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Determinants of Consumer's Preference for Imported Rice over Locally Processed in Sokoto and Kebbi States

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Abstract: **The study was carried out in two States of North Western Nigeria, Kebbi and Sokoto States covering the largest markets in the state capitals of the two states. The markets selection was purposive, based on high patronage of locally processed and imported rice in the markets. The confirmatory factor analysis (CFA) model was designed to test the multidimensionality of the theoretical constructs. Specifically, we test the hypothesis that rice quality is a multidimensional construct composed of three factors; Experience attributes (EXP), Search attributes (SEAR) and Credence attributes (CRE). From the result of the study, an examination of unstandardized regression weight reveals that almost all estimates to be both reasonable and statistically significant; and all standard errors appear also to be in good order. The results of the study revealed new quality scales have three dimensions and some of the items have very little loading on the factor thy supposed to measure but all the items are intended to measure preference.**

Keywords: **Confirmatory factor, Consumers, Rice, Experience and Credence.**

1. INTRODUCTION

Rice is the major staple food in Nigeria and is eaten almost every day, but the most common rice is the foreign rice which has gone through many process of redefining before it is ready to be sold. The reason many people prefer the foreign (white rice) to the locally-made unpolished rice in Nigeria is the stress they go through in picking the stones and many unwanted materials before cooking it, compared to the foreign rice which is very clean and ready for boiling and also can be cooked in less than 20 minutes. Also the perception that local rice was meant for only poor people and it was mostly eaten during war times when it is hard to find foreign ones is not only by Nigerian people.

The issue of importation of "poisonous rice" into country adds to a problem for the foreign rice over the local ones in Nigeria. Poisonous and unwholesome food is not new in Nigeria, how does raw rice become poisonous? Rice becomes poisonous due to improper or long-term storage. A good example is the products donated to the war-torn country by Asian countries (6,000tonnes) which became poisonous after being at sea for a long time. This was happened due to the long delay encountered during transit as a result of sea storm, thereby becoming contaminated. The expert proved that the rice was no longer fit for human consumption, before they were approached by the Nigerian businessmen who offered to buy them for shipment to their country. The poisonous rice is said to have found its way into markets in Kaduna, Sokoto and other neighboring states, consequently, causing fear within communities (Rutsaert et al. 2013). Another example of such treated rice was in Guandong China in December 2000 when rice which had been stored for 17years, was marketed as new rice. A northeast China food processor polished up and sold tonnes of the 17 years old rice.

The use of poisonous chemicals to enhance the look of the rice will also make the product to become poisonous. A good example is that of Guandong case, poisonous rice can come from a mixture of the two i.e. aflatoxins from storage and chemicals from treating it. This is the case of Guangzhou where "Poisonous rice" was discovered to be an adulterated polished rice variety with mineral white wax mixed in, which was sold by unlawful money-grabbing profiteers. That particular rice caused acute poisoning, serious diarrhea and did great harm to people's health. A chinese firm, Wanshunhua Feed Co. Ltd was said to have processed 28,000 tonnes of poisonous rice for sale. At other times, rice is treated simply to make it more attractive to the buyer. An example of that was several years ago, in Eastern China, when rice was polished with industrial oil to make it more attractive (Cuevas et al. 2016). Industrial oils usually contain chemicals which may be toxic to humans.

The recent "Plastic rice" importation in the country shows how the problems of importing poisonous products were elevated. The News Agency of Nigeria reports that officers of the Nigerian Customs Service (NCS), Federal Operations Unit, Ikeja, on Tuesday seized 102 bags of plastic rice branded "Beat Tomato Rice'' with no date of manufacture (Oladeinde, 2016).

Different dishes prepared from rice also have different type of rice suitable for its preparation (Chamhuri and Batt 2013). Probably for the choice of taste, color and stickiness after cooking some consumers prefer certain type of rice over another. However, documented information as regards what influence consumers' choice of foreign rice over local rice is still inadequate. Aside, information of the effect of various factors that are likely to influence the choice of foreign rice over our local rice is not certain. Yet, such information is important not only for the purpose of local rice quality improvement, but also for strategic planning of rice sector in Nigeria.

Despite the problems of foreign rice as highlighted above, many Nigerians make preference of foreign rice over our local ones. The coexisting of many consumers' preferences indicate that there are certain attributes which satisfy their needs and wants that are present or absent in the foreign rice. This might be contributed by different psychographic profiles of present consumers. Rice consumption and purchase decisions for instant are influenced by these psychographic variants, and has somewhat shifted the marketing landscape of rice in Nigeria. It is imperative that to dissect and understand every segment of consumers in the markets so that necessary marketing strategies can be formulated. As such several critical questions need to be addressed. Why consumers still prefer foreign rice over local ones? What factors influence or motivate consumers' choice of foreign rice? And what are the consumers' demographic factors that influence their choice of foreign rice over local ones? In market place, consumers purchasing purpose might influence their preferences. These factors or attributes influence their preference needs to be identified and determined. To achieve this, confirmatory factor analysis was used in constructing summated scales of these attributes and Structural Equation Modeling (SEM) were used in measuring reliability and validity of the scales.

For most countries, including Nigeria, increasing population, rising disposable income, education, information and communication, changes in lifestyle and household structure are among contributing factors toward significant shifts in food demand and taste and preference changes of one product over another. This research addressed the issues of the impact of demographic factors on consumers' preference of foreign rice and criteria for selection imported rice over the locally processed one among the consumers.

2. CONCEPTUAL FRAMEWORK

The confirmatory factor analysis (CFA) model was designed to test the multidimensionality of the theoretical constructs. Specifically, we test the hypothesis that rice quality is a multidimensional construct composed of three factors; Experience attributes (EXP), Search attributes (SEAR) and Credence attributes (CRE). The theoretical underpinning of this hypothesis derives from the random utility model used by (Zainudin 2012) estimating the preference of consumers for alternative rice types as a function of rice attributes and is presented below. The framework demonstrates that the choice of quality rice is influenced by the experience attributes, search attributes and credence attributes.

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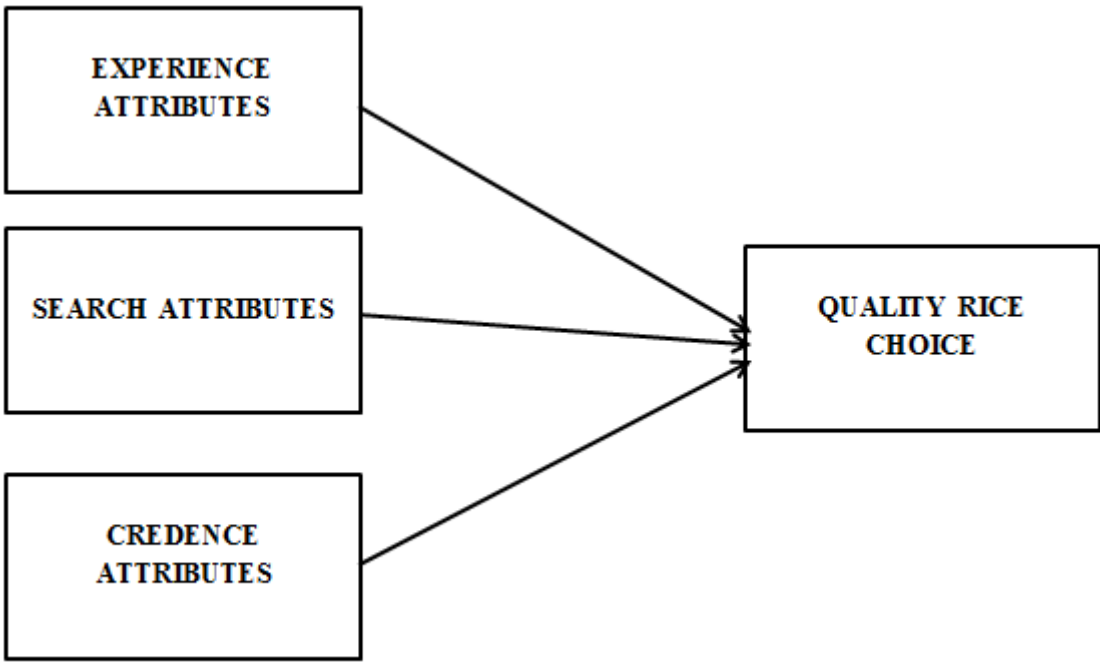

Figure 1: Conceptual framework

Experience attributes are those that can only be evaluated open product experience, thus after purchase or product use. Examples are taste, texture, ease of cooking and swelling capacity.

Search attributes are those attributes that are available for product evaluation before purchase, such as price, appearance, brand and packaging. In the case of credence attributes, consumers cannot evaluate or verify by themselves. Instead, they rely on people or institutions such as government controls or industry claims. Attributes relating to production, processing and product contents are typical examples of credence-type attributes

3. METHODOLOGY

The study was carried out in two States of North Western Nigeria, Kebbi and Sokoto States. The States are located within latitude 10^0 05^1 and 13^0 27^1 N of the equator, and between longitude 3^0 35^1 and 6^0 54^1 E. Kebbi and Sokoto States have the population of 3,351,831 and 2,809,168 people respectively, as at 2006.The study covered the largest markets in the state capitals of the two states. The markets selection was purposive, based on high patronage of locally processed and imported rice in the markets. A total of 500 households were randomly selected from each state making a total of 1000 respondents interviewed for the study which serves as the sample size. Likert scales were employed to assess the farmers' Preference toward imported rice over local ones (Wong 2007). Each item on the Likert scale has a weight or score attached to it. The responses were ordered on a five-point likert format ranging from strongly disagree (SD=1) to strongly agree (SA=5), for positive statements and inverse, for negatively worded statements.

The summated scales for the quality rice choice used in the questionnaire for the study were presented as

Experience Attributes Scales

1. Imported rice has better taste than the local one (EXP1)
2. Smoothness is what makes me to choose imported rice (EXP2)
3. Better polish of the imported rice is what makes me in choosing the brand (EXP3)
4. Easy cooking is important factor for me in choosing the type of rice to buy (EXP4)
5. Swelling capacity of the imported rice makes me to go for it (EXP5)
6. Absence of foreign matter is important for choosing the type of rice to buy (EXP6)
7. Taking long period in cooking is not my concern in choosing the rice to purchase (EXP7)

Search Attributes Scales

1. I am always looking for long –grain rice while purchasing (SEAC1)

2. I am always concern about the whiteness of rice while purchasing (SEAC2)

3. Good packaging is what I am looking for while purchasing rice (SEAC3)

4. Brand name is not my concern while purchasing rice (SEAC4)

5. Food safety is number one concerned in selecting the type of rice to purchase (SEAC5)

6. Good price is always my concern in selecting the type of rice to purchase (SEAC6)

Credence Attributes Scales

1. I can add more money to get organic rice (CRED1)

2. I like our local rice based on the methods used in production process (CRED2)

3. I am more concerned with the certification of the imported rice (CRED3)

4. I always look at the expiry date before purchasing the product (CRED4)

5. I always mindful with the nutritional content of the rice to purchase (CRED5)

6. Method used in processing rice is not my concern while purchasing the product (CRED6)

A structural equation model were used in measuring reliability and validity of these newly summated scales of quality rice choice using Amos graphic software.

4. RESULT AND DISCUSSION

Confirmatory Factor Analysis (CFA), sometimes it is called the measurement model of a construct, is the first step in data preparation in SEM. In Confirmatory Factor Analysis (CFA), individual construct will be assessed before modeling their inter-relationships. The three measures to be employed by the CFA are, to test for the model fit; to assess the convergent validity; and that of construct reliability of each construct. Convergent validity is achieved when all the items in a measurement model are statistically significant (Zainudin, 2012). According to Kline (2005), convergent validity is a set of items (indicators) that presume to measure a given construct. Another scholar in the field, Browne and Cudeck (1989), defined convergent validity as the internal consistency of a set of items or indicators. Convergent validity represents the strength of the relationships between indicators that are predicted to represent a single latent variable. According to Fornell and Larcker (1981), convergent validity can be tested through average variance extracted (AVE) of each construct and the value should be greater than or equal to 0.5 in order to achieve convergent validity. AVE is the average percentage of variation explained by the items in a construct and the AVE is calculated with the following formula:

$$\text{AVE} = \frac{\Sigma\lambda^2}{n}$$

Where: λ^2 = squared multiple correlation for each item, n = number of items in the model.

On the other hand, Hair et al. (2010) and Byrne (2010) argued that convergent validity can also be tested through assessing factor loading of each indicator and the value of > 0.5 indicate high factor loading and hence high convergent validity.

Parameter Estimates

In reviewing the model parameter estimates, three criteria are of interest as stated by Byrn, (2010) (1) the feasibility of the parameter estimates, (2) the appropriateness of the standard errors, and (3) the statistical significance of the parameter estimates. In the case of the parameters, it exhibits unreasonable estimates if correlations > 1.00, negative variances, and covariance or correlation matrices that are not positive definite. Standard errors reflect the precision with which a parameter has been estimated, if it has small values, it means accurate estimation. Thus, another indicator of poor model fit is the presence of standard errors that are excessively large values or excessively smaller value. For example, if a standard error approaches zero, the test statistic for its related parameter cannot be defined (Bentler, 2005). Likewise, standard errors that are extremely large indicate parameters that cannot be determined (Joreskog & Sorbom, 1993)

Because standard errors are influenced by the units of measurement in observed and/ or latent variables, as well as the magnitude of the parameter estimate itself, no definitive criteria of "small" and "large" have been established (Joreskog & Sorbom, 1989). The test statistic here is the critical ratio (C.R.), which represents the parameter estimate divided by its standard error; as such, it operates as a z-statistic in testing that the estimate is statistically different from zero. Based on a probability level of .05, then, the test statistic needs to be > ±1.96 before the hypothesis (that the estimate equals 0.0) can be rejected. No significant parameters, with the exception of error variances, can be considered unimportant to the model

The Estimation Process

The primary focus of the estimation process in SEM is to yield parameter values such that the discrepancy (i.e., residual) between the sample covariance matrix S and the population covariance matrix implied by the model [Σ(θ)] is minimal. This objective is achieved by minimizing a discrepancy function, F[S, Σ(θ)], such that its minimal value (Fmin) reflects the point in the estimation process where the discrepancy between S and Σ(θ) is least [S – Σ(θ) = minimum]. Taken together, then, Fmin serves as a measure of the extent to which S differs from Σ(θ). An examination of this unstandardized solution as in Table 1 reveals all estimates with exception of CRED4 to be both reasonable and statistically significant; all standard errors as in Table 2 appear also to be in good order.

5. CONCLUSION

The new quality scales have three dimensions and some of the items have very little loading on the factor thy supposed to measure. A reformulation or exclusion should be considered. All the items are intended to measure preference.

Table 1: Parameter Estimates (Regression Weights) of the Amos Output

			Estimate	S.E.	C.R.	P
EXP1	<---	EXP	0.084	0.023	3.567	***
EXP2	<---	EXP	0.336	0.029	11.700	***
EXP3	<---	EXP	0.913	0.028	32.790	***
EXP4	<---	EXP	0.272	0.023	1.816	***
EXP5	<---	EXP	1.145	0.016	3.097	***
EXP6	<---	EXP	0.101	0.023	4.346	***
EXP7	<---	EXP	1.000			
SEAC1	<---	SEAC	0.376	0.028	13.447	***
SEAC2	<---	SEAC	0.081	0.024	3.305	***
SEAC3	<---	SEAC	0.382	0.028	3.709	***
SEAC4	<---	SEAC	1.000	0.000	2.532	***
SEAC5	<---	SEAC	0.079	0.025	3.208	0.001
SEAC6	<---	SEAC	1.000			
CRED1	<---	CRED	0.919	0.031	9.644	***
CRED2	<---	CRED	0.083	0.021	3.880	***
CRED3	<---	CRED	0.919	0.031	9.644	***
CRED4	<---	CRED	0.023	0.021	1.145	0.252
CRED5	<---	CRED	0.293	.022	3.107	***
CRED6	<---	CRED	1.000			

Table 2: AMOS Output Error Residual Variance Parameter

	Estimate	S.E.	C.R.	P
EXP	2.047	.089	22.981	***
SEAC	1.523	.060	25.399	***
CRED	1.924	.132	14.523	***
e1	1.417	.056	25.391	***
e2	2.102	.083	25.320	***
e3	1.815	.073	24.811	***
e4	1.352	.053	25.328	***
e5	.340	.017	19.659	***
e6	1.387	.055	25.388	***
e7	.216	.012	18.225	***
e8	1.681	.065	25.683	***
e9	1.341	.053	25.421	***
e10	1.667	.065	25.689	***
e11	.000	.000	8.161	***
e12	1.356	.053	25.419	***
e13	.000	.000	8.156	***
e14	.938	.036	25.915	***
e15	1.356	.053	25.438	***
e16	.938	.036	25.915	***
e17	1.255	.049	25.400	***
e18	1.289	.050	25.880	***
e19	2.095	.078	26.780	***

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