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## Perceived Risk Effect on Brand Attachment: Explore Linear Regression Combined with Structural Equations Model Methods

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### Abstract

The extent to which consumers like a brand is reflected by brand attachment, which is widely recognized by academics as an emotional relationship with the brand. Has this relationship always been strong and reliable? Does brand attachment have an impact under the influence of perceived risk? There is a great lack of research in this area and need to investigate. This study explores the methodology of a new model of perceived risk and brand attachment. Using a quantitative approach combining multiple linear regression and structural equation modelling, the analysis of the data revealed that COVID-19 perceived risks of financial, social, physical, psychological, and temporal risks can have a negative impact on brand attachment. In future research, the authors attempt to explore more factors influencing brand attachment, using panel data for a more in-depth study. This study also provides evidence to enrich the empirical research on brand attachment and also brings some lessons for companies' brand management practices.

**Keywords:** Risk Effect, Brand Attachment, Structural Equations Model

### Introduction

Brand attachment theory has been researched and developed over a long period of time and is developing more areas under the influence of the internet and various factors.

The authors have found, after collating the existing literature, that current research on brand attachment is more in the realm of research on the behaviors of consumers themselves, and that there is insufficient empirical evidence found in the existing literature on what external factors influence brand attachment. Particularly in the context of COVID-19, it is more about the fields of health care, psychology, etc., while in the field of marketing more research is directed at consumer buying behaviors, purchase intentions, etc. There is a lack of empirical research in the COVID-19 context to verify the impact of COVID-19 on brand attachment. Even more, a model is lacking to meet and validate the relationship of perceived risk including COVID-19 on brand attachment. It is important and necessary to investigate whether

consumers' attachment to brands has changed in the context of COVID-19. This study will therefore fill a gap in this research, enrich the evidence and literature on empirical research on brand attachment, and provide empirical support for brand management and practice.

## **Literature Review**

### **Brand Attachment**

In 1989, Schultz, an American marketing scholar, completed his doctoral dissertation entitled "An Empirical Investigation of Person-Material Possession Attachment" at the University of Cincinnati, marking the entry of attachment theory from the field of psychology into the study of consumer behavior (Thomson et al., 2005).

Ball and Tasaki provide another definition, "Attachment is the extent to which consumers use the objects of consumption that they have, expect to have, or have had to maintain their self-concept" (Tasaki, 2001). Building on attachment theory, Park et al (2006) define brand attachment as "the strength of the cognitive and emotional connection between an individual and a brand".

Since the birth of brand attachment, different scholars have defined and expanded the scope of the connotation of brand attachment, but none of them have abandoned the study of the most fundamental emotional attachment relationship of brand attachment, because the essence of attachment is the maintenance and preservation of emotions. Therefore there are also many scholars who have expanded on the development of brand attachment theory. Wu et al (2017) reviewed the concept of brand attachment, measurement methods, theoretical models, influencing factors and outcome variables, and the identification of related variables, and concluded that future research on brand attachment should be conducted in three areas, including integrating theoretical perspectives, improving external validity, and examining cultural differences.

Throughout the existing research, the theoretical constructs on brand attachment are still divergent, and there are few empirical studies, almost all of which are on dimensionality and measurement, and there is no authoritative research methodology (Xia & Dai, 2010).

The brand attachment scales developed by Thomson (2005); Park (2010) both have high reliability and validity, and contain fewer items, are shorter and easier to administer. Both scales have good predictive validity for consumer psychology and behavior. For example, the Emotional Attachment Scale can effectively predict brand loyalty and premium purchase intention, and the Brand Attachment Scale can effectively predict consumers' actual consumption behavior (Wu et al., 2017). Therefore, although the measurement of brand attachment has been studied by many scholars, the two most dominant brand attachment scales have been used by scholars as the basis for reform.

### **COVID-19 Perceived Risk**

Perceived risk is a sense of uncertainty that arises from the fact that consumers cannot predict the outcome of their purchases and the consequences that will result from them (Derbaix, 1983). Bettman (1973) uses the concept of risk perception to explain consumer buying behaviour, arguing that consumers will buy the goods with the least perceived risk.

Heeler (1972) divided the perceived risk into 1. Financial 2. Psychological 3. Performance 4. Physical 5. Social. Kaplan et al (1974) further validated these dimensions of perceived risk. These classifications of perceived risk provided the basis for subsequent scholarly research, Gao (2004) integrated different scholars' research on perceived risk, classified perceived risk into time risk, functional risk, physical risk, financial risk, social risk and psychological risk.

Time risk: the risk of time wastage due to the need to adjust, repair or return a purchased product. Functional risk: the risk arising from a product not performing as one would expect or from a product performing less well than the competition. Physical risk: the risk that a product may be hazardous to one's own health and safety or that of others. Financial risk: the risk of financial loss due to overpricing or quality problems with a product. Social risk: the risk of being ridiculed or alienated by others as a result of poor purchasing decisions. Psychological risk: the risk of damage to the consumer's ego as a result of a poor decision. These six perceived risks are the basis and have been applied and continually reformed by academics in subsequent research, Dong et al (2005) studied consumer perceived risk in the Internet environment, extending the original research on measuring online perceived risk in a single product purchase context to produce a scale for measuring consumer perceived risk in the Internet environment.

However, there is a lack of academic research on COVID-19 perceived risk, with some scholars building on previous research on perceived risk. Chen and Guo (2020) investigate and analyze the current employment risk perceptions of university students, their risk perceptions in the context of the epidemic, their employment preferences and their corresponding coping strategies. Zhang (2021) developed the COVID-19 scale of perceived risk based on the research of different scholars, which contains financial risk, physical risk, social risk, temporal risk, and psychological risk, and these dimensions also contain previous definitions of risk perception dimensions by different scholars, which have been validated and analyzed. Therefore, perceived risk has been influencing various behaviors of people. Based on the literature related to brand attachment and perceived risk, this study proposes the hypothesis that:

**COVID-19 perceived risks of financial, social, physical, psychological, and temporal risks can have a negative impact on brand attachment.**

### Methodology

Firstly, based on a thorough review of the literature, the brand attachment dimension of this study questionnaire was measured using a scale developed by Thomson (2005) and the COVID-19 perceived risk dimension was measured using a scale developed by (Zhang, 2021). The research framework for this study is as follows.

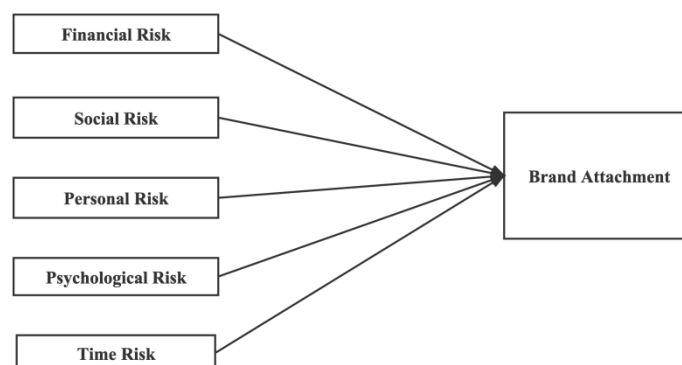


Figure 1: Research Framework

Secondly, in order to have a targeted and representative study to verify the level of consumer attachment to a specific brand under the influence of the perceived risk of COVID-19, the sample collected for this study was from the membership system of a brand and the type of

data collected was cross-sectional. In order to reduce the risk of exposure during the COVID-19 epidemic, 212 questionnaires were distributed through an internet platform and 209 questionnaires were returned, resulting in 209 valid questionnaires.

Finally, the data were analyzed, and the hypotheses were validated by SPSS software.

## Data Analysis

### Frequency Analysis

Table 1

#### Frequency Description

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	123	58.9	58.9	58.9
	Female	86	41.1	41.1	100.0
	Total	209	100.0	100.0	

#### Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-28	27	12.9	12.9	12.9
	29-38	103	49.3	49.3	62.2
	39-48	62	29.7	29.7	91.9
	48+	17	8.1	8.1	100.0
	Total	209	100.0	100.0	

#### Education Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	College and below	84	40.2	40.2	40.2
	Bachelor's degree	100	47.8	47.8	88.0
	Postgraduate	25	12.0	12.0	100.0
	Total	209	100.0	100.0	

#### Income Monthly

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2K	16	7.7	7.7	7.7
	2K-5K	85	40.7	40.7	48.3
	5K-8K	82	39.2	39.2	87.6
	8K+	26	12.4	12.4	100.0
	Total	209	100.0	100.0	

Descriptive statistics of the sample are presented in Table 1 for Gender, Age, Education Level, and Income monthly. The sample size was 209, 123 for males and 86 for females. 49.3% of the sample was aged 29-38, 47.8% had a bachelor's degree and 40.7% had a monthly income of 2K-5K.

**Reliability and Validity Analysis**

**Reliability Statistics**

Cronbach's Alpha	N of Items
.878	32

**KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.952
Bartlett's Test of Sphericity	Approx. Chi-Square	6151.901
	df	496
	Sig.	.000

Figure 2: Reliability and Validity

The overall reliability and validity of the study questionnaire was tested with an Alpha value of 0.878, a KMO value of 0.952, and a Sig value of less than 0.05, all of which passed the test, indicating that the questionnaire in this study had good reliability and validity.

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	16.109	50.340	50.340	16.109	50.340	50.340	6.609	20.652	20.652
2	2.291	7.161	57.500	2.291	7.161	57.500	4.678	14.618	35.270
3	2.034	6.356	63.856	2.034	6.356	63.856	4.367	13.646	48.916
4	1.939	6.059	69.915	1.939	6.059	69.915	4.286	13.393	62.309
5	1.354	4.233	74.148	1.354	4.233	74.148	3.788	11.839	74.148
6	.946	2.956	77.104						
7	.629	1.966	79.069						
8	.519	1.622	80.692						
9	.484	1.512	82.203						
10	.437	1.366	83.569						
11	.424	1.325	84.894						
12	.396	1.236	86.130						
13	.377	1.179	87.309						
14	.351	1.097	88.406						
15	.343	1.072	89.478						
16	.331	1.036	90.514						
17	.307	.960	91.474						
18	.279	.870	92.344						
19	.271	.847	93.191						
20	.259	.808	93.999						
21	.250	.780	94.779						
22	.236	.737	95.516						
23	.220	.688	96.204						
24	.203	.635	96.840						
25	.180	.562	97.402						
26	.153	.479	97.881						
27	.146	.456	98.336						
28	.135	.421	98.757						
29	.120	.375	99.132						
30	.105	.327	99.459						
31	.102	.319	99.778						
32	.071	.222	100.000						

Figure 3: Exploratory Factor Analysis

The exploratory factor analysis showed that the total variance explained in this study was 74.148, indicating that the five factors could explain 74.148% of the information in the whole questionnaire and had good explanatory effect.



### Correlation Analysis

		q6	q7	q8	q9	q10	BA
q6	Pearson Correlation	1	.551**	.501**	.516**	.473**	-.541**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	209	209	209	209	209	209
q7	Pearson Correlation	.551**	1	.560**	.561**	.532**	-.554**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	209	209	209	209	209	209
q8	Pearson Correlation	.501**	.560**	1	.489**	.467**	-.515**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	209	209	209	209	209	209
q9	Pearson Correlation	.516**	.561**	.489**	1	.482**	-.567**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	209	209	209	209	209	209
q10	Pearson Correlation	.473**	.532**	.467**	.482**	1	-.561**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	209	209	209	209	209	209
BA	Pearson Correlation	-.541**	-.554**	-.515**	-.567**	-.561**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	209	209	209	209	209	209

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Figure 4:Correlations

The variables were named as: q6=financial risk, q7=social risk, q8=physical risk, q9=psychological risk, q10= temporal risk and BA=brand attachment. Correlation analysis showed that the Pearson correlation coefficients between q6-q10 were all positive, with two-tailed significance values less than 0.01, and were significantly correlated. The Pearson correlation coefficients between q6-q10 and BA were negative, with two-tailed significance values less than 0.01, and were significantly correlated.

### Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.704 <sup>a</sup>	.496	.484	.83561

a. Predictors: (Constant), q10, q8, q9, q6, q7

b. Dependent Variable: BA

Figure 5:R square Value

The R-square shows that 49.6% of the BA variation can be explained by the variation in the independent variables q6-q10.



**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	139.641	5	27.928	39.998	.000 <sup>b</sup>
	Residual	141.743	203	.698		
	Total	281.383	208			

a. Dependent Variable: BA

b. Predictors: (Constant), q10, q8, q9, q6, q7

Figure 6:F test

ANOVA on the regression equation:  $F=39.998$ ,  $Sig<0.01$ , proving that the independent variables q6-q10 had a linear relationship with the dependent variable BA, which passed the F-test.

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	6.267	.194		32.371	.000		
	q6	-.186	.070	-.172	-2.656	.009	.588	1.699
	q7	-.149	.079	-.132	-1.887	.061	.507	1.973
	q8	-.138	.067	-.133	-2.069	.040	.597	1.675
	q9	-.269	.078	-.224	-3.441	.001	.584	1.711
	q10	-.251	.066	-.239	-3.801	.000	.629	1.591

a. Dependent Variable: BA

Figure 7:Regression Coefficients

Regression analysis showed: q6 regression coefficient of  $-.186$ ,  $Sig<0.05$ , q7 regression coefficient of  $-.149$ ,  $Sig>0.05$ , q8 regression coefficient of  $-.138$ ,  $Sig<0.05$ , q9 regression coefficient of  $-.269$ ,  $Sig<0.05$  and q10 regression coefficient of  $-.251$ ,  $Sig<0.05$ . The VIF values for q6-q10 were less than 5 and there was no multi-collinearity.

**The regression model was  $BA=6.267-.186q6-.138q8-.269q9-.251q10$ .**

Therefore, among the COVID-19 perceived risks, financial risk, physical risk, psychological risk, and temporal risk all have a significant negative impact on brand attachment. The greater the perceived risk, the smaller the brand attachment. Social risk is not significant, and the hypothesis does not hold, other hypotheses hold.

**Structural Equation**

Table 2

*Model Fit Index*

Observation indicators	Evaluation indicators	Value of this model
$\chi^2/df$	<3	1.206
RMESA	<0.05	0.031
SRMR	<0.05	0.036
TLI	>0.9	0.985
CFI	>0.9	0.987

To validate the fit of the research model, the structural equations of this study were tested by Mplus and the model fit indices showed that the model fit poly of this study met the measurement index (Table2), proving that the model of this study has a good fit.

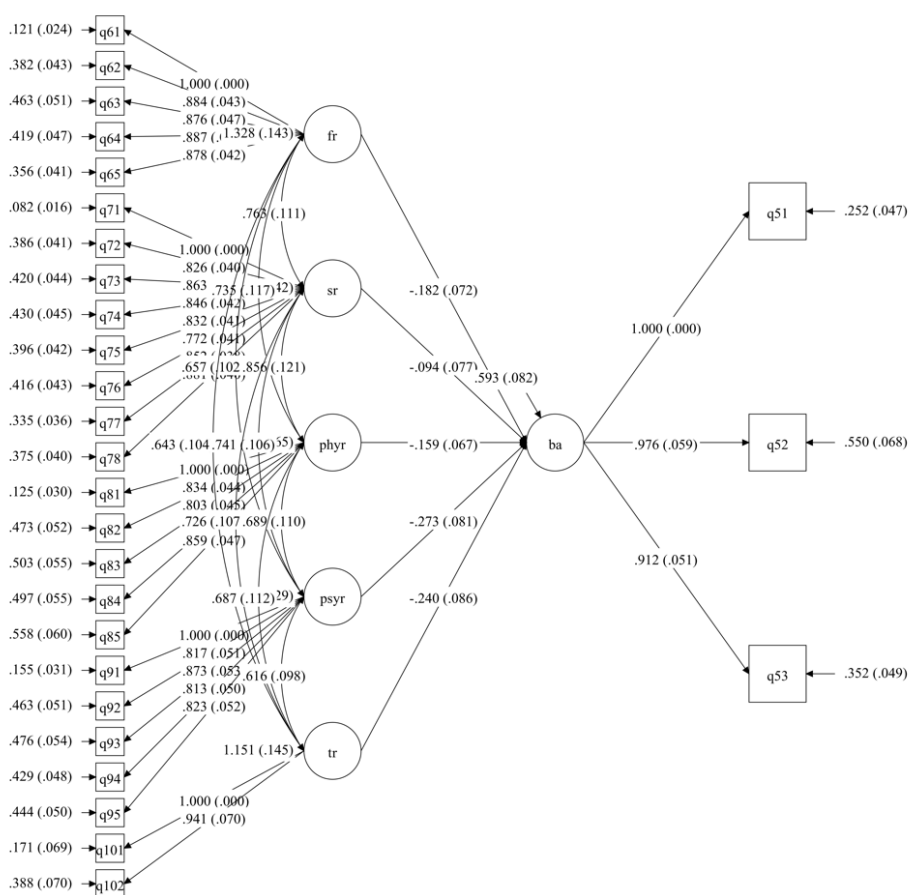


Figure 8: Path Image

In path research from Figure8, FR=financial risk, SR=social risk, PHYR=physical risk, PSYR=psychological risk, TR= temporal risk and ba=brand attachment. FR-0.182, P=0.011, SR-0.094, P=0.224. PHYR-0.159, P=0.018. PSYR-0.273, P=0.001. TR-0.240, P=0.005. SR was not significant; all other variables were significant and the structural equation validation results remained consistent with the linear regression results.

## **Conclusion and Recommendation**

### **Conclusion**

Main findings of this study that under the continuous influence of COVID-19, perceived risk brings some harm and negative impact on brand attachment. Of all the COVID-19 perceived risks, physical risk: -.138, financial risk: -.186, temporal risk: -.251, psychological risk: -.269. temporal risk and psychological risk reduce consumers' attachment to the brand, the declining level of brand attachment directly affects consumers' attention to the brand, the brand is becoming blurred in the minds of consumers and more consumers are starting to move away from the brand. If this situation continues, it will eventually lead to a decline in sales performance and affect the survival of the company.

The impact of physical and financial risks on brand attachment during the COVID-19 epidemic also had a negative impact, with consumers becoming less attached to the brand mainly due to concerns about their bodies and finances. Especially in the current environment, COVID-19 has not completely disappeared, and its impact still exists.

### **Recommendation**

#### **Reduce the Perceived Risk of Consumers**

Reducing the perceived risk of COVID-19 is primarily about mitigating physical, financial, temporal, and psychological risks for consumers. Management policies should be developed to protect consumers from the physical risk of COVID-19 infection and to return to normal production and living as quickly as possible, so that consumers have a stable source of income before they can buy their favorite branded products. In addition, reducing the time spent isolating consumers in COVID-19, so that they have less time at risk and more time to spend on social activities, reduces the psychological risk to consumers and will ultimately help the company's brand attachment to improve.

#### **Improve the Promotion of Brand Attachment**

Traditionally, brand managers and departments have used rich marketing campaigns as the main way to increase consumer attachment to the brand. However, from the consumer's point of view it is more important to focus on the risk to oneself, which may not come from the brand, but from causes external to the brand. When something big happens, corporate brand managers and departments should pay more attention to the deeper impact of the big event rather than just focusing on the brand itself. Therefore, brand attachment should be improved in a way that is dynamic and in line with social development, and moreover should have consumer protection at its core.

### **Limitation and Prospects**

During the prevalence of COVID-19, based on the extant literature, the authors have not identified and explored additional risk perception factors on brand attachment, and what factors exist within a firm that influence brand attachment needs to be further explored in future research. Furthermore, the cross-sectional data reflects the opinions of the sample collected so far and more types of data should be used for future research as the impact of COVID-19 continues and evolves.

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