Consumer Preferences to Pay a Price Premium for Quality Attributes in Pakistani Grown Mangoes

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Abstract

Consumer preferences in food products are complex and multidimensional in nature, whose measurement requires the designing of succinctly validated scales. This study investigates how urban consumers perceive quality of locally grown mangoes varieties in Pakistan and how much extra price they are willing to pay for these quality attributes. Data was collected through a survey employed at supermarkets in five major cities of Pakistan, and responded 304 randomly selected consumers. Partial least square structural equation modelling was employed in the analysis. The results showed a dimensional structure representing the mango quality perceptions, profiled through extrinsic and intrinsic attributes, and consumers are willing to pay significantly different price premiums for quality attributes in mangoes. The findings of the study will be useful for the policy makers and mango value chain actors because quality in fresh fruits such as mangoes play a key role in determining the final market value of the produce and acceptance by the consumers to pay price premiums. This study contributes to advancing the knowledge on fruit consumption behavior in a developing country where existing research on assessing the willingness-to-pay with actual behavior is scant.

Keywords: perceived quality, consumer preferences, willingness-to-pay, partial least square analysis, structural equation method, mango, Pakistan.

1. Introduction

In recent decades in Pakistan, due to urban lifestyle, education, increase in per capita disposable income, and food retail modernization, consumers have displayed a growing demand for quality fresh fruits. Therefore, this draws our attention to the marketing of horticultural produce. (Ghafoor, Mustafa, Zafar, & Mushtaq, 2010; Mustafa & Mehdi, 2007). To capture the opportunities, horticultural industry stakeholders and business firms are foraying into this market segment (Aujla, Abbas, Mahmood, & Saadullah, 2007). This has created a need for scholars to tackle the issue from consumer science and marketing perspective (Badar, Ariyawardana, & Collins, 2015; PHDEB, 2005; Sun et al., 2011).

Our intent, in this research, is how consumers in Pakistan perceive quality and develop preferences to pay a price premium for fresh fruits such as mango. It is well-known that amongst many locally produced fresh fruits in Pakistan, mango occupies the position of 'King of fruits' due to its notoriety (Badar et al., 2015; Ghafoor et al., 2010; PHDEB, 2005). Nevertheless, mango consumption in Pakistan is deeply rooted, therefore, domestic market, within the summer season, consumes 90-95% of the locally grown mango varieties (CSF, 2007). As such, both public and private sectors are interested in enhancing the competitiveness of the mango industry through increased investment with the hope that the sector can also boost the rural economy in Pakistan (CSF, 2007; PHDEB, 2005; Sun et al., 2011).

The existing research has primarily focused on physiological and biological properties of Pakistani mangoes. For instance, Anwar, Malik, Amin, Jabbar, and Saleem (2008) and Jabbar et al. (2011) provide an outlook of biological and post-harvest losses treatments respectively in the mango industry. From the marketing perspective, however, consumer research is limited. Badar et al. (2015), being an exception, who apply a clustering approach to identify consumers value preferences for realizing the importance of mango consumers, and many of the insights to improve supply chain practices in Pakistan's mango industry.

Since marketing concept focuses on the changing need and wants of the customers, the understanding of such changes, combined with the needs of businesses to grow, has become vital to achieve continued market success (Woodruff, 1997). From consumers' perspective, a concern for quality in fresh produce is the most crucial strategic priority facing the agri-food companies (Grunert, 2005; Zhllima et al., 2015). Previous studies have indicated that quality perceptions have significant impact on the likelihood of paying a price premium for fresh produce (Grunert, 2007; Gunden & Thomas, 2012; Jones, 2015). As such, it is highly likely that agri-food companies should know how to actualize consumer demands about food quality into physical attributes if remain competitive.

Quality perceptions can be defined as judgmental signals about multi-faceted attributes that act as proxies for meeting or exceeding consumer expectations (Grunert, 2005; Olsen, 2002; Verdú Jover, Lloréns Montes, & Fuentes Fuentes, 2004; Zeithaml, 1988). Such perceptions are subjective in nature, therefore, these might differ from the objective nature of quality attributes (Grunert, 2007; Moser, Raffaelli, & Thilmany-McFadden, 2011; Verdú Jover et al., 2004). With this in mind, the focus of this consumer study understands the relationships among quality perceptions, consumer attitudes and

willingness-to-pay (hereafter WTP) through a survey by means of a structured questionnaire conducted in five cities in Pakistan.

This research is based on the work carried out in mango value chain improvement project to enhance the domestic profitability of mangoes funded by ACIAR. The aim is to build capacity within the mango supply chain through fruit differentiation and niche marketing thereby developing a competitive advantage for the mango industry.

Therefore, the main research question is;

'What attributes make a quality mango and how these attributes add value in developing consumer buying preferences and, how much price premium, if consumer are willing to buy quality mangoes, will be paid for the quality mangoes?

Accordingly, the research objectives are:

➢ What is the profiling of different extrinsic and intrinsic attributes of quality mangoes perceived by Pakistani consumers?

➢ To what extent do preferences for quality mangoes vary and affect WTP in Pakistan?

➢ How much price premium customers are willing to pay for added quality attributes?

The paper is structured as follows. Following the introduction on the research problem, a background on Pakistan's mango industry is provided. Further, literature review on perceived quality and consumer preferences affecting WTP is described and a conceptual framework and hypotheses and proposed. Subsequently, the research methodology used to test the model and the results are explained. Finally, conclusions are drawn and implications for Pakistan's mango industry are presented.

2. Literature Review

2. 1 Pakistan's Mango Industry

Agriculture is the mainstay of Pakistan which contributes 20% in the overall GDP of the country (GOP, 2015). Among agricultural produce, horticultural crops such as mango, citrus and vegetables are high valued for commercial production. The agribusiness of such crops is escalating both in the domestic as well as in the international markets such as Europe, UK and USA.

Pakistan is the fourth largest producer of mango in the world and competes with India China and Mexico (FAOSTAT, 2014) and produces more than two hundred varieties of mangoes and some varieties such as Chaunsa, Sindhri, Anwar Ratool, and Dusheri received high commercial value. Mango season expand over five months in Pakistan starting in early May and ends up in late September. Such commercially grown varieties of mango are famous with respect to their taste, color, size and acidity level (CSF, 2007; Khushk & Smith, 1997). However, Chaunsa and Sindhri are cultivated at the extended level thereby getting voluminous production. These two varieties got distinct feature of sweetness and bright yellow color respectively (Collins & Iqbal., 2011; PHDEB, 2005).

Marketing of fruits is dominated by middle men and traders in Pakistan who controlled the supply from farm to market as per their vested interest. They believe on volume sales rather quality and certified standards as their interest is in making commission over sale (Ghafoor et al., 2010; Mehdi, 2012; Mustafa & Mehdi, 2007). The role of Government is

very critical in the overall marketing system as they have to perform the regulatory function, market intelligence and provision of appropriate market infrastructure for the fruit and vegetables markets.(Ghafoor et al., 2010; PHDEB, 2005).

Domestic retail markets in Pakistan are highly unorganized consisting of small shops and the mango prices vary depending upon the location of the shop (Mustafa & Mehdi, 2007). All these shops buy their supplies mainly from the wholesale markets which is controlled by the middle men and traders. Supermarkets such as Hyper star and Metro are growing the big cities but with the little impact of sales of standardized fruit and vegetables (Ghafoor et al., 2010; Mehdi, 2012;Mustafa & Mehdi, 2007). These outlets are increasing in the major cities but are still in an introductory phase of procuring premium quality fruit from reliable sources.

Problems such as inadequate information flow between the progressive growers and the high end markets, lack of market intelligence system for standardized products, absence of cool chain system from farm to market and poor road infrastructure are major bottlenecks to develop domestic premium quality mango value chain in Pakistan (CSF, 2007; Ghafoor et al., 2010; PHDEB, 2005). Consequently, an information gap exists between producers and consumers, therefore, strengthening the position of contractors, who not only control the market but also share the major part of the sale price with little value addition (Badar et al., 2015; Ghafoor et al., 2010; Mehdi, 2012).

There is a great potential for the consumption of quality mangoes in the domestic markets of Pakistan particularly as middle/upper middle to high income groups are becoming quality conscious and have the willingness and financial ability to buy quality mangoes. Given the existence of the potential for quality mangoes in the domestic markets a question arises: 'how consumers perceive different extrinsic and intrinsic attributes which in turn develops their willingness to pay a price premium for quality mangoes'?

The structure of mango supply/value chain prevalent in Pakistan is illustrated in the following Figure 1.
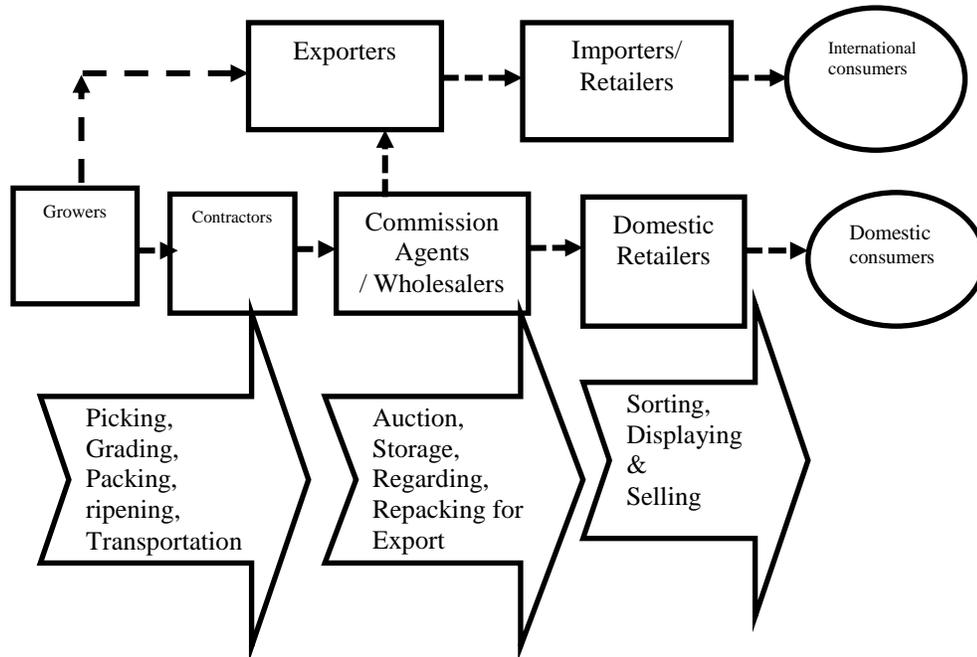
Figure 1: Mango Value Chain Flow Diagram

3. Theoretical Assumptions and Conceptual Framework

WTP, an area of scholarly research, has gained higher attention in research on food consumption behavior (Boccaletti & Nardella, 2000; Karina Gallardo, Kupferman, & Colonna, 2011; Mugera, Burton, & Downsborough, 2016; Voelckner, 2006). The notion of WTP is the monetary value a person would be willing to pay for superior quality attributes (Karina Gallardo et al., 2011; Voelckner, 2006). Generally speaking, this concept can be applied to fruits with special quality attributes, however, "quality" fruits in Pakistan, has limited distribution mostly through specialized market channels such as supermarkets and specialty fruit stores (Ghafoor et al., 2010; Mehdi, 2012).

Secondly, most of the consumers are not able to differentiate quality fruits from traditional fruits until unless visible differences appear (Chamhuri & Batt, 2013; Mora et al., 2011). As such, mango consumers in Pakistan, because of less information available on quality and limited consumption experience often doubt the existence of quality mangoes (Badar et al., 2015).

Various approaches have been utilized to explain the perceived quality (Chamhuri & Batt, 2013; Grunert, 2007; Holmes & Yan, 2012; Jones, 2015). For example, market information approach distinguishes between search, experience and credence (Grunert, 2007; Moser et al., 2011; Verdú Jover et al., 2004). Search attributes explain that consumer verify the attribute prior to purchase or consumption through direct observation (Martínez-Carrasco, Brugarolas, Martínez-Poveda, Ruiz, & García-Martínez, 2012). When buying fruit and fresh produce, consumer perceive fruit color, size, price, firmness, packaging, blemish, wrinkle free texture and packaging as important external quality

features in the market place (Al-Shamsi, Rahman, Abdullah, & Claereboudt, 2013; Camarena & Sanjuán, 2006; Martínez-Carrasco et al., 2012; Verdú Jover et al., 2004).

Conversely, taste, aroma, freshness, chemical free and traceability of the product are internal in nature which is typically an experience of characteristic much which requires consuming the fruit (Bond, Thilmany, & Keeling Bond, 2008; Grunert, 2007; Gyau, Akalakou, Degrande, & Biloso, 2014; Jiménez-Guerrero, Gázquez-Abad, Huertas-García, & Mondéjar-Jiménez, 2012; Verdú Jover et al., 2004). Finally, desirable product benefits like nutritional value and wholesomeness cannot be directly experienced as one has to rely on the judgment or information of others that the product contains a determined quality attribute (Mora et al., 2011; Moser et al., 2011; Ragaert, Verbeke, Devlieghere, & Debevere, 2004). Environmental quality of products, health or pesticides friendly processes are examples of typical credence quality attributes since they deal with a question of trust (Boughanmi, Al-Musalami, Al-Oufi, & Zaibet, 2007; Martínez-Carrasco et al., 2012).

To cope with the intense market competition, agri-food companies should enhance their understanding of quality attributes associated with food products (Boughanmi et al., 2007; Mora et al., 2011; Mugera et al., 2016). Because quality can be anticipated so it is crucial to distinguish between objective and subjective view of quality form customers' perspective (Grunert, 2007; Peri, 2006; Zeithaml, 1988). Verdú Jover et al. (2004) described the objective component as a measurable component, whereas the latter is more perceptual driven (Boccaletti & Nardella, 2000; Boughanmi et al., 2007; Grunert, 2005).

Zeithaml (1988) argued that perceived quality is based on mindful judgments a consumer make about the excellence of a product. In line with this, Grunert (2007) posited that it is crucial for the agri-food companies that consumers' desire be expressed by subjective quality characteristics of the product. Hence, it is the scholastic inquiry to find a model that can express consumer behavior based on both objective and subjective judgments of the quality cues they observe in the market place (Aprile, Caputo, & Nayga, 2016; Bond et al., 2008).

Many scholars have posited that consumer derive their benefits not just from the product itself but from the associated bundle of product characteristics (Jiménez-Guerrero et al., 2012; Moser et al., 2011; Poulsen, Juhl, Kristensen, Bech, & Engelund, 1996; Ridley, Shook, & Devadoss, 2015; Verdú Jover et al., 2004). Therefore, understanding the consumer responses to quality is one of the central themes in the agri-food industry (Boccaletti & Nardella, 2000; Bond et al., 2008; Gunden & Thomas, 2012). Using the definition of quality perception, a few scholars have attempted to construct a conceptual model representing the extrinsic and intrinsic quality attributes (Grunert, 2007; Martínez-Carrasco et al., 2012; Peri, 2006; Verdú Jover et al., 2004; Zeithaml, 1988).

As such, it is reasonable to state;

➢ **H₁:** Higher perceived extrinsic attributes will imply higher perceived intrinsic attributes of quality mangoes.

Verdú Jover et al. (2004) and Grunert (2007) argued that inference making in the perception of food quality is made by both intrinsic and extrinsic attributes but preferences is more likely shaped by external features and confidence in using that product. It seems that extrinsic attributes might get more weight of human psychology

when food buying decisions are made (Al-Shamsi et al., 2013; Aprile et al., 2016; Bond et al., 2008). Aprile et al. (2016) explained extrinsic attributes such as brand name, price, and local labels play a more critical role in buying food under an organized market structure (e.g. supermarket purchase). Badar et al. (2015) extended the study and identified through value preference mapping that Pakistani consumers are more value seekers in mangoes thereby the perception of both intrinsic and extrinsic attributes is necessary to get a price premium in modern retail outlets.

Therefore, we can argue that in the area of food, it is posited that extrinsic and intrinsic attributes together develop the perception of fruit quality (Aprile et al., 2016; Badar et al., 2015; Martínez-Carrasco et al., 2012). The consumers' overall response to quality is the result of both expected and experiential quality (Grunert, 2007; Verdú Jover et al., 2004). This is critical in consumers' decision making process particularly when one is more conscious about the safety and physiological feature of the product (Grunert, 2005).

For example, according to Dunne and Johnson (2011) and Badar et al. (2015), it was clearly shown that demand for premium quality mangoes exist[1] and knowledge of consumer preferences relating to mango quality attributes can contribute substantial to inform supply chain actors specially growers about what kind of future improvements are required to align their practices for consumer value preferences thereby enhancing sustained industry development.

Based on the aforementioned arguments, it can be hypothesized;

➢ **H₂:** Higher perceived extrinsic attributes will imply greater consumer preferences to buy quality mangoes.

➢ **H₃:** Higher perceived intrinsic attributes will imply greater consumer preferences to buy quality mangoes.

Consumer preferences in this study are attitudes towards mango quality. Attitudes towards food represent consumers' judgments involving beliefs, evaluation, and intention linked to propensity to buy (Aprile et al., 2016; Peri, 2006). To the extent that the market for quality mangoes in Pakistan has shown a growth, attitudinal data can provide a better understanding by assessing its effect on WTP (Didier & Lucie, 2008; Voelckner, 2006). Preferences for quality foods such as healthiness, safety, nutrients and natural are expressed by WTP for quality attributes.

There are many structural models including contingent valuation to assess buying probabilities for quality products through WTP (Sichtmann & Stingel, 2007; Voelckner, 2006; Wertenbroch & Skiera, 2002). However, behavior-psychological models explain consumers' buying behavior through WTP by focusing on attitudes and preferences for quality attributes. In this case, the hypothesized relationships indicate a positive association between preferences revealed through attitudes and WTP.

Thus, it can be stated;

➢ **H₄:** Greater consumer preferences will imply higher willingness to pay a price premium for quality mangoes.

4. Material and Methods

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[1]These two studies were also limited to supermarkets in big cities of Pakistan

To test the afore-described hypothesized relationships between quality attributes, consumer attitudes, and willingness-to-pay with respect to Pakistani mangoes, we proceeded to analyse the behaviour of consumers in five metropolitan cities of Pakistan. Two reasons led us to select this product and markets.

In the first place, the fact that mango is recognized as 'king of fruits' in Pakistan, which makes it easier for consumers to have developed both positive and negative attitudes towards premium quality mangoes. In the second place, within the Pakistan, the demographic characteristics of these five big cities of two largest provinces Punjab and Sindh present high volume of quality mango purchase.

4.1 Data Collection and Sample

To represent the population diversity in Pakistan, the survey was employed in supermarkets at different locations and the quantitative data was collected through consumer surveys in five cities from two provinces:

➢   Lahore, Faisalabad, Islamabad, and Multan were selected from Punjab

➢   Karachi was selected from Sindh

The context is appropriate because Punjab contributes 79.71% of total mango production, whereas Sindh offers 20.22% (FAOSTAT, 2014; GOP, 2015). Within these provinces, Islamabad, Lahore, Faisalabad, and Multan are major metro areas in Punjab while Karachi is the biggest metropolitan area in Sindh. Supermarkets including modern food retailing is increasing at the expense of traditional wet market structure in such metro areas (Mustafa & Mehdi, 2007). In this way, we expect premium quality fresh produce including mango in summer season is to be important part of the modern food retailing in the afore-said metropolitan areas.

Simulated test market data (sales point set-up under project) and transactions data in supermarkets were utilized to draw a representative sample for this research. A sample of 339 participants was randomly selected in line with their predetermined revealed preferences (e.g. scanner data and test market simulations). Accordingly, a cross-sectional dataset using personal mode of inquiry was collected during May-July 2014. Out of 339 responses, 35 surveys were discarded because of missing values thereby leaving a total of 304 surveys representing 89.7% usable surveys which is considered acceptable in consumer studies (Kaden, 2006).

Further, G*Power 3.1.3 software was utilized to calculate the power of 304 usable sample size for rejecting the null hypotheses (Faul, Erdfelder, Buchner, & Lang, 2009). The power value of 1.0 was obtained with effect size 0.15 at α: 0.05 thereby showing the satisfactory power of the sample for the study (Faul et al., 2009).

4.2 Survey Instrument

The survey instrument was developed through a number of processes. Firstly, three researchers in the scholarly area of consumer behaviour (specifically fresh produce marketing experts) defined terminology on what constitutes perceptions of quality in mangoes. After this, a brainstorming session was conducted with two focus groups each consisting of 07 mangoes consumers to understand quality perceptions and consumer attitudes relating to consumption of mangoes. In this phase of instrument development, respondents were asked to think of what they would consider to be a premium quality mango based on their consumption experience. Thereafter, we concluded with 11

attributes forming impressions of premium quality of mangoes uncovered during this stage and these were color, size, blemish free, firmness, wrinkles free, freshness, packaging, chemical-free, aroma, taste, and traceability.

The questionnaire items in this study, relating to quality attributes, consumer preferences and willingness-to-pay, were measured through a questionnaire. The questionnaire was operationalized in the national language of Pakistan, Urdu. To raise the content validity of the items, objective and subjective attributes of quality and consumer attitudes were pretested with 13 premium mangoes consumers and the purpose of this was to evaluate whether the statements were understandable. The respondents found questions comprehensible and without confusion.

Respondents in the main survey were asked to reflect their opinion of the desirable attributes of premium quality mangoes and attitudes by looking at the statements included in the questionnaire and responding on a 5-point Likert scale anchored by '1- strongly disagree' and '5- strongly agree' endpoints. Appendix-1 shows the detail of the study questionnaire.

4.4 Analysis

Previously, many studies have applied choice modelling framework to understand consumer preferences in food products (Camarena & Sanjuán, 2006; Mugera et al., 2016), conjoint analysis to explore multi-attribute consumer choices (Boughanmi et al., 2007), discrete choice experiments to assess the utility placed on certain quality attributes (Canavari, Nocella, & Scarpa, 2005), logistic regression to discriminate factors influencing consumer preferences (Gyau et al., 2014), and cluster analysis to estimate consumer preferences across different homogenous groups (Badar et al., 2015). However, many of these are effective with one specific choice mode particularly in existing situation with the assumption that alternative situation is hypothetical (Moser et al., 2011).

Structural equation modelling offered a good platform for experimenting with different choice structures simultaneously. A few studies have applied structural equation modeling to understand consumers' preferences for fresh produce (Alonso, Paquin, & Mangin, 2002; José Sanzo, Belén del Río, Iglesias, & Vázquez, 2003; Martínez-Carrasco et al., 2012; Mora et al., 2011). In line with this, to test the hypothesized relationships in the study, partial least square structural equation modelling was employed using SmartPLS 3.2.0 software (Ringle, Wende, & Will, 2014).

5. Results

A description of the sample socio-demographics is provided in Table 1.

Table 1: Description of the Study Sample

Demographics	Category	% count
Gender	Male	0.78
	Female	0.22
Age	<25s	0.08
	26-35s	0.25
	36-45s	0.46
	>45	0.21
Education	Below Matric	0.18
	Matric-Graduation	0.46
	Above Graduation	0.36
Marital Status	Married	0.81
	Single	0.19
Family Size	<4	0.29
	4-6	0.43
	7-9	0.15
	>9	0.13
Income Level (per month)	<50000	0.04
	50000-75000	0.35
	76000-100000	0.37
	> 100000	0.24
Monthly expenditures on fruits	<5000	0.27
	6000-9000	0.54
	>9000	0.19
Occupation	Government Employees	0.22
	Company Employees	0.38
	Self-Employed	0.26
	Others (e.g. part-time)	0.14
Localization	Karachi	0.31
	Multan	0.16
	Lahore	0.35
	Faisalabad	0.11
	Islamabad	0.07

5.1 Descriptive analysis

From the descriptive statistics, it appeared that five components of intrinsic attributes showed higher mean score ($\bar{X}$ = 68.38) in comparison with the six components of extrinsic attributes ($\bar{X}$ = 63.27). This may indicate that intrinsic attribute may have higher significance when assessing consumer's willingness to pay for premium quality mangoes.

Table 2 shows the %age of respondents who showed willingness to pay extra price for each of the eleven premium quality attributes for mangoes. From the table, it appears that sweetness (89%) receives the highest proportion followed by wrinkle-free (84%) and flesh firmness (81%). On the other hand packaging (57%) and chemical-free (45%) receive comparatively lower acceptance respectively. These attributes may be important to consumers; they have less desire to pay extra money for this.

Table 2 also indicates the mean score for each quality attribute. It appears that freshness (81.59), fruit size (79.44), and fruit color (76.37) receive the highest acceptance while

traceability (51.62) and packaging (43.15) receive comparatively lower acceptance respectively. It can be inferred that importance of quality attribute and willingness to pay a price premium for that attribute do not go hand in hand.

Table 2: Quality Attributes Means Score and % of Respondents Willing to Pay Extra

Quality attribute	Mean Score	S.D.	%age of Respondents Willing to Pay a Premium
Freshness	81.59	10. 95	76
Fruit Size	79.44	16.47	72
Fruit color	76.37	14.69	62
Sweetness	73.94	13.32	89
Chemical-free	72.60	2.84	45
Firmness	69.56	11.30	81
Wrinkle-free	68.82	9.26	84
Aroma	62.16	8.80	68
Blemish-free	57.29	7.21	76
Traceability	51.62	6.09	74
Packaging	43.15	5.64	57

%ages are rounded off to near zero

5.2 PLS Measurement Model Results

Given the skewness in data distribution as identified by Kolmogorov-Smirnov's test ($p < 0.05$) and first time testing of the research model in Pakistan's mango industry, structural equation modelling using the Partial Least Squares (PLS-SEM) method was employed to test the hypotheses (Hair, Hult, Ringle, & Sarstedt, 2014; Hair, Ringle, & Sarstedt, 2011). PLS-SEM, with the aim to understand causal-predictive relationships, is notable for normality free assumptions (Chin, 1998), small sample size (Hair et al., 2014) and less invariant model specification to identify the key drivers of target variable such as willingness to pay in this study (Götz, Liehr-Gobbers, & Krafft, 2010). As such, PLS is an approach to integrate an econometric perspective with a psychometric emphasis of perceptual variables in consumer behavior studies (Sosik, Kahai, & Piovoso, 2009).

To understand the effects of extrinsic and intrinsic quality cues on WTP through consumer preferences, scales were realized reflectively to tap into perceptual assessment of quality subjectively (Chin, 1998; Hair et al., 2014). This operationalization is more useful to investigate the quality cues for choosing the type of mango based on certain characteristics (Hair, Ringle, & Sarstedt, 2013). Further, quality measures are interchangeable without affecting the nature of extrinsic and intrinsic attributes more specifically at credence and experiential level (Grunert, 2007).

The quality of the conceptual model was assessed by using an PLS algorithm which generated standardized regression coefficients and thereafter a bootstrapping algorithm with 1000 resamples was applied to estimate the significance levels of regression weights and loadings (Chin, 1998; Hair et al., 2014). Further, to test the predictive significance and relevance of each latent variable in the study, a blindfolding procedure with an omission distance of 9 was run to generate parameters (Götz et al., 2010; Hair et al., 2014; Sosik et al., 2009).

Before performing the PLS analysis, common method bias (CMB) was assessed due to self-reported measures as suggested by Podsakoff, MacKenzie, Lee, and Podsakoff (2003) and Harman (1960) one-factor test. The test showed seven factors accounting for 61.34% of the variance, and amongst these, the largest factor accounted for 27% variance in the variables under investigation thereby lessening the probability of CMB.

The validation of the reflective model was conducted through internal consistency and validity (Hair et al., 2014). Internal consistency was assessed by Cronbach's alpha and composite reliability while construct validity was examined through convergent and discriminant validity. Table 3 reports outer loadings, cross-loadings, Cronbach's alpha, composite reliability and the results of convergent validity.

The data analysis showed acceptable results for the validation of the constructs through reliability and validity with expected signs. For internal consistency all Cronbach alphas (CA) exceeded 0.6 and composite reliabilities (CR) were found greater than 0.7 thereby confirming indicator and construct level internal consistency (Table- 3).

Average variance extracted (AVE) is used to assess convergent validity with a threshold value of 0.5 and was found above the parameter. This indicated that the variance captured by each construct was larger than variance due to measurement error thus showing uni-dimensionality. Convergent validity was further confirmed by indicators' standardized loadings which exceeded the 0.7 threshold and the significance of these loadings was substantiated by generating t-statistics through bootstrapping procedure at ($p<0.05$). Five items EXT-4, ATT-4, ATT-6, WTP-4, and WTP-5 showed outer loading less than 0.5 thereby removed for further analysis. All other loadings were found significant at 95% confidence level thereby reaffirming a higher convergent validity.

Finally, three criteria were used to examine discriminant validity of the constructs. First, the loadings of indictors should be greater than their cross loadings (Hair et al., 2011). Second, according to Fornell–Larcker criterion, the latent variable correlations should be lower than the square roots of AVE of the latent variable (Fornell & Larcker, 1981). Third, Hetero trait-Mono trait ratio (HTMT) was used which is a more conservative approach to detect discriminant validity (Henseler, Ringle, & Sarstedt, 2015). HTMT ratio is computed by taking the geometric mean of the average of the two mono trait-hetero method sub matrices, which is known as the average of hetero trait-hetero method correlations (Henseler, Hubona, & Ray, 2016). The threshold value for HTMT was 0.85 (Henseler et al., 2016; Henseler et al., 2015). Table 4 reports the results of Fornell–Larcker criterion and HTMT ratios.

First, a comparison of the loadings across the columns in the matrix indicated loading on its own latent variable was higher than the cross loading on other variables (Table-3). Second, for the Fornell-Larcker criterion, it was confirmed that square roots of the AVEs in the matrix diagonal were greater than the off-diagonal reporting in the corresponding rows and columns (Table-4). For HTMT, each construct showed a value less than 0.85 thereby concluding the evidence of acceptable discriminant validity.

Consequently, after validating the measurement model, the structural model was assessed to determine the capability and strength of causal/predictive relationships and testing the study hypotheses.

Table 3: Measurement Model Assessment

Constructs	Measures	EXT	INT	CP	WTP
Extrinsic attributes (EXT) CA: 0.76; CR: 0.84; AVE: 0.62	Ext-1 Ext-2 Ext-3 Ext-5 Ext-6	**0.749** **0.785** **0.726** **0.754** **0.818**	0.574 0.566 0.463 0.420 0.629	0.568 0.572 0.448 0.416 0.550	0.492 0.358 0.303 0.241 0.405
Intrinsic attributes (INT) CA: 0.80; CR: 0.86; AVE: 0.66	Int-1 Int-2 Int-3 Int-4 Int-5	0.505 0.585 0.626 0.416 0.482	**0.823** **0.769** **0.747** **0.791** **0.772**	0.619 0.608 0.629 0.416 0.482	0.497 0.401 0.476 0.560 0.415
Consumer preferences (CP) CA: 0.86; CR: 0.90; AVE: 0.74	ATT-1 ATT-2 ATT-3 ATT-5 ATT-7	0.568 0.529 0.601 0.500 0.585	0.662 0.611 0.669 0.633 0.520	**0.862** **0.839** **0.830** **0.807** **0.775**	0.474 0.568 0.493 0.510 0.329
Willingness-to-pay (WTP) CA: 0.69; CR: 0.77; AVE: 0.58	WTP-1 WTP-2 WTP-3	0.226 0.255 0.490	0.270 0.335 0.589	0.403 0.354 0.527	**0.725** **0.729** **0.832**

Table 4: Discriminant Validity

Fornell-Larcker criterion				
-----	Ext	Int	CP	WTP
Ext	**0.79**			
Int	0.72	**0.81**		
CP	0.75	0.77	**0.86**	
WTP	0.51	0.62	0.60	**0.76**
Hetero trait-Mono trait (HTMT) ratio				
Ext				
Int	0.80			
CP	0.74	0.82		
WTP	0.69	0.78	0.81	

5.3 PLS Structural Model Results

To test the structural model, the PLS algorithm in Smart PLS 3 software generated structural path coefficients and R^2 values as a criterion of predictive accuracy (Götz et al., 2010; Hair et al., 2014; Henseler et al., 2016). The significance of paths was tested by using a bootstrap with 1000 resamples. Figure 2 shows the regression weights and t-values (in parentheses) for the study hypotheses. Table 5 reports the structural model results through explanatory power, strength of relationships and predictive relevance.

Table 5: Structural Model Assessment

Criterion	Predictors	Standardized coefficients (β)	t-values	R^2	f^2	q^2
Intrinsic attributes				0.52		
	Extrinsic attributes	0.72	18.76			
Consumer preferences				0.69		
	Extrinsic attributes	0.38	4.22		0.23	0.12
	Intrinsic attributes	0.52	6.01		0.40	0.14
Willingness-to-pay				0.36		
	Consumer preferences	0.60	3.05		0.01	0.02

In this study, the model explained 69% of the consumer preferences and 36% of the willingness-to-pay for premium quality mangoes. With regard to the explanatory power of the model, the threshold values 0.19, 0.33, and 0.67 are considered weak, moderate and substantial respective (Hair et al., 2014; Hair et al., 2011). Accordingly, consumer preferences ($R^2 = 0.69$) can be described as substantial whereas intrinsic attributes ($R^2 = 0.52$), and willingness to pay ($R^2 = 0.36$) can be said moderate.

Further, a blindfolding algorithm in Smart PLS 3.2.0 was run via a cross-validated redundancy procedure for obtaining Q^2 values indicating the model's predictive relevance (Hair et al., 2014; Sosik et al., 2009). A Q^2 value greater than zero indicates empirical data can be reconstructed by using the conceptual model and PLS parameters and a value less than zero means otherwise. By using R^2 value and Q^2 values, we calculated the effect size $(f^2)^2$ and predictive relevance $(q^2)^3$ of each exogenous construct contributing to the endogenous construct.

The structural model results strongly supported the study hypotheses. H_1 was hypothesized that higher perceived extrinsic attributes will imply higher intrinsic attributes of quality mangoes was confirmed by results (H_1: $\beta = 0.721$, t = 18.76, sig < 0.05). The results supported that if external characteristics of premium quality mangoes are perceived higher then internal characteristics of mangoes are also likely to be perceived higher. H_2 was hypothesized that higher perceived extrinsic attributes will imply greater consumer preferences to buy quality mangoes was confirmed by results (H_2: $\beta = 0.378$, t = 4.22, sig < 0.05).

Similarly, the results (H_3: $\beta = 0.571$, t = 6.01, sig < 0.05) confirmed H_3 which was hypothesized that higher perceived intrinsic attributes will imply greater consumer preferences to buy quality mangoes. As such, H_2 and H_3 supported that both extrinsic and intrinsic attributes will influence consumer attitudes towards buying premium quality mangoes. The results (H_4: $\beta = 0.598$, t = 3.05, sig < 0.05) also strongly supported H_4 that

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[2] $f^2 = R^2\text{included} - R^2\text{excluded}/1 - R^2\text{included}$

[3] $q^2 = Q^2\text{included} - Q^2\text{excluded}/1 - Q^2\text{included}$

CV-redundancy $(F^2j) = 1 - \Sigma D = (\Sigma D\ SSE_D) / (\Sigma D\ SSO_D)$; D: omission distance in blindfolding algorithm

Threshold points for f^2 and q^2: 0.02 (small), 0.15 (medium); and 0.35 (large) effect sizes and relevance (Hair et al., 2014)

greater consumer preferences will imply higher willingness to pay a price premium for quality mangoes.
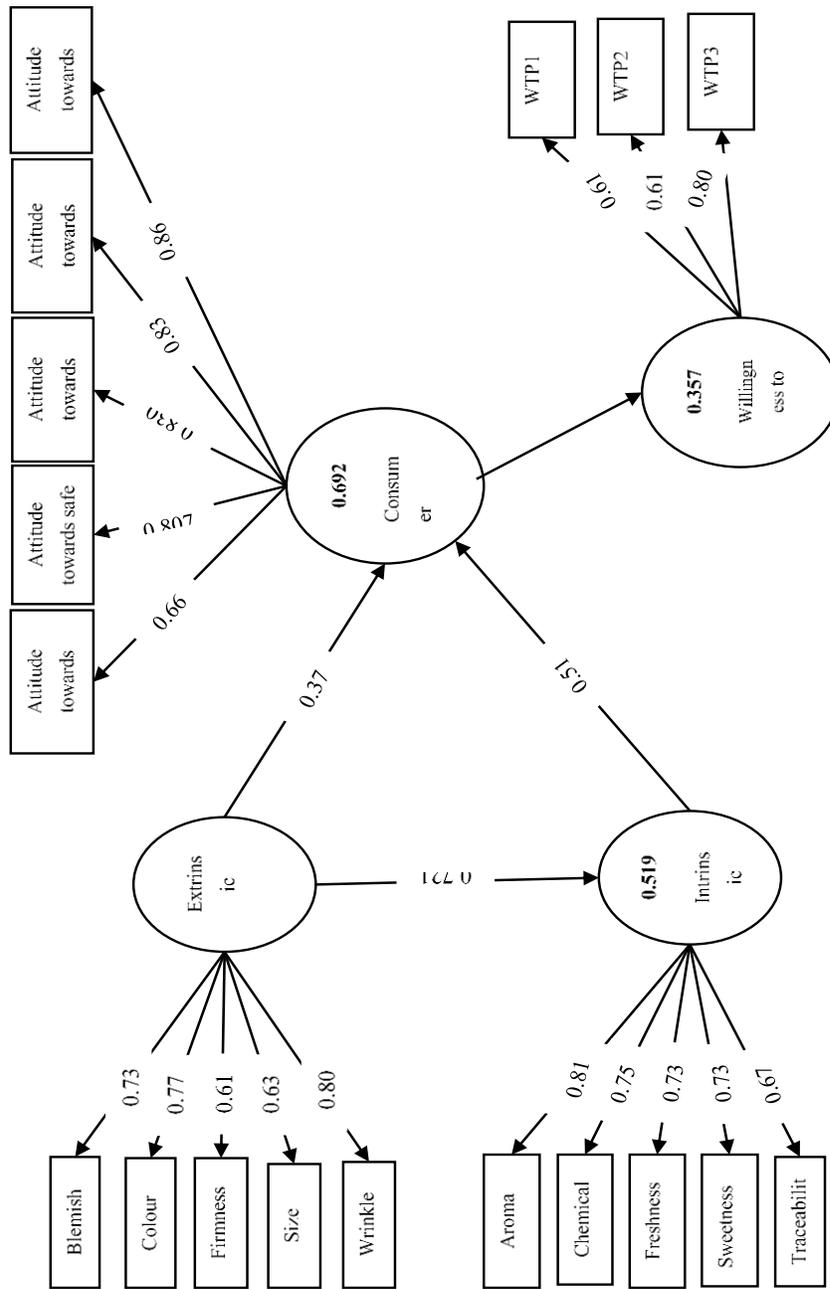
Figure 2: PLS Model

The study, to understand the preference ordering for the quality attributes of mangoes, calculated marginal premiums to make a comparison on the strength of preference for each attribute. Table 6 reports marginal price premium of each quality attribute relative to its importance considered by our surveyed respondents. It is evident from the results that Pakistani mango consumers evaluate different quality attributes in the different manner. For example, sweetness is found the most preferred attribute for which our surveyed consumers are ready to pay a price premium of 21 PKR per kilogram, followed by fruit size with a price premium of 16.42 PKR and mango freshness with a price premium of 13.81 PKR per kilogram.

Further, respondents are clearly willing to pay a price premium of 13 PKR for mango firmness and 12.5 PKR per kilogram for blemish free mangoes. Among other mango quality attributes that carry a positive premium, chemical free properties, aroma, and mango color carry relatively lower premium respectively which is indicated by the values 10.44 PKR, 9.34 PKR and 8.83 PKR per kilogram.

It is interesting to note that packaging and traceability does not carry significant price premium. It can be speculated that such a result might be due to the caveat that there is a lack of informed perspective regarding traceability forms and practices in the fruit industry of Pakistan. So far, anecdotal efforts are made to address the barriers to ensure traceability thereby viewing it as a mandated cost. Further, packaging has not been widely used as a marketing tool in the Pakistan's fruit industry and retailers are flexing their competitive position largely based on lowering prices of perishable products such as mangoes.

Table 6: Marginal Premiums for Each Quality Attribute of Mangoes (Rupees/Per Kilo)

Variables	Marginal WTP (PKR per Kilogram[4])	P-Value
Sweetness	21.43** (0.138)	0.070
Fruit size	16.42** (0.152)	0.003
Freshness	13.81** (0.120)	0.002
Firmness	13.17** (0.103)	0.004
Blemish free	12.56** (0.117)	0.000
Chemical free	10.44** (0.131)	0.030
Aroma	9.34* (0.08)	0.040
Fruit Color	8.83* (0.128)	0.000
Packaging	5.28 (0.227)	0.531
Traceability	4.72 (0.192)	0.274

6. Discussion and Research Implications

The proposed hypotheses were all confirmed and, four important findings can be drawn from the results of the study.

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[4]For reference, PKR is a Pakistan currency unit and Kilogram is a weighing unit commonly used to sell mangoes in Pakistan and commonly spoken as Kilo.
1PKR is equal to
0.00954153 USDhttp://www.xe.com/currencyconverter/convert/?Amount=1&From=PKR&To=USD

First, the main finding of the analysis is that quality of mangoes is perceived in a two dimensional structure. In particular, both extrinsic (expected quality) and intrinsic (experiential quality) attributes played a critical but varying role in developing consumers' preferences. Therefore, marketers need to understand that consumers pay more attention to blemish-free, fruit color, firmness, fruit size and homogenous texture while searching quality mangoes. On the other hand, consumers are more willing to pay a price premium when they experience sweetness, chemical-free, and aroma in mangoes. Such information is crucial for regulating efficient postharvest practices and developing infrastructure for quality maintenance to reach specific target consumers at supermarkets.

Second, considering the regression estimates obtained between EA-IA ($\beta= 0.72$), EA-CP ($\beta=0.38$), and IA-CP ($\beta= 0.52$), it can be stated that perceptions of intrinsic quality attributes contribute more towards the formation of specific consumer attitudes, however, the role of extrinsic quality attributes should also be given due emphasis because of its greater significance in explaining intrinsic attributes. Therefore, this finding may be useful for different agents involved in the mango quality improvement chain that consumers are more attracted to big sized ripened mangoes and blemish and wrinkle-free mangoes but willing to pay a price premium when this visual appearance is followed by experience and credence attributes including sweetness, flavor, juicy and finding it naturally ripened.

Third, according to the results, fruit size, wrinkle-free, sweetness and aroma attributes possess higher significance for quality mangoes commercialization. The first two attributes belong to extrinsic group therefore can be examined at the time of purchase while the latter two constitutes experience and credence and thus become a part of intrinsic quality attributes. The finding implicates that retailers should offer consumers a sample of mangoes to form their perceptions of quality.

Fourth, in regard to consumers' preferences, attitude towards quality is the main predictor, followed by attitude towards healthiness and disease-free as the most important determinants of willingness to pay a price premium. Nevertheless, this indicates significant changes relating to the image of quality mangoes in the eyes of the consumers. This implies that quality standards need to be defined to strengthening the mango value chain in Pakistan thereby resulting in enhanced trust and safety of quality mangoes. Consequently, this will change the mango supplies for retailers not only from big but also from small and medium sized mango producers and should lead to an increase in customer satisfaction at consumer level.

7. Conclusion, Limitations and Future Research

The marketing of fresh fruits in Pakistan is evolving. In this respect, the study was designed to better understand WTP through consumers' preferences which are influenced by a number of qualities attributes when fruit is purchased. The product examined in this study, namely mango is often referred in Pakistan as the '*king of fruits*' due to its importance to consumers and economically to the country. The study has provided baseline information about different quality attributes of mangoes which largely affect perceptions thereby contributing towards willingness of mango consumers to pay a price premium. This study has numerous implications for industry and government, which will be discussed below.

This study has shown that intrinsic product attributes contribute more to consumer attitudes than extrinsic, albeit extrinsic cues contribute greatly to explaining intrinsic attributes. This has great implications for supermarket retailers and their suppliers, who should focus post-harvest practices and retail stocking and displaying efforts on maintaining and enhancing this attributes as a way of enticing consumer to purchase and pay more for mangoes.

Trust and safety issue were identified as being important factors influencing consumers' willingness to pay. Members of the mango value chain, through strict, codified traceability systems, could allay these issues and the authors believe that it is in the best interest of the members of this chain and government/ NGOs to co-invest in these systems particularly and provide training on these systems to members of the chain who physically handle the product.

This study had numerous limitations with implication for future research avenues. Firstly, the research was limited to Pakistan, one country and its two provinces and two provinces, albeit the major economic centers of Pakistan, however this places doubt on the generalizability of the study outside of this context. Future research could examine the preference of consumers in other provinces of Pakistan or from other countries to create more generalizable results. Secondly, the study was based on one data collection point and focused on one quantitative method: PLS-SEM. Future research could compare the results of this study using co-variance based algorithm analysis utilizing AMOS, or similar type software. Furthermore, the study could be extended using longitudinal data to observe whether government or private sector enhancements to post-harvest practices and traceability systems, and resulting improvements in product quality, have an impact on consumer preference and willingness to pay.

A qualitative study, via focus group or semi-structured interviews could be performed to further validate the findings of this study but could also be used to explore the nature of intrinsic and extrinsic product attributes. For example, quality dimensions tested in this study were developed from a small sample (14) pre-test of consumer. A greater sized qualitative study could explore other intrinsic or extrinsic attributes that are valued by consumers or further delve into the nature of these attributes as it may come to pass that some of these attributes such as traceability, freshness, sweetness, are multidimensional in nature and require further definition and validation.

A finding of interest from this study was that aroma has a lower weight in the structural model (as an intrinsic factor) and that flesh firmness has a lower weight (as extrinsic factor.) The reason for this is unclear and may be the result of consumers requiring more tasting experience with product or may be due to post-harvest quality maintenance practices. These two issues could be further explored, particularly via qualitative methods, to ascertain the reasons for the lower weighting.

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Appendix-1: Description of the Study Items

- ➢ The 6 items that make up the extrinsic attributes refer to blemish-free, fruit color, firmness, packaging, fruit size, and fruit texture (wrinkle-free).
- ➢ The 5 items that make up the intrinsic attributes refer to fruit aroma, chemical-free, freshness, sweetness and fruit traceability.
- ➢ There are 7 attitudes that deal with consumers' views (forms of judgments) representing their cognition and behavioural intention about quality mangoes. These attitudes are towards quality, healthiness, disease-free, higher price, sweetness, identification and availability.
- ➢ The 5 items of willingness-to-pay mention buying behaviour for quality mangoes.

Constructs	Measurement Items
Extrinsic attributes	EXT-1: A premium quality mango is one that is usually blemish-free.
	EXT-2: A big sized mango is frequently graded as premium quality.
	EXT-3: The flesh firmness indicate premium quality of mangoes.
	EXT-4: An attractive packaging and labelling have a strong influence on perceiving the premium quality of mangoes.
	EXT-5: The yellow skin color without abscission layers indicate premium quality of mangoes.
	EXT-6: A premium quality mango is one that is usually wrinkle-free
Intrinsic attributes	INT-1: The premium quality of mango is appreciated if it more sweet.
	INT-2: The quality is appreciated if a mango is prepared without chemicals.
	INT-3: An aromatic mango is a premium quality mango.
	INT-4: The more a mango is fresh, the more excellent it will be.
	INT-5: The mango farm's fame is a determining factor of quality mangoes.
Consumer preferences	ATT-1: I prefer to eat only quality mangoes for high nutrient quality.
	ATT-2: I prefer to eat quality mangoes for healthiness.
	ATT-3: I prefer to eat quality mangoes for food safety.
	ATT-4: I do not consider price important to buy quality mangoes.
	ATT-5: I feel pleasure to eat quality mangoes because of natural (without pesticides).
	ATT-6: I prefer to buy mangoes with farm identification.
	ATT-7: It is usually difficult to find quality mangoes.
Willingness-to-pay	WTP-1: I am ready to paying a premium for quality mangoes.
	WTP-2: I buy mangoes instead of walking away empty-handed.
	WTP-3: I try to buy quality mangoes.
	WTP-4: I consider it important to buy clean and safe mangoes.
	WTP-5: I would like to buy quality mangoes even if a premium is too high.