

HUMAN FACTORS

How is anthropometric data collected and translated into a meaningful format that is useful for people such as designers and architects?

As anthropometric data can be time consuming, costly and relatively cumbersome to undertake, it is easier to take a sample to represent the population. A sample is a faster way to collect data as it is less time consuming. Another way to collect data is surveying, or anthropometric books and 3D scanning, buy using books thousands of measurements are already collected so this makes data gathering a lot easier and less time consuming.

Why are certain measurements collected to establish particular guiding rations and where does this information come from?

Not all body measurements are necessary for a design; certain measurements are needed for particular products.

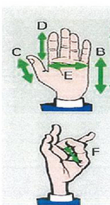
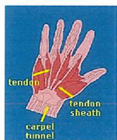
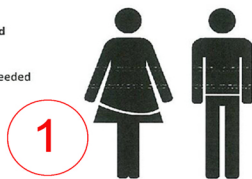
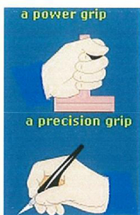
Eg. For a peeler hand and finger measurements are necessary but feet and leg measurements are not.

How are guiding rations established for one product that is to be used by diverse groups?

By a sample size that best fits the population. Sampling a variety of ages and genders will best fit the whole population so people are able to get an indication of the 'average' measurements needed.

What is important to know when decision making behind the sampling, measuring and the basis on which the guiding ratio has been established?

Due to the variations in individuals body sizes an average of data is needed by a designer. It is necessary for them as it is impractical to design for the entire population, with an average they can design for a segment from the middle portion. Measurements need to be taken from the 5th to the 95th percentile when designing an object that will be used by majority of the population. As there is high and size variation throughout different countries (ie. People in Asia tend to be smaller than those in highly developed countries) it is important when taking measurements that we consider the averages. The maximum and minimum values also need to be considered when designing something so the product is suitable for the smaller or larger people of the population. Eg. When designing a door the tallest in the population will need to be taken into account.



What are two main types of grips when using hand tools? What is the difference? What grip is required for your hand tool?

The first type of grip is the power grip. It requires relatively strong muscles in the forearm as the whole hand wraps around the handle of the product.

The second type of grip is the precision grip. This uses relatively weaker and smaller finger muscles as the object is held between the thumb and the index finger. This grip should not be used for tools or actions that require a lot of force.

For my peeler I will be using the power grip, as it is the most suitable grip for the type of product I am designing.

What are the 3 main things that cause discomfort when using hand tools?

The three main things that cause discomfort when using hand tools are: repeated muscle use which can lead to painful tendons, excessive bending which causes discomfort and restricted movement and repeated twisting. Bending of the wrist can be backwards (extension), forwards (flexion) or sideways (deviation).

What are some important things that you will need to consider when designing your kitchen utensil and how will this affect your particular utensil?

My peeler will have to be comfortable when held in the customer's hand. Because this utensil will be used for reasonable lengths of time I don't want to be causing any harm or discomfort so I will make sure I have no sharp edges or uncomfortable shapes to hold around the grip.

My peeler has to be durable in order for it to fit its purpose. It must be able to be used for long periods of time without breaking and must also be stainless steel or plastic so it does not rust. It is important to consider materials when designing a product as you want a material that is comfortable but durable so the product gets a lot of use.

My peeler also has to be efficient; it must be easy to use in order for it to function properly. I also need to consider the safety around using a peeler, I don't want to harm anyone using my product otherwise it won't be fit for purpose. Therefore when designing my product in need to consider the shape and material.

Dimension	20th %ile	50th %ile	95th %ile
A Hand length	173	189	205
B Palm length	98	107	116
C Thumb length	44	51	58
D Index finger length	64	72	79
E Hand breadth	78	87	93
F Maximum grip diameter	45	52	59

Applying Human Factors

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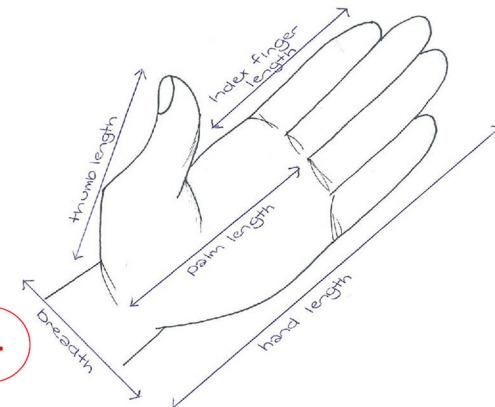
Psychological Sensory:

After getting potential clients to test the functional purposes of my peeler, I was able to get feedback on the shape and size of my design. People said it was nice and comfortable to hold as the shape was rounded suitably to fit into the palm and be easily held or used. Even though the design is quite geometrical and has a sharply influenced shape, the rounded curve on the handle allows it to be comfortable for use as the hand can easily wrap around the handle. This feature also allows the client to hold the peeler in multiple ways, depending on the job it is being used for or the shape of the clients' hand. This is important as I want majority of the population to be able to easily and comfortably use my design without any pain or issues. From my feedback I was able to note that multiple clients suggested a thinner handle to get a better grip and hold. I will be sure to incorporate this in my final design.



What data was used to make it the size you did?

I used Anthropometric data, taken from the table on the left which I applied to figure out the correct sizing and shape of my design. I looked at the anthropometric estimates for British adults aged between 19-65 and used data from the 15th percentile as I would need to consider the smallest average in the population for my peeler. The measurements I used for my peeler was 130mm for the length around the handle and 60mm for the height of it. When making this decision I made sure I still incorporated the Bauhaus design while making a comfortable shape with smooth edges for my clients to be able to easily use.



The blade part of the peeler is 9mm tall by 60mm long. I worked out these measurements by getting an average of fruit/vegetable sizes, therefore making it more user friendly as all fruit/vegetables will be able to be peeled.

I made a simple cardboard model of my design because it wasn't time consuming to make as there was no need to glue or stitch anything together. It was also useful as it showed the basic shape and structure of my model but still allowed it to be altered or changed if needed. It was also easily held so the client could feel the shape and general size of the form before giving feedback.



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Likert Scale

- Psychometric scale used for research
- Respondents specify their level of agreement or disagreement on a scale for a series of statements
- Therefore the range captures the intensity of their feelings for a given range

Is the utensil comfortable and easy to hold?

After surveying a range of potential clients all of them agreed that my design was comfortable and easy to hold. This response tells me that I will not have to make any changes to my design to make it more comfortable and easy to hold eg. rounder, smoother.

Is the size in relation to ability to be held accurate?

I found out through my survey that my utensil was of a reasonable size for most clients hand shapes. However people with larger hands found that the internal height could be slightly bigger, allowing people to get a better grip as more fingers will be able to fit around the handle. I need to keep in mind that when designing a product, data from the 5th percentile must be taken into account as the portion of the population who have smaller hands need to be considered. From this I asked the younger people surveyed on their opinion and gave them another slimmer model. This allowed them to compare both designs and decide what measurements felt best. This testing allowed me to come to the conclusion that I will need to make my model thinner in order to suit majority of the population. By changing this the safety of my model will increase as peoples fingers will be further away from the blade, therefore helping to prevent unnecessary accidents.

Is the utensils shape and form visually appealing?

My utensil is visually appealing. This means I won't have to make any changes to the shape of my peeler. I was able to come to this conclusion through my survey in which all of my potential clients ticked 'agree'. I also has some additional comments informing me on how the shape of my design was well liked for its simplicity and geometrically influenced style.

Is the utensil comfortable to use?

Everyone surveyed agreed that my design was comfortable to use. This is very important as a key factor in designing a kitchen utensil is for it to be easily used for excessive amounts of time without causing any rubbing, pain, strain or discomfort. This response means I will not have to change anything major to affect the comfort around my design.

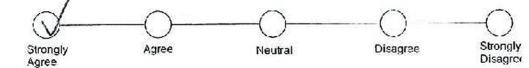
Am I able to get a good grip on the utensil?

All my surveyed participants agreed that a good grip could be easily found with my design. This was because it was shaped nicely to fit inside the palm without causing any discomfort. They also stated that it was versatile as it has the ability to be held in many different ways, this makes it more publically appealing as people of all hand shapes and sizes will be able to find a way to easily use this utensil and get a comfortable grip on it. The grip on a peeler is vital as your hands need to be able to wrap around the handle before the purpose is fulfilled. The grip will be dependant on the material my design is made from.

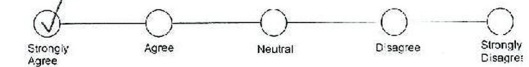
Kitchen Utensil Feedback

early terms

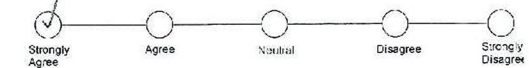
The utensil is comfortable and easy to hold



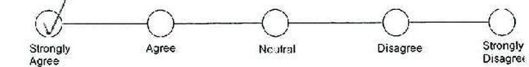
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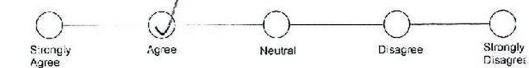
The utensil is a good size for my hand to hold.



I am able to get a good grip on the utensil.



The utensil's shape and form is visually appealing



Any other comments:

It was very comfortable to hold, but possibly make the utensil slimmer since my fingers could get easily caught in the blade.