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CHINESE TECHNOLOGY: A STUDY OF THE IMAGE AND THE DESIRE FOR POSSESSION, USING THE TECHNOLOGY READINESS INDEX – TRI SCALE

TECNOLOGIA CHINESA: UM ESTUDO DA IMAGEM E DO DESEJO DE POSSE, UTILIZANDO A ESCALA TECHNOLOGY READINESS INDEX – TRI

TECNOLOGÍA CHINA: ESTUDIO DE LA IMAGEN Y DEL DESEO DE POSESIÓN, UTILIZANDO EL ÍNDICE DE PREPARACIÓN TECNOLÓGICA – ESCALA TRI

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Abstract

Objective: This article intends to measure the readiness of Brazilian consumers to adopt products based on Chinese technology, using the Technology Readiness Index - TRI scale.

Originality/Relevance: The importance of the image of new technological products and services has resulted in debates and discussions in academic and executive circles. However, there are still gaps, where the need to identify and characterize the importance of image to encourage ownership of Chinese products can present innovative nuances in the knowledge of the subject.

Methodology/approach: A survey was carried out with 865 consumers of Chinese products in Brazil, evaluating the instrument used based on statistical procedures.

Main results: This study allowed evaluating the Technology Readiness Index (TRI) model and its applicability in the analysis of consumer readiness for Chinese products. The constructs and variables showed consistency, with six confirmed and three unconfirmed hypotheses. Innovativeness, Optimism, Insecurity and Insecurity are important emotional states to characterize Explorer, Pioneer, Skeptical, Paranoid and Laggard consumers.

Theoretical/methodological contributions: The study enabled the identification of consumer behavior in the use of products based on Chinese technology. The Technology Readiness Index (TRI) has proven to be an important model for measuring technology readiness in different contexts.

Social/Management Contributions: The validation of the model allows its use in corporations of different sizes and different types of products and services.

Keywords: Technology Readiness Index Scale (TRI). Chinese technology. Possession desire. Image.

Resumo

Objetivo: Este artigo pretende mensurar a prontidão dos consumidores brasileiros para adoção de produtos baseados em tecnologia chinesa, utilizando a escala Technology Readiness Index - TRI.

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Originalidade/Relevância: A importância da imagem dos novos produtos e serviços tecnológicos tem resultado em debates e discussões no meio acadêmico e executivo. Contudo, ainda existem lacunas, onde a necessidade de identificar e caracterizar a importância da imagem para estimular a posse de produtos chineses pode apresentar matizes inovadores no conhecimento do tema.
Metodologia/abordagem: Realizou-se uma survey com 865 consumidores de produtos chineses do Brasil, com avaliação do instrumento utilizado a partir de procedimentos estatísticos.
Principais resultados: Este estudo permitiu avaliar o modelo da Technology Readiness Index (TRI) e sua aplicabilidade na análise da prontidão de consumidores em relação a produtos chineses. Os construtos e variáveis demonstraram consistência, com seis hipóteses confirmadas e três não confirmadas. Inovatividade, Otimismo, Insegurança e Insegurança são estados emocionais importantes para caracterizar consumidores Exploradores, Pioneiros, Céticos, Paranoicos e Retardatários.
Contribuições teóricas/metodológicas: o estudo possibilitou a identificação do comportamento do consumidor no uso de produtos baseados em tecnologia chinesa. A Technology Readiness Index (TRI), tem se mostrado como um importante modelo de mensuração da prontidão para tecnologia em diferentes contextos.
Contribuições sociais/para a gestão: A validação do modelo permite sua utilização nas corporações, de diversos portes e diversos tipos de produtos e serviços.

Palavras-chave: Escala Technology Readiness Index (TRI). Tecnologia chinesa. Inovação. Imagem.

Resumen
Objetivo: Este artículo tiene como objetivo medir la disposición de los consumidores brasileños para adoptar productos basados en tecnología china, utilizando el Índice de Preparación Tecnológica – IPT, la escala TRI (Technology Readness Index)
Originalidad / Relevancia: La importancia de la imagen de los nuevos productos y servicios tecnológicos ha dado lugar a debates y discusiones en círculos académicos y ejecutivos. Sin embargo, aún existen vacíos, donde la necesidad de identificar y caracterizar la importancia de la imagen para incentivar la apropiación de los productos chinos puede presentar matices innovadores en el conocimiento del tema.
Metodología / enfoque: Se realizó una encuesta a 865 consumidores de productos chinos en Brasil, evaluando el instrumento utilizado con base en procedimientos estadísticos.
Principales resultados: Este estudio permitió evaluar el modelo de Índice de Preparación Tecnológica (TRI) y su aplicabilidad en el análisis de la preparación del consumidor para los productos chinos. Los constructos y variables mostraron consistencia, con seis hipótesis confirmadas y tres no confirmadas. La innovación, el optimismo, la inseguridad y la inseguridad son estados emocionales importantes para caracterizar a los consumidores exploradores, pioneros, escépticos, paranoicos y rezagados.
Aportes teórico-metodológicos: el estudio permitió identificar el comportamiento del consumidor en el uso de productos basados en tecnología china. El Índice de Preparación Tecnológica (TRI) ha demostrado ser un modelo importante para medir la preparación tecnológica en diferentes contextos.
Contribuciones sociales / gerenciales: La validación del modelo permite su uso en corporaciones de diferentes tamaños y diferentes tipos de productos y servicios.

Palavras-claves: Escala del Indice de Preparación Tecnológica (TRI). Tecnología china. Innovación. Imagen.

1 Introduction

Currently, technological products and services are present in society, making the daily life of individuals in the personal and professional scope more agile. The technological market is in a constant process of change, becoming progressively more qualified to shape the behavior

of consumers in face of market innovations, since these new products, when well disseminated and tried, cause several social changes in the lives of individuals (Christo & Demuner, 2017).

China, for example, stands out in the marketing of technological products with the export of transmission products, chips, smartphones, tablets, smartwatch, notebooks and other components with a 10% growth in 2018, followed by the United States and Germany (Diniz, 2019). In this article, the readiness to adopt Chinese technology products and services will be measured, using the Technology Readiness Index (TRI) scale established by Parasuraman (2000) and Parasuraman and Colby (2001) corroborated by Lai and Lee (2020). The proposed application of the TRI scale is evidenced in the literature, so that new studies can replicate theories in other contexts, in order to promote scientific advancement. Indications of research suggested by Parasuraman (2000) regarding the importance of applying the readiness measurement scale for technology products in cultures different from the original country are considered. It uses the Technology Readiness Index (TRI) model, from the perspective of the consumption of Chinese technology products, allowing the measurement of the typology of consumers regarding the constructs of optimism, innovativeness, discomfort and insecurity. The studied model stands out as an extremely useful tool for decisions, especially technological readiness. It studies and identifies the involvement of consumers in the adoption of products based on Chinese technology, through the application of the TRI scale model. The theme appears in renowned publications that indicate the continuity of research by some authors such as: Parasuraman (2000), Penz, Amorim, Nascimento and Rossetto, (2017) and Duttha and Lanvin, (2019). According to Dias (2012), the adoption of new technologies is a growing trend, aiming to meet the satisfaction needs of consumers, characterized by the increase in people's interaction and connectivity. The technology revolution opens windows to history, giving rise to new cities, configurations of spaces, time, economic, social, political, cultural relations, new habits, interests, ways of feeling and thinking. It is understood, then, that in anticipation of the breadth of people's comprehensive training, there must be technological participation and engagement, in which the product's image plays an important role through status, boosting or rejecting the acquisition of a Chinese technological product.

Previous studies have sought to assess technology readiness factors in major journals and conferences over the years. (Parasuraman, 2000; Parasuraman & Colby, 2001). To measure technology readiness, Souza and Luce (2005), Penz, Amorim, Nascimento and Rossetto (2017) and Duttha and Lanvin (2019) state that the use of the TRI scale is characterized as an effective instrument in measuring consumer behavior. Therefore, this study focused on the following

problem: What are the levels of readiness of Brazilian consumers to adopt products based on Chinese technology? To answer this research problem, this paper aims to measure technology readiness in the context of consumers of Chinese technological products, through the TRI scale. In this study, the theoretical justification is found in the novelty when it presents the direct link between the constructs possession, optimism, innovation, discomfort, insecurity, and image of the Chinese product or service, little explored before. This theme, despite being present with a strong density in academic and technological literature, still presents conceptual, taxonomic and nomological gaps, despite the intense efforts of researchers in different parts of the world.

2 Theoretical framework

The current state of the art on this topic has demonstrated its importance, density, opportunity, consistency and relevance, both in the logic of the evolution of knowledge and in the field of executive applicability, as shown in the literature in some references presented below, notably on the TRI Model.

2.1 The strategy and adoption of new technologies

In the context of the intensification of competition in cutting-edge technology markets, the importance of the strategy, directing the differentiation of products and services aimed, especially, at Business-to-Consumer customers, stands out. Dias (2012) and Rogers (1962) find that the adoption of technological products and services results from the acceptance of the diffusion processes of these new products by users. Rogers (1962) defines technology using channels along a path between members of a social system in which non-acceptance creates a distance between the individual and society. Bessant (2009) understands technological development as the implementation of a new or significantly improved such as: a new marketing method; a new organizational method in business practices; in the organization in the workplace or in external relations. It is evident that success is rooted in a range of activities that need to happen in a coordinated and synchronized way, not being treated as a simple event but as parts of a large process. Pigola, Costa, Mazzieri, and Scafuto (2021) draw attention to the challenges of researching innovation and highlight the importance of a strict alignment between science and reality, which requires resilience, discipline, teamwork and focus.

From the 1970s onwards, the scenario of technological evolution in the more developed world was altered by major technological, socioeconomic, cultural and political changes, in which organizations became more complex and markets became highly competitive, dynamic

and flexible. As a strategy, organizations open up the space for marketing and through it enable the best guidelines in the management of the product's image, seeking customer satisfaction, in addition to taking care of the company's image, so that they can maintain themselves in the long term. Kotler (2000) and Lai (2017), among other authors, emphasize that organizations have emphasized the product image as a communication and relationship strategy with consumers, as a means to intensify product acceptance. Thus, the company must create the content of the message to be passed on to the potential buyer, with technology being one of the preferred attributes in the perceptions already present in their minds (Barbosa & Campbell, 2006). In this context, organizational strategies are constantly revised and directed to the market niche, in which the image, whether visual or mental, of a product or brand, arising from internal or external factors, positive or negative, has the potential to guide consumer behavior , mainly that referring to the decision to purchase products and services. When products or brands have clear images, they help consumers understand the value being offered, adding meaning to the products, encouraging purchase. Thus, the image of the product can be considered the sum of impressions, attitudes and convictions (Solomon, 2011).

As far as technology strategy is concerned, China's rise is highly relevant and attracts worldwide attention. The development of innovation and technology in that country, which began in the 1980s, is intensely driven by the government (Yang, Lee & Lin, 2012), determining considerable economic growth. Under its regime, the government encouraged the entry of foreign companies into the technology sector through tax exemption for companies that destined 70% of their sales for export, for the protection of profits, for financial support, for credit conditions differentiated and lower interest rates for companies that reinvest their profits in the domestic market, as well as by granting subsidies to foreign companies that form partnerships with local cooperatives (Chinn, 2013). Cunha (2007) and Geromel (2019) point to at least three dimensions for the important role that China has acquired in the international economy: the significant growth of its exports, its growing demand for raw materials and energy and its attractiveness in terms of investment foreign. The state's unusual control over the financial system allowed local governments to rapidly develop infrastructure (roads, ports and energy) encouraging business investments through reliable infrastructure and low-cost financing (Dollar & Jones, 2013).

2.2 The Technology Readiness Index (TRI)

Built from a research program, the Technology Readiness Index (TRI) scale is composed of several phases (Parasuraman & Colby, 2001). However, the literature is already beginning to present evolutions on the applicability of TRI, for example, in ITAUT versions (Leong, Kauan & Ming, 2021). In its most evolutionary phase, the conceptual foundations of technology readiness and scale itself had their origins in an extensive literature review on the topic and in preliminary quantitative research. Thus, three phases stand out in the study by Parasuraman (2000) on the construction of the TRI: The first phase (condensed scale – from 44 to 28 items), contemplated the generation of scale items from the literature review and discussion groups with corporate clients from a wide range of industries (financial services, internet providers, e-commerce, and telecommunications); The second phase involved the empirical reassessment of the 28-item scale, and the results were again analyzed in the light of exploratory factor analysis and Cronbach's alpha coefficient; The third phase involved the purification of the 66-item scale. The sequence of reliability and factor analysis was repeated and further eliminations and reassessments were carried out until no improvement in Alpha values was possible. In view of the investigation developed by Parasuraman and Colby (2001), and given the relevance of the instrument originated, both in the academic and in the business scope, we seek to understand how TRI can be used in other contexts.

2.3 The analytical model of research

The model proposed for conducting the survey was the Technology Readiness Index (TRI), formed by four factors, with 36 indicators of readiness for the technology. The general combination for technology is therefore given by the combination of four dimensions, which is to say that it is based on the dimensions: innovativeness, optimism, discomfort and insecurity (Parasuraman & Colby, 2001). These authors claim that the readiness for the TR - Technology Readiness concerns the propensity of individuals to adopt new technologies, and is the result of mental drivers and inhibitors that, together, determine the individual's predisposition to interact with products and services of technological bases (Parasuraman, 2000), ratified by Lima et al. (2018), Bakirtaş and Akkaş (2020) and Lai and Lee (2020). For Parasuraman and Colby (2001), when launching a new technology on the market, the reactions are different, that is, varying from consumer to consumer, according to their beliefs, cultures, values and feelings. Dimensions are responsible for the driving and inhibiting issues regarding the adoption of technology-based products and services.

The dimensions expose the positive and negative feelings about the consumer's affection towards technology, determining the multifaceted character of the construct, according to Bastianello and Hutz (2015) and Berger, Rossetto and Sausen (2015). Optimism represents the positivity of views regarding technology, in addition to beliefs about what it provides to individuals in terms of flexibility and efficiency in their lives. Innovativeness is a biased dimension of the individual, with regard to being a pioneer in the adoption of technology-based products and services. Discomfort refers to the perception of lack of control over technology and a possible feeling of oppression. Insecurity indicates possible distrust in relation to technology-based products and services and skepticism in relation to competences and abilities, regarding the use of them efficiently in their totality of benefits.

Measuring predisposition or interests in adopting technology-based products and services varies widely among individuals, as anyone can be a technology consumer; however, the path leading to adoption and the implications of adoption will depend on the degree and nature of individual readiness. Technology readiness is multifaceted, that is, it is not just about assessing the consumer's degree of innovativeness. Hence, different types of beliefs and feelings emerge that produce a general readiness, which predicts and explains consumer responses to the adoption of technology-based products and services, which can flow from their enchantment to revenge (Lara, Locatelli, Santos- Filho & Bahia, 2017).

In this context, the general readiness for the adoption of technology-based products and services is given by the combination of the four dimensions presented, resulting in five types of consumers, named by Parasuraman and Colby (2001) and Bakirtaş and Akkaş (2020), as: a) the Exploiting Consumers segment has a high propensity for readiness to adopt new technologies, with high scores in the dimensions that drive adoption (Optimism and Innovativeness) and low scores in the inhibiting dimensions (Discomfort and Insecurity); b) the Pioneer Consumers segment shares with the Explorers, with high levels of (Optimism and Innovativeness), but at the same time revealing high levels of (Discomfort and Insecurity); c) in the Skeptical Consumers segment all scores are low in all dimensions; d) the segment of Paranoid Consumers differs a little from the others, as it presents high levels of optimism, revealing high levels in the inhibiting dimensions of adoption, and this group presents a low degree of innovativeness; e) Late Consumers represent the opposite of Explorers, exhibiting low scores in the dimensions driving adoption, with high scores in the inhibiting dimensions. Regarding these dimensions, Souza and Luce (2005) argue that each segment, in addition to presenting divergent patterns of beliefs and feelings about technology, can also manifest

demographic and psychographic differences. However, these attributes are sufficiently distinct to help organizations in the search for better management of the customer-technology relationship, as well as in the consequent customization of strategies aimed at addressing the topic. That said, with regard to technology, Souza and Luce (2005), Penz, Amorim, Nascimento and Rossetto (2017) and Lai and Lee (2020) , state that the use of the TRI scale is characterized as a consistent instrument for measuring the attitudes and beliefs of individuals, being useful for predicting technology adoption behaviors, identifying distinct types of individuals and predicting, in a more accurate way, future behaviors of customers and products.

It is considered possible to identify the levels of readiness for technology of the Brazilian consumer, based on the beliefs of these consumers about the technology, as well as to segment them based on the same criterion, among other benefits generated by the results of using such a scale. However, it is necessary to assess whether TRI applies to an environment other than the one in which it originated. In other words, it is about verifying whether the TRI is a valid instrument for measuring the technology readiness of Brazilian consumers.

3 Methodology

This research is characterized as a survey, with the application of a questionnaire to 1051 consumers of Chinese products, with 186 multivariate outliers, resulting in 865 respondents. Objectively, the essential purpose is to identify and analyze the readiness of Brazilian consumers to adopt products based on Chinese technology, through the use of the TRI Scale, with its constructs and variables. Data collection was carried out and refined in the period from May to August 2021. For this purpose, an electronic form was created, available on the internet. This questionnaire was also made available on the intranet of Grupo Drogarias Pacheco, Drogaria São Paulo and also through the group's external LinkedIn contacts. Initially, data consistency analysis was performed, which consists of identifying extreme data (outliers), using univariate techniques and multivariate outliers tests, using the Mahalanobis distance. The comparison of the absolute value of the standardized variables (Z) indicated the established limit of critical Z equal to 3.29. Confirmatory Factor Analysis (CFA) of the structure found was used to verify the unidimensionality, reliability, convergent and discriminant validity of the dimensions related to technology readiness. It was found, by the Bartlett Test, that there is statistical significance of the correlations between the variables (Sig. = 0.000), showing the existence of linearity of the data. To verify the normality of the data, the KS – Kolmogorov-

Smirnov test was conducted for the variables present in the research, as well as tests for multivariate normality.

In this research, the Kolmogorov-Smirnov K-S test found that the observable variables, or indicators, do not follow the Normal Distribution. Cronback Alphas, for all constructs [Desire to possess Chinese products, DIS (Discomfort with products), Image of products, INN (Innovation of Chinese products), INS (Insecurity with Chinese products) and OPT (Optimism with Chinese products) met the reliability criteria, with the lowest value being 0.865. Internal validations were obtained by correlations between latent variables of the Full Model. Thus, for the application of the structural scale, the PLS method – PartialLeast Square estimation was applied, through the SmartPLS program, which does not require data normality.

The constructs and the 46 variables were then analyzed using descriptive statistics and structural equation modeling. A statistical reassessment of the scales was carried out. The questionnaire was about the questions specific to the TRI model, seeking the interviewees' evaluations about the variables exposed to them. An interval scale was used, with scores from 0 to 10, with 0 (zero) being "Strongly Disagree" and 10 (ten) "Strongly Agree", divided into six blocks with 50 statements of the TRI scale, being processed by SPSS software and SmartPLS v3 (Table 1).

Table 1

TRI Model Scales

CHINESE OWNERSHIP SCALE	
1	I would like to own a Chinese Smartphone
2	I would like to own a Chinese computer
3	I would like to own Electronic Devices like Chinese MP3, MP4, MP5 and MP6
4	I would like to own a Chinese Camcorder Camera
5	I would like to own a Chinese Video Game
6	I would like to own a Chinese tablet
7	I would like to own a Chinese Drone
8	I would like to own a Chinese Makeup Kit
9	I would like to own a Chinese Luxury Watch
10	I would like to own a Chinese Luxury Perfume
SCALE OF OPTIMISM (OPT) REGARDING CHINESE PRODUCTS	
1	Chinese product technology allows me more control over my personal activities
2	Chinese products that use the latest technologies are much more convenient to use because I'm not restricted to business hours
3	I like Chinese products because they allow me to tailor things to my own needs
4	I prefer to use the most advanced Chinese technology
5	I like the idea of doing business online using Chinese cell phones, because I'm not restricted to business hours
6	Chinese products make me more efficient in my work
7	Chinese products give me more freedom
8	Learning how to use Chinese products can be just as rewarding as having our own products
9	I'm sure Chinese products are more reliable

CHINESE PRODUCTS INNOVATION SCALE (INN)	
1	Other people ask me for advice on Chinese products
2	It seems my friends are using more Chinese products than I am
3	In general, I am among the first of my group of friends to purchase Chinese products.
4	Normally I can understand new Chinese products without the help of others.
5	I am up to date with the latest Chinese products in my areas of interest.
6	I like the challenge of understanding Chinese products.
7	I have fewer problems than other people using Chinese products
SCALES ABOUT DISCOMFORT (DIS) WITH CHINESE PRODUCTS	
1	I think technical support services for Chinese products do not help because they are too complicated.
2	Sometimes I think Chinese products are not designed to be used by everyday people, because they are complicated.
3	There is no manual for Chinese products that is written in simple language
4	When I use tech support from a supplier of Chinese products, I sometimes feel like someone who knows more than I am is taking advantage of me.
5	When purchasing a Chinese product, I prefer the basic model rather than a model with many additional features.
6	It's embarrassing when I have problems with some Chinese product while other people are looking
7	Care should be taken when replacing domestic products with Chinese products, as Chinese products may fail
8	Many Chinese products present health or safety risks that aren't discovered until people have used them.
9	Chinese product technology enables government and businesses to access confidential consumer information
10	Chinese products always seem to fail at the worst possible time.
SCALE ON INSECURITY (INS) ON CHINESE PRODUCTS	
1	I consider it safe to provide my credit card number when purchasing Chinese products
2	I consider it safe to make any kind of financial transaction with Chinese products
3	I'm afraid that the information I make available when purchasing Chinese products will be seen by others.
4	I feel safe doing business with a company that only sells Chinese products
5	Any transaction made with Chinese products should have more guarantees
6	Whenever using Chinese products, it is necessary to carefully check that the product is not subject to failure.
7	More security should be sought when doing business involving Chinese products
8	When I call a company, I prefer to talk about domestic products than Chinese products
9	When I provide information to a Chinese website, I'm never sure it actually got to the right destination.
SCALE ON THE IMAGE OF CHINESE PRODUCTS	
1	I associate Chinese product with low quality product
2	I associate Chinese product with counterfeit product
3	I associate Chinese product with cheap product
4	The use of Chinese product harms my Personal Image

Source: Survey data, adapted from Parasuraman and Colby (2001).

The use of this adapted scale allowed the verification and contrast of the hypotheses in the complete research model, whose results are presented in the next session.

4 Results and discussion

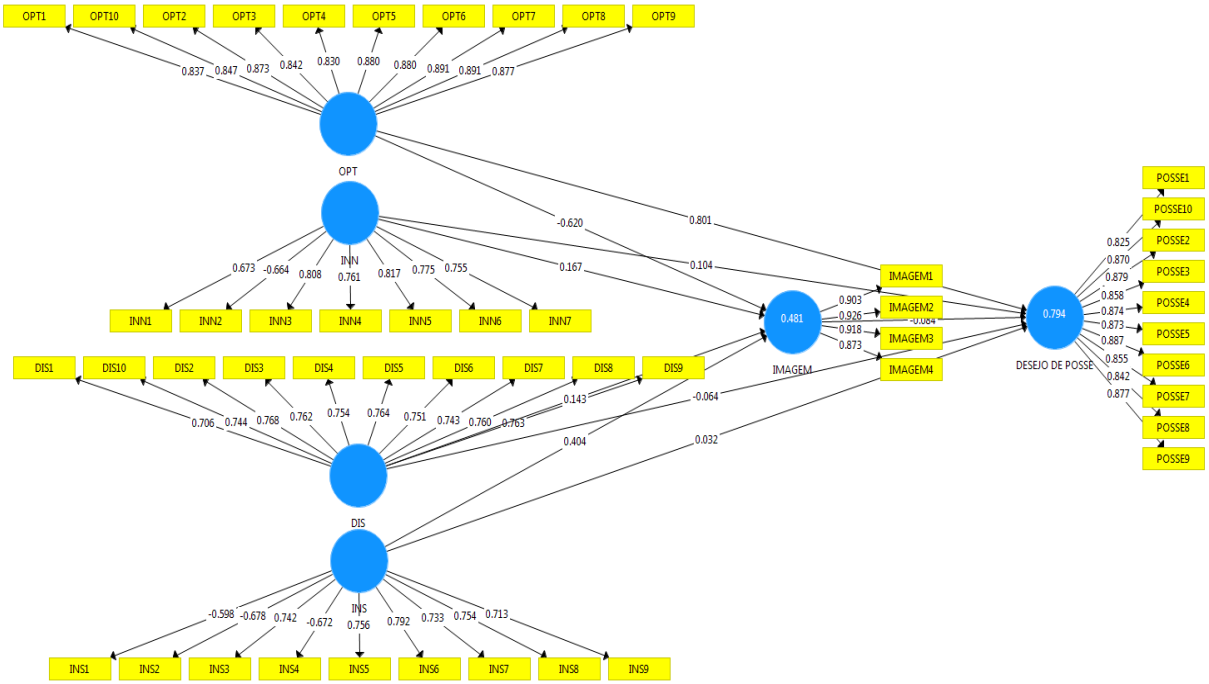
The characterization and description of data and information on the applicability of the TRI model to the acceptance of Chinese cars are presented in the following units.

4.1 Influence of the TRI Full Model Scale

A complete model is presented below that associates scale with the negative image of Chinese technology and the desire to own products and services with Chinese technology, as well as the effect of the negative image of Chinese technology on the desire to own products and services with Chinese technology. With this model in focus, the reliability and validity of the TRI scale and the capacity of its constructs to influence the dimensions present in the "Complete Model" are analyzed. Figure 1 describes the initial relationships existing in the complete model.

Figure 01

Initial complete model



Subtitles: Possession, DIS (Discomfort), Image, INN (Innovation), INS (Insecurity), OPT (Optimism).
Source: Author's formulation.

To assess the TRI scale in the model formulated above, the reliability of the indicators is initially tested. Table 02 presents the values of the indicator loads.

Table 02

Test of TRI indicators full initial model

	Desire to possess	DIS	Image	INN	INS	OPT
Possession1	0.825					
Possession2	0.879					
possession3	0.858					
Possession4	0.874					
Possession5	0.873					
Possession6	0.887					
Possession7	0.855					
Possession8	0.842					
Possession9	0.877					
Possession10	0.870					
DIS1		0.706				
DIS2		0.768				
DIS3		0.762				
DIS4		0.754				
DIS5		0.764				
DIS6		0.751				
DIS7		0.743				
DIS8		0.760				
DIS9		0.763				
DIS10		0.744				
Image1			0.903			
Image2			0.926			
Image3			0.918			
Image4			0.873			
INN1				0.673		
INN2				-0.664		
INN3				0.808		
INN4				0.761		
INN5				0.817		
INN6				0.775		
INN7				0.755		
INS1					-0.598	
INS2					-0.678	
INS3					0.742	
INS4					-0.672	
INS5					0.756	
INS6					0.792	
INS7					0.733	

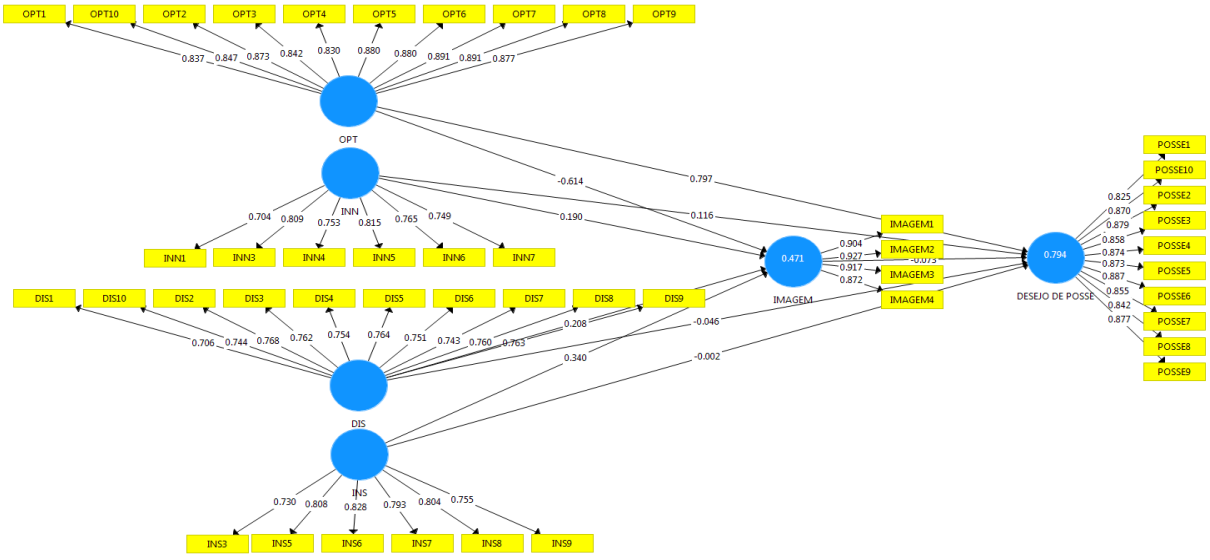
	Desire to possess	DIS	Image	INN	INS	OPT
INS8					0.754	
INS9					0.713	
OPT1						0.837
OPT2						0.873
OPT3						0.842
OPT4						0.830
OPT5						0.880
OPT6						0.880
OPT7						0.891
OPT8						0.891
OPT9						0.877
OPT10						0.847

Subtitles: Possession, DIS (Discomfort), Image, INN (Innovation), INS (Insecurity), OPT (Optimism).
Source: Survey data.

According to Hair et al. (2010), indicators with a load lower than 0.50 should be eliminated. Thus, they were eliminated using the stepwise method, that is, step by step. After the due eliminations, the new model was recalculated and is represented by figure 02.

Figure 02

Final complete model



Subtitles: Possession, DIS (Discomfort), Image, INN (Innovation), INS (Insecurity), OPT (Optimism).
Source: Survey data.

Table 03 shows the indicator loads shown in the figure above.

Table 03

Test of the TRI significant indicators of the final complete model

	Desire to posses	DIS	Image	INN	INS	OPT
Possession1	0.825					
Possession2	0.879					
Possession3	0.858					
Possession4	0.874					
Possession5	0.873					
Possession6	0.887					
Possession7	0.855					
Possession8	0.842					
Possession9	0.877					
Possession10	0.871					
DIS1		0.706				
DIS2		0.768				
DIS3		0.762				
DIS4		0.754				
DIS5		0.764				
DIS6		0.751				
DIS7		0.743				
DIS8		0.760				
DIS9		0.763				
DIS10		0.744				
Image1			0.904			
Image2			0.927			
Image3			0.917			
Image4			0.872			
INN1				0.704		
INN3				0.809		
INN4				0.753		
INN5				0.815		
INN6				0.765		
INN7				0.490		
INS3					0.730	
INS5					0.808	
INS6					0.828	
INS7					0.793	
INS8					0.804	
INS9					0.755	
OPT1						0.837
OPT2						0.873

	Desire to posses	DIS	Image	INN	INS	OPT
OPT3						0.842
OPT4						0.830
OPT5						0.800
OPT6						0.880
OPT7						0.891
OPT8						0.891
OPT9						0.877
OPT10						0.847

Subtitles: Possession, DIS (Discomfort), Image, INN (Innovation), INS (Insecurity), OPT (Optimism).
Source: Survey data.

It can be seen that the factor loading of all indicators satisfy the criterion established by Hair et al. (2010), surpassing the limit of 0.50. The scale's internal reliability test, according to the criteria by Hair et al. (2010), requires a Cronbach's alpha coefficient above 0.70. Cronbach's alpha values for the TRI scale are greater than 0.70, demonstrating the internal reliability of the TRI scale in the present investigation.

Table 04

Internal Reliability of the Complete Model

	Cronbach's Alpha	Composite Reliability	Extracted Mean Variance (AVE)
Desire to posses	0.962	0.967	0.747
DIS	0.914	0.929	0.565
Image	0.927	0.948	0.820
INN	0.865	0.895	0.588
INS	0.876	0.907	0.619
OPT	0.963	0.967	0.748

Subtitles: Possession, DIS (Discomfort), Image, INN (Innovation), INS (Insecurity), OPT (Optimism).
Source: Survey data.

Table 04 also presents the indexes for testing the convergent validity of the TRI constructs. Convergent validity can be verified through the composite reliability (CR) above 0.70 for all constructs. Such constructs meet Bagozzi's criteria (1988). Table 05 aims to assess the discriminant validity of the TRI scale used in this research. For this, the correlations between the latent variables are presented.

Table 05

Correlations of the latent variables of the Full Model

	Desire to posses	DIS	Image	INN	INS	OPT
Desire to posses	0.864					
DIS	0.253	0.752				
Image	-0.382	0.372	0.905			
INN	0.613	0.623	0.039	0.767		
INS	0.097	0.713	0.466	0.376	0.787	
OPT	0.887	0.319	-0.370	0.664	0.153	0.865

Subtitles: Possession, DIS (Discomfort), Image, INN (Innovation), INS (Insecurity), OPT (Optimism).
Source: Survey data

As the AVE root is superior to the correlations between the latent variables, it means that the TRI scale satisfies the criterion established by Hair et al. (2010) to demonstrate the convergent validity. Another way to prove the discriminant validity is the correlation of the manifest variables with the constructs of the model. In this case, the correlations of the indicators with the constructs they reflect must surpass the correlations with the other constructs.

Table 06

Cross loadings of the Complete Model

	Desire to posses	DIS	Image	INN	INS	OPT
Possession1	0.825	0.249	-0.257	0.535	0.142	0.722
Possession2	0.879	0.209	-0.355	0.540	0.093	0.784
Possession3	0.858	0.245	-0.294	0.550	0.128	0.747
Possession4	0.874	0.190	-0.344	0.509	0.070	0.756
Possession5	0.873	0.237	-0.322	0.564	0.091	0.781
Possession6	0.887	0.213	-0.345	0.533	0.065	0.776
Possession7	0.855	0.200	-0.329	0.505	0.073	0.758
Possession8	0.842	0.213	-0.342	0.520	0.053	0.766
Possession9	0.877	0.227	-0.347	0.537	0.069	0.780
Possession10	0.870	0.204	-0.359	0.507	0.057	0.787
DIS1	0.228	0.706	0.245	0.545	0.434	0.280
DIS2	0.206	0.768	0.223	0.533	0.509	0.279
DIS3	0.205	0.762	0.259	0.481	0.523	0.243
DIS4	0.229	0.754	0.242	0.477	0.514	0.272
DIS5	0.210	0.764	0.283	0.502	0.554	0.242
DIS6	0.227	0.751	0.218	0.507	0.506	0.284

	Desire to posses	DIS	Image	INN	INS	OPT
DIS7	0.114	0.743	0.342	0.394	0.583	0.175
DIS8	0.147	0.760	0.299	0.423	0.489	0.177
DIS9	0.213	0.763	0.305	0.471	0.606	0.277
DIS10	0.131	0.744	0.358	0.371	0.617	0.181
Image1	-0.354	0.355	0.904	0.037	0.438	-0.345
Image2	-0.364	0.333	0.927	0.024	0.439	-0.349
Image3	-0.388	0.297	0.917	-0.017	0.412	-0.380
Image4	-0.267	0.370	0.872	0.110	0.396	-0.256
INN1	0.719	0.241	-0.319	0.704	0.078	0.779
INN3	0.419	0.545	0.124	0.809	0.317	0.446
INN4	0.361	0.536	0.159	0.753	0.341	0.385
INN5	0.392	0.564	0.125	0.815	0.363	0.426
INN6	0.353	0.586	0.200	0.765	0.419	0.393
INN7	0.326	0.566	0.193	0.749	0.377	0.353
INS3	0.131	0.617	0.343	0.370	0.730	0.168
INS5	0.056	0.567	0.391	0.291	0.808	0.100
INS6	0.075	0.574	0.389	0.317	0.828	0.120
INS7	0.044	0.539	0.347	0.248	0.793	0.071
INS8	0.060	0.563	0.369	0.277	0.804	0.116
INS9	0.092	0.506	0.356	0.269	0.755	0.143
OPT1	0.742	0.277	-0.281	0.549	0.146	0.837
OPT2	0.776	0.246	-0.359	0.542	0.110	0.873
OPT3	0.766	0.341	-0.204	0.622	0.204	0.842
OPT4	0.752	0.221	-0.343	0.486	0.118	0.830
OPT5	0.784	0.265	-0.348	0.571	0.118	0.880
OPT6	0.770	0.262	-0.325	0.575	0.112	0.880
OPT7	0.785	0.286	-0.346	0.587	0.115	0.891
OPT8	0.784	0.279	-0.344	0.597	0.115	0.891
OPT9	0.773	0.319	-0.304	0.615	0.170	0.877
OPT10	0.738	0.270	-0.338	0.601	0.120	0.847

Subtitles: Possession, DIS (Discomfort), Image, INN (Innovation), INS (Insecurity), OPT (Optimism).
Source: Survey data.

It is observed that table 06 shows the "Cross Loadings" correlations, that is, cross-correlations of the observable variables with the constructs of the model, that such variables have greater correlations with the dimensions they reflect. Summarizing the results found, for the established model, the TRI scale, after some adjustments in the observable variables, which constitute the questions formulated in the questionnaire, presented satisfactory performance for the reliability of the indicators, internal reliability of the scale, convergent validity and discriminant validity, for explain the Full Model. Once the reliability and validity of the TRI scale is demonstrated, the influence of its constructs on the dimensions of the Complete Model

begins to be studied. For this, the path coefficients in the conceived model are examined. Table 07 presents the path coefficients.

Table 07

Path coefficients of the Full Model

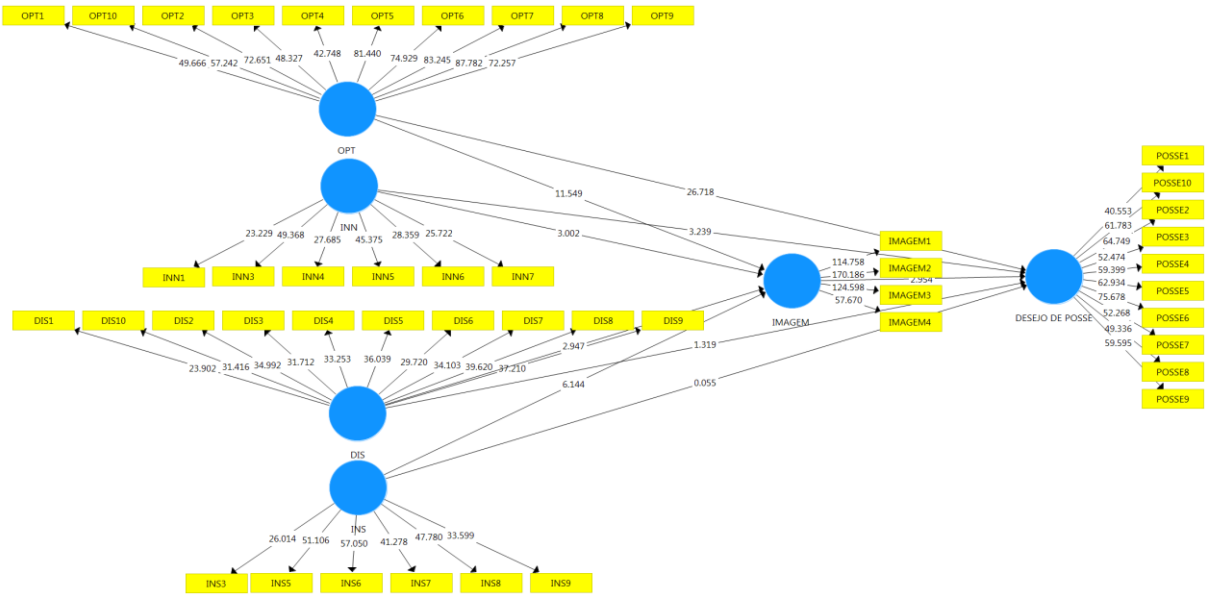
	Desire toposses	DIS	Image	INN	INS	OPT
Desire to posses						
DIS	-0.046		0.208			
Image	-0.073					
INN	0.116		0.190			
INS	-0.002		0.340			
OPT	0.797		-0.614			

Subtitles: Possession, DIS (Discomfort), Image, INN (Innovation), INS (Insecurity), OPT (Optimism).
Source: Survey data

It can be observed that Discomfort (Coefficient = 0.208), Innovativeness (Coefficient = 0.190), and Insecurity (Coefficient = 0.340) exert a direct influence, and Optimism (Coefficient = -0.614) has an inverse influence on the negative image of Chinese technology. Innovativeness (Coefficient = 0.116), and Optimism (Coefficient = 0.797), exert a direct influence on the desire to possess Chinese technology. Discomfort (Coefficient = -0.046), and Insecurity (Coefficient = -0.002) exert an inverse influence on the desire to possess Chinese technology. The effect of the negative image of Chinese technology (Coefficient = -0.073) on the desire for possession is inverse in character, the greater the perception of a negative image, the lower the desire for possession. However, it is necessary to test the statistical significance of the observed relationships. Statistical significance can be tested by the Bootstraping method, which consists of simulating several samples from the research database. These samples allow the calculation of the mean, standard deviation, standard error and t-statistic used in testing the significance of the path coefficients. Table 08 presents these statistics and the P-value, which determines the significance of the path coefficients. Coefficients are considered statistically significant if P-value values are less than 0.05.

Figure 03

T-statistic of the TRI path coefficients Full Model



Subtitles: Possession, DIS (Discomfort), Image, INN (Innovation), INS (Insecurity), OPT (Optimism).
Source: Survey data.

Table 08

Full Model path coefficients t-test

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T-statistic (|O/STDEV|)	P values
DIS -> Desire to posses	-0.046	-0.042	0.035	1.319	0.188
DIS -> Image	0.208	0.209	0.070	2.947	0.003
INS -> Desire to posses	-0.002	0	0.033	0.055	0.956
INS -> Image	0.340	0.339	0.055	6.144	0
Image -> Desire to posses	-0.073	-0.074	0.025	2.954	0.003
INN -> Desire to posses	0.116	0.112	0.036	3.239	0.001
INN -> Imagem	0.190	0.188	0.063	3.002	0.003
OPT -> Desire to posses	0.797	0.798	0.030	26.718	0
OPT -> Image	-0.614	-0.617	0.053	11.549	0

Subtitles: Possession, DIS (Discomfort), Image, INN (Innovation), INS (Insecurity), OPT (Optimism).
Source: Survey data

Table 08 shows the following relationships: as reported above, the components Discomfort (Coefficient = -0.046 and P value = 0.188), and Insecurity (Coefficient = -0.002 and P value = 0.956), did not have a significant influence on the desire for possession. However, these two components: Discomfort (Coefficient = 0.208 and P Value = 0.003), and Insecurity

(Coefficient = 0.340 and P Value = 0), exerted a significant influence on the negative image. This is a direct relationship, the greater the Discomfort and Insecurity, the greater the effect on the negative image of Chinese technology. On the other hand, the driving factors, Optimism (Coefficient = 0.797 and P Value = 0), and Innovativeness (Coefficient = 0.116 and P Value = 0.001), had a positive influence on the desire for ownership. Optimism (Coefficient = -0.614 and P value = 0) exerted a significant influence on the significant image. Innovativeness (Coefficient = 0.190 and P value = 0.003) had a positive influence on the negative image. The influence of Optimism on the negative image, as predicted in the hypothesis initially formulated, constitutes an inverse relationship (Coefficient = -0.614), the greater the Optimism, the lower the intensity of a negative image of Chinese technology. However, the relationship between Innovativeness and negative image is direct (Coefficient = 0.190), the greater the Innovativeness factor, the greater the intensity of the negative image of Chinese technology, not corroborating the hypothesis initially formulated. This result may seem contradictory and needs further study and reflection. Finally, an inverse relationship was found between the Negative Image and the desire to possess, meaning that the greater the perception of a negative image, the lower the desire to possess Chinese technology. Based on the resolved Complete Model, we can verify the study's hypotheses that were or were not proven, as presented in table 09 below.

Table 09

Full Model

Hypothesis	Influence Relationship	Type of Relationship	Research Result
1	Innovativeness influences the Desire for Ownership	Direct	Confirmed
2	Optimism influences the Desire for Ownership	Direct	Confirmed
3	Insecurity influences the Desire for Possession	Reverse	Not Confirmed
4	Discomfort influences the Desire for Possession	Reverse	Not Confirmed
5	Innovativeness Influences the Negative Image	Reverse	Not Confirmed
6	Optimism influences the negative image	Reverse	Confirmed
7	Insecurity influences the Negative Image	Direct	Confirmed
8	Discomfort influences the Negative Image	Direct	Confirmed
9	Negative Image Influences Desire for Possession	Reverse	Confirmed

Source: Survey data.

Considering the nine hypotheses initially formulated, six were confirmed and three were not accepted, results that should be explored in the conclusions of this study.

4.2 TRI typologies of technology adopters

The characterization of respondents regarding their segments in Explorers, Pioneers, Skeptics, Paranoids and Laggards. After the validations, the characterization was carried out: (a) the explorer consumer or in the Explorer segment, have high rates of readiness for technology, with high scores on the dimensions driving adoption (Optimism and Innovativeness), and low scores on the inhibiting dimensions (Discomfort and Insecurity); (b) the Pioneer segment shares with Explorers high levels of Optimism and Innovativeness, but at the same time reveals high levels of Discomfort and Insecurity; (c) in the Skeptics segment all scores are low in all dimensions; (d) in the segmentation of Paranoids it differs a little from the others, as it presents high levels of optimism, also revealing high levels in the inhibiting dimensions of adoption, this group also presents a low degree of Innovativeness; (e) Laggards represent the opposite of Explorers, exhibiting low scores on the dimensions driving adoption, with high scores on the inhibiting dimensions. The sample indicated that most of the profile is Pioneer 53.8%, which reveals an audience prone to technology, with high levels of Optimism and Innovativeness, but at the same time reveals also high levels of Discomfort and Insecurity.

The sample signals an important opposite trend, with 1.6% both Laggards and Explorers. Explorers have high rates of technology readiness, with high scores on the dimensions driving adoption (Optimism and Innovativeness) and low scores on the inhibiting dimensions (Discomfort and Insecurity), Laggards represent the opposite of Explorers, exhibiting low scores on the driving dimensions adoption, with high scores in the inhibitory dimensions. When adding the percentage of Pioneers and Explorers, 53.8% and 4.4%, respectively, add up to a total of 58.2% of the total sample of consumers, indicating a propensity to adopt Chinese technology products and services, and thus revealed as drivers of technology adoption, the table below shows the result of all respondents within this perspective.

Table 10

TRI Typology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Explorers	38	4.4	6.8	6.8
	Pioneers	465	53.8	8.0	89.8
	Skeptical	22	2.5	3.9	93.8
	Paranoid	21	2.4	3.8	97.5
	Latecomers	14	1.6	2.5	100.0
	Total	560	6.7	100.0	
Missing	System	305	35.3		
Total		865	100.0		

Source: Survey data

Table 10 indicates in the sample that the Skeptical and Paranoid profiles represent a total of 4.9% in relation to the sample, with 2.5% and 2.4% respectively. The Paranoid group is convinced of the benefits but is extremely concerned about the risks, has high levels of Optimism, but has equally high levels in the adoption-inhibiting dimensions. This group also has a low degree of Innovativeness. The Skeptics group, on the other hand, scores low on all dimensions, they need to be convinced of the benefits of Chinese technology. The sample also reveals an audience of 35.30% that does not belong to any of the segments defined by the model, as they do not fit into any of the profiles of the TRI scale. The table below shows the levels of Optimism, Innovativeness, Discomfort and Insecurity for the five segments identified by the TRI scale.

Table 11

Average TRI typology

TRI Typology	Optimism	Innovativeness	Discomfort	Insecurity
	Mean	Mean	Mean	Mean
Explorers	8.65	5.73	4.73	4.68
Pioneers	8.29	6.02	5.91	5.38
Skeptics	2.20	2.53	2.01	4.11
Paranoid	7.71	4.46	5.90	5.63
Latecomers	3.08	2.81	6.14	7.13

Source: Survey data.

As described above, the Explorers had an average above 5 for the driving dimensions and an average below 5 for the inhibiting dimensions. The Pioneers had an average above 6 for the conductive dimensions and above 5 for the inhibiting dimensions, which shows the sample as prone to adopting technological products and services. Paranoids showed means below 5 of the Innovativeness driving dimensions, and they showed means above 5 of the Optimism driving dimensions and Discomfort and Insecurity driving dimensions. Skeptics showed means below 5 for the conductive dimensions in the inhibiting dimensions, and finally the Laggards showed means below for the conductive dimensions and above 5 for the inhibiting dimensions.

4.3 Discussion

The due evidence of the reliability and validity criteria of the TRI scale, allows possible to verify that its constructs have significant influences on the dimension of the model designed to explain the Possession of technology products, as demonstrated by Shim, Han and Há (2020) and Kaushik and Agrawal (2021). Therefore, the established model, based on the TRI scale, demonstrated a good statistical significance of the relationships observed in the TRI scale construct Discomfort, Innovativeness and Optimism that explain the Possession of products in accordance with Bakırtaş and Akkaş (2020).

The TRI scale, with due evidence of the reliability and validity criteria, it was possible to verify that its constructs had significant influences on the dimension of the model designed to explain the negative image of Chinese products and services, as described by Lai and Lee (2020) and Kaushik and Agrawal (2021). The established model, based on the IRT scale, demonstrated a good statistical significance of the relationships observed in the IRT construct Discomfort, Innovativeness, Insecurity and Optimism, which explain the negative image of Chinese products and services. The TRI scale was related to the Complete Model, which showed the following relationships: the components Discomfort and Insecurity do not have a significant influence on the desire for possession. However, these two components exert a significant influence on the image. This is a direct relationship, the greater the Discomfort and Insecurity, the greater the effect on the negative image, which in the present study is a bad image of Chinese technology. On the other hand, the driving factors, Optimism and Innovativeness exerted a positive influence on the desire for ownership. Likewise, Optimism and Innovativeness exerted a significant influence on the negative image. The influence of optimism on the negative image is an inverse relationship, the greater the optimism, the lower the intensity of a negative image of Chinese technology. However, the relationship between

Innovativeness and negative image is direct, the greater the Innovativeness factor, the greater the intensity of the negative image of Chinese technology. Finally, an inverse relationship was found between the negative image and the desire for possession, meaning that the less negative the image, the greater the desire for possession, according to Matarirano, Yeboah and Gqokonqana (2021) and Leong, Kawan and Ming (2021).

The model also characterized the sample in five segments according to the TRI typology, addressed in the theoretical framework, the sample in terms of typology, signaled that the majority of the profile is Pioneer 53.8%, which reveals a technology-prone audience, with high levels of Optimism and Innovativeness, but at the same time reveals also high levels of Discomfort and Insecurity. The sample signals an important opposite trend, with 1.6% both Laggards and Explorers. Explorers have high rates of technology readiness, with high scores on the dimensions driving adoption (Optimism and Innovativeness), and low scores on the inhibiting dimensions (Discomfort and Insecurity), Laggards represent the opposite of Explorers, exhibiting low scores on the dimensions conducive to adoption, with high scores in the inhibitory dimensions. When adding the percentages of Pioneers and Explorers, 53.8% and 4.4%, respectively, add up to a total of 58.2% of the total sample of consumers, indicating a propensity to adopt Chinese technology products and services, and thus revealed as drivers of technology adoption. The questionnaire model used to measure ownership, there is a concern in the researcher for not having described the various technologies of Chinese products and services, which are entering the market daily due to technological obsolescence. The scale used to measure the image of the Chinese product may have created a negative view of Possession, harming the reliability of the indicators. The same constructs were evaluated by Alharbi and Sohaib (2021), who obtained coherent indicators, studying the IRT for the adoption of cryptocurrencies.

The study resulted in the vision of the TRI scale, regarding consumer readiness to use Chinese technology products and services regarding Possession and Image. It is understood that the facts presented are relevant, however, the scale can be used in several other contexts, such as the propensity to use technology products from Germany, Switzerland, Israel, Brazil and other countries. The TRI model is a powerful instrument to measure technology readiness in several sectors, as confirmed by the most recent literary contributions, such as Leong, Kwan and Ming (2021), Lai and Lee (2020) and Bakırtaş and Akkaş (2020). Therefore, the theme, despite the robust contributions of the literature, has significant potential as an analytical unit for academic studies.

5 Final considerations

The present study is based on studies initially developed by Parasuraman (2000), and Parasuraman and Colby (2001), in addition, to more recent ones, confirming the consistency of the original model to identify and describe consumer behavior in the use of based products and services. in Chinese technology, as well as in Lai and Lee (2020), regarding the relationship between TAM (Technology Acceptance Model) and TRI. The Technology Readiness Index (TRI) has proven to be an important model for measuring technology readiness in different contexts, according to the configuration of the state of the art in academic studies.

In this sense, the purposes and processes of this research were fulfilled, in terms of the literature review relevant to the topic, in its epistemological, theoretical, morphological, methodological and metric dictates, with the objective of measuring consumer readiness to accept basic products technology, in the context of Chinese products, through the TRI scale. Thus, the general objective was fulfilled in the characterization of the constructs and variables, as well as in the contrasts of the statistical tests required to explain in depth the defined and sought-after contents.

Six hypotheses were confirmed, that is, the innovativeness of the products influences the desire to possess Chinese products, the optimism of the consumer influences the desire to possess, the optimism of the consumer influences the negative image of the products, the insecurity regarding the products influences the negative image towards the consumer, discomfort in use influences the negative image of the product and the negative image of the country and technologies influence the desire to own the products. Three hypotheses were not confirmed, namely: insecurity with the products influences the desire for ownership, discomfort influences the desire for ownership and innovativeness influences the negative image of Chinese products.

In the contrasts of the typology of consumers (Explorers, Pioneers, Skeptics, Paranoids and Laggards) with their emotional states and visions about technological products (Optimism, Innovativeness, Discomfort, Insecurity), the perceptual variations were quite significant, with low averages predominating. The exceptions were Explorers, Pioneers and Paranoids, for the Optimism construct, and Laggards, for the Insecurity construct.

In line with the state of the literature in this area, notably in the applicability of the TRI scale, this research allows making recommendations on the convenience, opportunity and relevance of carrying out new in-depth studies, analyzing the model and its contribution to the evolution of the literature in this field, are located at frontiers such as: confirmatory replication

of the model in diversified consumers and technologies, verification of constructs in different cultural environments, the explanatory power of the model on individual relationships in relation to complex technologies, TRI explaining the sensory perceptions of consumers in relation to high-impact technologies and the ability of TRI to explain other emotional states of consumers in relation to the longitudinal interaction with emerging technologies. Furthermore, it is recommended to reformulate the approaches to the respondents, in the questionnaire, on the questions referring to the hypotheses not confirmed in this study.

As a limitation, this study does not include a qualitative investigation that describes the reasons for the responses of the research subjects.

Authors' contributions

Contribution	Lara, J. E.	Novaes, A. C.	Afonso, B. P. D	Tissot-Lara, T. A.
Contextualization	X	X	----	----
Methodology	X	X	X	X
Software	X	X	X	X
Validation	X	X	X	X
Formal analysis	X	X	----	___
Investigation	X	X	----	___
Resources	X	X	----	------
Data curation	X	X	X	X
Original	X	X	___	___
Revision and editing	X	___	___	___
Viewing	X	___	___	___
Supervision	X	-----	-----	-----
Project management	X	X	----	-----
Obtaining funding	____	X	----	___

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