1. INTRODUCTION

1.1 Introduction to the project

When we go to a market to buy a product, what do we take into consideration when there are several options available in the same price range?
Well of course it's not just one thing. Few products are shortlisted from the rest on the basis of some criterion. This project as the title '**DO LEADING BRANDS NEED TO HAVE THE BEST QUALITY PRODUCTS?**' tries to figure out what are such criterion that people take into account when they make a decision while buying a product and to what extent do they affect their buying behaviour. The relationship amongst such factors is measured in dissertation and the various observations have been noted. The factors were divided into three groups considered for this project.

1. Customer Attitude
2. Quality Attributes
3. Firm's Marketing Strategies

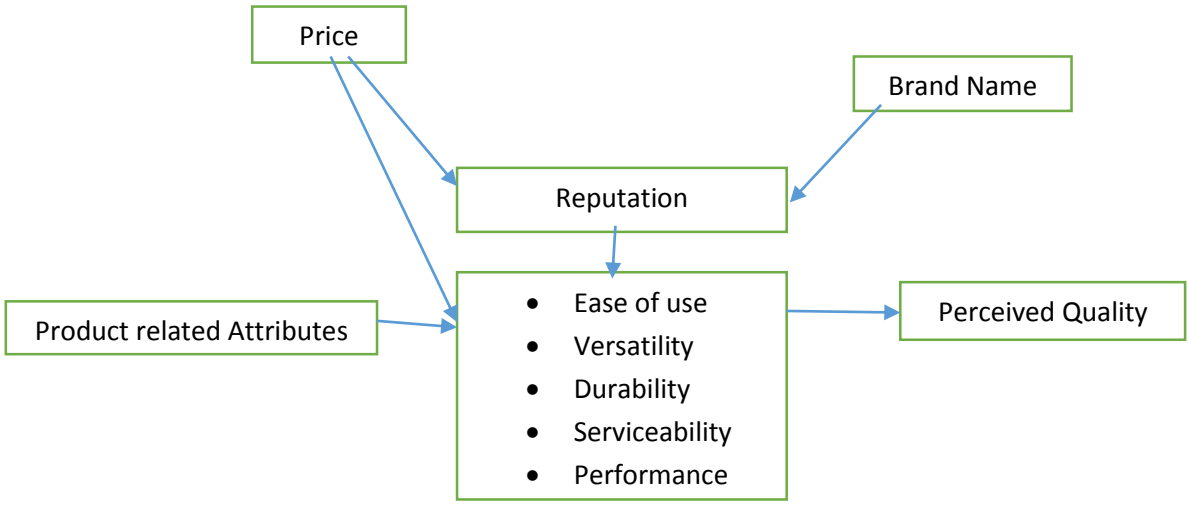


Fig 1: Showing the conceptual model of Perceived Quality

Delivering quality products requires an understanding of the critical dimensions and cues that consumers use to judge quality. Using a qualitative study, a generalizable typology of Customer attitude, Quality Attitude, Firm's Marketing Strategies desired goods that includes the following elements was developed.

Brand consciousness

Brand Loyalty

Price sensitivity

Brand Popularity

Word of mouth

Group 1: Customer Attitude

Product features

Performance

Reliability

Ease of use

Durability

Technology

Aesthetics

Quality standard

Serviceability

Group 2: Quality Attributes

Competitive Pricing

External Communication

Advertisement

Brand Promoters

Group 3: Firm's Marketing Strategy

This Qualitative research asserted that consumers do not think about quality as the only overall assessment but other multiple abstract dimensions as well.

What is a BRAND?

An association of positive qualities with a widely recognized name, as of a product line is called a brand.

Unique design, sign, symbol, words, or a combination of these, employed in creating an image that identifies a product and differentiates it from its competitors. It sometimes even represent implicit values, ideas, and even personality. Over time, this image becomes associated with a level of credibility, quality, and satisfaction in the consumer's mind. Thus brands help harried consumers in crowded and complex marketplace, by standing for certain benefits and value.

What is a Leading Brand?

Most widely sold and recognized product in a particular market segment. Also called market leader, a brand leader usually also commands the largest profit margins. *(Business dictionary.com)*

Some key terms related to brands

Marketers engaged in branding seek to develop or align the expectations behind the brand experience, creating the impression that a brand associated with a product or service has certain qualities or characteristics that make it special or unique. A brand image may be developed by attributing a "personality" to or associating an "image" with a product or service, whereby the personality or image is "branded" into the consciousness of consumers. A brand is therefore one of the most valuable elements in an advertising theme. The art of creating and maintaining a brand is called brand management. A brand which is widely known in the marketplace acquires brand recognition. When brand recognition builds up to a point where a brand enjoys a critical mass of positive sentiment in the marketplace, it is said to have achieved brand franchise.

Brand equity measures the total value of the brand to the brand owner, and reflects the extent of brand franchise. The term brand name is often used interchangeably with "brand", although it is more correctly used to specifically denote written or spoken linguistic elements of a brand. In this context a "brand name" constitutes a type of trademark, if the brand name exclusively identifies the brand owner as the commercial source of products or services. A brand owner may seek to protect proprietary rights in relation to a brand name through trademark registration.

Brand energy is a concept that links together the ideas that the brand is experiential; that it is not just about the experiences of customers/potential customers but all stakeholders; and that businesses are essentially more about creating value through creating meaningful experiences than generating profit. Economic value comes from businesses' transactions between people whether they be customers, employees, suppliers or other stakeholders. For such value to be created people first have to have positive associations with the business and/or its products and services and be energised to behave positively towards them – hence brand energy. It has been defined as "The energy that flows throughout the system that links businesses and all their stakeholders and which is manifested in the way these stakeholders think, feel and behave towards the business and its products or services." Attitude branding is the choice to represent a feeling, which is not necessarily connected with the product or consumption of the product at all.
"A great brand raises the bar -- it adds a greater sense of purpose to the experience, whether it's the challenge to do your best in sports and fitness, or the affirmation that the cup of coffee you're drinking really matters." - Howard Schultz (CEO, Starbucks Corp.)

What is Brand Image?

To survive today's competitive environment it is quiet necessary to understand liking and disliking of the customer. Consumer attitude help to know about what is their view about product. Customer is the central point of all marketing activities. Thus, it becomes very necessary to know about his attitude because customer attitude decides the position of product in market.

Importance of study of consumer attitudes & brand preference:
In present context, it is very important to study consumer attitudes, as it's a competitive world if a manufacturer doesn't know about consumer attitudes he become outdated and couldn't stay in market for long.
The study of consumer nature helps in following:
1. Price Policy.
2. Decision regarding channel distribution.
3. Production policy.
4. Consumer Satisfaction.

Theoretical and empirical studies have shown that consumer satisfaction is one of the loyalty enhancing factors. The company's market success depends on being able to attract, satisfy and retain customers. This requires an understanding of what factors affect consumers' satisfaction with a product or service and what determines their decision to
Purchase a product or use a service and their loyalty to the company. It should be noted that scientists believe the brand has an impact on customer satisfaction. Essentially, it can be stated that the impact on customer satisfaction of brand factor in setting loyalty is becoming an important marketing aspect of the investigation

Definitions of a Product
The end result of the manufacturing process, to be offered to the marketplace to satisfy a need or want. *–Investor Words 2010*

Goods, idea, method, information, object, service, etc., that is the end result of a process and serves as a need or want satisfier. It is usually a bundle of tangible and intangible attributes (benefits, features, functions, uses) that a seller offers to a buyer for purchase. *–Business dictionary 2010*

Products satisfy customers' needs and wants. On customer's needs and customization of processes of globalization, evolving products that are very similar in features. Then the brand for consumers is becoming one of the most important steps to identify, but for the company it is to stand out from the crowd.

What is quality?

If a product fulfils the customer's expectations, the customer will be pleased and consider that the product is of acceptable or even high quality. If his or her expectations are not fulfilled, the customer will consider that the product is of low quality. This means that the quality of a product may be defined as "its ability to fulfil the customer's needs and expectations". Quality needs to be defined firstly in terms of parameters or characteristics, which vary from product to product. For example, for a mechanical or electronic product these are performance, reliability, safety and appearance. For pharmaceutical products, parameters such as physical and chemical characteristics, medicinal effect, toxicity, taste and shelf life may be important. For a food product they will include taste, nutritional properties, texture, and shelf life and so on.

What are firm's strategies?

Brands are a direct consequence of the strategy of market segmentation and product differentiation. As companies seek to better fulfil the expectations of specific customers, they concentrate on providing the latter, consistently and repeatedly, with the ideal combination of attributes – both tangible and intangible, functional and hedonistic, visible and invisible – under viable economic conditions for their businesses

What is Customer Loyalty?

There are many definitions of customer loyalty. Yet each of them fails to realize that loyalty runs hand-in-hand with emotions. Customer loyalty is the result of consistently positive emotional experience, physical attribute-based satisfaction and perceived value of an experience, which includes the product or services.

Consider who you yourself are loyal to. Surely you'll answer family and friends. Why? Because of the emotional bond you have with them. Your family and friends can do things you may not like, but you stay loyal because of that bond. The same applies with customer loyalty. To prompt customer loyalty you must build an emotional bond with your customers.

To build customer loyalty, customer experience management blends the physical, emotional and value elements of an experience into one cohesive experience.

Retaining customers is less expensive than acquiring new ones, and customer experience management is the most cost-effective way to drive customer satisfaction, customer retention and customer loyalty. Not only do loyal customers ensure sales, but they are also more likely to purchase ancillary, high-margin supplemental products and services. Loyal customers reduce costs associated with consumer education and marketing, especially when they become Net Promoters for your organization.

Given the highly discommoded competitive landscape today, customer experience programs are the most effective way to differentiate your organization from the competition. Such differentiation effectively drives customer loyalty when customers are engaged on an emotional, intellectual, or even spiritual level, and when a customer cherishes a product or service before, during and after its use.

1.2 Objective Of The Study

Primary Objective: To figure out the different parameters of a product that affects the brand image.

Secondary objective: To what level does the quality of the product matters compared to other factors for branded goods.

2. LITERATURE REVIEW

Delivering quality products requires an understanding of the critical dimensions and cues that consumers use to judge quality. Using a qualitative study, a generalizable typology of quality dimensions for durable goods that includes ease of use, versatility, durability, serviceability, performance, and prestige is developed. An experiment to examine how key marketing variables—Price, External Communication Advertisement Brand promoters and product attributes and consumer variables such as Brand consciousness, Brand loyalty, Price Sensitiveness, Brand popularity—affect consumers' judgment processes and inferences about how products perform on the nine quality dimensions is conducted.

To compete in today's global market, Companies are being told they need the competitive advantage of quality as well as its measurable benefits in profits, market share, and cost savings. Companies implemented objective quality strategies, such as Total Quality Management (TQM), and tactics, such as quality circles.

Recently, companies have become aware of the need for a market-driven definition of quality, instead of a firm-driven objective quality measure. To understand market-driven quality, companies must learn how consumers perceive and evaluate it instead of relying on firm-driven objective measures of quality. Vague and abstract definitions of quality such as "goodness or shininess or weight" (Crosby 1979) and one-dimensional measures of quality do not adequately capture consumers' definitions of quality (Garvin 1987). Understanding how consumers view quality is not an easy task, however. Thus, the literature supports the need for both a clear understanding of how consumers perceive quality and a generalizable typology of dimensions of quality that could be applicable to a broad range of consumer goods.

With an increased emphasis on producing quality products, it is necessary to establish empirically supported quality dimensions. Acknowledging and articulating these dimensions from the customer's viewpoint is critical to understanding, measuring, diagnosing, and delivering product and service quality. Accordingly, "How do consumers perceive and evaluate quality with respect to his attitude toward market and firms strategy that may or may not influence his purchasing tendencies?" is asked. Study addresses this question through a qualitative study of consumers, yielding a generalizable typology of quality dimensions for durable goods.

How brand awareness means value (as per the secondary research)

Recent marketing research shows that brand awareness is not a mere cognitive measure. It is in fact correlated with many valuable image dimensions. Awareness carries a reassuring message: although it is measured at the individual level, brand awareness is in fact a collective phenomenon. When a brand is known, each individual knows it is known. This leads to spontaneous inferences. Awareness

is mostly correlated with aspects such as high quality, trust, reliability, closeness to people, a good quality/ price ratio, accessibility and traditional styling.

However it has a zero correlation with innovativeness, superior class, style, seduction: if aspects such as these are key differentiation facets of the brand, they must be earned on their own merit.

The product and the brand

Since the early theorisation on the brand, there has been much discussion on the relationship of brands to products. Many a CEO repeats to his or her staff that there is no brand without a great product (or service), in order to stimulate their innovativeness and make them think of the product as a prime lever of brand competitiveness. On the other hand, there is ample evidence that market leaders are not the best product in their market.

The laundry detergent category, market leaders such as Tide, Ariel are those delivering the best performance for heavy-duty laundry, but in other cases it is the brand with the best quality/price ratio that is market leader.

Are Dell's computers the best? Surely not. But who really needs a 'best computer'? What would be the criterion for evaluation? 'Best' is a relative concept, depending on the value criteria used to establish comparisons and identify the 'best'. In fact the market is segmented: the largest proportion of the public, and even most of the B2B segment, wants a modern, reliable, cheap computer. Thanks to its build-to-order business model, Dell was able to innovate and become the leader of that segment. Co-branded 'Intel inside', it reassures buyers and surprises them by its astonishing price and one-to-one customisation: each person makes his or her own computer. Is Swatch the best watch? Surely not either. But in any case this is not what is asked by Swatch buyers: they buy convenience and style, not long-lasting superior 'performance', whatever this may mean.

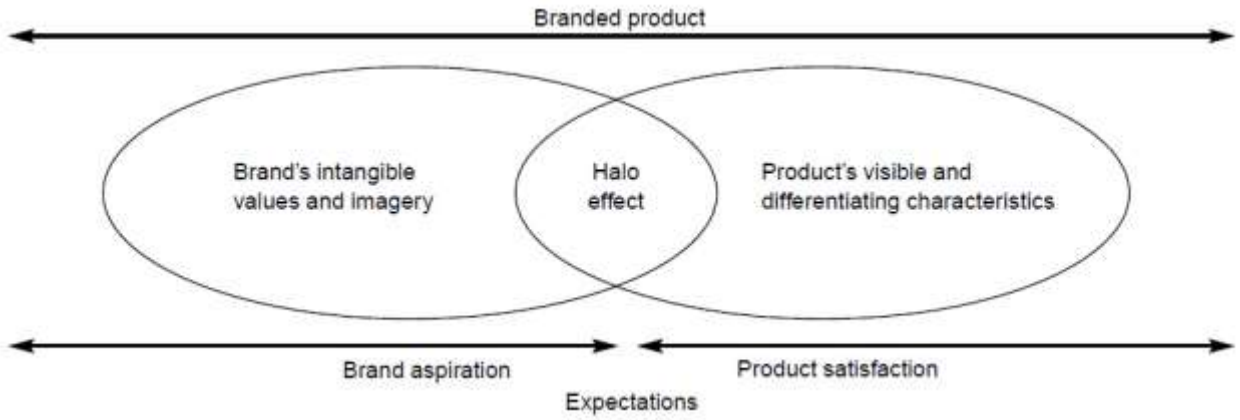
Looking at history, most brands are born out of a product or service innovation which outperformed its competitors. A superior product/service was the determining factor of the launch campaign. Later, as the product name evolves into a brand, customers' reasons for purchase may still be the brand's 'superior performance image', although in reality that performance has been matched by new competitors. This has been the basis of Volkswagen's leadership and price premium: a majority of consumers keeps on believing that Volkswagen cars are the most reliable ones. As all tests and garage repair records demonstrate, Volkswagen quality has now been matched and even bypassed by Toyota, but for buyers, perception is reality. It took 20 years for Toyota to shake the belief among US consumers that Volkswagen cars are the most reliable: it takes time to prove one's reliability. Often, to go faster it is best to target a new generation of drivers with an open mind.

Looking at competitive behaviour, it seems that brands alternate in their focus. They capitalise on their image, then innovate to recreate or nurture the belief of product superiority (on some consumer benefit), then recapitalise on their image, and so on. Sony's advertising is very typical of this pendulum behaviour: it alternates ads that introduce new products and pure image ads with no specific material content or superiority content.

Suppose a consumer wants to buy a new car because of the birth of his or her fourth child. This major event creates a new set of expectations, some tangible, some intangible. The consumer wishes to buy a minivan, with two sliding doors, high flexibility within the cabin, and of course a reliable, secure brand, with credentials and some status. By looking at Internet sites, at magazines and visiting dealers, it is possible to identify those models with the requested visible attributes (size, flexibility,sliding doors). Now what about the invisible attributes, like the experiential ones (driving pleasure) or those one has to believe on faith, such as reliability? Obviously, these attributes do or do not belong to the brand's reputational capital. They cannot be observed. This is one of the key roles of brands: to guarantee, to reassure customers about desired benefits which constitute the exclusive strength of the brand, also called its positioning.

Psychologists have also identified the halo effect as a major source of value created by the brand: the fact that knowing the name of the brand does influence consumer's perception of the product advantages beyond what the visible cues had themselves indicated, not to speak of the invisible advantages. Finally, attached to the brand there are pure intangible associations, which stem from the brand's values, vision, philosophy, its typical buyer, its brand personality and so on. These associations are the source of emotional ties, beyond product satisfaction. In fact, in the car industry, they are the locus of consumers' desire to possess a brand.

Some brands sell very good products at fair price but lack thrill or desire: they cannot command a price premium in their segment.



A given brand will not be jeopardised by competitors offering similar products, unless there are large quantities of the latter. It is indeed inevitable for certain models to be duplicated in the product lines of different brands. Suppose that brand A pursues durability, brand B practicality and brand C innovation: the spirit of each brand will be especially noticeable in certain specific products, those most representative or typical of the brand meaning.

Brands and other signs of quality

In many sectors, brands coexist with other quality signs. The food industry, for instance, is also filled with quality seals, certificates of norm compliance and controlled origin and guarantees. Quality seals are promotional tools. They convey a different concept of quality, which is both more industrial and scientific. They reduce perceived difference.

Brands define their own standards: legally, they guarantee nothing, but empirically they convey clusters of attributes and values. In doing so, they seek to become a reference in themselves, if not the one and only reference.

Are leading brands the best products or the best value?

To create a brand is much more than simply marking a product or service, the necessary first step of brand differentiation. It is about owning a value.

It is often held to be a paradox that the number one brands are not the best products. Was the original IBM PC the best PC available at the time? No. Is Pentium the best chip? Who knows? Are Dell computers the best computers?

The paradox stems from the word 'best': best for whom, and at what? Let's take the analogy of a school class. Academic gradings are determined according to well-understood criteria: students who do well display qualities such as excellent memory, the ability to solve problems fast, to work accurately and to present their work well. These are the values of the schoolroom; and similarly, each market has values. To become number one in any market it is necessary to understand what the market values are. Of course, one cannot succeed without a good product or service. Those who try the product must like it enough to make repeat purchases, to refer others to it; the product must build brand loyalty.

In the spirits market, Bacardi is world number one; is it the best spirit? One could certainly argue that it is nothing of the kind: it has no taste, and in all blind testings it fares very poorly. So why does it sell in such volume? The source of its business is not experts deliberating over its taste, but casual drinkers and partygoers. They generally want a spirit that will blend well in a cocktail, and an ideal mixer should have a very neutral taste. This is exactly what Carta Blanca delivers; it provides 90 per cent of Bacardi's sales.

3. RESEARCH METHODOLOGY

3.1 Need Of The Study

India has recently joined the race for conveying brands and branded products. A few decades back such a scenario wasn't so intense. This has brought the market to a pedestal as the money potential has significantly increased and this obligates firms to adhere with their commitment to manufacture better products than ever before. It encourages firms towards iterative improvement. As the competition barges in just in the nick of time, firms cannot afford to hold back and relax but rather come out with a strategy so as to even the score. A pre knowledge of such factors that govern a brand and product relationship might come handy.

The efforts the firm makes in building a brand really depends upon the consumer attitude, products quality and firms surviving strategy. Since they burn a lot of cash in such endeavours hence to figure out if it needs to be fuelled as well from time to time will wary the top executives. The respondents will give a generic Idea about the perception of Indian people towards the products they are being offered and about the brands they are inclined to.

The results can substantiate the efforts and investment that existing and emerging brands are making in order to market their product successfully.

3.2 Significance Of The Study

For new brands that are still in the seeding phase are need to be aware of the factors which determine their value in the market. With due diligence they can try to match these factors and create perfect rhythm to position their products better than their competitors. The demographic details tell us about the variation in inclination towards brands and products. This information can be tapped by the interested industries so as to specifically target such audience. The honest remarks in the questionnaire, aided with computer algorithm, can be looked for the keywords or/and similar words that are repeated most of the times.

3.3 Scope Of The Study

The different elements for the 3 factors have been defined by personal observations and a secondary research. There are different factors applicable in different industries so I have selected the most generic ones and hence the calculations again the specific industries have not been performed. In case of automobiles, the detailed factors for quality have been defined but for the simplicity of research, I have kept it as generic as it can.

3.4 Data Collection

For this dissertation was qualitative in nature hence a questionnaire was designed by me constituting the various factors and elements within those factors after consulting few books which I have mentioned in the reference. The survey I conducted was through Google forms and which was floated on social network like Facebook and Google+. To some of my known, I send the link via whatsapp as well. The scale I have used for collecting the ordinal data i.e. factors governing the brands is a 7 point Likert Scale. In total there were 22 questions out of which 18 were asked to measure the degree to which they agree to the factors important for a branded product to survive in the market. The questionnaire has been attached in the appendix. In the study 62 respondents took part from different age groups, income groups, Gender and their industry preference.

Prior to data collection a form was floated to know what does the people know about a brand.
The question was "Please describe what 'The Best Product' is for you."

Few responses that were collected are:

- Something that is reliable and give you happiness.
- There is nothing as "The Best Product"
- Product that meets the required specifications and is reliable.
- Easily available, value for money,good quality, after sales service excellent, good interpersonal relation and trustworthy

This gave me an overall idea about the consumer perception.

3.5 Data Analysis Tools

For the purpose of the study various statistical tools are used viz.

- Tables
- Percentages
- Pie Charts
- Bar Charts
- Mean
- Standard Deviation
- Variance
- Correlations
- Covariates
- Descriptive Studies – has been carried out, the objective of descriptive study was to find answer to questions like-"Who, what, where and when". In conducting descriptive study statistical method has been adopted.
- Statistical Method – has been applied, as statistical method is the most widely used method in marketing research and is the method usually implied when a survey is referred to. Data were collected for statistical studies by designing a questionnaire. The percentages and means have been use in the statistical method.
- Chronbacs alpha
- Reliability test
- Anova Twokey test
- Softwares:
    - MS Excel 2013
    - IBM® SPSS™ 21
    - Minitab 17

3.6 Limitations of The Study

Sample size Sample size: The number of respondents who participated in the survey was less than it was expected can make the calculations and results questionable. To focus on different industries this sample size was not enough. The sample size is very small, hence it is difficult to find significant relationships from the data, as statistical tests normally require a larger sample size to ensure a representative distribution of the population and to be considered representative of groups of people to whom results will be generalized or transferred.

Likert scale precision is questionable when it comes to psychoanalysis of eccentric population and since its values are qualitative in nature, only a limited statistical tools can be implemented to draw results.

4. CASE STUDY

4.1 Approach

The following questionnaire was designed to gauge customer's demographic profile, customer's attitude, quality attitudes and firms marketing stategy and their responses were collected.
The case turns out to be that 62 respondents took part in the study to determine is quality is the greatest factor in when it comes to choosing a product. The following questionnaire was divided into 4 parts.

General profile
Consumer Attitude
Quality Attributes
Market Firm's strategies

The questions that were asked are shown below. The respondents had to choose the level of personal agreeing or disagreeing to that claimed proposition on a 7 point likert scale.

Questionnaire

DO LEADING BRANDS NEED TO HAVE THE BEST PRODUCTS

*Required

General Profile

Please Specify your gender *

- (•) Male
- ( ) Female

Age group you belong to *

- (•) 18-25
- ( ) 25-32
- ( ) 32-40
- ( ) 40+

Annual Household income *

- ( ) under 3 lacs
- (•) 3-7 lacs
- ( ) 7-12 lacs
- ( ) more than 12 lacs

Please Choose the industry/industries of your interest *

About which you have some insights like the best products, best brands, or their competitors.

- [x] Airline
- [x] Automobile
- [ ] Computers and electronics
- [ ] Electronic household appliances
- [ ] Fashion and apparel
- [ ] Food and Confectionaries
- [ ] Furniture
- [ ] Hospitality
- [ ] Mobile Phones/TABS
- [ ] Photography
- [ ] Personal and beauty care
- [x] Watches
- [ ] Other:

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Attitude towards buying behaviour

Please choose the best option that follows accordingly

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To what extent do you agree with the following set of propositions when it comes to your personal relationship with a brand? *

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
You are a brand conscious person	○	○	○	○	○	○	◉
You are loyal to a particular brand	○	○	○	○	○	◉	○
You are Price sensitive	○	○	○	○	○	◉	○
Popularity of a product in the public as well as among the peers encourages you to ask for a demonstration of the product directly from the company	○	○	○	○	○	○	○
If happy with a product, you spread a positive word of mouth	○	○	○	○	○	○	○

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Quality Dimensions

Please choose the best option that follows accordingly

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To what extent does the following aspects of quality of a product are of concern to you? *

These questions are to be answered irrespective of a brand.

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
The better the features are of a product, than other firms's, the more interested you are in that product	○	○	○	○	○	◉	○
You want the best performance even if you have to compromise with other criteria	○	◉	○	○	○	○	○
You would buy the same product again if it has proven to be Reliable in the past. That is consistent performance according to the specification of the product.	○	○	○	○	○	○	◉
You prefer a product that is easy to use over complicated controls and mechanisms	☐	○	○	○	○	○	○

You prefer a product that is easy to use over complicated controls and mechanisms	○	○	○	○	○	○	○
You go for Durable Product (Performs well even under extreme condition) even if you have to pay extra	○	○	○	○	○	○	○
Technological upgrades from the previous models forces you to buy a new product	○	○	○	○	○	○	○
You are more likely to buy products that have good aesthetic appeal	○	○	○	○	○	○	○
Quality standards such as ISO : 9001, ISI etc. really matters	○	○	○	○	○	○	○
You prefer to check the serviceability of the product,like maintenance cost etc before buying a product	○	○	○	○	○	○	○

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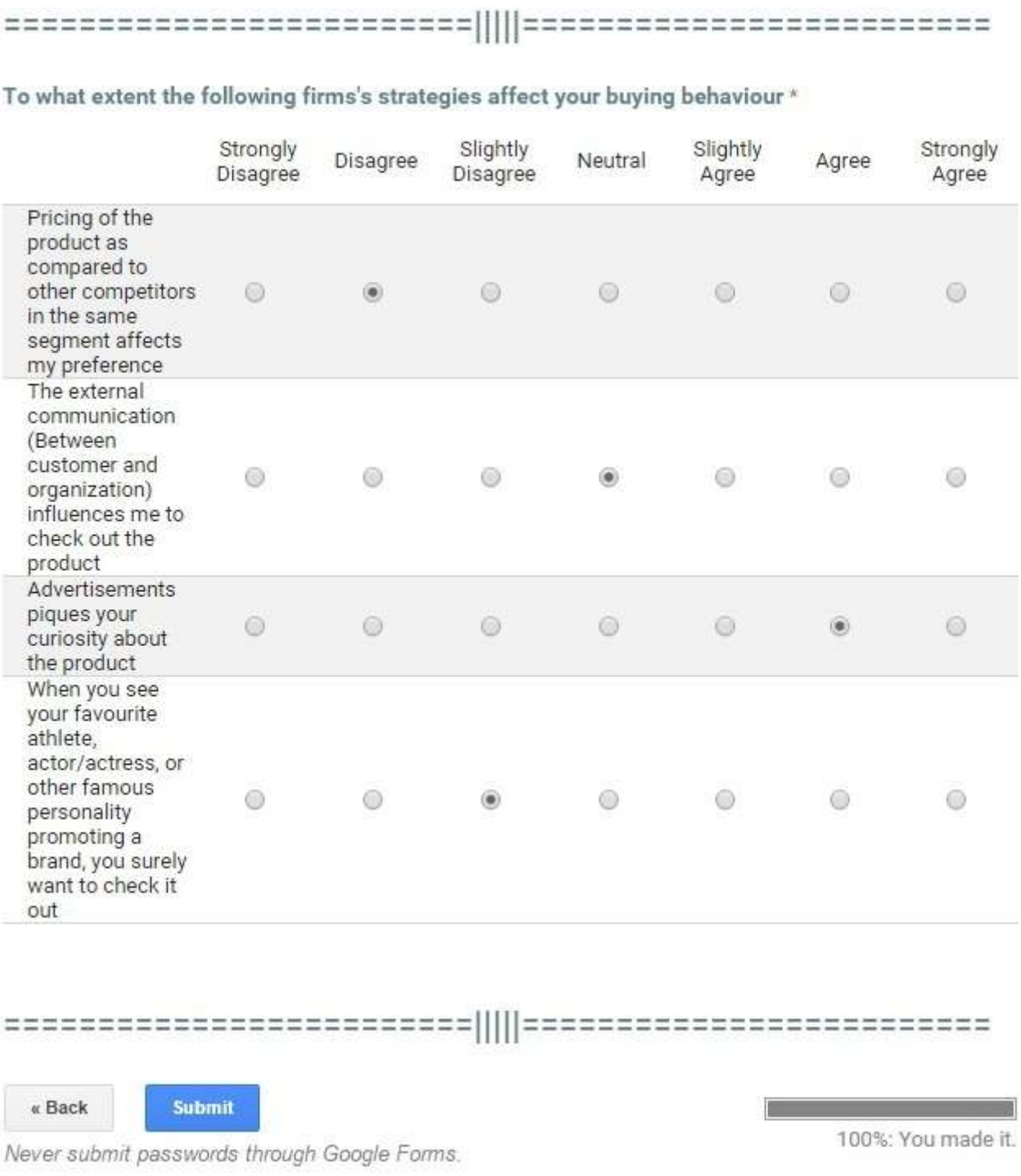

To what extent the following firms's strategies affect your buying behaviour *

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
Pricing of the product as compared to other competitors in the same segment affects my preference	○	◉	○	○	○	○	○
The external communication (Between customer and organization) influences me to check out the product	○	○	○	◉	○	○	○
Advertisements piques your curiosity about the product	○	○	○	○	○	◉	○
When you see your favourite athlete, actor/actress, or other famous personality promoting a brand, you surely want to check it out	○	○	◉	○	○	○	○

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100%: You made it.

Never submit passwords through Google Forms.

Hypothesis:

H_0 : All the three factors play equal role in the customer's buying behaviour ($\mu_{c=}\mu_{q=}\ \mu_f$)

H_1: All the three factors doesn't play equal role in the customer's buying behaviour $\mu_{c\neq}\mu_{q\neq}\ \mu_f$

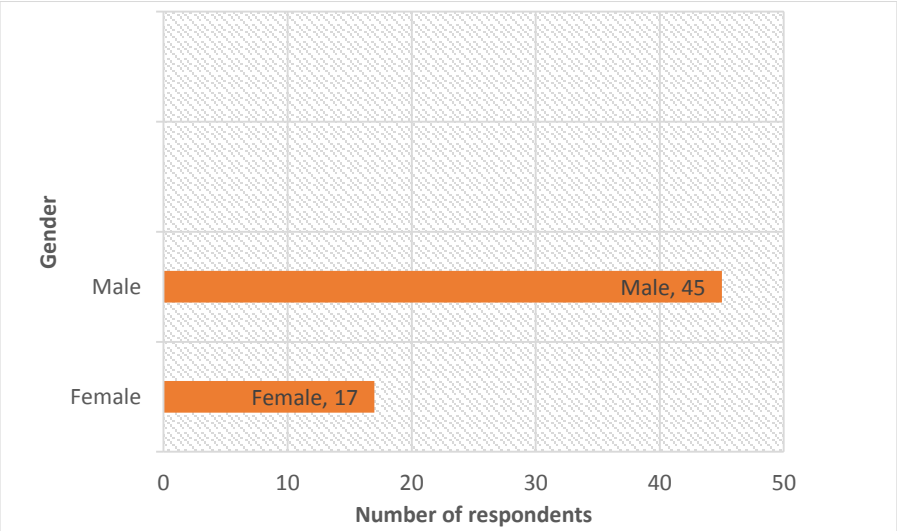
4.2 Findings

Demographics

Number of male and female respondents

Gender

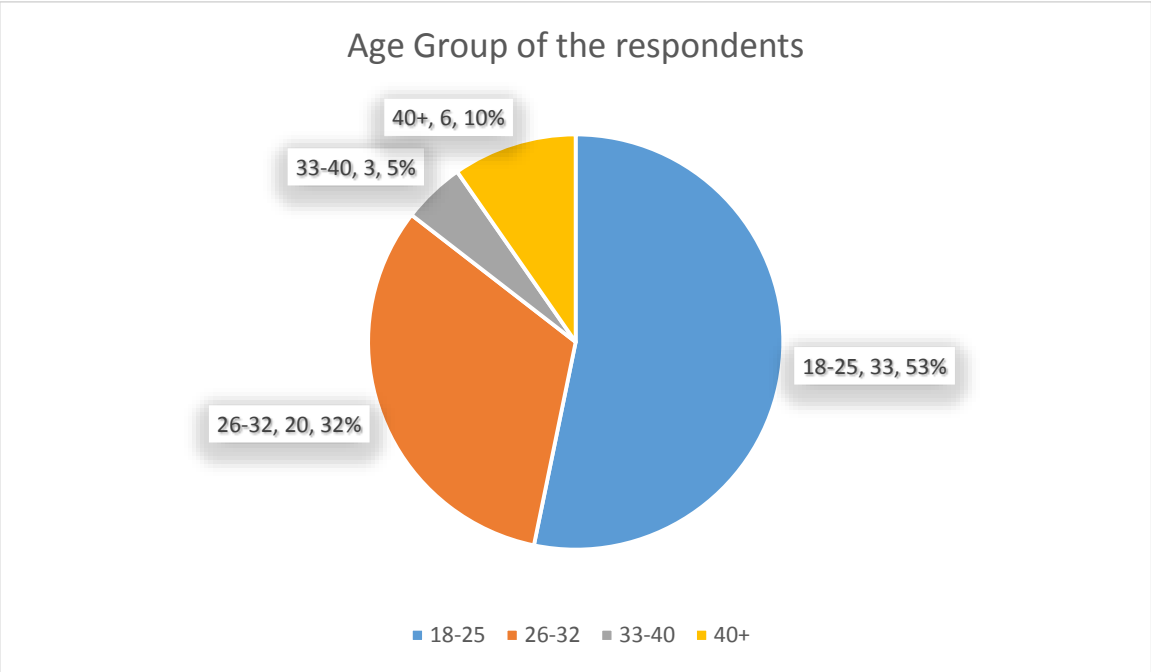
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	17	27.0	27.0	28.6
	Male	45	71.4	71.4	100.0
	Total	62	100.0	100.0	



Age group to which the respondents belong

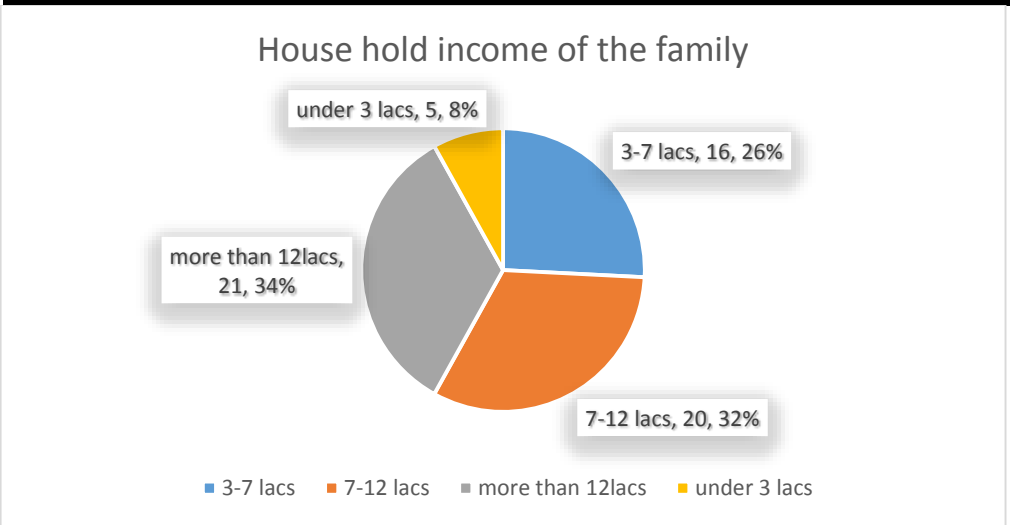
Age_group

	Frequency	Percent	Valid Percent	Cumulative Percent
	1	1.6	1.6	1.6
18-25	33	52.4	52.4	54.0
26-32	20	31.7	31.7	85.7
33-40	3	4.8	4.8	90.5
40+	6	9.5	9.5	100.0
Total	62	100.0	100.0	



Annual_Household_income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	1.6	1.6	1.6
	3-7 lacs	16	25.4	25.4	27.0
	7-12 lacs	20	31.7	31.7	58.7
	more than 12lacs	21	33.3	33.3	92.1
	under 3 lacs	5	7.9	7.9	100.0
	Total	62	100.0	100.0	



Frequency Table for distribution of customer's attitude

Brand_conscious

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	1.6	1.6	1.6
	Agree	9	14.3	14.3	15.9
	Disagree	6	9.5	9.5	25.4
	Neutral	18	28.6	28.6	54.0
	Slightly Agree	15	23.8	23.8	77.8
	Slightly Disagree	11	17.5	17.5	95.2
	Strongly Disagree	3	4.8	4.8	100.0
	Total	62	100.0	100.0	

Brand_Loyal

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	1.6	1.6	1.6
	Agree	7	11.1	11.1	12.7
	Disagree	13	20.6	20.6	33.3
	Neutral	9	14.3	14.3	47.6
	Slightly Agree	16	25.4	25.4	73.0
	Slightly Disagree	7	11.1	11.1	84.1
	Strongly Agree	1	1.6	1.6	85.7
	Strongly Disagree	9	14.3	14.3	100.0
	Total	62	100.0	100.0	

Price_sensitive

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	1.6	1.6	1.6
	Agree	9	14.3	14.3	15.9
	Disagree	3	4.8	4.8	20.6
	Neutral	8	12.7	12.7	33.3
	Slightly Agree	17	27.0	27.0	60.3
	Slightly Disagree	14	22.2	22.2	82.5
	Strongly Agree	4	6.3	6.3	88.9
	Strongly Disagree	7	11.1	11.1	100.0
	Total	62	100.0	100.0	

Brand_Popularity

		Frequency	Percent	Valid Percent	Cumulative Percent
		1	1.6	1.6	1.6
	Agree	5	7.9	7.9	9.5
	Disagree	7	11.1	11.1	20.6
	Neutral	13	20.6	20.6	41.3
	Slightly Agree	24	38.1	38.1	79.4
	Slightly Disagree	4	6.3	6.3	85.7
	Strongly Agree	6	9.5	9.5	95.2
	Strongly Disagree	3	4.8	4.8	100.0
	Total	62	100.0	100.0	

Word_of_mouth

		Frequency	Percent	Valid Percent	Cumulative Percent
		1	1.6	1.6	1.6
	Agree	9	14.3	14.3	15.9
	Disagree	4	6.3	6.3	22.2
	Neutral	12	19.0	19.0	41.3
Valid	Slightly Agree	15	23.8	23.8	65.1
	Slightly Disagree	12	19.0	19.0	84.1
	Strongly Agree	7	11.1	11.1	95.2
	Strongly Disagree	3	4.8	4.8	100.0
	Total	62	100.0	100.0	

Bar charts for customer attitudes

Ratings 1 - 7
1=Strongly Disagree | 2=Disagree | 3=Slighty Disagree | 4=Neutral | 5=Slightly Agree | 6= Agree | 7=Storngly A

Frequency distribution of perception of quality of a product

Product_features

		Frequency	Percent	Valid Percent	Cumulative Percent
		1	1.6	1.6	1.6
	Agree	13	20.6	20.6	22.2
	Disagree	3	4.8	4.8	27.0
	Neutral	9	14.3	14.3	41.3
Valid	Slightly Agree	17	27.0	27.0	68.3
	Slightly Disagree	8	12.7	12.7	81.0
	Strongly Agree	6	9.5	9.5	90.5
	Strongly Disagree	6	9.5	9.5	100.0
	Total	62	100.0	100.0	

Performance

		Frequency	Percent	Valid Percent	Cumulative Percent
		1	1.6	1.6	1.6
	Agree	10	15.9	15.9	17.5
	Disagree	4	6.3	6.3	23.8
	Neutral	10	15.9	15.9	39.7
Valid	Slightly Agree	16	25.4	25.4	65.1
	Slightly Disagree	7	11.1	11.1	76.2
	Strongly Agree	12	19.0	19.0	95.2
	Strongly Disagree	3	4.8	4.8	100.0
	Total	62	100.0	100.0	

Reliability

		Frequency	Percent	Valid Percent	Cumulative Percent
		1	1.6	1.6	1.6
	Agree	11	17.5	17.5	19.0
	Disagree	4	6.3	6.3	25.4
	Neutral	10	15.9	15.9	41.3
Valid	Slightly Agree	19	30.2	30.2	71.4
	Slightly Disagree	9	14.3	14.3	85.7
	Strongly Agree	8	12.7	12.7	98.4
	Strongly Disagree	1	1.6	1.6	100.0
	Total	62	100.0	100.0	

Ease_of_use

		Frequency	Percent	Valid Percent	Cumulative Percent
		1	1.6	1.6	1.6
	Agree	6	9.5	9.5	11.1
	Disagree	6	9.5	9.5	20.6
	Neutral	10	15.9	15.9	36.5
Valid	Slightly Agree	18	28.6	28.6	65.1
	Slightly Disagree	8	12.7	12.7	77.8
	Strongly Agree	11	17.5	17.5	95.2
	Strongly Disagree	3	4.8	4.8	100.0
	Total	62	100.0	100.0	

Durability

		Frequency	Percent	Valid Percent	Cumulative Percent
		1	1.6	1.6	1.6
	Agree	10	15.9	15.9	17.5
	Disagree	1	1.6	1.6	19.0
	Neutral	11	17.5	17.5	36.5
Valid	Slightly Agree	19	30.2	30.2	66.7
	Slightly Disagree	8	12.7	12.7	79.4
	Strongly Agree	10	15.9	15.9	95.2
	Strongly Disagree	3	4.8	4.8	100.0
	Total	62	100.0	100.0	

Technology

		Frequency	Percent	Valid Percent	Cumulative Percent
		1	1.6	1.6	1.6
	Agree	5	7.9	7.9	9.5
	Disagree	3	4.8	4.8	14.3
	Neutral	13	20.6	20.6	34.9
Valid	Slightly Agree	16	25.4	25.4	60.3
	Slightly Disagree	14	22.2	22.2	82.5
	Strongly Agree	7	11.1	11.1	93.7
	Strongly Disagree	4	6.3	6.3	100.0
	Total	62	100.0	100.0	

Aesthetics

		Frequency	Percent	Valid Percent	Cumulative Percent
		1	1.6	1.6	1.6
	Agree	14	22.2	22.2	23.8
	Disagree	3	4.8	4.8	28.6
	Neutral	8	12.7	12.7	41.3
Valid	Slightly Agree	18	28.6	28.6	69.8
	Slightly Disagree	7	11.1	11.1	81.0
	Strongly Agree	11	17.5	17.5	98.4
	Strongly Disagree	1	1.6	1.6	100.0
	Total	62	100.0	100.0	

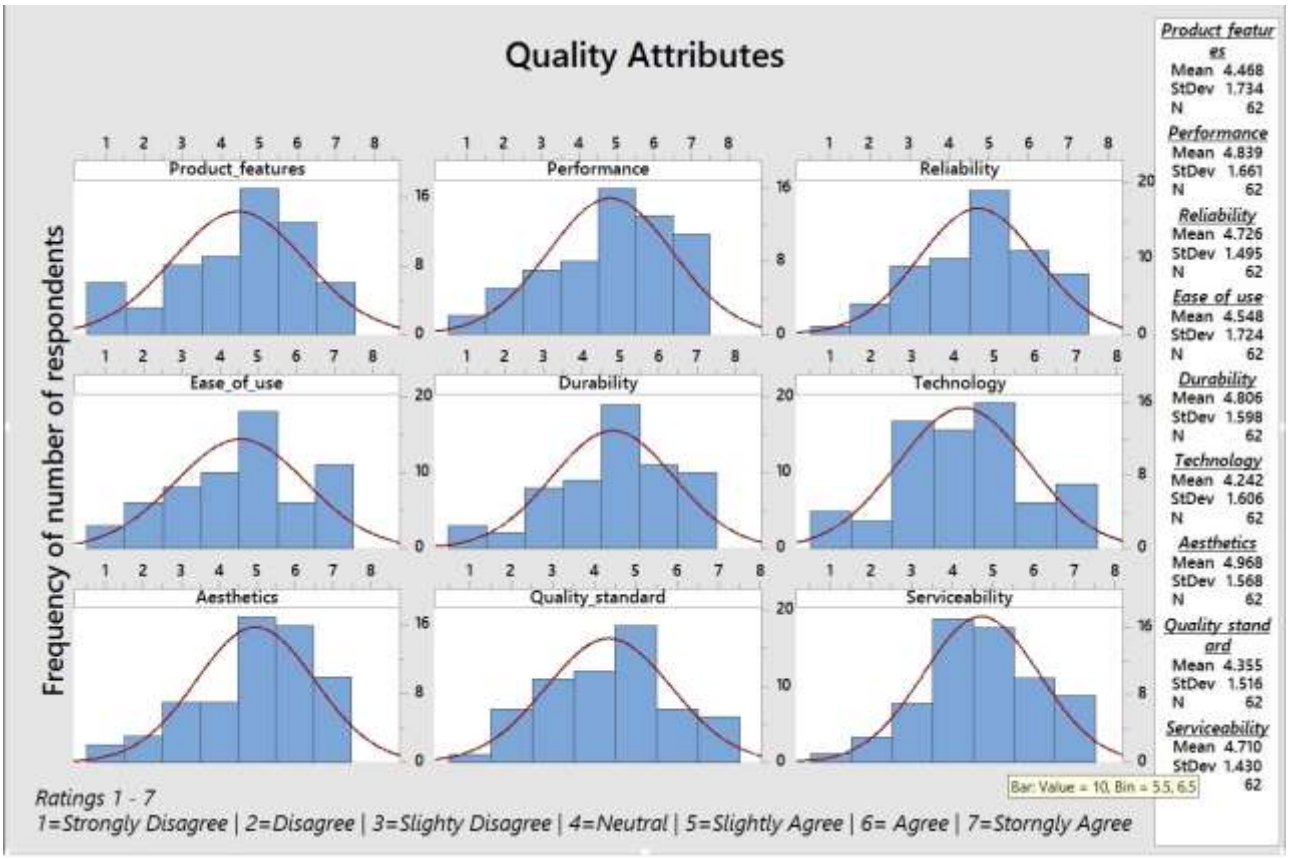
Quality_standard

		Frequency	Percent	Valid Percent	Cumulative Percent
		1	1.6	1.6	1.6
	Agree	7	11.1	11.1	12.7
	Disagree	7	11.1	11.1	23.8
	Neutral	12	19.0	19.0	42.9
Valid	Slightly Agree	18	28.6	28.6	71.4
	Slightly Disagree	11	17.5	17.5	88.9
	Strongly Agree	6	9.5	9.5	98.4
	Strongly Disagree	1	1.6	1.6	100.0
	Total	62	100.0	100.0	

Serviceability

		Frequency	Percent	Valid Percent	Cumulative Percent
		1	1.6	1.6	1.6
	Agree	10	15.9	15.9	17.5
	Disagree	3	4.8	4.8	22.2
	Neutral	17	27.0	27.0	49.2
Valid	Slightly Agree	16	25.4	25.4	74.6
	Slightly Disagree	7	11.1	11.1	85.7
	Strongly Agree	8	12.7	12.7	98.4
	Strongly Disagree	1	1.6	1.6	100.0
	Total	62	100.0	100.0	

Bar Charts for the distribution of frequency of product attributes



Frequency distribution of influence of firm's strategy on the consumer

Competitive_pricing

		Frequency	Percent	Valid Percent	Cumulative Percent
		1	1.6	1.6	1.6
	Agree	4	6.3	6.3	7.9
	Disagree	4	6.3	6.3	14.3
	Neutral	14	22.2	22.2	36.5
Valid	Slightly Agree	20	31.7	31.7	68.3
	Slightly Disagree	13	20.6	20.6	88.9
	Strongly Agree	3	4.8	4.8	93.7
	Strongly Disagree	4	6.3	6.3	100.0
	Total	62	100.0	100.0	

External_communication

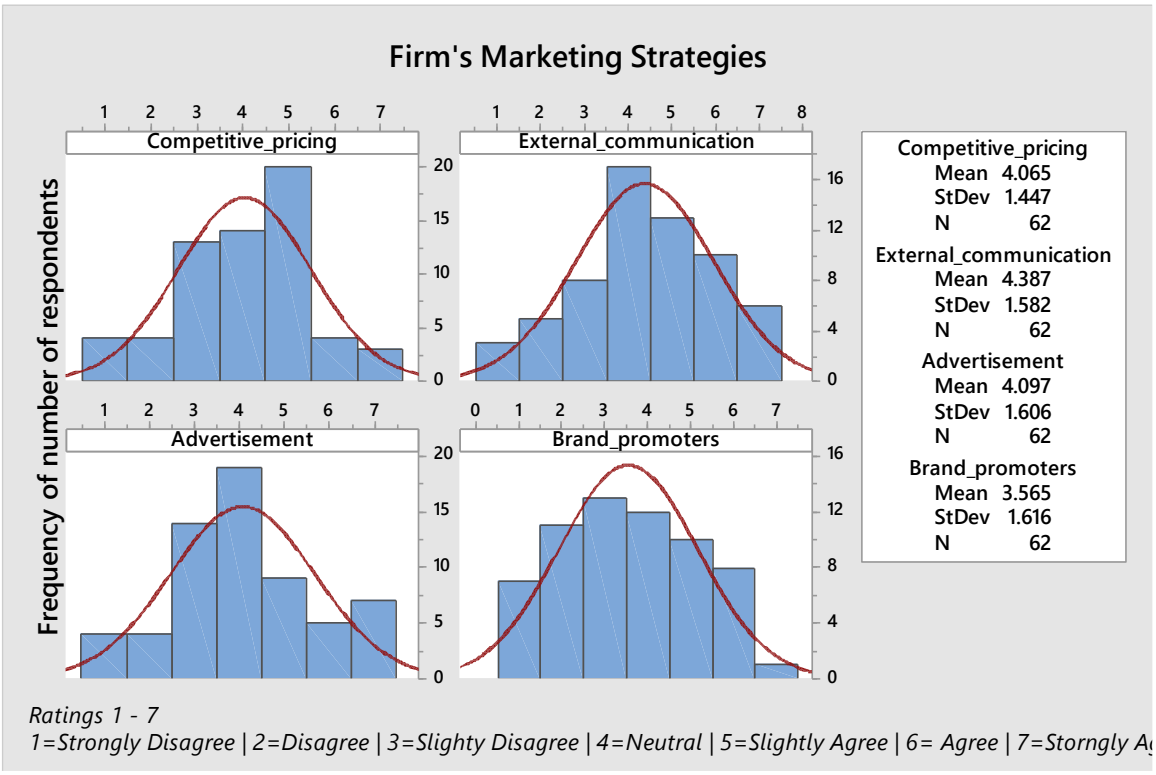
		Frequency	Percent	Valid Percent	Cumulative Percent
		1	1.6	1.6	1.6
	Agree	10	15.9	15.9	17.5
	Disagree	5	7.9	7.9	25.4
	Neutral	17	27.0	27.0	52.4
	Slightly Agree	13	20.6	20.6	73.0
Valid					
	Slightly Disagree	8	12.7	12.7	85.7
	Strongly Agree	6	9.5	9.5	95.2
	Strongly Disagree	3	4.8	4.8	100.0
	Total	63	100.0	100.0	

Advertisement

		Frequency	Percent	Valid Percent	Cumulative Percent
		1	1.6	1.6	1.6
	Agree	5	7.9	7.9	9.5
	Disagree	4	6.3	6.3	15.9
	Neutral	19	30.2	30.2	46.0
Valid	Slightly Agree	9	14.3	14.3	60.3
	Slightly Disagree	14	22.2	22.2	82.5
	Strongly Agree	7	11.1	11.1	93.7
	Strongly Disagree	4	6.3	6.3	100.0
	Total	63	100.0	100.0	

Brand_promoters

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	1.6	1.6	1.6
	Agree	8	12.7	12.7	14.3
	Disagree	11	17.5	17.5	31.7
	Neutral	12	19.0	19.0	50.8
	Slightly Agree	10	15.9	15.9	66.7
	Slightly Disagree	13	20.6	20.6	87.3
	Strongly Agree	1	1.6	1.6	88.9
	Strongly Disagree	7	11.1	11.1	100.0
	Total	63	100.0	100.0	



Ratings 1 - 7

1=Strongly Disagree | 2=Disagree | 3=Slighty Disagree | 4=Neutral | 5=Slightly Agree | 6= Agree | 7=Storngly A

4.3 Relibility scores for the factors

Reliability
Scale: CUSTOMER ATTITUDE

Case Processing Summary

		N	%
Cases	Valid	62	100.0
	Excluded[a]	0	.0
	Total	62	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.728	.732	5

Item Statistics

	Mean	Std. Deviation	N
Brand_Conscious	4.02	1.361	62
Brand_Loyal	3.56	1.724	62
Price_sensitive	4.10	1.705	62
Brand_Popularity	4.40	1.552	62
Word_of_mouth	4.40	1.614	62

Inter-Item Correlation Matrix

	Brand_Conscious	Brand_Loyal	Price_sensitive	Brand_Popularity	Word_of_mouth
Brand_Conscious	1.000	.352	.218	.253	.288
Brand_Loyal	.352	1.000	.093	-.031	.023
Price_sensitive	.218	.093	1.000	.530	.146
Brand_Popularity	.253	-.031	.530	1.000	.163
Word_of_mouth	.288	.023	.146	.163	1.000

Inter-Item Covariance Matrix

	Brand_Conscious	Brand_Loyal	Price_sensitive	Brand_Popularity	Word_of_mouth
Brand_Conscious	1.852	.827	.507	.534	.633
Brand_Loyal	.827	2.971	.272	-.084	.064
Price_sensitive	.507	.272	2.909	1.403	.403
Brand_Popularity	.534	-.084	1.403	2.409	.409
Word_of_mouth	.633	.064	.403	.409	2.605

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	4.097	3.565	4.403	.839	1.235	.119
Item Variances	2.549	1.852	2.971	1.119	1.604	.204
Inter-Item Covariances	.497	-.084	1.403	1.487	-16.738	.162
Inter-Item Correlations	.204	-.031	.530	.561	-16.918	.026

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
20.48	22.680	4.762	5

ANOVA with Tukey's Test for Nonadditivity

			Sum of Squares	df	Mean Square	F
Between People			276.697	61	4.536	
	Between Items		29.613	4	7.403	3.607
		Nonadditivity	.193[a]	1	.193	.094
Within People	Residual	Balance	500.594	243	2.060	
		Total	500.787	244	2.052	
	Total		530.400	248	2.139	
Total			807.097	309	2.612	

ANOVA with Tukey's Test for Nonadditivity

			Sig
Between People			
	Between Items		.007
		Nonadditivity	.760[a]
Within People	Residual	Balance	
		Total	
	Total		
Total			

Grand Mean = 4.10 = μ_C

Scale: QUALITY OF PRODUCT

Case Processing Summary

		N	%
Cases	Valid	62	100.0
	Excluded[a]	0	.0
	Total	62	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.794	.791	9

Item Statistics

	Mean	Std. Deviation	N
Product_features	4.47	1.734	62
Performance	4.84	1.661	62
Reliability	4.73	1.495	62
Ease_of_use	4.55	1.724	62
Durability	4.81	1.598	62
Technology	4.24	1.606	62
Aesthetics	4.97	1.568	62
Quality_standard	4.35	1.516	62
Serviceability	4.71	1.430	62

Inter-Item Correlation Matrix

	Product_features	Performance	Reliability	Ease_of_use	Durability	Technology
Product_features	1.000	.550	.025	.138	.530	.488
Performance	.550	1.000	.061	.295	.822	.463
Reliability	.025	.061	1.000	-.062	-.002	.165
Ease_of_use	.138	.295	-.062	1.000	.206	.283
Durability	.530	.822	-.002	.206	1.000	.562
Technology	.488	.463	.165	.283	.562	1.000
Aesthetics	.518	.766	.024	.273	.868	.517
Quality_standard	.216	.023	-.079	.069	.056	.011
Serviceability	.386	.559	.139	.278	.513	.331

Inter-Item Correlation Matrix

	Aesthetics	Quality_standard	Serviceability
Product_features	.518	.216	.386
Performance	.766	.023	.559
Reliability	.024	-.079	.139
Ease_of_use	.273	.069	.278
Durability	.868	.056	.513
Technology	.517	.011	.331
Aesthetics	1.000	.122	.625
Quality_standard	.122	1.000	-.103
Serviceability	.625	-.103	1.000

Inter-Item Covariance Matrix

	Product_features	Performance	Reliability	Ease_of_use	Durability	Technology
Product_features	3.007	1.585	.065	.411	1.469	1.360
Performance	1.585	2.760	.152	.844	2.181	1.236
Reliability	.065	.152	2.235	-.159	-.005	.395
Ease_of_use	.411	.844	-.159	2.973	.567	.783
Durability	1.469	2.181	-.005	.567	2.552	1.441
Technology	1.360	1.236	.395	.783	1.441	2.580
Aesthetics	1.409	1.995	.057	.739	2.174	1.303
Quality_standard	.569	.058	-.180	.179	.135	.027
Serviceability	.958	1.329	.296	.686	1.172	.760

Inter-Item Covariance Matrix

	Aesthetics	Quality_standard	Serviceability
Product_features	1.409	.569	.958
Performance	1.995	.058	1.329
Reliability	.057	-.180	.296
Ease_of_use	.739	.179	.686
Durability	2.174	.135	1.172
Technology	1.303	.027	.760
Aesthetics	2.458	.290	1.400
Quality_standard	.290	2.298	-.223
Serviceability	1.400	-.223	2.045

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	4.629	4.242	4.968	.726	1.171	.058
Item Variances	2.545	2.045	3.007	.962	1.470	.107
Inter-Item Covariances	.763	-.223	2.181	2.405	-9.775	.468
Inter-Item Correlations	.295	-.103	.868	.971	-8.433	.071

Summary Item Statistics

	N of Items
Item Means	9
Item Variances	9
Inter-Item Covariances	9
Inter-Item Correlations	9

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Product_features	37.19	59.175	.587	.437	.758
Performance	36.82	56.312	.752	.733	.734
Reliability	36.94	74.356	.048	.098	.825
Ease_of_use	37.11	66.758	.288	.199	.802
Durability	36.85	57.011	.757	.839	.735
Technology	37.42	60.641	.584	.443	.760
Aesthetics	36.69	56.642	.794	.812	.730
Quality_standard	37.31	73.823	.066	.158	.824
Serviceability	36.95	63.030	.562	.483	.765

ANOVA with Tukey's Test for Nonadditivity

			Sig
Between People			
	Between Items		.043
		Nonadditivity	.012[a]
Within People	Residual	Balance	
		Total	
	Total		
Total			

Grand Mean = 4.63 $=\mu_q$

a. Tukey's estimate of power to which observations must be raised to achieve additivity = -1.973.

Scale: FIRM STRATEGY

a. List wise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.704	.703	4

Item Statistics

	Mean	Std. Deviation	N
Competitive_pricing	4.06	1.447	62
External_communication	4.39	1.582	62
Advertisement	4.10	1.606	62
Brand_promoters	3.56	1.616	62

Inter-Item Correlation Matrix

	Competitive_pricing	External_communication	Advertisement	Brand_promoters
Competitive_pricing	1.000	.419	.434	.187
External_communication	.419	1.000	.391	.368
Advertisement	.434	.391	1.000	.433
Brand_promoters	.187	.368	.433	1.000

Inter-Item Covariance Matrix

	Competitive_pricing	External_communication	Advertisement	Brand_promoters
Competitive_pricing	2.094	.958	1.010	.438
External_communication	.958	2.503	.995	.942
Advertisement	1.010	.995	2.581	1.125
Brand_promoters	.438	.942	1.125	2.611

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	4.028	3.565	4.387	.823	1.231	.117
Item Variances	2.447	2.094	2.611	.516	1.247	.057
Inter-Item Covariances	.911	.438	1.125	.686	2.566	.053
Inter-Item Correlations	.372	.187	.434	.247	2.317	.008

Summary Item Statistics

	N of Items
Item Means	4
Item Variances	4
Inter-Item Covariances	4
Inter-Item Correlations	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation
Competitive_pricing	12.05	13.817	.447	.266
External_communication	11.73	12.432	.519	.278
Advertisement	12.02	11.885	.565	.332
Brand_promoters	12.55	13.104	.428	.239

Item-Total Statistics

	Cronbach's Alpha if Item Deleted
Competitive_pricing	.665
External_communication	.621
Advertisement	.590
Brand_promoters	.678

ANOVA with Tukey's Test for Nonadditivity

			Sum of Squares	df	Mean Square	F
Between People			316.052	61	5.181	
	Between Items		21.690	3	7.230	4.707
		Nonadditivity	.121[a]	1	.121	.078
Within People	Residual	Balance	280.940	182	1.544	
		Total	281.060	183	1.536	
	Total		302.750	186	1.628	
Total			618.802	247	2.505	

ANOVA with Tukey's Test for Nonadditivity

			Sig
Between People			
	Between Items		.003
		Nonadditivity	.780[a]
Within People	Residual	Balance	
		Total	
	Total		
Total			

Grand Mean = 4.03 = μ_f

a. Tukey's estimate of power to which observations must be raised to achieve additivity = .734.

5. RESULT

For customer attitude Cronbach's Alpha is greater than 0.7 hence it is a reliable factor to consider for the study

Cronbach's Alpha Based on Standardized Items	N of Items	
.728	.732	5

With a grand Mean (μ_c) = 4.10 it states that Attitude of the customer matters when they are to make decisions while buying a product and since 4 represent neutral and the value is 4.10 close to 4 hence we can say that there is a neutral attitude of the customer toward a brand or a product.

For Quality attribute the Cronbach's Alpha is greater than 0.7 hence it is a reliable factor to consider for the study

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.794	.791	9

With a grand Mean (μ_q)
= 4.63 it states that Attitude of the customer matters when they are to make decisions while buying a product and since 4 represent neutral and the value is 4.63 close to 5 hence we can say that the quality of the product matters for a brand for every customer.

For Firms strategy elements the Cronbach's Alpha is greater than 0.7 hence it is a reliable factor to consider for the study

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
04	.703	4

Grand Mean = 4.03

6. CONCLUSION

With a grand Mean (μ_f) = 4.03 it states that Attitude of the customer matters when they are to make decisions while buying a product and since 4 represent neutral and the value is 4.03 close to 4 hence we can say that there is a neutral attitude of the customer toward a brand or a product.

Now that our Null hypothesis $\mu_{c=}\mu_{q=}\ \mu_f$ is rejected by anova Tukey's test and we found $\mu_{q>}\mu_{c>}\mu_f$

Hence Quality of the product matters the most than any other factors with two other factors showing a neutral perception from customer's point of view.
So the following dissertation states that in a sample size of 62 respondents from different gender,age group and annual household income the overall population states that it is the quality of the product which influences the most to the customer than his own attitudes and behaviour and the firm's marketing and positioning skills. The perceived neutral score towards the personal attitude and firm's strategy suggest an indifferent behaviour but when it comes to quality, they stress on its elements like Performance, Reliability, Durability, Product features etc.

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8. APPENDIX

Likert Scale

A **Likert scale** is a psychometric scale commonly involved in research that employs questionnaires. It is the most widely used approach to scaling responses in survey research, such that the term is often used interchangeably with *rating scale*, or more accurately the **Likert-type scale**, even though the two are not synonymous. The scale is named after its inventor, psychologistRensis Likert Likert distinguished between a scale proper, which emerges from collective responses to a set of items (usually eight or more), and the format in which responses are scored along a range. The format of a typical five-level Likert item, for example, could be:

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

Likert scaling is a bipolar scaling method, measuring either positive or negative response to a statement. Sometimes an even-point scale is used, where the middle option of "Neither agree nor disagree" is not available. This is sometimes called a "forced choice" method, since the neutral option is removed.[8] The neutral option can be seen as an easy option to take when a respondent is unsure, and so whether it is a true neutral option is questionable. A 1987 study found negligible differences between the use of "undecided" and "neutral" as the middle option in a 5-point Likert scale.[9]

Designing a scale with balanced keying (an equal number of positive and negative statements and, especially, an equal number of positive and negative statements regarding each position or issue in question) can obviate the problem of acquiescence bias, since acquiescence on positively keyed items will balance acquiescence on negatively keyed items, but defensive, central tendency, and social desirability biases are somewhat more problematic.

Hypothesis

In statistics, it is conventional to refer to possible states of the world as hypotheses since they are hypothesized states of the world. Using this terminology, the probability value is the probability of an outcome given the hypothesis. It is not the probability of the hypothesis given the outcome.

This is not to say that we ignore the probability of the hypothesis. If the probability of the outcome given the hypothesis is sufficiently low, we have evidence that the hypothesis is false. However, we do not compute the probability that the hypothesis is false.

The hypothesis that the population parameter is equal to the company specification is referred to as the null hypothesis. A null hypothesis is always one of status quo and is identified by the symbol H0. Whenever a null hypothesis is specified, an alternative hypothesis is also specified, and it must be true if the null hypothesis is false. The alternative hypothesis, H1, is the opposite of the null hypothesis, In the hypothesis-testing methodology, the null hypothesis is rejected when the sample evidence suggests that it is far more likely that the alternative hypothesis is true.

Cronbach's Alpha (α) using SPSS

Cronbach's alpha is the most common measure of internal consistency ("reliability"). It is most commonly used when you have multiple Likert questions in a survey/questionnaire that form a scale and you wish to determine if the scale is reliable.

Example

A researcher has devised a nine-question questionnaire to measure how safe people feel at work at an industrial complex. Each question was a 5-point Likert item from "strongly disagree" to "strongly agree". In order to understand whether the questions in this questionnaire all reliably measure the same latent variable (feeling of safety) (so a Likert scale could be constructed), a Cronbach's alpha was run on a sample size of 15 workers.

(Note that a reliability coefficient of .70 or higher is considered "acceptable" in most social science research situations.)

Published by SPSS, IBM Corporation.

One-way ANOVA

What is this test for?

The one-way analysis of variance (ANOVA) is used to determine whether there are any significant differences between the means of three or more independent (unrelated) groups. This guide will provide a brief introduction to the one-way ANOVA, including the assumptions of the test and when you should use this test. If you are familiar with the one-way ANOVA, you can skip this guide and go straight to how to run this test in SPSS Statistics by clicking here.

What does this test do?
The one-way ANOVA compares the means between the groups you are interested in and determines whether any of those means are significantly different from each other. Specifically, it tests the null hypothesis:

$$H_0: \mu_1 = \mu_2 = \mu_3 = \cdots = \mu_k$$

where μ = group mean and k = number of groups. If, however, the one-way ANOVA returns a significant result, we accept the alternative hypothesis (HA), which is that there are at least 2 group means that are significantly different from each other.

At this point, it is important to realize that the one-way ANOVA is an *omnibus* test statistic and cannot tell you which specific groups were significantly different from each other only that at least two groups were. To determine which specific groups differed from each other, you need to use a *post hoc* test. *Post hoc* tests are described later in this guide.

When might you need to use this test?

If you are dealing with individuals, you are likely to encounter this situation using two different types of study design:

One study design is to recruit a group of individuals and then randomly split this group into 3 or more smaller groups (i.e., each subject is allocated to one, and only one, group). You then get each group to undertake different tasks (or put them under different conditions) and measure the outcome/response on the same dependent variable.

Tukey's range test

Tukey's range test, also known as the **Tukey's test**, **Tukey method**, **Tukey's honest significance test**, **Tukey's HSD (honest significant difference) test**, or the **Tukey–Kramer method**, is a single-step multiple comparison procedure and statistical test. It can be used on raw data or in conjunction with an ANOVA (Post-hoc analysis) to find means that are significantly different from each other .

Tukey's test compares the means of every treatment to the means of every other treatment; that is, it applies simultaneously to the set of all pairwise comparisons

$\mu_i - \mu_j$

and identifies any difference between two means that is greater than the expected standard error. The confidence coefficient for the set, when all sample sizes are equal, is exactly $1 - \alpha$. For unequal sample sizes, the confidence coefficient is greater than $1 - \alpha$.

Assumptions of Tukey's test

1. The observations being tested are independent within and among the groups.
2. The groups associated with each mean in the test are normally distributed
3. There is equal within-group variance across the groups associated with each mean in the test (homogeneity of variance).