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The Impact of Organizational Context on the Levels of Cross-Border E-Commerce Adoption in Chinese SMEs: The Moderating Role of Environmental Context

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Abstract: With the rapid technological developments, cross-border e-commerce (CBEC) as a sector is also expanding rapidly. In the past couple of decades, China has become a major force in promoting and developing CBEC and, therefore, it was needed to explore the various antecedents and outcomes of Chinese CBEC to expand the understanding and existing CBEC scholarship. Ample studies have been conducted to understand the antecedents and outcomes of CBEC. However, limited studies have explored such variables which can mitigate the adoption of CBEC. With this background, this empirical study was focused on addressing this gap by studying the moderating role of environmental context between organizational context and the four levels of CBEC adoption with the help of a technology-organization-environment framework. SMEs operating in China were targeted for data collection, where data were collected through an online survey. A final sample size of 208 was recorded. It was found that the organizational context has a direct and positive impact on all four levels of CBEC adoption. Furthermore, the moderating role of environmental context on Level 1 and 2 was not supported. Finally, the moderating role of environmental context on Level 3 and 4 was supported by the data. It was concluded that the organizational context plays a significant role in shaping CBEC at all four levels, whereas the environmental context has the potential to mitigate the relationships between organizational context and CBEC Level 3 and 4.

Keywords: cross-border e-commerce (CBEC); organizational context; environmental context; SMEs

1. Introduction

With the backdrop of rapid technological developments, organizations across the globe are adopting the latest technologies mainly because they bring more efficiency, cut costs, and give access for frequent interactions with stakeholders. Consequently, the adoption of the latest technological tools has become a matter of managerial concern [1]. This rapid technological advancement has made it possible for organizations to communicate, retrieve, respond, collaborate, and share knowledge not only within its employees but also with their other stakeholders such as customers, vendors, investors, and suppliers, etc. In a way, technology has democratized the usage of knowledge and information and thereby promotes creativity and innovation [2]. With so much on the plate as its perks, it is vital to understand the drivers and motivators behind the technological adoption [3].

On the other hand, small and medium organizations (SMEs) are considered as the backbone of an economy because they play the role of a catalyst in boosting up rural and urban economies and have the flexibility to adopt to changing situations [4]. According to a study conducted by [5], SMEs in most Organization for Economic Co-operation and Development (OECD) countries account for 96–99% of the total businesses and contribute to 80% in their economic growth. SMEs are also considered as the biggest employment generation sector in any country. Although SMEs vary in size, number of employees, investment volume, and annual turnover, etc., they are considered as the drivers/bedrock

of an economy [6]. Therefore, the importance of this sector in economic development of a country cannot be discounted or taken for granted.

To grow further and to take even more leverage, SMEs across the globe are turning to the adoption of innovative approaches. One such approach is the adoption of e-commerce, which provides innovative options and additional conduits to enter into different markets and expand its services, even to other countries [3], and is considered as cross-border e-commerce (CBEC). A system where the sale and purchase of goods and services are taking place from different countries through online platforms is called CBEC [7]. Studies suggest that CBEC operates between countries far from each other [8]. A study conducted by [9] reported that the volume of CBEC has reached USD 676 billion in 2018 and has recorded an impressive growth of over 27% over the last year. Another study reported that the overall volume of CBEC has reached USD 26.7 trillion in 2019 (UNACTD, 2020). This growth trajectory would even further accelerate in the aftermath of the COVID-19 pandemic and the global ban on travelling, restrictions on face-to-face interactions, and social distancing measures taken worldwide.

With this huge potential of opportunities for SMEs in CBEC, it is reasonable to understand the drivers, motivators, and even mitigating factors of CBEC adoption [3]. In the past, several studies on technological adoption have been conducted by scholars (e.g., [3,10–14], etc.); however, limited studies have considered the moderating role of potential variables that may mitigate the relationship of CBEC adoption [4,15–17]. Past studies found the moderating role of size between technological factors and health information system adoption [15]. However, this study was focused on the hospitality industry and the dependent variable was the health information system. Similarly, another study conducted in Iran by [18] tested the moderating role of organization culture in B2B e-commerce adoption by utilizing a technology-organization-environment (T-O-E) framework. In essence, literature on organization size and culture—key factors of organizational context in the T-O-E framework—vary from organization to organization and country to country [18]. It is similar to organizational context, and the environmental context for an organization would also vary, and therefore, has the potential to mitigate the CBEC adoption.

Keeping in view the above arguments, this study aimed to investigate the moderating role of environmental context between organizational context and the four levels of CBEC adoption. With few exceptions, i.e., [16,17], who have studied the moderating roles of size, industry and facilitating conditions, and trust, respectively, the overall environmental context as moderator is yet to be tested. Furthermore, three other contributions of this study can be noted. First, this study is aimed at SMEs, whereas the majority of the past studies conducted on technology adoption have focused on large organizations [1]. Second, this study is focused on the four levels of CBEC adoption as explained by [19]. Past studies are only limited to general technology adoption, which cannot clarify the impact of technology on each level of CBEC and hence is a grey area worth exploring. Third, this study explores the direct impact on different levels of CBEC adoption. Past studies have mostly taken CBEC as a single level variable. Those studies were mostly involved in studying the impact of T-O-E on general technology of e-commerce adoption [16]. Finally, the study will also help in furthering the understanding of the authors in the field of CBEC because this is a growing field and, therefore, has huge future potential career and policy level implications for them. Furthermore, one of the authors is actually practicing CBEC and, therefore, it is of high importance for him to understand the contextual influences on CBEC (see Figure 1 for conceptual framework).

In the next part of the paper, hypotheses development and literature around the topic is given. This section is then followed by detailed discussion of the methodology adopted to complete this study. Results follow suit and are further followed by detailed discussion on the results and findings, implications, and limitations, which concludes the paper.
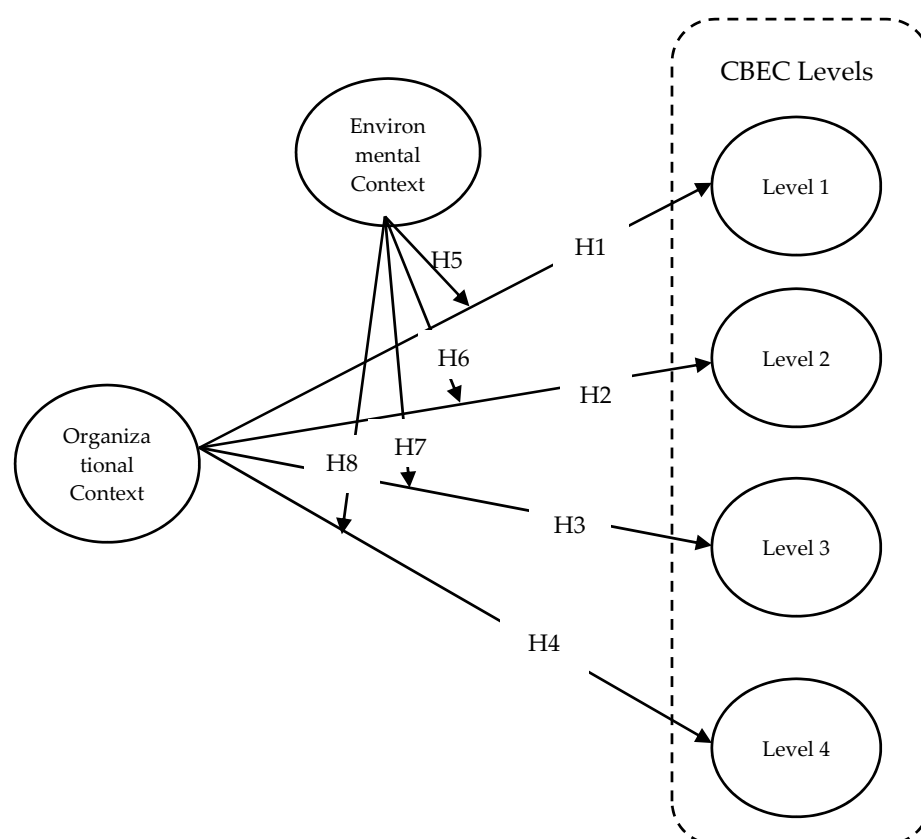
Figure 1. Conceptual framework.

2. Conceptual Framework and Hypotheses Development

2.1. Organizational Context and the Four Levels of CBEC

To explain the underlying mechanism between the proposed variables, this study adopts the T-O-E framework which suggests that three main factors or contexts are affecting the adoption of technology in any organization, i.e., technological context, organizational context, and environmental context [20]. This framework is strongly backed by numerous empirical studies in the extant literature [11,18,21,22] and hence it is the right model for explaining the proposed framework of this study. As evident from its name, the three factors affect an organization's decision for adopting any kind of technology [23]. Among these factors, technological factors cover internal and external technologies including hardware and software through which organizations extract benefits [21]; organizational factors include organizational size, managerial support, organizational policies and procedures, technological resources, organizational structure, and human resource, etc. [20], whereas environmental factors cover the competition's pressure, suppliers' pressure, regulatory and legal environment, and the country's e-readiness [23], see Table 1.

As far as the levels of CBEC are concerned, a review of the literature shows that there are several models of CBEC available from various authors (e.g., [24–29]). However, the most widely used and authentic model is the six-stage model of Lefebvre [19]. The first two levels of this model are associated with non-adopters' organizations or those SMEs who are planning to adopt CBEC in the future. To effectively address their needs, SMEs tend to adopt the four levels of CBEC; however, their effectiveness is linked with the level of adoption [30]. According to Lefebvre [19], at Level 1, SMEs make a static website to secure an online presence only. These SMEs only display basic organizational and product information along with contact details of the key personnel. There is no facility for interacting with the stakeholders, including customers, vendors, and suppliers, etc. At Level 2, SMEs further strengthen their online presence and offer the facility on their website to communicate with their customers, vendors, and suppliers, etc. At Level 3, in addition to

the facilities available at Level 2, the SMEs also provide the facility for online transactions and payments to be undertaken through their websites. Customers now have the facility to pay for the products, customize their orders, and can have a two -way communication with the organization [30]. At Level 4, SMEs electronically integrate their business operations with supply chain partners and suppliers, constituting an "online collaboration" [30].

Table 1. Summary of study variables and their characteristics.

Organizational Context	Top management support, Size of the organization, Human resource, Decentralization level, Formalization level, etc.
Technological Context	Internal, external technologies (internet, etc.), Software and hardware, Relative advantage, Complexity, Compatibility, etc.
Environmental Context	Competition's pressure, Customers' pressure, Suppliers' pressure, Regulatory and legal environment, Country's e-readiness, etc.
CBEC Levels	Level 1: Static website Level 2: Level 1 + communication with customers, vendors, suppliers Level 3: Level 2 + online transaction and payment facilities Level 4: Level 3 + integration of business operations with supply chain partners and suppliers (online collaboration)

There are numerous studies available in the extant literature that have explored the impact of organizational factors, as explained earlier, on technology adoption (see [11,18,22]), etc. Organizational factors are those characteristics of a firm which can affect the decision of adoption or non-adoption of technology, such as the levels of CBEC. For example, among the most widely held characteristics of organizational factors are the top management support and the size of an organization. It is argued that without the support of top management, organizations cannot successfully adopt any technology because it requires commitment and the decision to allocate required financial and physical resources, as well removing the barriers in implementation of CBEC [31]. On the other hand, size of an organization has mixed results. For example, a study conducted by [32] found that size has an impact on the adoption of technology, whereas [5] found no support for the organizational size in relation to the adoption of technology. Other authors argued that, compared to the large organizations who are handcuffed because of their size and less flexibility, SMEs are better positioned to adopt new technologies because of their agility [33]. Similarly, because of the constant support from the governments across the world to their informal sector (SMEs), this also gave them the opportunity to raise funds and adopt new technologies [5].

Apart from these two organizational factors, organizational readiness and skilled human resources are also key players in influencing the decision of adoption of CBEC. SMEs, because of their small size, have more highly skilled and specialized individuals. Such staff increase the potential of an organization to innovate different processes through the adoption of the latest tools and effectively take care of more complex tasks [34]. Similarly, [35] argued that an organization's HR policies depict its culture and values which play a key role in shaping the decision of technology adoption. The study further argued that those SMEs who invest more in the training and development of employees are more likely to adopt new technologies. Likewise, the decentralization level of an organization also makes them more prone to the adoption of new technologies. If organizations allow line managers to make some decisions on their own, they would better facilitate the

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adoption of technology [36–38]. SMEs are having small size and less hierarchy. Therefore, decision-making powers are often given to the line managers to speed up the processes. This approach is more susceptible to CBEC adoption.

Past studies also found positive impact of organizational factors on technology adoption. For example, [39] found the positive impact of organizational factors on the intention to adopt new technologies, [1] found a positive impact on the web knowledge exchange in SMEs, and [40] found support for adoption of e-commerce communications and application technologies (EC). In line with these findings and the earlier arguments, this study proposes that:

Hypothesis 1 (H1). *Organizational context will have a positive impact on CBEC Level 1 adoption.*

Hypothesis 2 (H2). *Organizational context will have a positive impact on CBEC Level 2 adoption.*

Hypothesis 3 (H3). *Organizational context will have a positive impact on CBEC Level 3 adoption.*

Hypothesis 4 (H4). *Organizational context will have a positive impact on CBEC Level 4 adoption.*

2.2. Moderating Role of Environmental Factors

Despite the availability of ample evidence in the extant literature on the positive impact of environmental factors on the adoption of technology (e.g., [6,23,41], etc.), no scholar has attempted to explore the moderating role of environmental factors. As explained earlier, environmental factors include the pressure of competition, the pressure of suppliers, government rules and regulations, and country's e-readiness, etc.

The pressure of competition as a moderator has been used in the past by [42–44], etc. All these studies have emphasized the market orientation of corporate managers and the intensity of competition. They argue that managers, while keeping in mind the limited resources available, carefully assess the cost and benefit analysis for their organizations. If the expected benefits are exceeded by the expected cost while keeping a market orientation, managers will change their focus. Linking this argument to our study, we propose that if managers in SMEs perceive that competition in the market is extensive and that it is beneficial for the organization to respond to such pressures such as the adoption of new technology, they will respond accordingly. However, if the competitive pressure is less severe, managers may divert their focus to other areas. Our argument is in line with that of [41,43], who suggest that the greater the strength of competition, the more hostile an organization should be to know the customer needs and wants and then respond accordingly. Therefore, more pressure from competition will make an organization more market oriented and pressure them to adopt innovative approaches for catering to customers' needs, such as adoption of CBEC. Other studies also found that if a firm believes that adoption of technology will strengthen their position against their competition, they will adopt it; however, if they believe that the benefits are less than its cost, they will not adopt it [18].

Similarly, the pressure of suppliers has been studied in a direct relationship with the adoption of technology. However, its mitigating role has been generally ignored, which may lead to uninformed decision making [16]. Studies on other related terms, such as coercive power [45] and power exercise [16], have covered the pressure of suppliers as the possessors of coercive power or power exercise. Using these studies as our theoretical foundation, we believe that if suppliers are strong enough to influence the decision making of an organization, they would coerce them to change their policies, and in this case, adopt CBEC. This is largely true in the case of SMEs because of their resource dependency on such suppliers. The greater the supplier's pressure, the more likelihood of an organization to adopt new technology [18].

The same argument can be also used for the governmental pressure and rules and regulations. Governments often make new policies and procedures which organizations must adopt. Past studies suggest that the more favorable the policies of the government

are, the more chances for adoption of CBEC [18]. The legal infrastructure of a country is an essential component in determining the success or failure of e-commerce [46]. It is worth noting that if the government policies are more open and relaxed, it will open up opportunities for hackers and, therefore, chances are that e-commerce will be negatively affected. However, if the policies are more stringent, it may not be feasible for the organizations to adopt new technology. Governments' supportive legislation also play a key role in the e-readiness of a county. The more supportive the legislation is, high speed internet connectivity is available, and organizations are facilitated for adoption of new technologies, the higher chances of its adoption, and in this case, CBEC [18]. However, the opposite will inhibit such adoption.

Therefore, in line with these arguments, we propose that:

Hypothesis 5 (H5). *The relationship between organizational context and CBEC Level 1 adoption is moderated by environmental context.*

Hypothesis 6 (H6). *The relationship between organizational context and CBEC Level 2 adoption is moderated by environmental context.*

Hypothesis 7 (H7). *The relationship between organizational context and CBEC Level 3 adoption is moderated by environmental context.*

Hypothesis 8 (H8). *The relationship between organizational context and CBEC Level 4 adoption is moderated by environmental context.*

3. Methodology

3.1. Research Design

The focus of this study was to investigate the moderating role of environmental context between the relationship of organizational context and the four levels of CBEC adoption. We collected the data from CEOs and owners of SMEs in China because the study was focused on the organizational level. The questionnaire was designed from extensive studies of the prior research on similar themes and the scales were adopted from these studies. Although the questionnaire contained items related to our study variables, to assess the demographics of the respondents, we also collected data about their position, age, location, type of SME, number of employees, current focus of business, and other relevant variables.

Before collecting the data from our target respondents, the questionnaire was vetted from three managers who had a master's degree in business studies to assess its adequacy. The questionnaire was also sent to three experts in China for double verification and adequacy assessment. Items related to organizational context, environmental context, and the four levels of CBEC were designed and measured via Likert scale ranging from 1 = strongly disagree to 5 = strongly agree.

3.2. Data Collection Technique

Due to the COVID-19 pandemic, several restrictions were in place in China inhibiting close interactions, hand shaking, and other social gatherings; therefore, it was impossible to physically approach the respondents and collect the data from them. Therefore, an online survey (e-survey) using an online platform called wjx.com was designed to reach our target respondents. This technique of data collection also helped us in speeding up the whole process, reducing the chances of mistakes in data entry, and gave more flexibility to respondents and the researchers [47]. The time period for data collection was mid-August to early-September in the year 2020. We further set conditions that those respondents who took less than 200 s on filling the questionnaire would not be incorporated in the final analysis. The purpose of this was to ensure that the respondents paid adequate attention to the questions and only then checked the appropriate responses. Keeping in view this

condition, along with the filled questionnaire criteria, a final sample size was recorded as 208 respondents.

3.3. Scales Used in the Study

3.3.1. Levels of CBEC Adoption

As explained in the earlier part of the research, we adopted the four levels model developed by [19]. The four levels are (i) existence of a static website, (ii) online ordering facility, (iii) the facility for online transactions, and (iv) integration of supply chain through online systems. It was a 12-item scale with 3 items for each level. A sample item from Level 1 is "we advertise our products/services through online ads".

3.3.2. Organizational Context

For developing the scale to measure organizational context, we considered the studies of [48] for top management support; [49] for measuring the size of the organization; and [48] and [49] for measures related to human resource, technological resource, decentralization level, and formalization level. This was a 19-item scale and a sample item from the decentralization level is "Small matters can be dealt with by operational level staff".

3.3.3. Environmental Context

For measuring the environmental context, we developed a scale which had 28 items from 8 different dimensions. These dimensions include 3 items for competitive pressure, 3 items for supplier pressure, 4 items for customer pressure, 4 items for regulatory and legal environment in China, 5 items for regulatory and legal environment of the targeted country, and 5 items for e-readiness and support in China. The items for these scales were adopted from [40,50–53].

3.4. Data Analysis Technique

The adequacy of the study variables was tested through the measurement model technique. Smart PLS 3 software [] was used for this purpose. Finally, the proposed hypotheses were tested through the partial least square structural equation modelling (PLS-SEM) technique. Smart PLS 3 software [8] was used for this purpose also. In the proceeding part of the paper, findings of these tests are explained in detail.

4. Data Analysis and Results

Following the data collection, this section comprises the results of our proposed hypotheses. However, before testing the hypotheses, the reliability and validity of the scales were assessed for adequacy. The SmartPLS 3 software [8] was used for testing the reliability, validity, and hypotheses of the study variables. Results of these tests are discussed below.

4.1. Reliability and Validity Analysis

The measurement model was used to assess the reliability and validity of the constructs. Reliability and validity were assessed both for lower order constructs and higher order constructs. First, the factor loadings of all the items in the model had a value greater than the minimum acceptable value of 0.50 [54]. None of the items were removed due to low factor loadings. In the current study, only a single item (ORGFL2) was removed due to high cross loadings. Reliability was assessed using Cronbach's alpha and composite reliability, and statistics for both were greater than the recommended value of 0.700 [55] for both lower order constructs and for the higher order constructs (Table 2), hence indicating good reliability [56].

Table 2. Reliability and validity analysis for lower order constructs.

	Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Environmental Context (ENV)				
CESH		0.866	0.888	0.616
ENVCESCH1	0.651			
ENVCESCH2	0.800			
ENVCESCH3	0.712			
ENVCESCH4	0.865			
ENVCESCH5	0.872			
CEST		0.932	0.949	0.787
ENVCESTC1	0.898			
ENVCESTC2	0.893			
ENVCESTC3	0.876			
ENVCESTC4	0.878			
ENVCESTC5	0.891			
CP		0.84	0.904	0.759
ENVCP1	0.820			
ENVCP2	0.904			
ENVCP3	0.886			
DCP		0.868	0.907	0.711
ENVDCP1	0.884			
ENVDCP2	0.928			
ENVDCP3	0.853			
ENVDCP4	0.689			
RLCH		0.912	0.937	0.789
ENVRLCH1	0.812			
ENVRLCH2	0.899			
ENVRLCH3	0.935			
ENVRLCH4	0.901			
RLTC		0.95	0.964	0.869
ENVRLTC1	0.892			
ENVRLTC2	0.948			
ENVRLTC3	0.956			
ENVRLTC4	0.931			
SP		0.832	0.898	0.746
ENVSP1	0.877			
ENVSP2	0.902			
ENVSP3	0.808			
Organizational Context (ORG)				
DL		0.813	0.872	0.695
ORGDL1	0.914			
ORGDL2	0.743			
ORGDL3	0.836			
FL		0.881	0.94	0.887
ORGFL2	0.912			
ORGFL3	0.971			
FS		0.845	0.906	0.762
ORGFS1	0.885			
ORGFS2	0.906			
ORGFS3	0.826			
HR		0.846	0.897	0.686
ORGHR1	0.827			
ORGHR2	0.845			
ORGHR3	0.896			
ORGHR4	0.735			

Table 2. *Cont.*

	Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
TECHR		0.885	0.921	0.744
ORGTECHR1	0.84			
ORGTECHR2	0.855			
ORGTECHR3	0.917			
ORGTECHR4	0.837			
TMS		0.905	0.932	0.775
ORGTMS1	0.885			
ORGTMS2	0.941			
ORGTMS3	0.853			
ORGTMS4	0.839			
Level 1		0.771	0.867	0.684
L1OCP1	0.819			
L1OCP2	0.832			
L1OCP3	0.831			
Level 2		0.823	0.895	0.74
L2OO1	0.867			
L2OO2	0.907			
L2OO3	0.803			
Level 3		0.87	0.921	0.795
L3OT1	0.863			
L3OT2	0.900			
L3OT3	0.911			
Level 4		0.875	0.923	0.801
L4OI1	0.873			
L4OI2	0.916			
L4OI3	0.895			
Second Order				
Environmental Context		0.858	0.890	0.538
CESH	0.631			
CEST	0.727			
CP	0.686			
DCP	0.819			
RLCH	0.741			
RLTC	0.779			
SP	0.738			
Organizational Context		0.802	0.830	0.467
DL	0.528			
FL	0.549			
FSize	0.696			
HR	0.879			
TMS	0.402			
TR	0.897			

Note: CR: composite reliability, AVE: average variance extracted, CESH: country e-readiness and support (China), CEST: country e-readiness and support (the targeted country), CP: competitors' pressure, DCP: distance customers' pressure, RLCH: regulatory and legal environment (China), RLTC: regulatory and legal environment (the targeted country), SP: suppliers' pressure, DL: decentralization level, FL: formalization level, FS: firm size, HR: human resource, TECHR: technological resource, TMS: top management support.

Convergent validity was acceptable because the AVE was higher than 0.500 for all the lower order and higher order constructs except for ORG (higher order), which was approximately 0.50. Discriminant validity was assessed by comparing the correlations among the latent variables with the square root of AVE [57]. The square root of AVE for the construct is higher than its correlation with all other constructs. Hence, discriminant validity was established for lower order (Table 3) and higher order constructs (Table 4).

Table 3. Discriminant validity—lower order constructs—Fornell–Larcker criterion.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
CESCH	*0.785*																
CEST	0.269	*0.887*															
CP	0.571	0.275	*0.871*														
DCP	0.509	0.398	0.716	*0.843*													
RLCH	0.386	0.536	0.293	0.440	*0.888*												
RLTC	0.381	0.626	0.300	0.426	0.760	*0.932*											
SP	0.425	0.386	0.613	0.749	0.326	0.359	*0.863*										
DL	0.391	0.142	0.354	0.256	0.157	0.108	0.204	*0.834*									
FL	0.369	0.205	0.399	0.327	0.179	0.128	0.267	0.700	*0.942*								
FSize	0.172	0.412	0.095	0.236	0.374	0.417	0.172	0.180	0.224	*0.873*							
HR	0.262	0.287	0.252	0.380	0.360	0.341	0.271	0.381	0.373	0.462	*0.828*						
TMS	0.406	0.155	0.555	0.452	0.137	0.110	0.371	0.433	0.433	0.127	0.342	*0.880*					
TR	0.324	0.390	0.260	0.408	0.413	0.443	0.344	0.453	0.444	0.494	0.709	0.292	*0.863*				
Level 1	0.142	0.124	0.141	0.244	0.109	0.201	0.123	0.071	0.106	0.223	0.364	0.084	0.345	*0.827*			
Level 2	0.152	0.307	0.179	0.333	0.225	0.295	0.273	0.084	0.161	0.279	0.395	0.063	0.430	0.672	*0.860*		
Level 3	0.160	0.388	0.188	0.317	0.258	0.308	0.229	−0.005	0.053	0.260	0.359	0.018	0.344	0.526	0.728	*0.891*	
Level 4	0.156	0.279	0.121	0.237	0.196	0.247	0.182	0.035	0.060	0.279	0.348	0.005	0.347	0.540	0.737	0.806	*0.895*

Note: Diagonal and italicized are the square roots of the AVE. Below the diagonal elements are the correlations between the construct's values.

Table 4. Discriminant validity—lower order constructs—HTMT.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
CESCH																	
CEST	0.268																
CP	0.697	0.311															
DCP	0.597	0.430	0.862														
RLCH	0.439	0.573	0.338	0.493													
RLTC	0.413	0.667	0.337	0.454	0.816												
SP	0.491	0.442	0.742	0.863	0.370	0.405											
DL	0.521	0.161	0.450	0.383	0.209	0.145	0.272										
FL	0.479	0.223	0.464	0.418	0.222	0.156	0.313	0.878									
FSize	0.179	0.472	0.122	0.241	0.425	0.465	0.195	0.223	0.262								
HR	0.316	0.313	0.288	0.431	0.398	0.376	0.303	0.477	0.432	0.554							
TMS	0.483	0.173	0.638	0.532	0.160	0.126	0.438	0.525	0.481	0.138	0.387						
TR	0.368	0.430	0.305	0.450	0.450	0.483	0.390	0.554	0.526	0.565	0.816	0.330					
Level 1	0.142	0.143	0.170	0.267	0.118	0.227	0.144	0.081	0.123	0.264	0.442	0.095	0.413				
Level 2	0.148	0.343	0.216	0.366	0.241	0.327	0.318	0.104	0.183	0.321	0.469	0.101	0.501	0.840			
Level 3	0.144	0.429	0.218	0.340	0.274	0.338	0.263	0.044	0.067	0.301	0.409	0.047	0.390	0.629	0.857		
Level 4	0.136	0.306	0.140	0.252	0.200	0.268	0.201	0.067	0.067	0.316	0.397	0.043	0.390	0.644	0.865	0.924	

Additionally, discriminant validity was also assessed using the hetero-trait-monotrait ratio (HTMT) (Table 5 for LOCs and Table 6 for HOCs); all values were lower than 0.90, except for one value, where the ratio between Level 3 and Level 4 was over 0.90. However, when cross loadings were assessed, the difference in loadings was greater than 0.10 and the square root of AVE was also found higher in the Fornell and Larcker criterion.

Table 5. Discriminant validity—higher order constructs—Fornell–Larcker criterion.

	ENV	ORG	Level 1	Level 2	Level 3	Level 4
ENV	*0.734*					
ORG	0.548	*0.683*				
Level 1	0.212	0.363	*0.828*			
Level 2	0.357	0.428	0.67	*0.861*		
Level 3	0.379	0.356	0.522	0.727	*0.891*	
Level 4	0.289	0.361	0.536	0.734	0.808	*0.895*

Note: Diagonal and italicized are the square roots of the AVE. Below the diagonal elements are the correlations between the construct's values.

Table 6. Discriminant validity—higher order constructs—HTMT.

	ENV	ORG	Level 1	Level 2	Level 3	Level 4
ENV						
ORG	0.677					
Level 1	0.251	0.358				
Level 2	0.405	0.421	0.84			
Level 3	0.415	0.301	0.629	0.857		
Level 4	0.316	0.303	0.644	0.865	0.924	

4.2. Structural Model

Before testing the hypotheses, the variance inflation factor (VIF) was checked to assess the issue of collinearity among the study variables. As per the recommended criteria [54], the values were below 5 and hence no issue of collinearity was predicted. Likewise, the standard root mean square residual (SRMR) value was recorded as 0.098 and the chi square value as 1117.761, indicating a good fit for analysis.

The structural model reflects the paths hypothesized in the research framework. A structural model is assessed based on the R2, Q2, and significance of paths.

In order to assess the goodness of the model, the strength of each structural path determined by R2 value for the dependent variable was assessed [58], and the R2 statistics shall be equal to or over 0.1 to establish predictive capability [59]. The results in Table 7 show that all R2 values were over 0.1, establishing the predictive capability. Furthermore, Q2 ascertains the predictive relevance of the endogenous variables. A Q2 statistic over 0 establishes the predictive relevance. The results (Table 7) show Q2 is over 0 for all endogenous constructs, hence establishing predictive relevance.

Table 7. Testing direct relationships.

	Coefficient	STDEV	*t*-Statistics	*p*-Values	2.50%	97.50%
H1: ORG→Level 1	0.330	0.074	4.447	0.000	0.184	0.474
H2: ORG→Level 2	0.311	0.071	4.369	0.000	0.17	0.446
H3: ORG→Level 3	0.183	0.064	2.863	0.004	0.047	0.299
H4: ORG→Level 4	0.255	0.058	4.433	0.000	0.143	0.367
	R^2	Q^2				
Level 1	0.153	0.090				
Level 2	0.225	0.148				
Level 3	0.227	0.167				
Level 4	0.200	0.142				

Further hypotheses were tested to ascertain the significance of the relationship. The results revealed a significant impact of organizational context on Level 1 ($\beta = 0.330$, $t = 4.447$, $p < 0.001$), Level 2 ($\beta = 0.311$, $t = 4.369$, $p < 0.001$), Level 3 ($\beta = 0.183$, $t = 2.863$, $p = 0.004$), and Level 4 ($\beta = 0.255$, $t = 4.433$, $p < 0.001$), supporting H1, H2, H3, and H4.

The study's 5000 resamples also generated 95% confidence intervals. A confidence interval different from zero indicates a significant relationship. Hypotheses testing results are summarized in Table 7.

4.3. Moderation Analysis

Moderation analysis was performed to assess the moderating role of environmental context on the linkage between organizational context and different levels of CBEC adoption. The results (see Table 8) revealed insignificant moderating roles of environmental context on the linkage of organizational context with Level 1 of CBEC adoption (H5: $\beta = 0.116$, $t = 1.499$, $p = 0.134$) and Level 2 of CBEC adoption (H6: $\beta = 0.115$, $t = 1.882$, $p = 0.060$). However, environmental context positively moderated the relationship between Level 3 of CBEC adoption (H7: $\beta = 0.182$, $t = 3.274$, $p = 0.001$). This shows that environmental context strengthens the relationship between organizational context and Level 3 of

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CBEC adoption, revealing that a stronger environmental context will further strengthen the impact of organizational context on Level 3 of CBEC adoption. This is further evident in Figure 2 where the impact of organizational context on Level 3 of CBEC adoption is much steeper when environmental context is above +1. Furthermore, the study also revealed a significantly positive moderating role of environmental context on the relationship between organizational context and Level 4 of CBEC adoption (H8: $\beta = 0.191$, $t = 3.975$, $p < 0.001$). This shows that environmental context strengthens the relationship between organizational context and Level 4 of CBEC adoption, revealing that a stronger context will further strengthen the impact of organizational context on Level 4 of CBEC adoption. This is further evident in Figure 3 where the impact of organizational context on Level 4 of CBEC adoption is much steeper when environmental context is above average (+1). Figure 4 contains all the results in a pictorial model (Table 8).

Table 8. Moderation analysis.

	Coefficient	STDEV	*t*-Statistics	*p*-Values	2.50%	97.50%
H5: Mod_ENV_L1→Level 1	0.116	0.077	1.499	0.134	−0.309	0.169
H6: Mod_ENV_L2→Level 2	0.115	0.061	1.882	0.060	−0.156	0.192
H7: Mod_ENV_L3→Level 3	0.182	0.056	3.274	0.001	0.053	0.275
H8: Mod_ENV_L4→Level 4	0.191	0.048	3.975	0.000	0.068	0.263
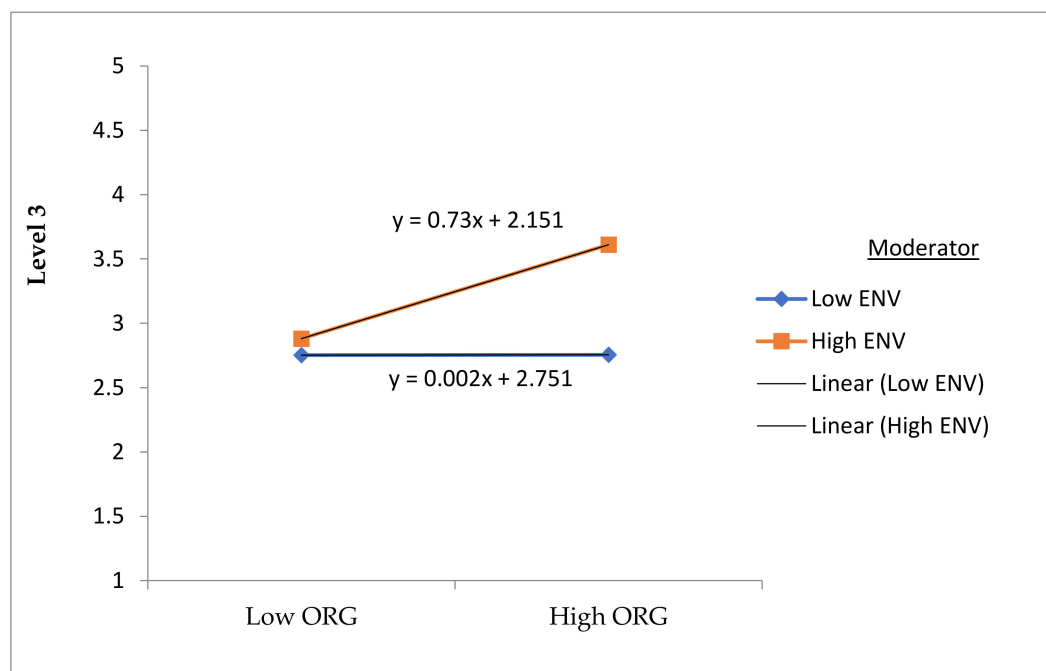
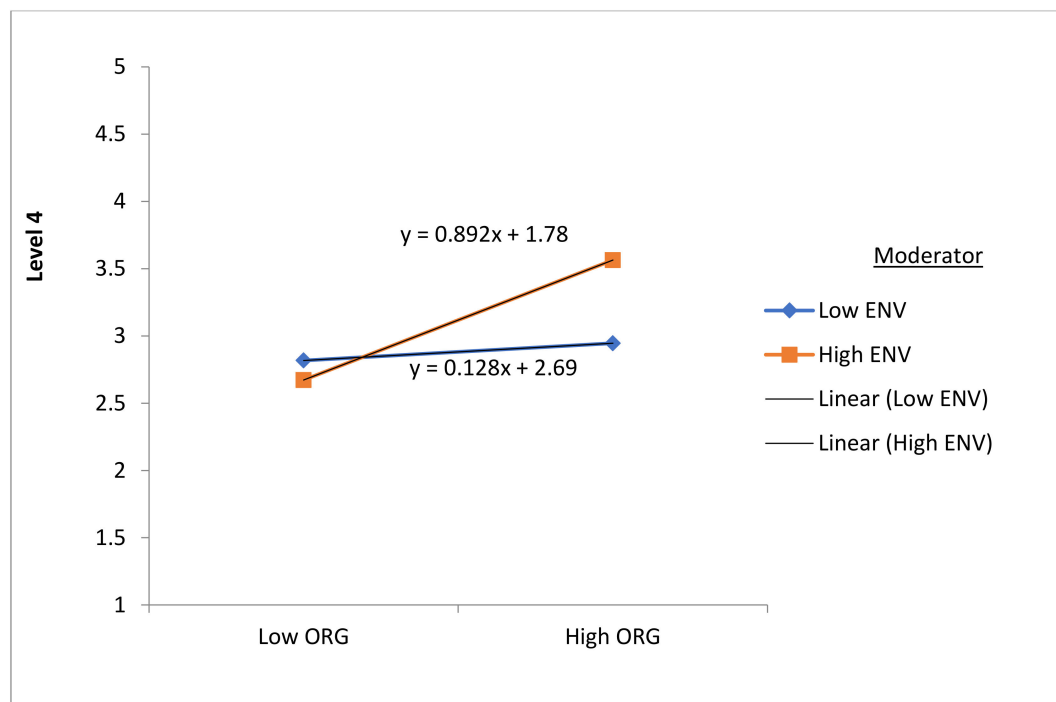**Figure 2.** ENV as moderator between ORG and Level 3.

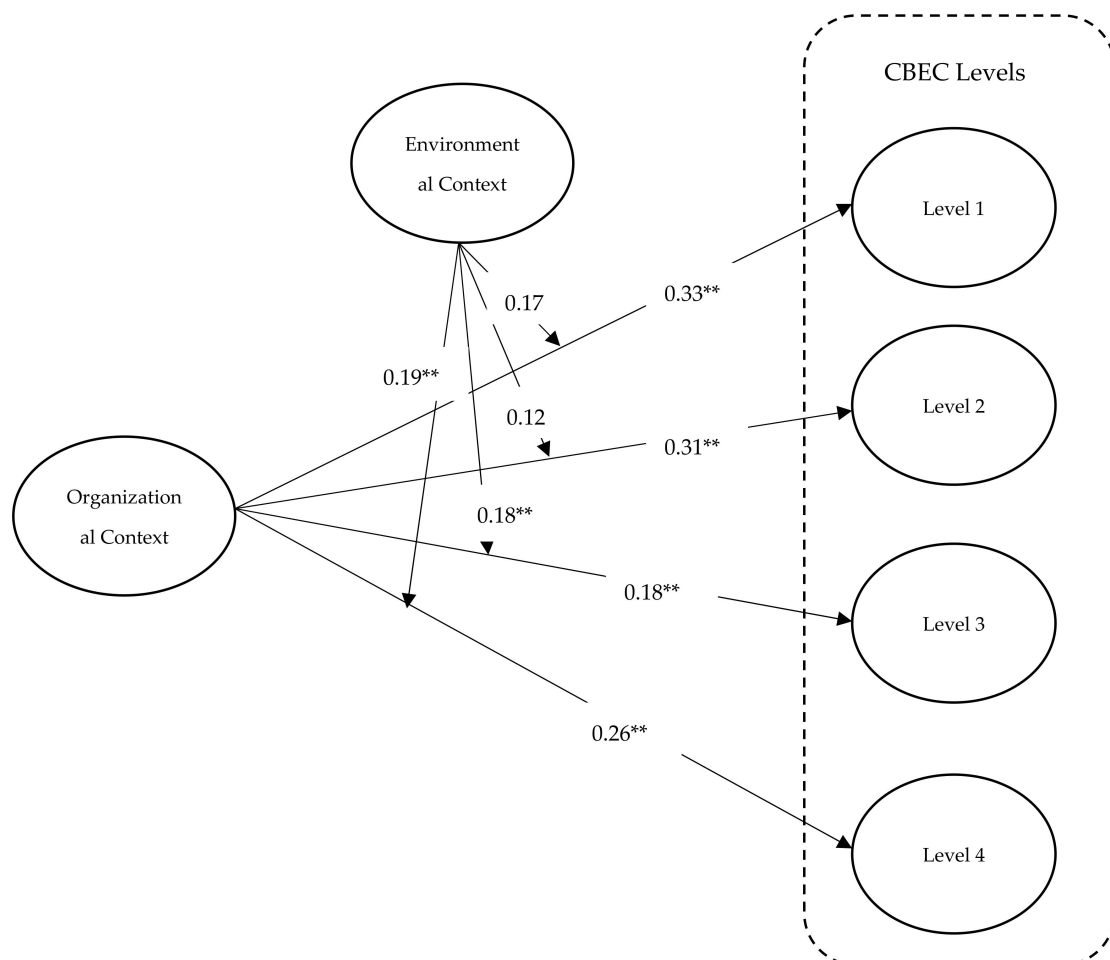**Figure 3.** ENV as moderator between ORG and Level 4.

Figure 4. Summary of the results of proposed hypotheses. Note: (**) indicates a significant relationship.

5. Discussion and Implications

5.1. Discussion

In this study, we aimed to explore the moderating role of environmental context between the relationship of organizational context and the four levels of CBEC adoption. To explain the underlying mechanism, we used the T-O-E framework developed by [20]. Data were collected from SMEs in China. Initially, we tested the direct impact of organizational context on the four levels of CBEC adoption through Hypotheses H1, H2, H3, and H4. The results supported our proposed hypotheses. These findings are in line with the previous studies of [18,29]. The findings are also in line with the arguments of [60] and [6], who suggested that organizational context is a key predictor of technology adoption. Furthermore, our findings also confirm the claim of [18], who suggested that organizational context such as the size, top management support, centralization and formalization of an organization, and its policies and procedures are playing key motivating roles in adoption of technology, and in our case, in CBEC adoption.

We further tested the moderating effect of environmental context between the relationship of organizational context and the four levels of CBEC adoption through H5, H6, H7, and H8. Unlike our propositions in Hypotheses H5 and H6, which were about Level 1 and Level 2 adoption of CBEC, we did not find any support from the data. This is quite surprising for us because past studies who tested the moderating roles of trust between organizational factors and the intention to adopt B2B e-commerce [16] were found positive. However, that study was focused on the overall measurement of B2B e-commerce adoption and not on its levels. One possible explanation for these results could be that it has occurred by chance. The second explanation of this may be that SMEs may not be market centric and, therefore, may not consider environmental factors as mitigators for Level 1 and Level 2 adoption of CBEC. They may consider the adoption of Level 1 and Level 2 CBEC as a necessity and not triggered by any external pressure such as environmental context.

Furthermore, in line with our proposed Hypotheses H7 and H8, we found that environmental context moderates the relationship between organizational context with Level 3 and Level 4 CBEC adoption. These findings are in line with our arguments of the intensity of competitive pressure, suppliers' pressure, governmental rules and regulations, and organizational e-readiness [18,44,45]. This finding is also in line with the argument of [4,14–16], who argued that the direct relationship as asserted by the T-O-E framework may not be fully explained and that ill-informed decisions are being made. They claimed that there are other intervening and/or mitigating variables, such as the environmental context in our case, that can strengthen or weaken these direct relationships.

5.2. Theoretical and Practical Implications

This study contributes in many ways to the existing literature on CBEC adoption. First, this study explored the direct impact on different levels of CBEC adoption. Past studies have mostly taken CBEC as a single level variable. Those studies were mostly involved in studying the impact of T-O-E on general technology of e-commerce adoption (see [16]). Second, our study was mainly focused on the SME sector. Although past studies have focused on this sector (e.g., [4,61]), the dependent variable in those studies were different than the one used in our study.

The third and one vital contribution of this study was to test the moderating role of environmental context. Past studies have used some characteristics of organizational factors as moderators, such as trust [16], size [15,17], demographic determinants [4], and organizational culture [18]. However, to the best of the authors' knowledge, no study had previously explored the moderating role of environmental context. Exploring this dimension of CBEC is a novel addition in the existing literature. This finding also challenges the existing model of the T-O-E framework and its utility as proposed by [20]. Our study adds empirical evidence to the fact that environmental context has the potential to either enhance or decrease the adoption of CBEC. The pressure from competition, suppliers, or governmental rules and regulations may not always have a positive role but they may

inhibit the adoption of CBEC in certain circumstances also. Fourth, with the help of this study, we have also addressed the research gap highlighted by [3], who recommended exploring different motivators and inhibitors of e-commerce adoption.

The practical implications of this study suggest that managers must not ignore environmental factors because they can give you clues and information about the time to adopt a new technology such as CBEC. The findings also help the managers identify the motivators and inhibitors in adopting CBEC. The evidence found from this study highlights the importance of top management's support, the existence of skilled human resource, and less hierarchical structures at the time of adoption of CBEC. If they are not in place, it is unlikely that organizations will adopt CBEC. The paper also challenges the view that large organizations have more resources and that is why they can better adopt technology. We argued that SMEs, because of their small size, are more agile and prone to technological adoption. Keeping in view the importance of organizational context, the management team must allocate resources and give reasonable authority to the line managers so that they can take decisions and solve challenging and complex tasks through innovative approaches, such as the adoption of CBEC for entering a new market or expanding to a different country. This support can also be further extended through frequent interaction with the staff, more empowerment, and investing in their skill development.

The study also has several implications for the government and policy-making institutions. For example, government can support the adoption of CBEC by passing favorable legislation. They must also make such policies that can stop unethical and illegal practices such as hacking, etc. Government must also invest in developing a conducive infrastructure, such as availability of high-speed internet, etc. Finally, they may incentivize the SME sector and encourage them to adopt CBEC.

6. Conclusions

This empirical study was focused on the investigation of the moderating role of environmental context between the relationship of organizational context and the four levels of CBEC adoption. Data were collected via online survey from 208 respondents. SmartPLS 3 software was used to test the proposed hypotheses. Support for six out of eight hypotheses was found. More specifically, we found that organizational context has a positive impact on all four levels of CBEC adoption. Furthermore, we did not find support for the moderating role of environmental context between the relationship of organizational context and Level 1 and Level 2 of CBEC adoption. Thereby support for H5 and H6 was not found. Finally, we found the environmental context has a moderating role in Level 3 and Level 4 CBEC adoption.

It was concluded from the findings of this study that organizational context (size, top management support, human resource, decentralization level, and formalization) plays a significant positive role in shaping the decision of CBEC adoption at all four levels in SMEs of China. It was also concluded that environmental context (competitors' pressure, customers' pressure, suppliers' pressure, regulatory and legal environment of both host country and the target country of CBEC along with both countries' readiness) may support or inhibit the adoption of CBEC on Level 3 and Level 4. Hence, six out of the eight hypotheses were supported. However, the study may not be 100% perfect and there may be some areas that can be improved in the future studies.

Therefore, the following limitations of the study must be taken into consideration before interpreting its findings. First, the cross-sectional nature of the data, where they were collected at one point of time from the respondents, may limit their reliability. Future research may consider a more longitudinal approach to data collection. Second, the study used a single self-reported questionnaire. Studies suggest that this approach can be problematic. For example, the respondent's attention span may affect the responses, their lack of information, and their interest in filling out the questionnaire, etc., all of which may affect the quality of the data [62]. This also raises the threat of biased responses [18]. Therefore, future studies may collect data from multiple respondents regarding the study

variable. Third, this study took the overall environmental context as a moderator without studying the impact of individual factors in the organizational context, such as pressure of competition as a separate variable or pressure of suppliers or customers, etc [63]. Therefore, our understanding of the impact of individual factors is limited in this study. Future studies may consider studying the moderating roles of competition, suppliers, customers, government rules and regulations, and firm's e-readiness as standalone variables to understand the individual strength and make more informed decision making. Fourth, the sample size of 208 SMEs may affect the statistical power of our results. Despite our repeated efforts to increase the sample size, we were unable to reach a bigger number of respondents. A major inhibiting factor in these efforts was the COVID-19 pandemic, and because of which, public face-to-face interactions were limited, and we had to rely on the online data collection only. Future studies may test the same with a bigger data set to validate our findings. Fifth, the study was conducted in China, which may inhibit the generalizability of our findings. Future research may conduct similar studies elsewhere to validate our findings. Finally, we have used a single self-reported questionnaire. Although we tested the data for reliability and validity, personal bias cannot be fully eliminated from single source data. Therefore, future studies may focus on collecting data from multiple sources to curtail the risk of biased responses.

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