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FACTORS INFLUENCING WILLINGNESS TO CONSUME GMF IN CHINESE POPULATION: THE MODERATING ROLE OF 'INFORMATION LITERACY'

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ABSTRACT

The study emphasized the factors affecting consumer perception regarding social valence view and consumer willingness to consume 'Genetically Modified Food' (GMF) in a Chinese population. The research highlighted the critical dominating role of 'Health Concerns' (toxins and genetic hazards) in consumer willingness of GMF consumption. Moreover, the GMF Labeling strongly influenced 'Benefits Perceived' (trust) in society towards GMF. The current study concludes the exciting moderating role of 'Information Literacy' as it can potentially enhance the consumers' Willingness to Consume by decreasing their 'Health Concerns' and by increasing the 'Benefits Perceived'. Further, it highlights the importance of effective communication strategy to convey the actual value of GMF to the society and stakeholders in the shortest possible time.

Keywords: Willingness to Consume; Health Concerns; Food Neophilia; Information Literacy; GM Labeling.

INTRODUCTION

The revolutionary transformation of the world accentuates the need to analyze the acceptance and the perceived attitude of the consumers towards technological innovations. Considering these risk aversion behaviors toward the technological involvement in food sciences, the concept of 'Genetically Modified Organism' (GMO) is noticeable. The term Genetically Modified Organism (GMO) can be classified as the genetic engineering technique in the discipline of biotechnology, which manipulates the genome to improve the organism(s) (Robaey, 2016a). Notably, in the context of GMO/GMF, It can be further branded into transgenic and congenic modification (Blancke *et al*., 2015). In the economic perspective, the GMO/GMF was introduced to improve the shelf life of edible products, yield maximization to benefit the grower and customer (Dizon *et al*., 2016). The importance of effective communication strategy and policy reforms have been discussed multiple times to improve the acceptance of GMO/GMF by the different researchers in the past (Frewer *et al*., 1998; Hansen *et al*., 2003; and Jayson L. Lusk, 2003). On the other hand, various behavioral, socio-psychological dimensions are also discussed to increase and improve the 'Willingness to Pay' (WTP) and 'Willingness to Accept' (WTA) (Huffman *et al*., 2007; Spence and Townsend, 2006; Steur *et al*., 2010; and Lusk *et al*., 2014).

In China, to cope with the international and national concerns about the strict safety evaluation of the GM crops, the government devotedly adopted science-based risk analysis, research and development, regulations and laws for GM-related production (Kou*et al*., 2015). For example: during the early phase of GM research and development, the State Scientific and Technological Commission's initiate the new wing 'Safety Control and Genetic Engineering' in the year 1993 and later Ministry of Agriculture's started 'Measure for Safety Control of Agricultural Biological Genetic Engineering' in the year 1996 (Kou *et al*., 2015). In the bird eye view, the inter-ministerial joint meeting of Safety Management of Agricultural Genetically Modified Organisms which comprises twelve different departments, Ministry of Agriculture, National Biosafety Committee (including critical stakeholders), Testing institutes (addressing environment and food safety concerns) are addressing all possible concerns related to testing, import, variety certification, product labeling and production (Kou *et al*., 2015). In the context of genuine institutional involvement in GMO as discussed above, the Chinese market holds unique characteristics, which demands to examine social acceptance and understanding about GMO/GMF. In the critical perspective, the economic drivers are dominating the ethical and social factors in the research evolution (Glasner, 2015; and Robaey, 2016b). The factors affecting GMO/GMF acceptance and awareness still demands to create strategic communication model to increase trust and reduce perceived risk. However, very few numbers of authors took the initiative to quantitatively measure the intentions, decision-making procedure, knowledge constructs, and the belief models of individuals towards

GMO/GMF. The purpose of the current study is to highlight the factors that can be strategically used while designing and implementing the 'smart communication strategy' for GMO/GMF acceptance. The current study comprises of two significant contributions. (1) The 'benefits perceived' of GMO/GMF and the 'health concerns' never been studied in the context of 'food neophilia,' 'knowledge about GMO/GMF' and 'GMF Labeling' in the case of GMO/GMF acceptance. (2) The moderating role of 'information literacy' is to re-examine the valence view while mapping consumers' GMF willingness to consume in China.

The studies from the western countries exist where the supportive and positive information loads turn the dark side lighter and reduce the perceived risks among the GMF consumers (Frewer, 2003). Whereas, the negative and less supportive information about GMF increases the 'Health Consciousness' (Tsatsakis *et al*., 2017) and 'neophobia' a sort of fear to technologically improved food (Ribeiro *et al*., 2016). In the current study, the Valence View is adopted that is derived from the 'Field Theory Concept' by Kurt Lewin(1939), where the individuals' view about GMF gauged over the continuum of benefits (Benefits Perceived) and risk (Health Concern). In successful GMF adoption and acceptance, the positive and supportive perception emerges, which fades the perceived risks (Scholderer and Frewer, 2003; and Christoph *et al*., 2008). While keeping the Kurt's valence view as the center of the study, the change enabling factors were taken under consideration. Specifically, perceived optimism represented by 'Food Neophilia', self-efficacy in terms of 'GM Knowledge' and facilitating conditions by highlighting the presence of 'GM Labeling' in the market place considered as the exogenous (external) factors which can comprehensively define the GM consumers' perceived view towards 'health concern' (risk) and 'benefits perceived' as value. The current study examines the citizens 'Willingness to Consume' GMF. Specifically, the lists of determinants are discussed as follows:

Food Neophilia: In the consumer market, the new entrant might experience higher consumption stimulation for its novel concept (Fenger *et al*., 2015). Literature provides evidence that new food items have a better probability of being tried by the consumer to get familiar with the taste, quality and sensory attributes (Ha and Jang, 2013). Such a tendency is recognized as food neophilia (inverse of food phobia) (Giordano *et al*., 2018). It increases the consumer tendency to adopt the new entrant (Tuncdogan and Ar, 2018) and helps to create an attitude that evolves the consumer interest to try the novelty (Giordano *et al*., 2018). The neophilic consumer is considered to be a better judge of taste and hedonic perspectives of food as they search new and better food options for sensory and sensational satisfaction (van Trijp and van Kleef, 2008), as the literature supports that the neophilia in Chinese consumers holds significant strength to define their food consumption preferences (Yang *et al,* 2014). Moreover, GMF observed to be associated with health and environmental concerns (Castéra *et al*., 2018). In the context of the existing literature, the following hypotheses are proposed.

H1(a & b) Perceived 'Food Neophilia' have a significant effect on 'Health Concerns' and 'Benefits Perceived' among GMF consumers.

Knowledge about GMF: Consumer knowledge is the primary ingredient for explicating desired consumer behavior, particularly regarding food and food purchase decisions (Vecchione *et al*., 2015). Knowledge becomes a critical attribute to be studied, especially when GMF hold negative perception in public (Linnhoff *et al*., 2017). This urges that food consumer makes rational decisions about consumption when they are aware of associated risks in term of health; consumer acquires knowledge to develop the judgment for evaluation of the allied risk factor (Ovca *et al*., 2018). These facts highlight the importance of consumer knowledge level about products. The literature states that buyers well aware of perceived risks and perceived benefits are in better position to show a willingness to consume. In the context of the current study, the following hypotheses are proposed.

H2(a & b) Perceived 'Knowledge about GMF' have a significant effect on 'Health Concerns' and 'Benefits Perceived' among GMF consumers.

GM Labeling: England, China, Japan, and South Korea are some of the pioneer nations adopting proper measurements to address labeling concerns in the context of GMO (Phillips and McNeill, 2000). From 2001 onward, the Chinese legislation supports the declaration of GMF products in the market place for consumers. Kayabası and Mucan (2011) emphasized about labeling as a critical factor while defining consumers attitude and perception towards GMF. Labeling as compared to non-labeling increases the consumer willing to pay, and it helps to intensify the consumers' concerns (Zilberman *et al*., 2018). However, it is likely to be impossible to predict the impact of 'Labeling' over the consumer's willingness to pay or avoid, in the generalized manner (Costanigro and Lusk, 2014). In the context of the existing pool of literature, we propose the following hypothesis:

H3(a & b) The presence of 'GM Labeling' significantly effects on 'Health Concerns' and 'Benefits Perceived' among GMF consumers.

Information Literacy (moderator): The dynamics of the social context have transformed the definition of fundamental construct 'literacy' by Street (1984) in a

more specialised manner. In the brief overview of the literature, literacies evolve around the terms information, computer, library, media network and the digital sphere (Bawden, 2001). The media and source biased behavior have created more complex technological risks in society (Vilella-vila and Costa-font, 2008). In the case of GMF, electronic media holds a robust dominating position as a prime source of information (Wunderlich and Gatto, 2015), as the modern fashion of informal learning environment includes the emerging electronic modes and mediums (Zhang and Xue, 2015). Cui and Shoemaker (2018) emphasized the urgency to have basic 'scientific knowledge' to understand GMF, and ability to identify GMF in the open market. Therefore, the following hypotheses are proposed while conceptualizing the 'Willingness to Consume' GMF in China.

H4(a & b) Perceived 'Health Concern' and 'Benefits Perceived' have a significant effect on 'Willingness to Consume' GMF.

H4(c & d) 'Information Literacy' moderates the relationship of 'Health Concerns' and 'Benefits Perceived' with 'Willingness to Consume' GMF.

MATERIALS AND METHODS

To achieve the study objectives, online and offline tools of data collection were used. To reach the targeted population, social media was used, as China is the world's leading market of social networks. The current study focuses on the 'Neophilia,' 'GM Labeling' and 'Knowledge' about GMF as the exogenous factors while defining 'Willingness to Consume' the GMF in China. The following sub-section comprised of the brief detail about the measurement, data collection and analysis procedure.

Instrument: The internal reliability of the items within each construct, the validity of constructs while representing in any conceptual or theoretical model demands to be examined through a statistical approach. The proposed model of the study comprises the constructs which are adapted from the existing pool of literature. The adapted instrument of scale for each construct is shown in table 1. Specially, the items addressing citizens perceived 'GMF Labeling' (GML) adapted from Waite (2017), to examine the individuals' knowledge about 'Genetically Modified Food' adapted from Vainio and Paloniemi (2013), items for 'Food Neophilia' (FN) by Dimitrovski and Crespi (2017), the scale set for 'Benefits perceived' (BP) and 'Willingness of individuals' to consume GMF by Brunner, Delley, and Denkel (2018). Moreover, the 'perceived 'Health Concerns' inherited by Steptoe, Pollard, and Wardle (1995). To examine the moderating role of 'Information Literacy' (IL), the item scale set adapted from Adigüzel(2011). All the constructs' items gauged on the seven points Likert scale as it helps to map behavioural, psychological view of the consumers.

Table 1. The instrument of scale adopted in the current study.

Construct	Instrument of Scale	Adapted source
GM Labeling (GML)	• GM Food should be labelled as the consumer has the right to know how the product was made. • I believe GMF should be labelled, even though the Food Authority approves them. • GM food should be labelled because it may have a long-term health effect.	(Waite, 2017)
Knowledge about 'Genetically Modified Food (KGM)	• I have read a lot about 'Genetically Modified Food.' • I know roughly how 'Genetically Modified Food' works. • I can understand the consequences of 'Genetically Modified Food.''	(Vainio and Paloniemi, 2013)
Food Neophilia (FN)	• I try foods from a different culture. • When I am at a food market, I try new food. • I usually talk about what I ate or am going to eat is something	(Dimitrovski and Crespi-Vallbona, 2017)
Benefit Perception (BP)	I see an advantage of 'Genetically Modified Food.' • (convenience) • (health) • (nutritious)	(Brunner *et al*., 2018)
Health Concerns (HC)	The food I typically eat daily contains • High level of protein.	(Steptoe *et al*., 1995)

	• Keeps me healthy • Contains vitamins and minerals.	
Willingness to Consume (WoC)	• I am willing to purchase GM foods if they are available. • I intend to buy GM foods if they are available. • I plan to consume GM foods if they are available for purchase.	(Asif, *et al.,* 2017)
Information Literacy (IL)	• I know how to organize information and its details in routine life. • I am aware of the sources to look for required information in routine life. • I know where to find the information when needed in routine life. • I can understand the information type and importance of the information source I need in routine life. I use.	(Adigüzel, 2011)

Data Sampling: The structured questionnaire was translated into Chinese and considered for collecting data. During the pilot study, the pre-test sample from 10 doctoral candidates requested to participate and provided suggestions to refine the final draft of the questionnaire. The initial survey was conducted during the first quarter of the year 2018. The on campus (universities) and off campus (high street and shopping arcades) were targeted for random sampling traditionally. Individually, Hefei, Nanjing and Shanghai took under consideration for data collection.

Moreover, through electronic platforms, convenience sampling was adopted while accessing individuals over social media networks. To accelerate the pace of data collection, the follow-ups were also observed in the second half of the data collection. In total, 920 individuals were approached and requested to participate. However, only 673 respondents attempted the survey. Whereas, only 560 respondents were counted for the quantitative examination. In other words, the successful response rate of 60.87% was observed in the current study. To increase the credibility of the data, the non-response bias was measured, which produced supportive results. Specifically, the author compared the results from the head and tail of the collected data, and no significant difference was recorded between both groups of data.

Table 2. Respondents profile from the collected survey.

Demographics		**Total**
		560
Gender	Male	208
	Female	352
Age group	Under 25	324
	25 – 35	167
	Above 35	69
Geographic	Urban	377
	Rural	183
The most preferred medium for information gathering	SNS (electronic media)	417
	T.V or Print media	143
A most crucial issue related to Genetically Modified Food	Health	382
	Environment or Ethics	178

The detailed profile of the respondents is shown in Table 2. Specifically, the female respondents were comparatively found high. Moreover, the high youth population skewed the age groups distribution in the collected sample. Similarly, the 'Urban' representation was also found comparatively high in the collected sample. Interestingly, 70% of the respondents used 'Social Media' as a prime source of information gathering and opinion building. In the context of 'GMF,' most of the respondents were concerned about the 'Health issues' as compared to 'Environment and Ethics.' In economic terms, the detailed findings produced impressive lead while making the 'communication and framing strategy' about GMF for the concerned consumer market.

RESULTS

The statistical tools, i.e., SPSS Statistics (v.23) and AMOS (v.21), were adopted to examine the measurement and structural model. The AMOS provided

a supportive environment to analyse path analysis of socio-psychological behavioral models by reviewing Confirmatory Factor Analysis (CFA) and Structural Model by measuring interaction among endogenous and exogenous constructs (Hair *et al*., 2010). In the following sub-sections, the measurement model will be discussed, which will lead to the structural model of the current study.

Table 3: Exploratory Factor Analysis and reliability analysis.

Construct	Items	FL	CA	AVE	CR
Food Neophilia (FN)	FN1	.876	.932	.758	.904
	FN2	.873			
	FN3	.863			
Knowledge about 'Genetically Modified Food' (KGM)	KGM1	.872	.969	.745	.898
	KGM2	.861			
	KGM3	.866			
GM Labeling (GML)	GML1	.862	.978	.751	.900
	GML2	.869			
	GML3	.871			
Benefit Perception (BP)	BP1	.806	.922	.658	.852
	BP2	.815			
	BP3	.812			
Health Concerns (HC)	HC1	.925	.962	.842	.941
	HC2	.913			
	HC3	.916			
Willingness to Consume (WoC)	WoC1	.906	.972	.819	.931
	WoC2	.905			
	WoC3	.904			
Information Literacy (IL)	IL1	.846	.966	.708	.907
	IL2	.848			
	IL3	.812			
	IL4	.860			

FL= Factor Loading, CA= Cronbach Alpha, CR= Composite Reliability, AVE= Average Variance Extracted

Measurement Model: The EFA was performed to examine the internal reliability of each of the construct, the variance extracted from each of the variable and external validity by inspecting discriminant Validity. With the support of SPSS statistics, the data structure and each of the dimension examined, the sample adequacy and sphericity by Kaiser-Meyer-Olkin (KMO) and Bartlett test, respectively. The KMO value of .908 was noted, which is higher than the lower threshold of 0.70 (Hair *et al*., 2010). Moreover, significant p-value also supported the results to be analyzed.

The internal reliability was measured by 'Cronbach α' and 'Composite Reliability', whereas the

Table 4. Discriminant Validity of the constructs.

Const	FN	KGM	GML	HC	BP	WoC	IL
FN	**.870**						
KGM	.339**	**.863**					
GML	.504**	.366**	**.867**				
HC	-.375**	-.542**	-.416**	**.917**			
BP	.519**	.450**	.596**	-.539**	**.811**		
WoC	.290**	.505**	.308**	-.469**	.411**	**.904**	
IL	.462**	.561**	.520**	-.495**	.541**	.463**	**.841**

*** = p<0.001, ** = p<0.01, * = p<0.05

Note: Food Neophilia (FN), Knowledge about 'Genetically Modified Food (KGM), GM Labeling (GML), Benefit Perception (BP), Health Concerns (HC), Willingness to Consume (WoC), Information Literacy (IL), and the square root of AVE's mentioned in the diagonal (bold and underlined)

lower satisfactory limit of 0.70 by Fornell and Larcker (1981) was observed in the current study. The 'Average Variance Extracted' (AVE) captures the variance extracted by each construct in association with the recorded variance because of measurement error. Statistically, it is advised to be higher than 0.50 (Hair *et al*., 2014), which indicates that the current study is valid for further examination. The results derived from EFA conclude the supportive findings as the items loading in the case of each construct indicates non-significant factor loadings, as shown in table 3. Specifically, the factor loadings recorded between the range of .806 to .925.

In the psychometric analysis, the discriminant validity helped to examine the external validity of each of the construct within the proposed model. Quantitatively, it was measured by computing the square-root of each of the constructs' 'Average Variance Extracted' which was supposed to be above the inter-construct correlation. Thus, the current study also satisfied the criteria of discriminant validity, as shown in table 4.

Moreover, the variance regarding 'Inflation Factor' measured through VIF that addressed the concerns related to multi-collinearity issues in the quantitative data. Quantitatively, it supposed to be remained lower than the upper limit of 10 (Hair *et al*., 2010). In the current study, the VIF was recorded between the range of 1.603 to 2.102, which eliminated the chances of multicollinearity.

Table 5. Measurement and Structural model fitness indices.

Fitness Indices	Recommended	Measurement Model	Structural Model
Chi-Square (X^2)		438.861	550.392
The degree of Freedom (df)		188	195
CMIN / df	<5.0	2.334	2.823
GFI	.90 (Hooper *et al*., 2008)	.933	.917
AGFI	.80 (Bollen, 1990)	.909	.893
TLI	.95 (Hu and Bentler, 1999)	.981	.974
NFI	.90 (Malaquias and Hwang, 2016)	.973	.966
CFI	.95 (Hu and Bentler, 1999)	.984	.978
IFI	.95 (Hu and Bentler, 1999)	.984	.978
RMSEA	<1 (<0.08) (Hooper *et al*., 2008)	.049	.057

Structural Model: The structural analysis was initiated by performing 'Confirmatory Factor Analysis' (CFA) to revisit the construct level analysis performed by EFA previously. The CFA concluded the supporting results, as shown in table 5. The ratio of Chi-Square (X^2) / degree of freedom in the acceptable range as advised by Chin and Todd (1995). Moreover, the relative indices (NFI and TLI), absolute indices (GFI and AGFI) and non-centrality based indices (RMSEA and CFI) fulfilled the criteria as all ranged within the recommended thresholds as shown in table 5. Thus the study can be concluded valid for further structural analysis and regression path analysis.

Moreover, the common method biases were measured with the support of 'Harman's single factor analysis. Harman's factor examines each construct's ability by its ability to explain the total percentage of variance. In other words, the common method biases exist if the variance explained by a single construct was recorded above 50%. As the maximum variance explained in the current study is 38.11% that eliminated the changes in common method bias.

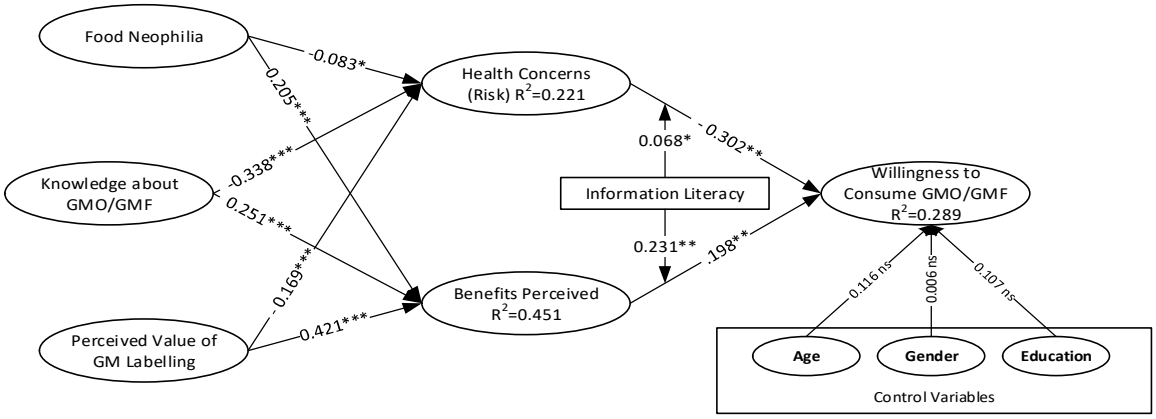

Figure 1: Graphical representation of the 'proposed model' and its path analysis.

The minimum discrepancy in the case of a structural model was recorded as 2.823, which defined the proposed model reasonably fit to be further studied. The value of RSMEA and CFI was recorded as .057 and .978 respectively, that confirms the model to be valid as per noncentrality measures. The observed value of NFI and TLI also satisfied the incremental measures of fit, as shown in table5.

The findings highlight the exciting trends while defining 'Benefits Perceived' (BP) and 'Health Concerns' (HC) by 'Food Neophilia' (FN), 'Knowledge about GMF' (FGM), and 'GM Labeling (GML). The first survey concluded that the 'Food Neophilia' holds a significant adverse effect on an individual perceived 'Health Concerns' (H1a = -.083*) in the case of GMF consumption. Moreover, positively significant relationship with 'Benefits Perceived' (H1b = .205***) among citizens has been recorded. The graphical representation of the proposed model is shown in figure 1. The 'Knowledge about GMF' (KGM) observed to be the strongest predictor which holds the negative effect while defining perceived 'Health Concerns' (H2a = -.338***). In other words, people with sound knowledge about GMF have a less critical view of its 'Health Concerns.' In the case of 'Benefits Perceived' (H2b = .251***), a significant positive relationship was observed in the initial survey. The 'GM Labeling' also observed to have a significant negative impact on perceived 'Health Concerns' of GMF as a risk (H3a = -.169***). It can be stated that GM Labeling helps to eliminate the 'perceived Risks,' in the case of GMF adoption. Moreover, 'GM Labeling' concluded as the most substantial significant positive relationship with 'Benefits Perceived' concluded in the current study (H3b = .421***). The proposed model explained that 22.1% of the variance exists in perceived 'Health Concerns', 45.1% of the variance is related to perceived 'Benefits Perceived', and 28.9% variance is related to the consumers' 'Willingness to Consume GMO/GMF. However, none of the control variables observed with significant effect while defining consumers' willingness to consume GMO/GMF in the case of China, as shown in Figure 1.

Table 6. Measurement and Structural model fitness indices.

Hypotheses	Relationship	Significance	Supported/Not Supported
H1(a)	FN+→HC-	-.083*	Supported
H1(b)	FN+→BP+	.205***	Supported
H2(a)	KGM+→HC-	-.338***	Supported
H2(b)	KGM+→BP+	.251***	Supported
H3(a)	LGM+→HC-	-.169***	Supported
H3(b)	LGM+→BP+	.421***	Supported
H4(a)	HC→WoC	-.302**	Supported
H4(b)	HC*IL→WoC	.068*	Supported
H4(c)	BP→WoC	.198**	Supported
H4(d)	BP*IL→WoC	.231**	Supported

*** = p<0.001, ** = p<0.01, * = p<0.05

Food Neophilia (FN), Knowledge about 'Genetically Modified Food (KGM), GM Labeling (GML), Benefit Perception (BP), Health Concerns (HC), Willingness to Consume (WoC), Information Literacy (IL)

Moderating effect of 'Information Literacy' over Willingness to Consume GMF: In the further examination of the proposed model of the study, the 'Information Literacy' (IL) counted as moderator while defining the relationship of 'Health Concern' (HC) and 'Willingness to Consume' (WoC) GMF. The statistical tool SPSS statistics (v.21) used. Specifically, the hierarchical regression adopted for this purpose. The unstandardized regression coefficients are shown in table 7 in the case of 'Health Concern' as an independent factor (H4a) and 'Information Literacy' as a moderator (H4c).

The 'Information Literacy' dampening the negative effect of 'Health Concerns' while defining consumers' willingness to consume is graphical, shown in figure 2 above. The interaction effect of 'Health Concern' and 'Willingness to Consume' (H4a= -.302**) observed as negatively related. Moreover, it can also be concluded that the 'Information Literacy' as moderator reduces the negative effect of 'Health Concerns' over 'Willingness to Consume' GMF (H4b= .068*) as shown in table 7.

The positive effect of 'Benefits Perceived' (BP) over 'Willingness to Consume' (WoC) recorded (H4c= .198**). The role of 'Information Literacy' examined twice in the current study. Specifically, it was revisited to understand the effect on the 'Benefits Perceived' among citizens while defining 'Willingness to Consume' GMF. For this purpose, the hierarchical regression analysis performed with the support of 'SPSS statistics.' The unstandardized regression coefficients are represented in table 8.

The 'Information Literacy' (IL) strengthening the positive relationship between 'Perceived Benefits' (PB) and consumers' 'Willingness to Consume' (WoC) as graphically shown in figure 3 above. Statistically, the positive moderating effect of 'Information Literacy' as moderator (H4d= 231**) observed in the relationship between 'Benefits Perceived' and 'Willingness to Consume' GMF as shown in table 8.

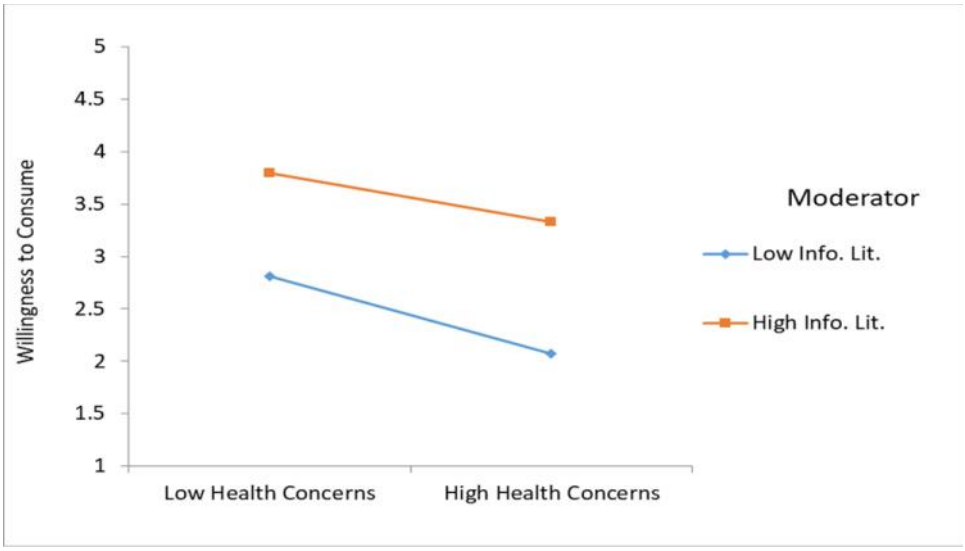

Figure 2. Moderation effect of 'Information Literacy' (IL) while defining the relationship between 'Health Concerns' (HC) and consumers' 'Willingness to Consume' (WoC).

Table 7. Moderating effect of 'Information Literacy.'

Constructs	Model1	Model 2	Model 3
Health concern	-.469***	-.311***	-.302**
Information Literacy		.321***	.561**
Health concerns * Information Literacy			.068*
F	271.165	183.851	125.217
R^2	.469	.546	.554

*** = p<0.001, ** = p<0.01, * = p<0.05

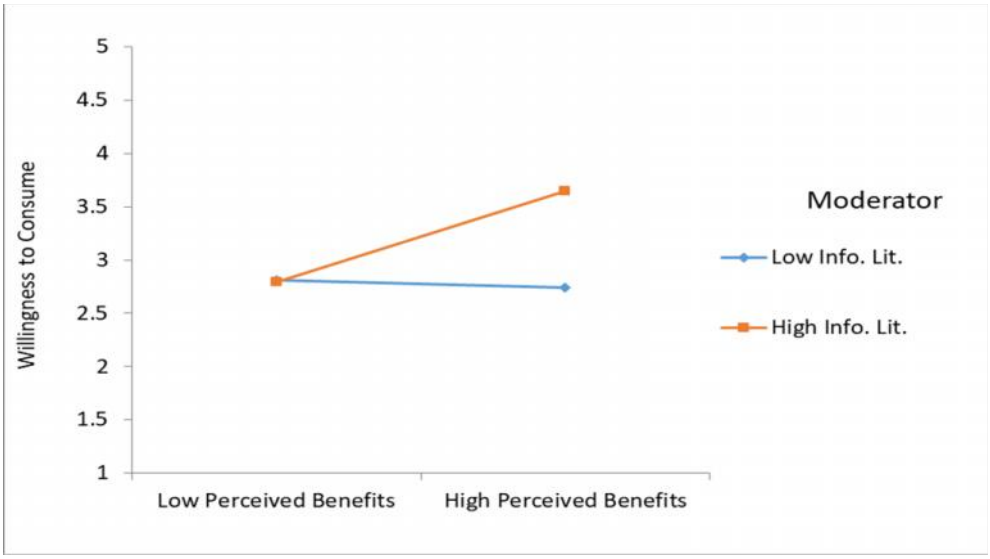

Figure 3. Moderation effect of 'Information Literacy' (IL) while defining the relationship between 'Perceived Benefits' (PB) and consumers' 'Willingness to Consume' (WoC).

Table 8. Moderating effect of 'Information Literacy.

Constructs	Model 1	Model 2	Model 3
Perceived Benefits	.411***	.277***	.198**
Information Literacy		.340***	.222**
Perceived Benefits * Information Literacy			.231**
F	113.737	164.851	144.217
R^2	.411	.501	.574

*** = p<0.001, ** = p<0.01, * = p<0.05

DISCUSSION

The study argued about the importance of the valence view to define and understand the buyer's willingness to consume GMF in society. The valence comprises 'Benefits Perceived' and 'Health Concern' as a risk while defining an individual's readiness to adopt GMF. The findings supported the model with some impressive rational and statistical results. Thus the current study marked a valued set of implications.

Theoretical Implications: The study highlighted many theoretical implications. Firstly, none of the previous studies about GMF understanding in society has applied Valence view to map 'Willingness to Consume' GMF while highlighting the role of 'Information Literacy'. The prior load of studies discussed the opinion of GMF in a more social context, attitude, demographic, sociographic and eco-graphic factors. The proposed academic view contributes to a unique essence in the intellectual structure of the knowledge sphere.

Secondly, the current study concluded the dominating role of 'Knowledge about GMF while defining perceived 'Health Concerns' in society. The negative effect of 'Food Neophilia' and weak 'Knowledge about GMF in the case of 'Health Concern' also derived exciting implications for future studies. For example, the diverse national culture, the readiness to adopt change, and possibly overlapping of 'GM Neophilia' and 'Food Neophilia' may lead to the valuable findings in the case of mapping Willingness to Consume GMF,' in context of cognitive and efficacy based constructs.

Thirdly, the study was the first initiative to examine 'Benefits Perceived' about GMF (SSI) in China by independent mapping construct of 'Food Neophilia, Knowledge about GMF and the effect of 'GM Labeling' together. The findings highlighted the driving role of 'GM Labeling' while creating individuals' perception of GMF Benefits. Moreover, the role of 'Knowledge' and 'Neophobia' (rate of uncertainty avoidance) can be reexamined and reanalyzed while mapping and executing effective communication strategies, i.e. Science Communication' / 'Science Popularization' fashion.

Fourthly, the domination of 'Health Concern' while defining 'Willingness to Consume' GMF have made the current study controversial and exciting, which can lead to enormous future studies to conceptualize the possible shift in the public understanding of GMF. Specifically, while examining H4 'Benefits Perceived' (BP) observed with less predictability power as compared to 'Health Concerns' (HC) while defining the 'Willingness to Consume' GMF (WoC). However, the exploratory power of 'Benefits Perceived' equally contributed to the understanding of 'Willingness to Consume' (WoC) with a lighter variation.

In nut-shell, the current study provoked the immediate need to understand the strategic communication value of 'GM Labeling' and 'Information Literacy' while about any Socio-Scientific Issue (SSI) through any medium as concluded by the H4 in the current study. The increase in Information Literacy may massively increase the GMF adoption rate, as it simultaneously decreased the negative concerns regarding GMF in the consumers' view as observed in the current research. The 'Willingness to Consume' GMF needs a more holistic view to understand, by covering variation of efficacies, literacies, cognitive abilities, and cultural dynamics.

Practical Implications: The important implications observed in the current study. At present, the dominating participants over different media sources about GMF related discussion include government, media, and the public. Within the sphere of general media, is comprised of commercial science communication media companies (i.e., Guokr, The-Intellectual); non-profit scientific communication organizations composed of scientists, people from all walks of life over a variety of media platforms. It emphasizes the future concerns about the 'source effect' and 'trust' in the institutions as critical determinate to understand GMF related discussion in China.

The 'Knowledge' concluded as a strong determinant to define 'Health Concern (Risk),' which leads to the dominating effect while conceptualizing 'Willingness to Consume' GMF as concluded in the current study. It can be justified, as the sources of 'weak Knowledge' or 'inaccurate data sources' include rumours, government's alignment with emerging GMO/GMF related challenges, delay of science popularization and freedom of voice. For example rumors

about GMO and GMF is fashion in China, and it includes fake news about the false harm of GMF to human and animal health, the fabricated hazard of agriculture and environment, and deceptive questions about the nutritional value of GMF. To deal with these circumstance, the Chinese government implemented a legal framework to reduce rumour by adding the law into 'Amendment IX' to the Criminal Law of the People's Republic of China on November 1, 2015. Still, the improvement of the 'Scientific Literacy' (SL) can also help the public to identify rumours and to deal with Socio-Scientific Issues more intelligently.

The mechanism to an immediate increase in the science popularization should be focused to reduce the negative impact of perceived Health Concerns regarding GMF. In the current scenario, the lag of 'Science Popularization' in society has provided an opportunity to spread the ambiguity. Therefore, the strategic use of 'crisis Communication,' 'public understanding of science' and 'science education' can be considered for the future value by creating a supportive, positive effect on GMF acceptance and favorable opinion. The positive opinion can be created by establishing government entities over all possible communication channels to actively carry out an investigation, and public communication in a strategic manner to inform the public and have two-way hyperactive, constructive communication.

Conclusion: The authors predicted the vibrant strategic role of 'GM Labeling' to reduce the negative impact of GMF related controversies about 'Health Concerns' in society. Moreover, the moderating role of Information Literacy to minimize the perceived risks, and catalyst to increase 'Benefits Perceived of GMF' is concluded. The findings highlight that citizens are 'critical stakeholder' in the case of GMF adoption and acceptance. Furthermore, the current study suggests that increasing social and institutional trust through effective communication can hold a significant effect on GMO/GMF acceptance in society. In other words, the world's one of the most populous region demands social awareness campaigns to eliminate the barriers and constraints in the acceptance of 'science-based innovation' in society.

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