

## **EFFECT OF EMOTIONAL FACTORS TO PRODUCT FUNCTIONALITY ON HOT BEVERAGE CONTAINERS.**

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### **Abstract**

Every human in the world is born with five sensory organs. Each of them is capable of identifying different sensory perceptions. The combination of these sensory organs makes a path to the most interesting subject in human lives which is human emotions. Each human is different from one to another so as the emotions. Also, it is important to keep our body hydrated. Water is the main beverage used by humans. beverage containers are an intelligent design created by humans. it can be found in different shapes and forms according to the purpose and relevant to the beverage philosophy it contains. This study was carried out to identifying emotional effects on product functionality. This research is focused to study only about hot beverage containers in Sri Lanka. It is based on mix methods and conducts a real product observation to analyze the written data. The results revealed that particular effect of designs and materials which are directly affected by human emotions and functionality of products. It was identified that the emotional effects of metal, ceramic, glass, plastic, and the impact of the surface finishes and forms. Also, by the research, it was identified the emotional levels and the effect of materials and designs on hot beverage containers on each level respectively.

**Keywords:** human emotions, emotional levels, product functionality, materials, emotions, the effect of human

### **1. Historical Evolution of the Beverage Containers in Sri Lanka**

five sensory organs are the most essential parts of the human body. Because of these organ's humans have different sensory perceptions. These organs can be satisfied positively and negatively. This negative and positive connection between humans, products, and services can be identified as emotions. Drinkware is another intelligent design created by humans. It was invented by the ancient people to satisfy their day to day needs as a result of fulfilling their thirst. In the beginning, they use natural containers to full fill their needs such as animal horns, animal skins, plant shells like coconuts *nelum kolaya*, *labbu kataya*, or different shaped clay objects. Today people can find drinkware in different shapes and forms. It was designed according to the purpose and the beverage it contains. Drinkware has different backgrounds to take shapes, forms, colors, sizes, materials its own. And drinkware directly effects on human behaviors and thinking patterns and psychology. This research will try to understand the connection between the consumer and the drinkware as well as its emotional and functional values. Furthermore, this research tries to find out the impacts of designers, to give positive and negative emotions on products.

#### **1.1 THE FUNCTIONALITY OF A PRODUCT**

The functionality of a product is the root system for a good product. Designing a product is not just making another art piece. Products are usually specific for a known work task. A good product should be functional and eye-pleasing at the same time. To build a functional product the designer has to understand the best possibilities such as shapes, materials, forms, textures, sizes, etc. (Wong, 1993) Wong explained about 4 elements which are related to the functionality of a product. Conceptual element, Visual element, Relational element, Practical element.

### **2. Historical Background and Different Approaches in Human Emotions**

#### **2.1 WHAT ARE HUMAN EMOTIONS?**

Mankind is the most intelligent living being on earth. Their thinking patterns and the behavioral pattern is different from one to another. So, it is very difficult to understand human emotions and functional levels. At the beginning of the studies emotions, mood and personality were identified as different stages in the human mind. Moods take longer time than emotions. Personality is with humans longer than both. After the term of emotion was described by Plato there were certain attempts to explain human

emotions. By the studies done by the Desmet, it was identified that there were four reactions happen in our body as a reaction to the emotions. Physiological reaction, subjective reaction, behavioral reaction, and expressive reaction are them. (Desmet, Pieter, 2005)

Humans are naturally adapted to react to emotions since birth. For that, almost every human being is born with five sensory organs. They are eye, nose, skin, tongue, and ear., these sensory perceptions can be identified by our self-experiences. Humans are naturally adapted to satisfy their sensory organ's perceptions in every possible manner. These organs can satisfy positively and negatively. This connection between humans, product and service can be identified as “emotions.” Humans are naturally used to like these positive emotions. They reject and get uncomfortable when they get negative emotions.

## 2.2 THE EMOTIONAL CONNECTION BETWEEN PRODUCTS AND CONSUMERS

Miklos states that “as humans, we establish some sort of an emotional connection with all kinds of products that we use. Therefore, we expect some level of human life feedback when we interact with them. Even though we know the products aren't human and can't feel emotions, we want to believe that they can” (Miklos,2018). When talking about human emotions and products, both these factors are depending on the consumers. The emotions of products and positive emotions such as attraction, attachment, and happiness are an effect on users

## 2.3 THE EMOTIONAL RELATIONSHIP BETWEEN THE USER AND THE DESIGNER

It states that people willing to keep their products as long as it remains, and they do care about the products as long as it remains, and they do care about the products which have good emotional values due to behavioral aspects of relationships. (Savas, 2004). Designers are the first perspective of this emotional relationship. They have to consider so many considerations which are depending on different factors like company cost, brand identity, and market analysis. User is the second perspective of emotional relationship and functionality and appearance are the key factors for the user. Users can be love or hate products depending on their emotional effect.

## 2.4 THE TWO PARALLEL LINES OF THE EMOTIONAL EFFECT ON PRODUCTS.

The emotional effect can be categorized into two different approaches. One approach is the effect of basic emotions to the humans and the other approach is three different emotional design levels. An individual person can experience a random number of emotions by experiencing a product. And at the same time, the above emotions can be in touch with the design levels as well.

## 2.5 SCALING OF EMOTIONS

The reaction of emotions is happening at different levels and scales and Human reaction of emotion happen in both verbal and nonverbal communication methods. These emotional effects are measured by using different methods like verbal and nonverbal manifestation and observing some physiological reactions. The nonverbal instrument is an objective way of scaling emotions. Ex- Gew, PrEmo, Emo card, Physiological reaction /ASN (autonomic nervous system), Electromyography, Electrodermal activity, Skin temperature, Blood volume pulse (BVP), Electrocardiogram (ECG) are some of the verbal methods of scaling

Verbal instruments are the subjective method of measuring emotions. Self-assessment manikin (SAM) – is one of the most common verbal instruments in emotional scaling. It is a kind of pictorial representation of the scale of emotions.

# **3. The evolution of the beverage consumption and its usage of beverage containers in Sri Lanka**

## 3.1 ANCIENT BACKGROUND OF SRI LANKAN BEVERAGE CONSUMPTIONS.

As Sri Lanka is a country which is located near the equator the temperature is normally taking a high number throughout the country. In the past, as they were depending on *chena* cultivation and paddy cultivation, people used to drink more water to keep their bodies hydrated. When it considers the

ancient beverage consumption culture it can be seen that cultural impact was highly affected by the beverage consumption of Sri Lankans. According to “*saddamalankaraya*” in Sri Lanka before the colonial period water, fruit juice and toddy were the main beverages used by the society.

As a Buddhist country for the consumption of the monks there were used certain special beverage types called “*ashtavidapana*”. Their beverage containers were small in size as they were drinking less amount. Alcoholic beverage toddy was the most famous drink among the general people since ancient time. There were *coconut toddy*, *palmyra toddy* and *kittul toddy* as the geographical variation of the country. As farmers work hard on their cultivations, they were used to drink more water than the other people. So, they were used *labu kataya* to take water to their *chena* or paddy field which contains more amount of water. Other than the main beverages, traditional ayurvedic beverages such as *ranawara*, *belimal*, and other *kada* types were used by the people as their daily beverages (Dharmakeerthi, 1996). Earlier in Sri Lanka had a very simple culture on beverage consumption. That is the “*eat and drink*” concept. They drink an amount of water right after a big meal.

### 3.2 CULTURAL, NATURE AND TRADITIONAL EFFECT ON BEVERAGE CONTAINERS IN SRI LANKA.

In Sri Lanka, all the products were based on two approaches like nature and culture. In Sri Lanka culture at an early period, before the colonial influenced were happen people use more flat containers to drink beverages. Coconut shell (*polkatta*) was the main natural container that they use and by the time clay containers were used for daily purposes. It is amazing to see how the designs were changed according to the cultural factors and traditions in Sri Lanka. Ancient Sri Lankans were used to pouring water into the mouth when someone else also using the beverage container. The designs that were used to pouring water came with more narrow ends which makes easy to pour water into the mouth. People used *kendiya* to pour water into the mouths. Other than the *mati koppe* and *polkatta* people use *labu kataya* to contain and drink water, especially when they are on *chena* or paddy fields.

When looking into the cultural side the direct effect of temples and monks can be seen in the product variations. Whatever the temple and monks were used considered as the highest level and later it was spread quickly in the culture. Every temple has *thaliya* to contain water for drinking purposes and later on, it becomes “*panthaliya* “. Our culture has hugely influenced by the Indian culture as the Buddhist arrivals. According to the “*ananadakuarasswami*” in *medieval Sinhalese art*, it says that the different patterns and designs were influenced by the Indian culture. The higher class of the society used materials such as clay, ceramic metal, bronze, copper, silver, gold as their likeness. The famous ancient folk song by the *andare* explains the material variation of the beverage containers according to the social class very well.

“*Ridi kale ran kothale beepu mata*  
*Nikam kale pan nethi wiya pipaseta*”

According to the song, it says that he used a silver pot and gold *kothale* for his personal use. And now at his bad time, there is not even a clay pot to drink water. This explains how the social class and materials derived in the Sri Lanka culture. Then after the influence of Portuguese, Dutch and English, things get changed in the traditional culture. As they were introduced tea and coffee that when the cup and source came. The beverage consumption also changes as the products. The china porcelain and glassware were highly spread all over the county. Different materials and designs were taken place of the old traditional designs. The foreigners introduced vine and alcohol to the country. In these two different cultural approaches, there was a very identical difference in the designs. Our designs were very stable and horizontal in shape but the foreign-influenced make it more vertical in shape.

### 3.3 THE EMOTIONAL BOND WITH ANCIENT PRODUCTS, CULTURE, AND PEOPLE.

Sri Lankans had two different approaches to experience product emotions. They were by the functionality of products and the aesthetic experience of the product. The emotions of the Sri Lankans were changed according to the age, actual activity and event with the time as well. As Sri Lankans had a family-based society people used to like things based on different approaches. They were mostly used to like, what they have used already, what their parents and grandparents used & The shape they're familiar with nature.

Even that time people had an emotional bond with their beverage containers. According to the “*paliputtaka viaya vinshya*” there was a case filed on a “*polkatta*”. The case was filed based on a complaint by a monk. According to the story, one monk from another temple borrowed a *polkatta* which was not used at that time. But however, after another monk has filed a case complaining that “*polkatta* was mine”. So, the case filed and the *polkatta* was given back to the owner of it. This story shows the strong emotional bond between humans and beverage containers at that time. Even the monks who practice leaving everything had such an emotional bond with their beverage containers.

Another example is the archaeological remain *kotale* which has the *kashyapa* name on it. It has been written on the *kotale* “*kasubu mage kothale*” which means this “*kotalke* belongs to *kashyapa*”. It shows how strong is the emotional bond in that time with beverage containers. They all had separated beverage containers for themselves. It was the same as today, people were used to attaching to the products that they use, and they had a huge bond with beverage containers.

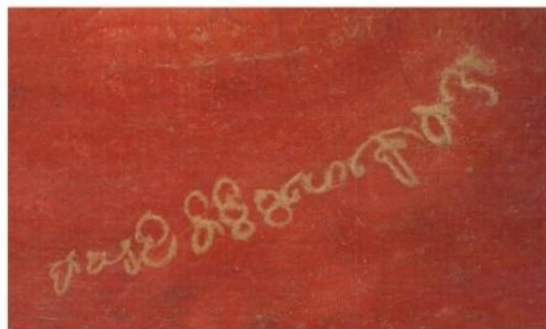


Figure 1/image of king Kashyap's Kotale details.  
source: A catalog of ancient pottery from Sri Lanka

### 3.4 ANCIENT CLASSIFICATION OF BEVERAGE CONTAINERS ACCORDING TO FORM AND FUNCTION

**Function** - It is proven by the evidence that ancient Sri Lankans were considered about the form and function of a product very effectively. Other than the basic beverage containers from the natural objects such as coconut shells, *labuakataya* or animal horns, the beginning of the forming beverage containers can be taken as the time period which is the clay vessels were made. It can clearly understand that those clay vessels were made by considering the basic form and functional values.

To understand this functional effect on the beverage containers the best example is to study the basics of a clay pot (*kalaya*) which is used to store and take water from the sources. The famous ancient folk song says that,

“*kata kadi kale diya ukule thabagena ,Rodi kella koi yanawada udasana*”

The *kalaya* was designed by considering the main function of it. Event today also rural women used to carry water from the *kalaya*. The *kalaya* has two main parts which is belly and the neck. The normal way of carrying a *kalaya* is by keeping it to the hip of the women and gripping by the elbow joint. In the design of the *kalaya* the large belly was designed to fit the hip of the women and the neck was strong and

small enough to grip by the elbow joint of the women. Comfort, Range of motion, Strong, Stable, and abrasion-resistant all these properties can be seen in the design of *kalaya*. The consideration of form and functionality to the beverage containers can be clearly seen in these old designs



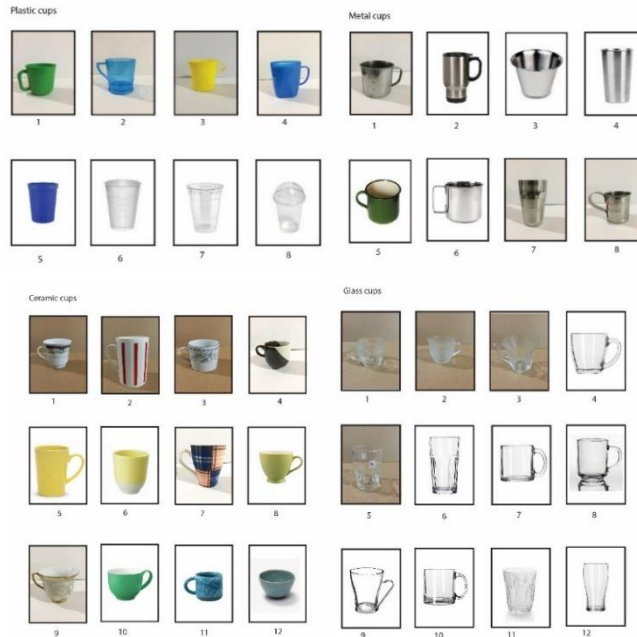
Figure 2/ Image of Rodi women with a traditional clay pot.

**Forms** - By studying the remaining archaeological samples furthermore it can be understood that the form of the beverage containers was highly considered by the ancient peoples. Rice said that the function of these vessels can be understood by its form. The form of these containers was based on factors like its capacity, handling, transporting, storing and stability of the product (Rice, 1987). The materials and their thickness also depend on these containers according to their form as well. Rice has categorized these products according to its manufacturing technologies. According to that four characteristics were considered in a product. they are, The thickness of a product, The hardness of a product, Density, Surface treatment (glaze/slip/burnish) (Rice, 1987) pg226.

Shape and the size of the containers were changed by the time with the cultural effect and usage. According to Professor de Silva (2008), these beverage containers can be divided into two parts. They are the upper part and lower part. The lower part was used basically for the containing purpose and the lower part was designed according to its body proportions and by considering the functional factors. (De silva& Bandara R, 2008) . These forms of beverage containers also can be divided into two groups according to their purpose. They are restricted mouth and non-restricted mouth containers. Restricted mouth containers were used for storing purposes and non-restricted mouth containers were usually used for serving purposes. The restricted mouth of the containers allows keeping the beverages without spreading even it carried.

#### **4. Research Methodology**

The research is mainly based on primary and secondary data to do as a literature review and as qualitative and quantitative surveys. As a secondary data which is written evidence was used. Books, websites, articles, research papers, murals, paintings and museum artifacts. The quantitative survey was done based on selected target groups by using open-ended and close-ended questionnaires. The questioners were based on available beverage containers in the local market during the last 5 years. The available samples were selected according to four material types, plastic, ceramic, glass and metal which are commonly used by the consumers. And use two types of questionnaires A and B. questioner B was conducted by a real product observation. questioner A was done to identify the most commonly preferred hot beverage containers, and the questioner B was conducted to identify the emotional factors and the general features of the selected cups from survey A.



from the above beverage containers, the most preferred two cups from each category were taken for survey B and through the survey, it was identified the emotional effect on the product functionality. Several emotions were rated through the experience of the participants' and they were able to have a real product experience with a hot beverage in the container before answering the questions. plastic, metal, ceramic and glass cups were rated by using different direct and indirect questions and general functional features and the emotional feeling were taken as answers. The emotional design levels were identified by the end of the survey and it was helping to analyze the data findings as well. Given below are the selected cups from each category with their identification



Figure 3/selected cups from each category

#### 4.1 EMOTIONAL EFFECT VARIATION WITH DIFFERENT CUP DESIGNS

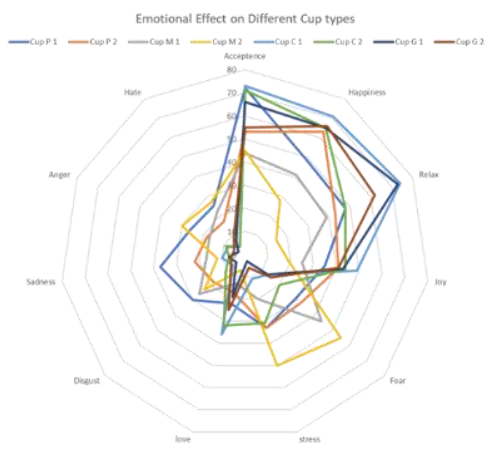


Figure 4/Emotional effect on different cups

As the data findings, it shows the deviation of emotions with the experience of each cup. According to the results, the positive rate cups such as ceramic and glass shows the flow of positive emotions on the chart and the negatively rated cups such as metal and plastic show the negative emotional impacts with the users. Cup M2 and M1 show the highest negative flows of emotions while the glass cup G1 shows the highest positive impacts on results.

#### 4.2 EMOTIONAL EFFECT ON CUPS CONSIDERING THE MATERIALS AND DESIGNS

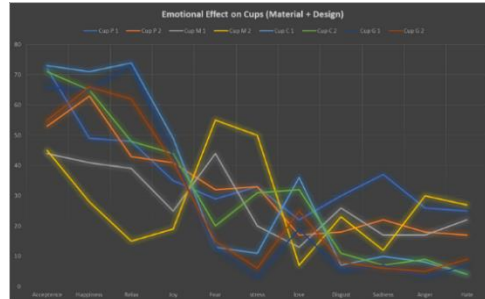


Figure 5/Emotional effect with designs + material

When compares the material and design it shows some kind of relationship with materials as well. Cups in the same material category shows the same kind of emotional flow according to the results. As the results metal cup, O2 shows the highest negative flow and the glass cup G1 shows the highest positive overall result in the chart.

#### 4.3 MATERIAL IMPACT TO HUMAN EMOTIONS.

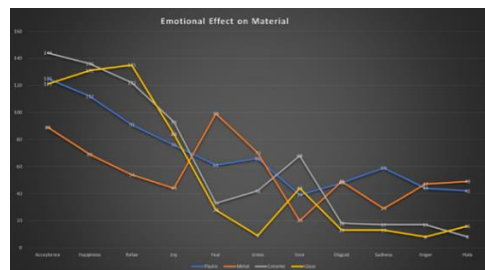


Figure 6/Material impact on human emotion

If the results were analyzed according to the materials it clearly shows the behavior of each emotion with the materials. As data ceramic, glass, are the best materials that are capable of touching the positive emotions and meatal is the material that has the highest capability of touching the negative emotions. Fear is the highest rated negative emotion with the metal and acceptance is the highest rated positive emotion with the ceramic cups.

### 5. Research Finding and Discussion

As the findings on the research, it shows the general behavior of the Sri Lankan beverage consumption as a tropical country. It shows the same as the past as findings in the literature. Still, people used to consume different beverages at least once a day to keep the body hydrated. As humans are very sensitive to temperature changes, to work with hot beverages people find a solution with a handle. It still moving forward continually from the past as it is the simplest solution for the problem. The aesthetical favors of the peoples become change during the time as well. The results show an idea that is different from the literature findings. Even if the details become more valuable and aesthetical pleasant in the past majority of the millennials from the survey preferred plain surface finished and bodies.

It may be a result of their modern simple lifestyles. Sometimes the new bad design details may be the reason for the trend. Culture and tradition can impact on people's choices when it came to the visual selections. As Sri Lanka is a multi-cultural country the Tamil and Muslim cultural effects can be seen in findings of the cup's selections. Even it hasn't handled, participants have selected the metal cup as it can be seen in every Tamil house and restaurant.



Figure 7/Researchers model on beverage consumption basics in Sri Lanka  
source: authors creation

The difference between first impression and the functionality can be clearly identified by the results of survey B. The aesthetical look should not be the only concern of a product. It proves that the need for attention to the functional details in a product. Even if the selections votes from the survey A is high, according to survey B the overall results of the plastic and metal cups are negative results. It shows how the functional and Aesthetical different ends approach products as well. The results show the less concern of new generations to the esthetical values than the functional factors like comfort, safety, and range of motion. The new generations do care about the functionality of a product than aesthetical deep approaches.

The material behavior of a product also plays a huge role in human emotions and the functionality of a product. Although today people used high heat transferring materials for hot beverages ancient people have used low heat transferring materials like clay to consume hot beverages. It shows how the general market become overruled by mass production techniques than consumer preferences. As mentioned in the literature findings the functional values depend on factors like cultural influence, traditions, visual memories, social impact. As the analysis of the data findings, most people select the functional values by their previous experiences. Most of them have selected ceramic cups for drinking processing and serving purposes as our daily usage. Ceramic cup C2 has the highest votes for serving purposes as it is the usual shape cup that people already used by a term of "our cup" to serve visitors. The cultural impact on the products can be seen by looking at the metal cups' results. The majority of the samples have selected it for the ritualistic purposes as most of the temples and other religious places used metal containers for the common ritualistic uses. According to the data findings even today the millennials have an impact from the culture in Sri Lanka.

Most of the participants have voted for several functional values in the same cup as their previous experiences. As overall results, it shows how the products become multifunctional in the local contexts. When it sees the big picture it all shows how history repeats itself in different forms. The cups which are rated in the survey A shows the best general feature in survey B as well. It shows how nonconscious decisions happen with previous memories. It only provides a single picture in survey A and yet the peoples have voted for the best general featuring products from their first impressions. But in reality, it is not only the aesthetical look that matters for these decisions it happens because of our previous experience with the same kind of products and its emotions. People have a relationship with visual memory and emotions. It can be good or bad emotions, yet they have an unconscious memory with the overall design of a product.



The emotional levels, as described in the literature chapter **Error! Reference source not found.** almost every product, have the capability to touch the three emotional levels. But as result, most of the emotions were an impact on the users at their behavioral level. Reflective level is having less impact on a short time using products than the other levels. The results have proven the researcher model on literature 0 and it shows how each level reacts with different users in different combinations. Not only the form and function of the product but also the material combination playing a huge role in human emotions. It has proven according to the data findings. As shown in figure 6. Human emotions have a unique variation with different materials. Given below *figure 8* shows the researches model on connection with human emotions and products.

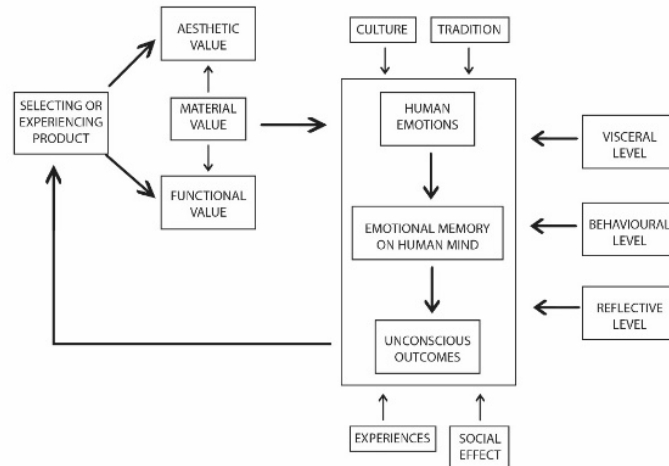


Figure 8/Researcher model on the connection between products and human

The research itself proved some facts and finding on the literature and some facts are changed as a result of a generation gap. And the results have clearly shown the effect of emotional factors on product functionally. Also, as experimental data, the emotional connection with materials has found out by the researcher.

## 6. Conclusion.

Form the literature and data analysis it was found a path to a better conclusion of the survey. The research was conducted by using physical and phycological features. as literature findings general and functional features were tested from the surveys. The basic emotions are happiness, sadness, acceptance, disgust, fear, love, hate, joy, anger, relax, stress. According to the findings, the researcher had come into some conclusions as below,

The hot beverage containers with a handle are the most suitable design for Sri Lankans. According to the results, almost every Sri Lankans consume hot beverages at least one times day. Because of that, when it comes to the hot beverage container industry it is a huge market to address. According to the general survey majority of 66% prefer ceramic as a material to the hot beverage containers. As the survey is based on the majority of millennials, they prefer more plain and clean design solutions for their lives. further studies can be done to identify their other preferences as well. According to the material and design glass and ceramic cups are the majority choice of the participants. Even though the majority choice of material is ceramic as a results glass cups has taken the highest number of votes from all participant. It shows the influence of the designer's role in a product. As it has the best general functional features people had good experience with the products as well. From the result of 56 % males and 43% of females, the emotional impact was measured. According to the results for the hot beverage containers, the highest concern of functional features was safety, comfort and the range of motion and weight. Enthought we think highly on cleaning easy, surface finishes, color combinations, the majority have minimum concerns on them.

The functional values of the beverage containers have a similar impact on the people as findings in the literature. Traditional, social, cultural impacts play a huge role in fictional values as same as the functionality. However, according to the data summary, the beverage containers in the Sri Lankan context plays a multifunctional role in the function. The effect of emotional factors on products has a direct connection with product functionality. According to the researcher's view, the functionality, materials and aesthetic values are the three primary variables to human emotions. Secondary variables of human emotions are the social impact, cultural values, traditions and the previous experiences of a user. When it comes to hot beverage containers functionality takes the first place among all. By observing the chart figure 4 it can be identifying the direct impact of the functionality to the human emotions. According to the results, it has proved the hypothesis which is **“The design features of the drinkware effected to improve human emotional levels”** as well. Also, materials play a huge role in both functionality and emotions. It was a new experimental result from the research to explore the connection of material and its impact on human emotions. These impacts of material can be happening directly or indirectly. The chart figure 6 shows the emotional variation it each material separately. As found in the literature the researchers build a model of emotional levels and their connection is practically experienced in the reach as well. Those probabilities as mentioned in chapter 02 can differ according to the consumers.

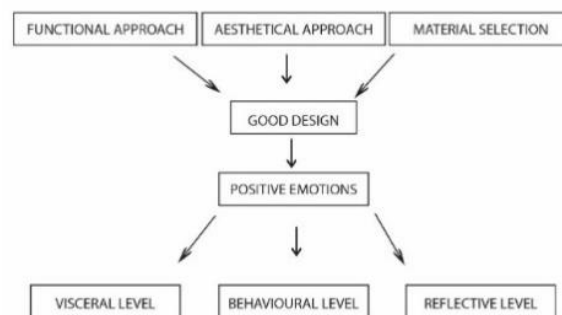


Figure 9/researchers' model on Different approaches and design levels on products  
source: Authors creation

According to the analysis of data findings, Designers have a huge role to design eye pleasant products as well as functional. Also, the correct material selection is very important to create a good product. If a designer were able to address these three approaches it will affect the human emotions positively and most probably it will be a design to touch the three emotional levels positively as well. The above figure 09 shows the researcher's model on the connection between different design approaches and design levels.

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