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Empirical Research on Brand Spillover Effect of Agricultural Product under the Background of Product Injury Crisis

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Abstract By referring to attribution theory, influence factor and internal mechanism of crisis brand generating two kinds of spillover effects are explored. In this paper, the influence mechanism on spillover effect is explored from the angles of network and industry information. Results show that high online review dispersion is easy to cause that consumer attributes the responsibility to the outside of the enterprise, while low online review dispersion is easy to cause that consumer attributes the responsibility to the inside of the enterprise; high industry base rate information is easy to cause that consumer attributes the responsibility to the outside of the enterprise, while low industry base rate information is easy to cause that consumer attributes the responsibility to the inside of the enterprise. When consumer attributes the responsibility to the outside of the enterprise, infectious network spillover is easy to occur. When consumer attributes the responsibility to the inside of the enterprise, contrast network spillover is easy to occur. Consumer's existing brand knowledge regulates the influence of online review dispersion on responsibility attribution and the influence of industry base rate information on responsibility attribution. Research result could provide effective theoretic reference and management suggestion for crisis enterprise and even whole industry responding to product injury crisis.

Key words Product injury crisis, Online review dispersion, Industry base rate information, Spillover effect

1 Introduction

With continuous popularization of Internet technology, negative information on repeated product injury incidents is also quickly spreading in the network. A lot of negative reviews quickly spread and form a hot spot of public opinion, which continuously attracts netizens to participate in discussion and dissemination, thereby making the negative impact of product injury incident spill over to crisis enterprise, competitive enterprise and even whole industry. Therefore, it is crucial to explore influence factor and internal mechanism of spillover effect regardless of the crisis enterprise or the competition enterprise. At the present stage, domestic and foreign relevant researches mostly concern negative spillover effect of product injury crisis. Crafton thinks that product injury crisis has negative spillover effect on competitor by studying automobile industry. Roehm *et al.* find that the similarity of product attributes from crisis brand and competition brand affects negative spillover of competition brand under product injury crisis. Votolat *et al.* study internal spillover effect of enterprise by product injury crisis, and find that ability type of brand scandal causes stronger negative spillover effect than moral type under the low fault endorsement situation. Jing Fengjie *et al.* also explore negative spillover effect of product injury crisis attribute especially negative spillover effect of group occurrence attribute. Positive spillover effect is not often considered. Besides the spillover phenomenon of "the gates of fire affecting the fish", the other spillover phenome-

non of "blessing in disguise" also exists. For example, Wahaha Group obtains consumers' trusts because of rigorous and earnest attitude displayed in the event of "Hentianran containing *Clostridium botulinum*". Therefore, spillover effect is divided into two types: contrast and infectious by referring to the existing results in this paper, and research framework on spillover effect of crisis enterprise under injury crisis background of agricultural product is constructed. Concretely saying, spillover effect is divided into two types: contrast and infectious, and the influence models of industry base rate information and online review dispersion on spillover effect are established. Meanwhile, the regulation effect of existing brand knowledge of consumer is also studied.

2 Theory bases

2.1 Product injury crisis and spillover effect Siomkos *et al.* think that product injury event indicates the incident appearing occasionally and widely publicized on one product having defect or threatening consumer. After that, Dawar *et al.* also define product injury crisis, and think that it is complex situation faced by enterprise or related interest body when product insecurity or dangerous event occurs^[1]. Domestic and foreign scholars more accept and use the definition of product injury crisis by Siomkos *et al.*, and the definition is also used in this paper. At the present stage, product injury crisis not only occurs in individual country but also frequently occurs in global range^[2-3]. Especially in agricultural product industry, product injury event is even more often than not. At present, the researches on product injury crisis mainly concentrate in four aspects: product injury type^[4-9], generation cause^[2-3, 10], caused impact^[11-12] and responding manner of crisis enterprise^[13-14]. Spillover effect mainly indicates that one behavior or feature of a subject could affect another subject with cer-

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tain relation with the subject but without the behavior or feature^[15]. The existing researches on spillover effect involve different sub-brands from a brand family^[16] and different brands^[17]. Feldman *et al.* propose accessibility – diagnosticity framework when studying spillover effect^[18]. "Accessibility – diagnosticity" framework is the most typical and important. Lang *et al.* think that industry effect could occur after product injury crisis^[19], and industry effect mainly contains contrast/competitive spillover effect and contagious/infectious spillover effect^[20–22]. In this paper, referring to classification manner of spillover effect mentioned above, spillover effect of agricultural product injury event is divided into two kinds: infectious spillover effect and contrast spillover effect. There are more researches on negative spillover of agricultural product injury crisis, which mostly concerns infectious spillover effect, and fewer researches contain contrast spillover effect. In this paper, two kinds of spillover effects and internal mechanism and influence factor of crisis enterprise generating different spillover effects under the background of agricultural product injury crisis are explored.

2.2 Online review dispersion and industry base rate information Online review dispersion indicates dispersion degree of positive and negative information of online word of mouth. Smaller dispersion illustrates that review is consistent, while larger dispersion shows review is inconsistent. Godes *et al.* find that audience rating of TV program is affected greatly by online review dispersion^[23]. Hu *et al.* also find that most of Amazon online reviews show wave peak distribution^[24]. It is clear that online review has certain whole feature. Cui *et al.* point out that most of researches only study single dimension of online review. Therefore, it is necessary to study the influence of online review on spillover effect from comprehensive dimension. Industry base rate information indicates crisis occurrence frequency or recall frequency in one industry under the scene of product injury crisis^[6]. In actual environment, people use uncertain information to make inferences and decisions via three manners. The first manner is Classical Bayesian Norms, which is also called as cognition processing and reasoning method^[25]. It is thought that people mainly take probability and statistical rule as the basis of judgment and decision making in real life. The second manner is "heuristic-deviation model" opinion. It is thought that people could have an association of deviating from probability and fallacy when facing the uncertainty event, and the phenomenon of "neglecting base rate information" occurs. The third opinion is ecological rational model. It is thought that people could spontaneously use the limited time, knowledge and calculation ability for corresponding judgment and selection when facing uncertain event. In this paper, how base rate information of product injury event in crisis enterprise to affect consumer's judgment under the background of agricultural product injury crisis is explored. Classical Bayesian Norms is used in this paper, and it is thought that consumer could judge and make a decision based on the existing industry base rate information (occurrence frequency of crisis in one industry).

3 Model and hypothesis

3.1 Online review dispersion and responsibility attribution of crisis enterprise Park *et al.* think that online review belongs to a kind of eWOM and mainly indicates positive or negative review published in network platform after online shopping by consumer^[26], and consumer is easy to be guided and affected by online review^[27]. In this paper, online review dispersion is defined as dispersion of positive and negative information of internet word of mouth. Attribution theory is proposed by Heider, and is defined as the process of individual attributing behavior to the individual itself or the external environment by analyzing his and other's behaviors. According to the attribution model of Kelley^[28], in human perception process, human behavior could be attributed to internal or external causes according to three standards: (i) consistency, if human behavior is consistent in different times; (ii) universality, if percept induces the same reaction on someone else; (iii) difference, if percipient responds to other percepts in the same manner. When most people act as the same as actors, observer may attribute actor's behavior to external part; when consistency decreases, it is easy to attribute behavior to internal part^[29–30]. Based on the universality principle of Kelley^[28], when consumer faces low-dispersion online review, due to consistent word of mouth from most netizens and higher consensus, consumer is easy to attribute review's dispersion to product or enterprise^[31]. Facing high-dispersion online review, due to scattered and inconsistent netizen's word of mouth and not reaching consensus, consumer is easy to attribute dispersion of online review to reviewers themselves^[31]. Because that each online reviewer's personality and opinion have difference, when product injury crisis occurs, consumer could not tend to attribute the responsibility to the inside of crisis enterprise when facing higher-dispersion online review. Therefore, below hypotheses are proposed. H1a: when online review has high dispersion, it is easy to cause that consumer attributes the responsibility to the outside of enterprise; H1b: when online review has low dispersion, it is easy to cause that consumer attributes the responsibility to the inside of enterprise.

3.2 Industry base rate information and responsibility attribution of crisis enterprise Industry base rate information indicates crisis occurrence frequency or recall frequency in one industry under the scene of product injury crisis. When product injury or recall event frequently occurs in one industry, consumer is easy to think that the industry has some common problems, and many enterprises could not avoid or subtly abide by "hidden rule of the industry". Therefore when industry base rate information is high, consumer is easy to attribute responsibility to the outside of enterprise and some uncontrollable factors of an enterprise^[32]. On the contrary, when industry base rate information is low, it illustrates that the industry has good character, and consumer is easy to attribute responsibility to the inside of enterprise and some controllable factors of an enterprise^[32]. Therefore, the below hypotheses are proposed. H2a: when industry base rate information is high, it is easy to cause that consumer attributes responsibility to the out-

side of enterprise; H2b: when industry base rate information is low, it is easy to cause that consumer attributes responsibility to the inside of enterprise.

3.3 Regulation effect of existing brand knowledge When crisis occurs, consumer accepts new information of related product, and the existing brand knowledge could make consumer generate contradiction. To solve the conflict, consumer starts to treat the relationship between the existing knowledge and new knowledge. The researches prove that good brand knowledge could make enterprise affected by negative information as little as possible in crisis event via halo effect^[4]. Good enterprise knowledge shows that consumer has good trust on enterprise, and consumer could trust the opinion issued by crisis enterprise. Therefore, below hypotheses are proposed. H3a: when the existing brand knowledge of consumer is positive, the impact of online review dispersion on attribution will be weakened, and vice versa; H3b: when the existing brand knowledge of consumer is positive, the impact of industry base rate information on attribution will be weakened, and vice versa.

3.4 Responsibility attribution of crisis enterprise and spillover effect Bosch *et al.* find that positive and negative spillovers

simultaneously exist in product injury crisis, that is to say, product injury crisis may generate negative or positive spillover on competitor^[33]. Lei *et al.* find that seriousness and attribution of crisis could affect the spillover effect of product injury crisis in brand combination, in which attribution plays a leading role^[6]. After injury event of agricultural product occurs, when consumer could attribute the responsibility to the inside of crisis enterprise, it is thought that product injury event is caused by controllable factors inside the enterprise. Therefore, consumer could be angry with enterprise, thereby selecting substitute products or products from competitive enterprises to punish crisis enterprise, namely generating contrast spillover effect. When consumer thinks that product injury event is caused by uncontrollable factors outside the enterprise, consumer is very easy to think that whole industry could not avoid it, and infectious spillover effect will be generated. Therefore, below hypotheses are proposed. H4: when consumer attributes the responsibility to the outside of enterprise, infectious spillover effect is easy to occur; H5: when consumer attributes the responsibility to the inside of enterprise, contrast spillover effect is easy to occur. In summary, research framework is shown as Fig. 1.

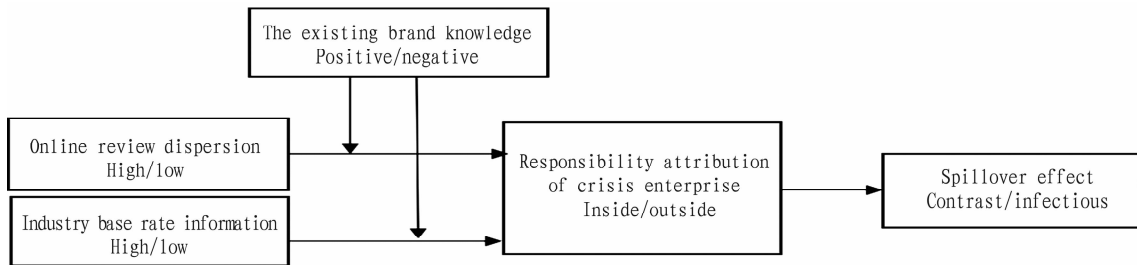


Fig. 1 Theoretic model of the research

4 Research methods

4.1 Experiment design There are two experiments in this research, and twelve sets of questionnaires are designed. Experiment one is conducted by two parts, which mainly verifies H1a, H1b, H3a, H4 and H5. Among them, experiment one A has two sets of questionnaires, which mainly verifies the impact of online review dispersion on spillover effect via responsibility attribution. Experiment one B has four sets of questionnaires. 2(online review dispersion: high / low) \times 2(brand knowledge: positive / negative) of inter-group experimental design is used to simulate four kinds of situations, which mainly verifies the impact of online review dispersion on spillover effect and regulation effect of existing brand knowledge of consumer. Experiment two is also conducted in two parts, which mainly verifies H2a, H2b, H3b, H4 and H5. Among them, experiment two A has two sets of questionnaires, which mainly verifies the impact of industry base rate information on spillover effect via responsibility attribution. Experiment two B has four sets of questionnaires. 2(industry base rate information: high / low) \times 2(brand knowledge: positive / negative) of inter-group experimental design is used to simulate four kinds of situations, which mainly verifies the impact of industry base rate information on spillover effect and regulation effect of existing brand knowledge

of consumer.

4.2 Pre-experiment Experiment method is used for research. Stimulus materials of online review dispersion and industry base rate information are measured in 60 college students. Firstly, the questionnaires (two kinds: 60 copies of class A questionnaires, two combinations of "online review dispersion"; 60 copies of class B questionnaires, two combinations of "industry base rate information") are randomly given to the subjects. Besides stimulus materials, the questionnaire also contains the definitions of online review dispersion and industry base rate information, and then it requires that the subjects judge the level of stimulus material according to the understanding. Results show that the subject could distinguish the levels of online review dispersion ($M_{\text{high dispersion}} = 5.21$, $M_{\text{low dispersion}} = 3.11$, $t(56) = 6.14$, $P < 0.001$) and industry base rate information ($M_{\text{high base rate information}} = 5.67$, $M_{\text{low base rate information}} = 3.58$, $t(56) = 4.80$, $P < 0.001$). Therefore, four copies of stimulus materials could be distinguished well in pre-experiment. Specific design of stimulus material in normal experiment is as below. (i) Product injury crisis. Based on injury crisis of agricultural product industry, considering universality and familiarity of the product, the research selects food as stimulus class. Experiment one takes real event of "spoiled fruits (blind fruit) being extracted

into brand A juice" reported in Sina Finance as the background. Experiment two takes real event of "delicious duck tongue, be careful of 'sweet' pitfall" reported in Sina Finance as the background. (ii) Online review dispersion. After injury crisis of brand A juice occurs, a lot of discussion is induced on the Internet, and netizens also express their opinions. In experiment one, the control of high online review dispersion selects some clear opinions, containing not only angrily condemning and promising no longer buying but also pardonable to select injured fruit for juice processing. The control of low online review dispersion selects unified opinion, namely angrily condemning and promising no longer buying. (iii) The existing brand knowledge. The existing positive brand knowledge control of experiment one is that "as far as you know, brand A juice is famous brand of Chinese fruit juice market and the represent of excellent-quality juice in the hearts of consumers. Juice of brand A is loved by the vast number of consumers with good taste and innovative package". The existing positive brand knowledge control of experiment two is that "as far as you know, brand KM snacks is famous brand of Chinese snacks industry and the representative of excellent-quality and best-selling snacks in the hearts of consumers". The existing negative brand knowledge control is that "as far as you know, brand KM snacks is not strong one in Chinese snacks market. Your friends vomited and had watery stools after eaten brand KM snacks. You think that brand KM snacks has single variety and general taste". (iv) Industry base rate information. Stimulus material of high industry base rate information in experiment two is that "quality problems are frequently exposed in meat products and snacks industry, such as pork hip, jerky and pot-stewed fowl, and a number of food safety problems were exposed from 2014 to 2015. This kind of food problems mainly show as anti-septic exceeding the standard, suspicious meat source, microorganism exceeding the standard, dirty and messy operation room, adding cyclamate and capsicum oleoresin. Whether it's a well-known brand or an ordinary brand, they are all affected in the exposure of quality problem". Stimulus material of low industry base rate information is that "meat snacks industry is always viewed as conscience industry, such as pork hip, jerky and pot-stewed fowl. Except some small workshops, snacks from most of brands pass national detection. Therefore, product injury event is rarely to occur in the industry, and consumer could set his mind at rest to eat".

4.3 Measurement tools Responsibility attribution of crisis en-

terprise is mainly measured by the scale, and the scale mainly refers to the research of Grégoire *et al.* [34], and is revised by combining local situation, forming 6 items, in which 3 items measure internal causes and 3 items measure external causes. Each item uses 7-level Likert scale for scoring, and 1–7 respectively show strongly disagree, relatively disagree, disagree, general, agree, relatively agree and very agree. The measurement items on infectious spillover effect and contrast spillover effect are from expert's opinion and the inspection on actual situation, forming 4 items. Each item uses 7-level Likert scale for scoring, and 1–7 respectively show strongly disagree, relatively disagree, disagree, general, agree, relatively agree and very agree.

5 Data analysis

5.1 Experiment one 240 copies of questionnaires are issued in the experiment one (160 copies online and 80 copies below the line), and 220 copies of effective questionnaires are recovered, with actual recovery of 91.67% (78 copies of questionnaires in experiment one A and 142 copies of questionnaires in experiment one B). Among them, female samples are 132 copies, accounting for 60%, while there are 88 copies of male samples, accounting for 40%. Firstly, experiment one A uses single-factor variance analysis to test hypothesis. Analytic result shows that online review dispersion significantly affects consumer's responsibility attribution to inside and outside of crisis enterprise. When subject accepts high or low online review dispersion control, internal attribution has significant difference ($M_{\text{internal attribution - high review dispersion}} = 2.437$, $M_{\text{internal attribution - low review dispersion}} = 5.926$, $F = 9.677$, $P = 0.003$). When subject accepts high or low online review dispersion control, external attribution has significant difference ($M_{\text{external attribution - high review dispersion}} = 4.879$, $M_{\text{external attribution - low review dispersion}} = 2.133$, $F = 20.712$, $P < 0.001$). Therefore, H1a and H1b are verified. Secondly, experiment one A uses stepwise linear regression analysis method to test hypothesis. Taking infectious spillover effect and contrast spillover effect as the dependent variables, and internal attribution and external attribution as independent variables, stepwise regression is conducted. Regression finds that external attribution tends to significantly affect infectious spillover effect, while internal attribution tends to significantly affect contrast spillover effect (Table 1). Therefore, H4 and H5 are verified.

Table 1 Regression analysis of experiment one A

Model	Independent variable	Unstandardized coefficient		Standardized coefficient	<i>t</i>	Sig
		Coefficient	Standard error	Coefficient		
Dependent variable: infectious spillover effect	Constant	4.558	0.301		16.581	0.000
	External attribution	0.382	0.067	0.296	4.823	0.000
	Constant	4.397	0.344		14.091	0.000
	External attribution	0.316	0.079	0.259	3.901	0.000
	Internal attribution	0.069	0.076	0.036	0.489	0.062
Dependent variable: contrast spillover effect	Constant	5.304	0.320		16.602	0.000
	Internal attribution	0.457	0.071	0.397	6.149	0.000
	Constant	5.031	0.351		14.524	0.000
	Internal attribution	0.413	0.081	0.384	6.633	0.028
	External attribution	0.129	0.069	0.103	1.801	0.073

Similarly, firstly experiment one B uses single-factor variance analysis to test hypothesis. Analytic result shows that online review dispersion significantly affects consumer's responsibility attribution to inside and outside of crisis enterprise. When subject accepts high or low online dispersion control, internal attribution has significant difference ($M_{\text{internal attribution - high review dispersion}} = 3.040$, $M_{\text{internal attribution - low review dispersion}} = 4.936$, $F = 284.293$, $P < 0.001$). When subject accepts high or low online dispersion control, external attribution has significant difference ($M_{\text{external attribution - high review dispersion}} = 5.470$, $M_{\text{external attribution - low review dispersion}} = 2.547$, $F = 290.477$, $P < 0.001$). Therefore, H1a and H1b are verified. Secondly, to verify mediation effect of attribution tendency, experiment one B refers to the method proposed by Wen Zhonglin *et al.* [35] to test, and result is

Table 2 Test of mediation effect of consumer attribution tendency in experiment one B

Item	Independent variable	Dependent variable	c	a	b	c'
External attribution	High online review dispersion	Infectious spillover effect	0.789 *	0.886 *	0.923 *	0.451 *
Internal attribution	Low online review dispersion	Contrast spillover effect	0.795 *	0.871 *	0.623 *	0.364 *

Note: * shows $P < 0.05$.

Finally, experiment one B uses multi-factor variance analysis to test hypothesis. Wen Zhonglin *et al.* propose that multi-factor variance analysis could be used to test moderating effect when independent variable and moderator variable are both categorical variables, and cross effect in multi-factor variance analysis is moderating effect [35]. Seen from Table 3, the interaction item of online review dispersion \times brand knowledge significantly affects internal attribution tendency ($F = 18.750$, $P < 0.001$) and external attribution tendency ($F = 8.295$, $P < 0.001$) of consumer. Under the control of high online review dispersion, different brand knowledge

shown as Table 2. The first step tests the significance of regression coefficient (c) of independent variable to dependent variable; the second step tests the significance of regression coefficient (b) of independent variable to mediator variable; the third step tests the significance of regression coefficient (a) of mediator variable to dependent variable; the fourth step tests the significance of regression coefficient (c') of independent variable to dependent variable under the situation of controlling mediator variable. Seen from stepwise regression result, the mediation effect of external responsibility attribution exists in the impact of high online review dispersion on infectious spillover effect; there exists the mediation effect of internal responsibility attribution in the impact of low online review dispersion on contrast spillover effect. Therefore, H4 and H5 are verified again.

significantly affects consumer's attribution tendency ($F = 3.034$, $P = 0.017$), and response value of negative brand knowledge ($M_{\text{external attribution - negative knowledge}} = 4.811$) is significantly more than that of positive brand knowledge ($M_{\text{external attribution - positive knowledge}} = 4.236$). Under the control of low online review dispersion, different brand knowledge significantly affects consumer's attribution tendency ($F = 13.400$, $P = 0.007$), and response value of negative brand knowledge ($M_{\text{internal attribution - negative knowledge}} = 4.970$) is significantly more than that of positive brand knowledge ($M_{\text{internal attribution - positive knowledge}} = 4.379$). Therefore, H3a is verified.

Table 3 Regulation effect of the existing brand knowledge

Item	Negative brand knowledge		Positive brand knowledge		F value	Sig
	High online review dispersion ($n = 54$)	Low online review dispersion ($n = 57$)	High online review dispersion ($n = 59$)	Low online review dispersion ($n = 50$)		
External attribution	4.811	4.120	4.236	4.089	8.295	0.000
Internal attribution	4.027	4.970	4.106	4.379	18.750	0.000

5.2 Experiment two 200 copies of questionnaires are issued in the experiment two (100 copies online and 100 copies below the line), and 180 copies of questionnaires are recovered, with actual recovery of 90% (80 copies in experiment two A and 100 copies in experiment two B). Among them, there are 117 female samples, accounting for 65%; 63 male samples, accounting for 35%. Firstly, experiment two A uses single-factor variance analysis to test hypothesis. Analytic result shows that industry base rate information significantly affects consumer's responsibility attribution to inside and outside of crisis enterprise. When subject accepts high or low industry base rate information control, internal attribution has significant difference ($M_{\text{internal attribution - high industry base rate information}} = 3.119$, $M_{\text{internal attribution - low industry base rate information}} = 5.237$, $F = 18.990$, $P < 0.001$). When the subject accepts high or low industry base rate information control, external attribution has significant difference ($M_{\text{external attribution - high industry base rate information}} = 4.806$, $M_{\text{external attribution - low industry base rate information}} = 2.718$, $F = 37.645$, $P < 0.001$).

Therefore, H2a and H2b are verified. Secondly, experiment two A uses stepwise linear regression manner to test hypothesis. Seen from Table 4, external attribution tendency significantly affects infectious spillover effect, while internal attribution tendency significantly affects contrast spillover effect. Therefore, H4 and H5 are verified.

Similarly, firstly experiment two B uses single-factor variance analysis to test hypothesis. Analytic result shows that industry base rate information significantly affects consumer's responsibility attribution to crisis enterprise. When the subject accepts high or low industry base rate information control, internal attribution has significant difference ($M_{\text{internal attribution - high industry base rate information}} = 2.987$, $M_{\text{internal attribution - low industry base rate information}} = 4.112$, $F = 84.275$, $P < 0.001$). Similarly, when the subject accepts high or low industry base rate information control, external attribution has significant difference ($M_{\text{external attribution - high industry base rate information}} = 5.103$, $M_{\text{external attribution - low industry base rate information}} = 2.619$, $F = 190.430$, $P < 0.001$). Therefore, H2a and H2b are verified again. Second-

ly, to verify the mediation of attribution tendency, experiment two B also refers to the method proposed by Wen Zhonglin *et al.* [35] to test hypotheses. Seen from stepwise regression result, there exists the mediation of external responsibility attribution in the impact of

high online review dispersion on infectious spillover effect; the mediation of internal responsibility attribution exists in the impact of low online review dispersion on contrast spillover effect. The result is shown as Table 5, and H4 and H5 are verified again.

Table 4 Regression analysis of experiment two A

Model	Independent variable	Unstandardized coefficient		Standardized coefficient	<i>t</i>	Sig
		Coefficient	Standard error	Coefficient		
Dependent variable: infectious spillover effect	Constant	6.711	0.344		18.810	0.000
	External attribution	0.436	0.058	0.317	5.482	0.000
	Constant	4.769	0.394		15.592	0.000
	External attribution	0.307	0.092	0.268	3.561	0.000
Dependent variable: Contrast spillover effect	Internal attribution	0.039	0.073	0.029	0.576	0.058
	Constant	5.116	0.318		15.512	0.000
	Internal attribution	0.448	0.069	0.389	6.122	0.000
	Constant	4.782	0.349		15.245	0.000
	Internal attribution	0.407	0.078	0.364	6.544	0.011
	External attribution	0.024	0.071	0.019	1.791	0.063

Table 5 Test of mediation effect of consumer attribution tendency in experiment two B

Item	Independent variable	Dependent variable	c	a	b	c'
External attribution	High industry base rate information	Infectious spillover effect	0.701 *	0.701 *	0.853 *	0.239 *
Internal attribution	Low industry base rate information	Contrast spillover effect	0.674 *	0.511 *	0.569 *	0.322 *

Note: * shows $P < 0.05$.

Finally, experiment two B uses multi-factor variance analysis to test hypothesis. Seen from Table 6, the interaction term of industry base rate information \times brand knowledge significantly affects internal attribution tendency ($F = 20.735, P < 0.001$) and external attribution tendency ($F = 7.995, P < 0.001$) of consumer. Under the control of high industry base rate information, different brand knowledge significantly affects consumer's attribution tendency ($F = 4.014, P = 0.005$), and response value of negative brand knowledge ($M_{\text{external attribution - negative knowledge}} = 4.970$) is significantly

larger than that of positive brand knowledge ($M_{\text{external attribution - positive knowledge}} = 4.122$). Under the control of low industry base rate information, different brand knowledge significantly affects consumer's attribution tendency ($F = 12.817, P = 0.008$), and response value of negative brand knowledge ($M_{\text{internal attribution - negative knowledge}} = 4.873$) is significantly more than that of positive brand knowledge ($M_{\text{internal attribution - positive knowledge}} = 4.301$). Therefore, H3b is verified.

Table 6 Regulation effect of the existing brand knowledge

Item	Negative brand knowledge		Positive brand knowledge		<i>F</i> value	Sig
	High online review dispersion ($n = 54$)	Low online review dispersion ($n = 57$)	High online review dispersion ($n = 59$)	Low online review dispersion ($n = 50$)		
External attribution	4.970	4.109	4.122	4.079	7.995	0.000
Internal attribution	4.017	4.873	4.119	4.301	20.735	0.000

6 Conclusions and discussion

In this paper, a lot of research results on spillover effect are reviewed. By combining injury crisis background of agricultural product, via experiment research, the relationship between online review dispersion, industry base rate information and spillover effect is discussed, and regulation effect of the existing brand knowledge of consumer is verified. Finally, below conclusions are obtained. Firstly, high online review dispersion is easy to cause that consumer attributes the responsibility to the outside of crisis enterprise; low online review dispersion is easy to cause that consumer attributes the responsibility to the inside of crisis enterprise. High industry base rate information is easy to cause that consumer attributes the responsibility to the outside of crisis enterprise; low industry base rate information is easy to cause that consumer attrib-

utes the responsibility to the inside of crisis enterprise. Secondly, when consumer attributes the responsibility to the outside of crisis enterprise, infectious spillover effect is easy to occur; when consumer attributes the responsibility to the inside of crisis enterprise, contrast spillover effect is easy to occur. Thirdly, when consumer's existing brand knowledge is positive, the impacts of online review dispersion and industry base rate information on attribution will be weakened, and vice versa. In this paper, inherent law of the impact on spillover effect by online review distribution status and occurrence frequency of industry crisis event is revealed. Due to limited by research level and condition, there exists deficiency in this paper. Firstly, stimulus material in the research is product injury event in food industry, and application degree of the research result in other industries also remains to be discussed. Therefore,

future research could consider repeatedly verifying the reliability of the conclusion in different industries. Secondly, the research uses student sample, and the group has advantage in internal consistency, which could greatly exclude other external interference factors, but has certain limitation in external validity. In future research, it could be considered containing more sample population under the situation of effective control. Thirdly, the research uses the manner of situation simulation to obtain data, and the replacing effect may be different from consumer experience to a certain degree. Even if most of researches in academic circles use the method, its limitation can not be ignored. Therefore, future researches should continuously overcome these limitations on the existing bases.

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