



Research on the Influencing Factors of Customer Service Performance of E-Commerce Enterprises Based on Two-Stage Least Square Regression Model

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Abstract. Rapid growth of market competition has made e-commerce enterprises attach increasing importance to customer relationship management. The call center with a modern CRM system have become a vital carrier for high quality customer service. This study examines the influence that interaction justice and emotion have on call center employees' performance. A total of 267 call audios were collected from an e-commerce enterprise. The theoretical model is tested based on two-stage least square regression. Results show that call center employees who are treated unfairly by customers during calls yield worse performance than those who are treated fairly. The above relationship is partially mediated by employees' negative emotion.

Keywords: enterprise informatization management · customer relationship management · emotion · two-stage least square regression

1 Introduction

As a product that implement customer relationship management via Internet, software, and application terminals, CRM systems are becoming increasingly widely used in e-commerce enterprises. The work of call centers runs through the entire process of customer relationship management. Call center employees undertake the task of reaching and screening potential customers and providing customized service for customers via computer communication integration technology [15]. Thus, the performance of call center employees determines the effect of customer relationship management systems to a great extent. It is therefore of major significance to study the performance influencing factors of call center employees to improve enterprise informatization customer relationship management.

Since the interaction with customers takes up the most of call center employees' work, the behaviors of customers has an nonnegligible impact on their work performance. Existing studies pay more attention to improving customer satisfaction, but lack of attention to the consequences of customers' injustice interaction behavior in the service process. What impact will injustice customer interaction have on call center employees?

What mechanism does it take to affect the work performance of call center employees? Further studies are needed to explain these questions.

Invoking the affective events theory (AET), this study examines the influence of customer injustice interaction behavior on the emotion and call performance of call center employees. This study collected 389 audio from a call center of a Chinese e-commerce company and verified the research hypothesis using a two-stage least square regression model. Results help to improve the importance that e-commerce enterprises attach to the emotion of call center employees, and to provide more emotional counseling for them, so as to improve their work performance.

2 Literature Review

2.1 Definition of Customer Interaction Justice

Interaction justice refers to the fairness to which organization members are treated in terms of interpersonal interaction and information interaction. Interaction justice in interpersonal communication means that employees are treated with dignity and respect without biased verbal attacks; Interaction justice in information sharing means that the communication that employees participate in is true and sincere, and the decisions related to employees are reasonable.

Regarding the source of interaction injustice in organizations, Bashshur, Rupp, Cropanzano, and Byrne have orderly listed three factors: leaders, organization, and colleagues. Rupp & Spencer [4], through empirical research, found that customers are also one of the important sources of interaction injustice. They noted that employees will experience significant emotional labor and are harder to follow the rules set by the company when treated unfairly by customers [4]; As shown by Grandy et al., when suffered from customers' verbal attack, call center employees experienced significantly greater emotional burnout and were more likely to be absenteeism. These studies all suggested that the customer interaction injustice negatively affects the emotions and attitudes of the service staff. However, few studies have shown whether customer interaction injustice can affect the performance of service providers.

In this regard, this study takes the results of each call as the work performance of call center employees, adopts a two-dimensional model of interaction justice and explores the impact of customer interaction injustice on the work performance of call center employees.

2.2 Affective Events Theory

The affective events theory provides a framework for studying "emotional event-emotion-attitude and behavior" in organizations. AET points out that organization members who experience specific work events will experience regarding emotions and then make emotion-driven behaviors, or then change their work attitude and make judgment-driven behaviors.

The AET has been widely used in the research on service personnel. Wegge's study of 2,091 call centre staff in the UK verified AET as a whole. It noted that negative

work events in operator work can cause negative emotions among employees, thus reducing operator's job satisfaction; Based on AET, Ranjia Chen's study of 228 service providers found out that customer bullying negatively affect workers' job satisfaction, with work value moderating the relationship; WanRong Xiao examined every encounter of customer and service provider and found out that customer interaction justice had an impact on service providers' emotion, and thus influencing their customer-oriented behaviors.

However, studies using AET mostly collect self-reported data by issuing questionnaires at a static timepoint. Since emotional problems are private, self-reported data of employees may be undermined by their impression management. Plus, Due to the fleeting dynamics of emotions, the emotions that employees report at static times are most likely unable to restore the real emotions at the occurrence of emotional events. Thus, this study will use dynamic emotional observation to replace employee static emotional reporting and analyze the impact of emotional events on the immediate work performance of call center employees.

3 Hypothesis

3.1 Effect of Customer Interaction Justice on Call Center Employees' Performance

The behaviour of the customer during interaction largely determines the direction and outcome of the call. On the one hand, customer interpersonal interaction justice affects the attitude of call center employees. Many studies have showed that customer's unfair interpersonal interaction has a negative impact on the quality of services provided by service personnel. For example, research by Dallimore and Sparks [3] showed that anger outbreaks of customers can affect service staff by means of emotional contagion. At this time, if the service staff can not adjust his emotions well, the service tends to end with failure. Customers with fair interpersonal interaction can often provide a relaxing environment for the staff so that the service effect will be better.

On the other hand, customer information interaction justice determines the extent to which call center employees can access the information needed for service success. It is difficult for employees to acquire genuine needs from a negatively communicating customer. But if customers show a high level of information interaction justice, the employee can clearly extract customer's needs and guide the call to the ideal direction. Accordingly, the following assumptions are made:

H1: During the call, customer interaction injustice lowers the instant call performance.

H1a: Customer interpersonal interaction injustice lowers the instant performance of the call.

H1b: Customer informational interaction injustice lowers the instant performance of the call.

3.2 The Impact of Customer Interaction Justice on Employees' Emotion

Firstly, the unfair interpersonal interaction of customers directly stimulates the negative emotions of call center employees, or indirectly doing so through emotional contagion

and emotional labor. Customers may show impolite and dissatisfaction or even verbal insults during the call, causing anger and grievance to the employees.

Secondly, the unfair information interaction of customers greatly improves the difficulty of employees' work. Call center employees can't observe the customers from the aspects of facial or posture expressions. So if the customer use a perfunctory attitude during communication, it's difficult for the call center employee to make progress in the call. This will dampen the work enthusiasm of call center employees, and reduce the self-efficacy of them [4]. Combined with the heavy performance pressure, call center employees will experience anger, frustration, anxiety and other negative emotions. Accordingly, the following assumptions are made:

H2: During the call, customer interaction injustice negatively affects the emotion of call center employees.

H2a: Customer interpersonal interaction injustice negatively affects the emotion of call center employees.

H2b: Customer informational interaction injustice negatively affects the emotion of call center employees.

3.3 The Impact of Call Center Employees' Emotion on Their Performance

Researches have shown that positive emotions can create positive mind sets of employees, expand their scope of attention and cognition [5, 16], and make employees to pursue novel and creative thoughts and action paths, producing a positive "emotion-cognition-behavior" spiral power [8]. Cote (1999) held that both natural emotions (long term) and emotional states (short term) are related to employees' performance. When employees have negative emotions, they need to spend more psychological resources to adjust their inner feelings and external performance, which occupy the energy that should be put in work, leading to a decline in their work performance. Accordingly, the following assumptions are made:

H3: Negative emotions of call center employees reduce their immediate job performance.

3.4 Intermediary Role of Call Center Employees' Emotion

Based on AET, if employees experience emotional events at work, they will experience corresponding emotions, resulting in behavioral or attitude changes. Every phone call can be an emotional event, leading call center employees to experience different emotions. The instant performance of this call will be affected when the employee experiences specific emotions. Therefore, it can be inferred that the emotion of the call center employee in the call will play an intermediary role in the relationship between customer interaction justice and the instant performance of this call.

H4a: The emotional of call center employees plays an intermediary role in the relationship between customer interpersonal interaction justice and call results.

H4b: The emotional of call center employees plays an intermediary role in the relationship between customer informational interaction justice and call results.

The theoretical model of this study is shown below in Fig. 1.

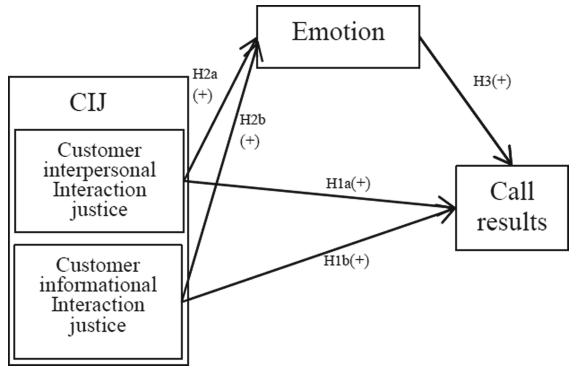


Fig. 1. Theoretical model.

4 Research Method

4.1 Collection of the Raw Data

The researcher entered the call center of a Chinese enterprise and collected the demographic information (name, gender, age and work duration on this position) and 389 call audio of all the employees.

After screening, the call audio with significant interference factors was removed. In this company, the purpose of every phone call is for the call center employee to understand customer’s needs, and to invite the customer to visit the company or recommend the customer to contact the company’s sales manager. This study eventually used 267 valid audio for a total of 240.32 min.

4.2 Processing of the Raw Data

The researchers listened to the audio of every call, and scored the customer interaction justice, call center employee’s emotion, and call results. The score of customer interaction justice was based on the Colquitt’s [2] scale, adapted to the specific scenarios of this study: 1. Are the customers polite to the call center employee during the call; 2. Whether the customer treats the call center employee with respect; 3. Whether the information transmitted by the call center employee during the call can get the same degree of information feedback from the customer.

Call center employees’ emotions were scored according to the degree of pleasure or anger and sadness. The instant performance of the call is scored on how much customers show the willingness to process of buying the company’s products. All variables were scored using the level 5 Likert scale with forward scores.

4.3 Mediator Regression Model Design

The independent variable customer interaction justice positively affects the intermediary variable emotion, and has a positive impact on the dependent variable call results. Age,

gender and the working years of this post are three control variables.

$$R = a_0 + a_1CIJ + a_2Gender + a_3Age + a_4Year + e_1 \tag{1}$$

$$Emotion = b_0 + b_1CIJ + b_2Gender + b_3Age + b_4Year + e_2 \tag{2}$$

$$R = g_0 + g_1CIJ + g_2Emotion + g_3Gender + g_4Age + g_5Year + e_3 \tag{3}$$

5 Data Analysis

5.1 Multiple Linear Regression Analysis

The multiple linear regression results between the variables are shown in the Table 1.

It's shown that customer interpersonal interaction justice ($b_1 = 0.269, p < 0.001$) and customer informational interaction justice ($b_1' = 0.235, p < 0.001$) both have positive effect on call center employees' emotion. Thus, H2a and H2b are verified. Also, customer interpersonal interaction justice ($g_1 = 0.398, p < 0.001$), customer informational interaction justice ($g_1' = 0.388, p < 0.001$) and employees' emotion ($g_2 = 0.370, p < 0.001$) all have positive effect on call results. Thus, H1a, H1b and H3 are verified.

5.2 Mediator Regression Analysis

The mediation effect test in this study used the “three-step analysis” method proposed by Wen Zhonglin et al. (2004). The results of the mediation effect tests are shown in Table 2.

After adding the intermediary variable call center employee's emotion, the relationship between the independent variable customer interpersonal interaction justice and the

Table 1. Multiple linear regression results.

Variable	Emotion			Call Result			
	M1	M2	M3	M4	M5	M6	M7
Age	.004	.002	.006	-.005	-.009	-.003	-.007
Gender	.042	.031	.054	.066	.050	.087	.051
Working years	-.110	-.102	-.106	-.023	-.011	-.304	.018
CIJ –interpersonal		.269***			.398***		
CIJ –informational			.235***			.388***	
Emotion							.370***
R2	.013	.085	.068	.005	.163	.155	.140
F	1.18	6.10***	4.79**	.41	12.76***	11.97***	10.66***

*** means $P < 0.001$, ** means $P < 0.01$, * means $P < 0.05$

Table 2. The mediation role of emotion.

Outcome Variable	Call Result				
	M1	M2	M3	M4	M5
Explanatory Variable					
Control Variable					
Age	-.005	-.009	-.003	-.009	-.005
Gender	.066	.050	.087	.041	.071
Working years of this post	-.023	-.011	-.304	.018	.014
Independent Variable					
CIJ - interpersonal		.398***		.323***	
CIJ - informational			.388***		.319***
Mediating Variable					
Emotion				.283***	.295***
R2	.005	.163	.155	.236	.221
F	.41	12.76***	11.97***	12.76***	11.97***

*** means $P < 0.001$, ** means $P < 0.01$, * means $P < 0.05$

dependent variable call results was still significant at the level of 0.001, but the coefficient g_1 decreased from 0.398 to 0.323, showing that emotion partially mediates customer interpersonal interaction justice and call results. Similarly, after adding emotion, the customer informational interaction justice still significantly relates to call results at the level of 0.001, but g_1 was reduced from 0.388 to 0.319, showing the partial mediating role of emotion. H4a and H4b are thus verified.

6 Discussion

6.1 Conclusion

Through the study of 267 call audio from the call center of a Chinese enterprise, this study found that customer interaction justice during a phone call has a significant impact on the results of that call. The result of a call means the extent of willingness to further the purchase of products and the satisfaction shown by the customer. The more respectful the customer is to the call center employee and the more active the customer responds, the better the result of the call. The emotion of call center employees has played a partially intermediary role in the relationship between the two. The internal mechanism is: the fairer the interpersonal interaction and information interaction of customers during the call, the more happy emotion the call center employee experiences, so that the better the call results are.

6.2 Theoretical Significance

This study enriches and expands the existing research field of customer relationship management (CRM) systems, and the evaluation method of employees' emotion. The specific theoretical contribution is reflected in the following two aspects:

First, this study is a supplement to the literature on improving the use of CRM systems. It is depending on customer service employees for CRM systems to play the value. However, the existing literature mostly studies how to improve the efficiency of CRM systems from the aspects of CRM software and key technologies, ignoring the employee efficiency of the use of CRM systems. This study fills in this gap.

Second, this study revealed the immediacy effect of call center employees' emotion using dynamic observations. Real-time emotional state of employees is analyzed by dynamic observation. Compared with the static emotional data collected in existing studies in relevant fields, the authenticity of the emotional data obtained is greatly improved.

6.3 Practical Significance

In today's fierce competitive environment, e-commerce businesses need to recognize the consequences of impolite and disrespectful customers affecting front-line service staff. By restoring the call center employees' emotion in each call, we found that this consequence is not only in the dimension of individual, but also in the enterprise dimension.

Commerce enterprises should actively provide emotional counseling channels and emotional management methods for call center personnel. By controlling the negative emotions, companies can block the channel of negative emotional events reducing employees' performance. Equally importantly, e-commerce companies need to recognize that negative emotional events are happening in real time throughout the calls. Therefore, the emotional guidance and control provided to the employees should not only be carried out at a general point, but should also be in real-time. For example, e-commerce enterprises can set up some enlightening prompts on the desk, so that call center employees can remind themselves to ease their emotions. In conclusion, e-commerce enterprises should pay attention to the real-time emotions in call center employees in the calling process, so as to improve their immediate performance. If so, the effect of CRM systems will be more fully manifested.

Also, CRM systems in e-commerce enterprises should improve the algorithms for mining potential customers to achieve more accurate customer identification. Because customers who are mistaken for having demand are more likely to show injustice interaction behavior when communicating with call center employees, causing negative emotions, and eventually leading to the decline of customer service performance.

References

1. Barsade BG, Gibson DE (2007) Why does affect matter in organizations? *J Acad Manag Perspect* 21(1)

2. Colquitt JA, Conlon DE, Wesson MJ, Porter COLH, Ng KY (2001) Justice at the millennium: a meta-analytic review of 25 years of organizational justice research. *J Appl Psychol* 86:425–445
3. Dallimore KS, Sparks BA, Butcher KJ (2007) The influence of angry customer outbursts on service providers' facial displays and affective states. *J Serv Res* 10(1):78–92
4. Rupp DE, Spencer S et al (2006) When customers lash out: the effects of customer interactional injustice on emotional labor and the mediating role of discrete emotions. *J Appl Psychol*
5. Fredrickson BL, Levenson RW (1998) Positive emotions speed recovery from the cardiovascular sequelae of negative emotions. *J Cogn Emotion* 12(2)
6. Fredrickson BL, Joiner T (2002) Positive emotions trigger upward spirals toward emotional well-being. *J Psychol Sci* 13(2)
7. Grandey AA, Dickter D, Sin H-P (2004) The customer is not always right: customer verbal aggression and Emotion Regulation of service employees. *J Organ Behav* 25(3):397–418
8. Liu X, Yang DT (2015) Influence of interaction justice on work engagement the intermediary role of trust leadership and the regulatory role of self-construction. *J Soft Sci* 29(03):84–87
9. Qi JY, Li HZ, Wu JL (2002) Discussion of customer relationship managements. *J Ind Eng J* 5(4):21–25
10. Rupp DE, Cropanzano R (2002) The mediating effects of social exchange relationships in predicting workplace outcomes from multifoci organizational justice. *J Organ Behav Hum Decis Process* 89:925–946
11. Viswesvaran C, Ones DS (2002) Examining the construct of organizational justice: a meta-analytic evaluation of relations with work attitudes and behaviors. *J Bus Ethics* 38:193–203
12. Wegge J, van Dick R, Fisher GK et al (2010) A test of basic assumptions of Affective Events Theory (AET) in call centre work. *Br J Manage* 17(3):237–254
13. Weiss HM, Cropanzano R (1996) Affective events theory: a theoretical discussion of the structure, causes and consequences of affective experiences at work. *Res Organ Behav* 18(3):1–74
14. Wen ZL, Zhang L, Hou JT et al (2004) Mediating effect testing program and its application. *Acta Psychol Sin* 5:614–620
15. Zhang Y (2009) Study on job burnout in telephone customer service center staff. *Jiangsu Bus Theory* 07:132–133
16. Zheng XM, Liu X (2016) The effect of interactive justice on employees' happiness: the intermediary role of psychological authorization and the regulatory distance of power. *Psychol Newspaper* 48(06):693–709

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