~W~~while inhibitive organizational support may make employees worry too much about their performance and fear the organization.

The sense of belonging ~~is~~ played~~ing~~ a mediating role between reinforcing organizational support and employee performance (H4a). That means ~~the~~ that reinforcing organizational support affecteds employee performance through the sense of belonging. This is also not inconsistent with the literature (Kurtessis et al., 2017, Rhoades and Eisenberger, 2002). The positive support ~~on~~ given to employees will increase ~~employees'~~ their commitment to the organization ~~which will~~and ~~self~~ motivate them to learn, work and solve problems. The performance improvement will come from the internal motivation.

~~(3) M~~~~The m~~oderati~~onn~~g role of organizational justice

Organizational justice as perceived by employees, has~~d~~ a moderating effect between IOS and sense of awe (H5a), and between ROS and sense of belonging (H5b). ~~—~~This is reasonable since organizational justice significantly affected

employees' perception of the organization (Collins, 2017). When employees ~~feel~~ felt that the or~~i~~ganizn~~z~~ation ~~is~~ was unfair, they did not develop a sense of belonging even ~~if~~ awith high organizational support~~;~~ ~~cannot give them a sense of belonging. H~~however, if they perceive the organization ~~is~~ as fair, even a small degree of support may make employees feel valued and encouraged. In contrast, when organizational justice ~~is~~ was low, a small ~~inhibitive support~~punishment like a fine may produce a high sense of awe (Wang et al., 2014). This result suggests that to make organizational support work effectively, a high degree of organizational justice is essential.

Based on the above analysis, we ~~come up~~created the following model for the role of organizational support on the frontline workers' performance (~~in~~ **Fig.~~ure~~ 2**).

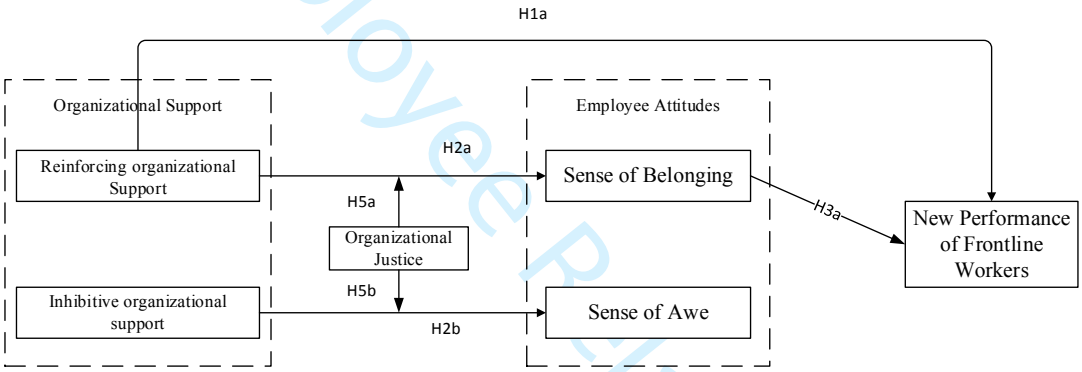

Figure 2. Optimized mechanism model

This figure demonstrates that reinforcing organizational support can impact employees' sense of belonging which in turn affects their performance. The organizational justice ~~is~~ plays~~ing~~ a moderating~~on~~ role on the path between organizational support and sense of belonging or awe.

Conclusion and practical implications

This paper studied~~s~~ the impact of organizational support on frontline workers' performance and its impact mechanisms in the context of flexible manufacturing. We found that reinforcing organizational support ~~has~~ had a significant impact on

employee performance via the sense of belonging. In addition, organizational justice ~~plays~~had a significant moderating effect on the role of organizational support. S~~In s~~pecifically, organizational justice moderate~~s~~d the impact of reinforcing organizational support on the sense of belonging, as well as the impact of inhibitive organizational support on the sense of awe. The findings are helpful in identifying the mechanisms of the impact of organizational support on employee attitudes, and can ~~effectively~~ help managers of frontline production personnel improve performance. In production management practice, because only the sense of belonging had a positive impact on employee performance, production managers should give employees more respect and recognition. Punitive measures such as fines will only strengthen awe ~~to~~ towards the organization, without having an impact on employee's work performance. In this sense, the management of production workers in the context of flexible manufacturing should use more ROS. Production managers should pay full attention to the role of organizational justice in their management of workers, whether through inhibitive organizational support or ROS. Organizational justice plays a strong moderating role in the impact of ROS on employee attitudes, so in giving rewards, such as strengthening process support, management should pay special attention to justice, otherwise it will bring negative effects.

Limitations and future research

Like any research, this paper is not free from limitations. Considering the specific situation of frontline employees, this study has greatly simplified the research variables and measurement items. This makes the research granularity coarser, lacking detail in the investigation ~~on~~of specific variables and their relationships ~~that are detailed enough~~. In the future, more detailed examination can be conducted on the research variables.

The samples selected in this study were solely from the automobile industry without covering the overall manufacturing industry. There may be some differences among industries, which need to be tested by subsequent studies. This study examined

the key roles of variable relationships relatively independently, and the test of the overall interaction between variables needs to be carried out in the next steps.

References

ABU QUDEIRI, J. E. 2017. Production simulator system for flexible routing optimization in flexible manufacturing systems. *Proceedings of the Institution of Mechanical Engineers Part B-Journal of Engineering Manufacture,* 231**,** 1237-1247.

ADLER, P. S. 1991. Workers and flexible manufacturing systems: Three installations compared. *Journal of Organizational Behavior,* 12**,** 447-460.

ANGLIN, A. H., REID, S. W., SHORT, J. C., ZACHARY, M. A. & RUTHERFORD, M. W. 2017. An Archival Approach to Measuring Family Influence. *Family Business Review,* 30**,** 19-36.

ARMELI, S., EISENBERGER, R., FASOLO, P. & LYNCH, P. 1998. Perceived organizational support and police performance: The moderating influence of socioemotional needs. *Journal of Applied Psychology,* 83**,** 288-297.

ARTHUR, J. B. 1994. EFFECTS OF HUMAN RESOURCE SYSTEMS ON MANUFACTURING PERFORMANCE AND TURNOVER. *Academy of Management Journal,* 37**,** 670-687.

ASADULLAH, A., JUHDI, N. B., ISLAM, M. N., ABDULLAH, A. & AHMED, A. A. A. 2018. The Effect of Reinforcement and Punishment on Employee Performance. *ABC Journal of Advanced Research,* 7**,** 97-108.

BAI, Y., MARUSKIN, L. A., CHEN, S., GORDON, A. M., STELLAR, J. E., MCNEIL, G. D., PENG, K. P. & KELTNER, D. 2017. Awe, the Diminished Self, and Collective Engagement: Universals and Cultural Variations in the Small Self. *Journal of Personality and Social Psychology,* 113**,** 185-209.

BIRECIKLI, B., ALPKAN, L., ERTURK, A. & AKSOY, S. 2016. Employees' need for independence, organizational commitment, and turnover intentions: The

moderating role of justice perceptions about performance appraisals. *International Journal of Organizational Leadership,* 5**,** 270-284.

BOSELIE, P., DIETZ, G. & BOON, C. 2005. Commonalities and contradictions in HRM and performance research. *Human Resource Management Journal,* 15**,** 67-94.

CHAIT, H. N. & SUMMERS, L. 1998. Commitment in the Workplace: Theory, Research and Application. *Personnel Psychology,* 51**,** 245-248.

CHOI, Y. 2019. A study of the effect of perceived organizational support on the relationship between narcissism and job-related attitudes of Korean employees. *Cogent Business & Management,* 6**,** 1573486.

COLLINS, B. J. 2017. Fair? I Don't Care: Examining the Moderating Effect of Workplace Cynicism on the Relationship Between Interactional Fairness and Perceptions of Organizational Support From a Social Exchange Perspective. *Journal of Leadership & Organizational Studies,* 24**,** 401-413.

COLQUITT, J. A. 2001. On the dimensionality of organizational justice: A construct validation of a measure. *Journal of Applied Psychology,* 86**,** 386-400.

COLQUITT, J. A., CONLON, D. E., WESSON, M. J., PORTER, C. & NG, K. Y. 2001. Justice at the millennium: A meta-analytic review of 25 years of organizational justice research. *Journal of Applied Psychology,* 86**,** 425-445.

COSENZ, F. 2018. Supporting public sector management through simulation-based methods: a dynamic performance management approach. *International Review of Public Administration,* 23**,** 20-36.

CROPANZANO, R. & MITCHELL, M. S. 2005. Social Exchange Theory: An Interdisciplinary Review. *Journal of Management,* 31**,** 874-900.

CULLEN, K., EDWARDS, B., CASPER, W. & GUE, K. 2014. Employees' Adaptability and Perceptions of Change-Related Uncertainty: Implications for Perceived Organizational Support, Job Satisfaction, and Performance. *Journal of Business & Psychology,* 29**,** 269-280.

EISENBERGER, R., ARMELI, S., REXWINKEL, B., LYNCH, P. D. & RHOADES, L. 2001. Reciprocation of perceived organizational support. *Journal of Applied Psychology,* 86**,** 42-51.

EISENBERGER, R., HUNTINGTON, R., HUTCHISON, S. & SOWA, D. 1986. Perceived organizational support. *Journal of Applied Psychology,* 71**,** 500-507.

ELMARAGHY, H. & CAGGIANO, A. 2016. Flexible Manufacturing System. *In:* THE INTERNATIONAL ACADEMY FOR, P., LAPERRIèRE, L. & REINHART, G. (eds.) *CIRP Encyclopedia of Production Engineering.* Berlin, Heidelberg: Springer Berlin Heidelberg.

HAGERTY, B. M., LYNCH-SAUER, J., PATUSKY, K. L., BOUWSEMA, M. & COLLIER, P. 1992. Sense of belonging: a vital mental health concept. *Archives of psychiatric nursing,* 6**,** 172-7.

HELLRIEGEL, D., JACKSON, S. E. & SOLOCUM, J. W. 1999. *Management,* Cincinnati, Ohio, South-Western College.

HOMANS, G. C. 1958. Social behavior as exchange. *American Journal of Sociology,* 63**,** 597-606.

JANSSEN, O. 2001. Fairness Perceptions as a Moderator in the Curvilinear Relationships between Job Demands, and Job Performance and Job Satisfaction. *The Academy of Management Journal,* 44**,** 1039-1050.

JUNG, H.-J. & ALI, M. 2017. Corporate Social Responsibility, Organizational Justice and Positive Employee Attitudes: In the Context of Korean Employment Relations. *Sustainability,* 9.

KEHOE, R. R. & WRIGHT, P. M. 2013. The Impact of High-Performance Human Resource Practices on Employees' Attitudes and Behaviors. *Journal of Management,* 39**,** 366-391.

KELLY, J. E. 1982. *Scientific Management, Job Redesign, and Work Performance,* New York, Academic Press.

KELTNER, D. & HAIDT, J. 2003. Approaching awe, a moral, spiritual, and aesthetic

emotion. *Cognition & Emotion,* 17**,** 297-314.

KIM, K., KOOK-YONG, L. & 김재선 2014. Trust, Sense of Belonging and Performance Expectation : Are These Related to Team Collaboration Intention? *The Journal of International Trade & Commerce,* 10**,** 1137-1154.

KNAPP, J. R., SMITH, B. R. & SPRINKLE, T. A. 2014. Clarifying the Relational Ties of Organizational Belonging: Understanding the Roles of Perceived Insider Status, Psychological Ownership, and Organizational Identification. *Journal of Leadership & Organizational Studies,* 21**,** 273-285.

KURTESSIS, J. N., EISENBERGER, R., FORD, M. T., BUFFARDI, L. C., STEWART, K. A. & ADIS, C. S. 2017. Perceived Organizational Support: A Meta-Analytic Evaluation of Organizational Support Theory. *Journal of Management,* 43**,** 1854-1884.

LIAO, Z., LIU, W., LI, X. & SONG, Z. 2019. Give and take: An episodic perspective on leader-member exchange. *Journal of Applied Psychology,* 104**,** 34-51.

MAHESO, M. N., MPOFU, K. & SIBANDA, V. 2018. Flexible and Adaptable Learning Factories for the Rail Car Manufacturing industry. *In:* MOURTZIS, D. & CHRYSSOLOURIS, G. (eds.) *8th Cirp Sponsored Conference on Learning Factories.* Amsterdam: Elsevier Science Bv.

MASTERSON, S. S. 2001. A Trickle-Down Model of Organizational Justice: Relating Employee's and Customers' Perceptions of and Reactions to Fairness. *Journal of Applied Psychology,* 86**,** 594-604.

NICHOLS, T. & ZHAO, W. 2010. Disaffection with trade unions in China: some evidence from SOEs in the auto industry. *Industrial Relations Journal,* 41**,** 19-33.

PORTER, L. W., STEERS, R. M., MOWDAY, R. T. & BOULIAN, P. V. 1974. ORGANIZATIONAL COMMITMENT, JOB SATISFACTION, AND TURNOVER AMONG PSYCHIATRIC TECHNICIANS. *Journal of Applied Psychology,* 59**,** 603-609.

PRADHAN, R. K. & JENA, L. K. 2017. Employee Performance at Workplace: Conceptual Model and Empirical Validation. *Business Perspectives and Research,* 5**,** 69-85.

PRIETO, I. M. & PEREZ-SANTANA, M. P. 2014. Managing innovative work behavior: the role of human resource practices. *Personnel Review,* 43**,** 184-208.

RHOADES, L. & EISENBERGER, R. 2002. Perceived Organizational Support: A Review of the Literature. *Journal of Applied Psychology,* 87**,** 698-714.

RIGGLE, R. J., EDMONDSON, D. R. & HANSEN, J. D. 2009. A meta-analysis of the relationship between perceived organizational support and job outcomes: 20 years of research. *Journal of Business Research,* 62**,** 1027-1030.

SKINNER, B. 1957. *Verbal Behavior,* New Yourk, Appleton-Century-Crofts Inc.

SORA, B., CABALLER, A., PEIRó, J. M., SILLA, I. & GRACIA, F. J. 2010. Moderating influence of organizational justice on the relationship between job insecurity and its outcomes: A multilevel analysis. *Economic and Industrial Democracy,* 31**,** 613-637.

VAN DYNE, L. & PIERCE, J. L. 2004. Psychological ownership and feelings of possession: three field studies predicting employee attitudes and organizational citizenship behavior. *Journal of Organizational Behavior,* 25**,** 439-459.

WANG, D., XIU, F.-F. & YU, H.-B. 2014. How Knowledge Employees' Perception of Organizational Justice Affects Job Performance: The Mediating Role of Work Attitude. *In:* LAN, H. (ed.) *2014 International Conference on Management Science & Engineering.*

YIZHONG, X., BARANCHENKO, Y., LIN, Z., LAU, C. K. & MA, J. 2019. The influences of transformational leadership on employee employability: Evidence from China. *Employee Relations,* 41**,** 101-118.

ZHONG, L., WAYNE, S. J. & LIDEN, R. C. 2016. Job engagement, perceived

organizational support, high-performance human resource practices, and cultural value orientations: A cross-level investigation. *Journal of Organizational Behavior,* 37**,** 823-844.