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Product Design Ba
UX Design - Hand Peeler
17 December 2018

Introduction Into Type 1 and Type 2 Hand Peeler Report



A.

I began my research into existing peeling products by investigating common health conditions affecting the hand, wrist and fingers. I felt that it was necessary to evaluate permanent conditions as well as temporary injuries, as “temporary” can still become a significant issue in handling day-to-day chores from a matter of days, months or in some cases years. The most common cases affecting the hand is arthritis, in which an estimates 10 million people living in the UK suffer from, a more specific case of this condition is rheumatoid. Rheumatoid arthritis affects the joints with severe swelling, stiffness and pain which causes moving your fingers and wrist a task in itself. It can also affect the cartilage, tendons, and ligaments.

B.

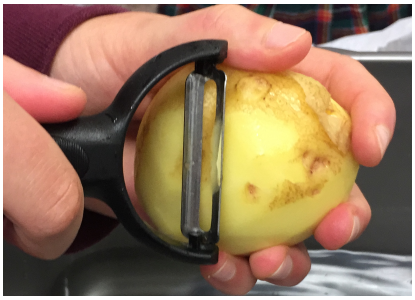


My research found that there is no real cure for sufferers of the conditions, although medication is offered to patients in order to slow down the process. In some sever cases the option of operating to release pain and swelling is offered, National Rheumatoid Arthritis Society (NRAS) suggests that is most common to find rheumatoid within females and smokers, however the condition can commonly be inherited. (https://www.nhs.uk/conditions/rheumatoid-arthritis/causes)

When looking into hand peelers designed with similar health conditions in mind, I found that the majority of peelers were designed with chunky, extruding handles for the purpose of being easier to hold as rheumatoid will effect the gripping sensation in the hand while being painful to handle. In some designs I found that people were using straps so that there was less emphasis on having to grip or hold the product, the other popular option available was peeler which did not need to be held in the hand but was able to be rested on a flat surface. With this in mind, I felt the appropriate option for my own design was to further explore a design in which minimised grime, this was purely due to having previously looked at hand conditions which were lifelong as well as temporary. I felt that looking at thicker materials and larger structures would become efficient for both cases.

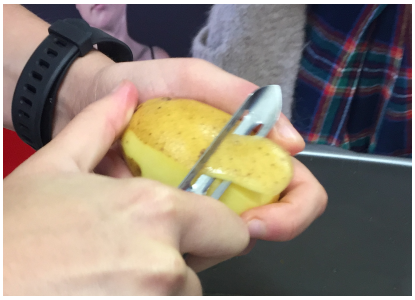
Empathy Research into Type 1 and Type 2 hand peelers.

C.









Before I began my design process I wanted to test the standard shop-bought hand peelers by efficiency of peeling, the weight of the peeler, the grip on the material and how comfortable the product is to use. When it came to testing the knife shaped peeler (type 2) **1 in 3** people found it easier to use. This was due to:

- More able to have grip on the product
- Faster when peeling

However, **1 in 3** also stated that the knife peeler produced more waste material and was known to slip when peeling.

2 in 3 peeler found the Y-shape peeler to be more useful due to:

- Being easier to peel away from themselves, leaving less chance for injury

Despite this, 2 in 3 people also found that skin of the vegetables can gather around the blade of the peeler causing even more difficulty when trying to carry out the task. The also found the blade to rotate inwards during use which would result in no peele being removed at all.

D.

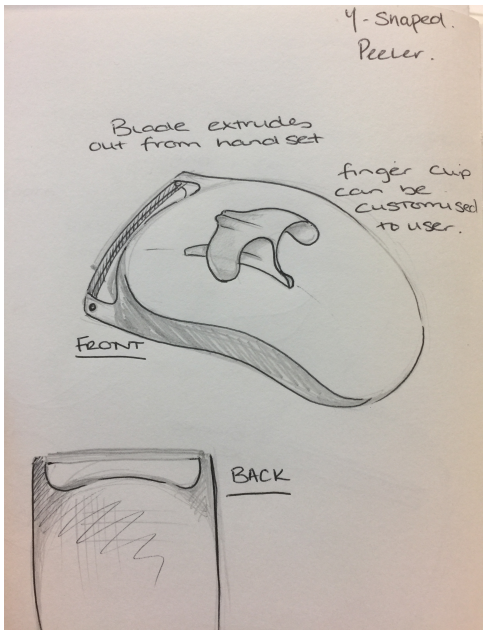


The first testing was carried out by using subject that did not suffer from any conditions of the hand, which is why I then moved on to look at sympathy research. I started with using tape around each knuckle on every finger, the idea of this was to obstruct movement to imitate swelling and loss of strength in the fingers, I also layered up with using thick washing up gloves to eliminate the tight gripping movements that would typically be used when holding or lifting something. The empathy research was carried out on two subjects where all three tested type 1 and type 2 hand peelers, all three subjects claimed that due to the restrains on their hands the found it extremely difficult to user the standard peelers as the had lack of strength in their hands to hold the handles correctly and apply enough force to peel. With this in mind I still felt that my research was not significant enough and that it was important to fully reflect the restrictions arthritis can cause to the use of fingers and hands, therefore I continued to apply more material to the hands of my test subject.

I did this by using more tape around the nucleus of the fingers, the finger joints, the thumbs, the palm of the hand and the wrists. I ensured that the tape was applied tight to the skin to cause restriction, despite allowing enough slack to not hurt the people carrying out the tests.

By adding more restraints to the hand, the users explained that mot only was the peeler difficult to hold but also, uncomfortable around the wrist area and thumb. With taking the feedback into consideration I then focused on initial concept to develop the peelers.

Type 1 - Y Shaped Peeler



E.

My initial idea was to design a peeler with the blades placed under the handset to avoid grazing the skin of the user should the peeler slip during use, although this at the time was a good idea, I reflected back to my initial testing of the Y peeler where, gatherings of skin peele was already an issue, I found by placing the blade under the handle, there would not be enough space for the skin to fall and more gathering would occur causing more effect on functionality. From there my thought was to focus on the hand set itself first as this is what would be most important in terms of users with arthritis being able to utilise the product, I wanted to use a thicker handle which would release strain from the wrist and palm of the hand this is where the idea of making a 'computer styled mouse' became a major factor in the design of my type 1 peeler as a computer mouse is designed for the palm of the hand to rest comfortably. Moving on to grip my concern was how much pressure the user would need to apply to grip the product, my main goal was to relieve as much discomfort as possible. I considered using a fabric strap to wrap around the wrist; however, issues of cleanliness when it came to washing the peeler arose. I considered the idea of having a removable strap, although I wanted to steer away from having multiple components as the design needed to be easy to put together and take apart while considering the factor of parts being lost which is where the idea of having a acrylic clip that sits over the fingers came from.



F.

I decided to keep with the traditional extruding blade of a Y-shaped peeler, for functionality purposed however I have considered having the blade widen for the purpose of having peel slide off efficiently. Indentations where designer into the peeler to imitate a relaxed closed hand so that fingers can rest in a comfortable position.

My next task was to produce a working prototype of my final Y-shaped peeler design.

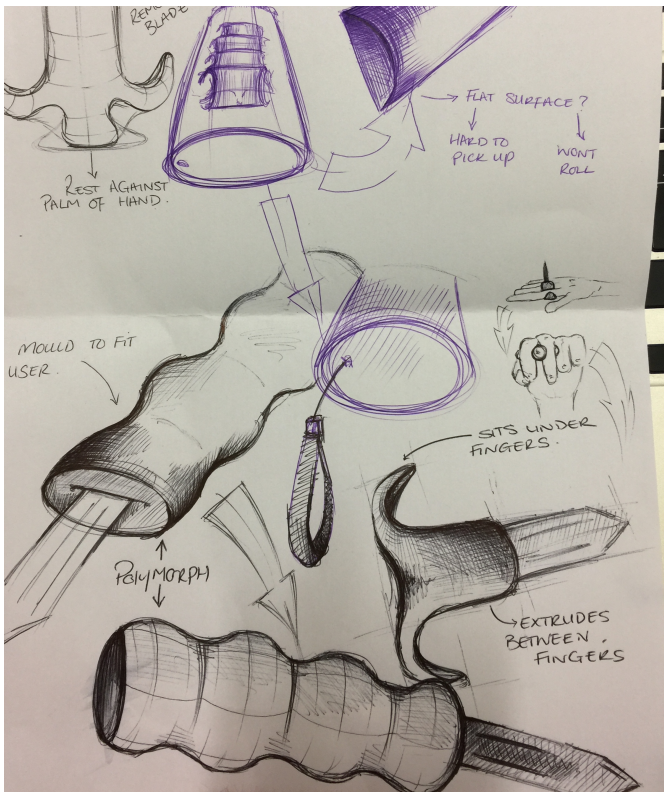






Type 2 - Knife Peeler

G.



With designing a knife styled hand peeler I felt that there was some what of an importance to design a shape that followed a natural form of the hand, i.e. when clenching the first or squeezing; however, for people suffering from conditions such as rheumatoid, its important to ensure it is scaled large enough to cope with added swelling and lack of control in the hand, therefore, I decided to design with a malleable material such as Polymorph in mind where the product can become customised for those suffering from arthritis that is also worsening over time. My design consists of a thick plastic handle with a slight curvature to follow the natural curve of the palm, with indentations of the fingers to rest comfortable while having the knife blade extrude from the handle.

Again, I tried to steer away from utilising fabric straps so I also experimented with handle shaped and home comfortable I could make the handle while decreasing the size before becoming unusable for people suffering from rheumatoid, I eventually decided against this and returned to my original design.







H.

UX Design **Hand Peeler** Questionnaire

In this questionnaire you will be asked a series of questions regarding the comfort, efficiency and function of a hand peeler design for users with significant destruction with hand movement and control. You will also be asked for personal information such as your age and gender, your personal details will remain anonymous.

How old are you?

.....

What is your gender?

Female Male Transgender Gender Neutral Prefer Not To Say

Do you have any conditions affecting the hand?

Yes No

If yes, what is the name of the condition?

.....

On a scale of 1 to 4, how comfortable if the product to hold?

Very uncomfortable > **1** **2** **3** **4** < Very comfortable

On a scale from 1 to 4, how efficient to you find the product?

Efficient > **1** **2** **3** **4** < Not efficient

On a scale of 1 to 4, how would you rate the peelers usability?

Very usable > **1** **2** **3** **4** < Not very usable

Mark the line to indicate how much the aesthetics of a product mean to you?

Very important **Unimportant**

Mark the line to indicate any discomfort you might have felt while using the peeler.

No discomfort **A lot of discomfort**

If you experienced any discomfort, please provide feedback. This will help develop the product for the future.

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Thank you for taking the time too respond to this questionnaire.

Briony Howells 1701034

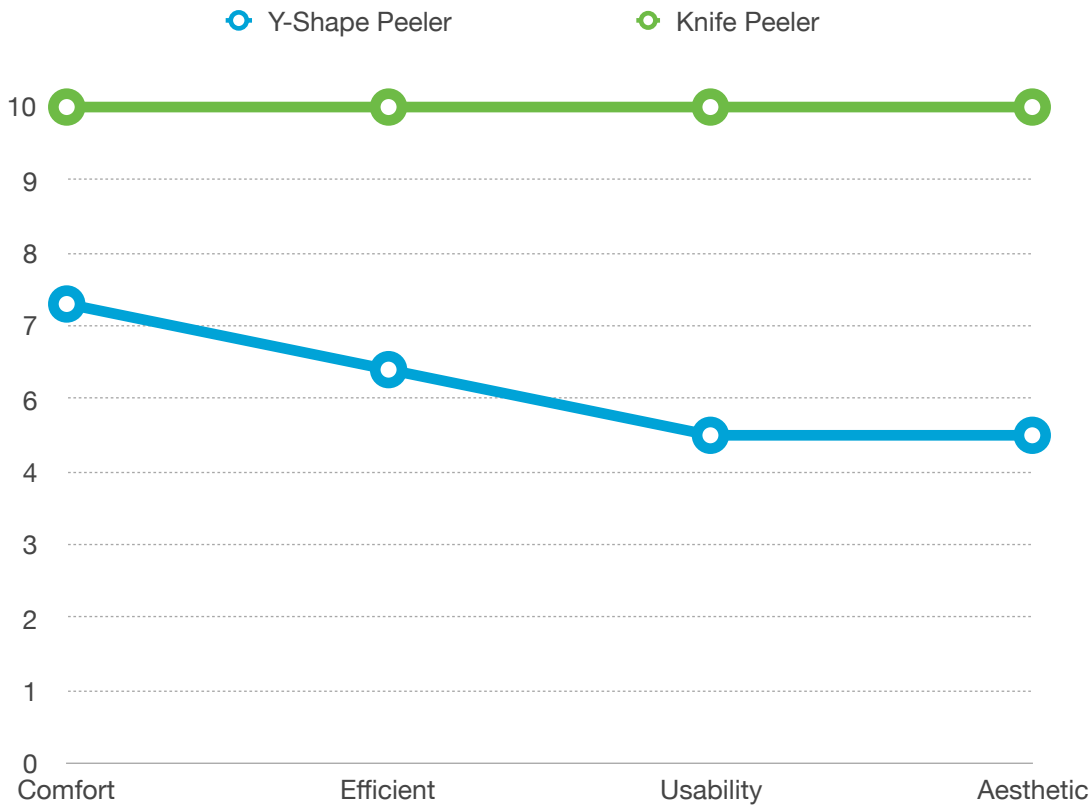
I.

Questionnaires and Surveys and Charts

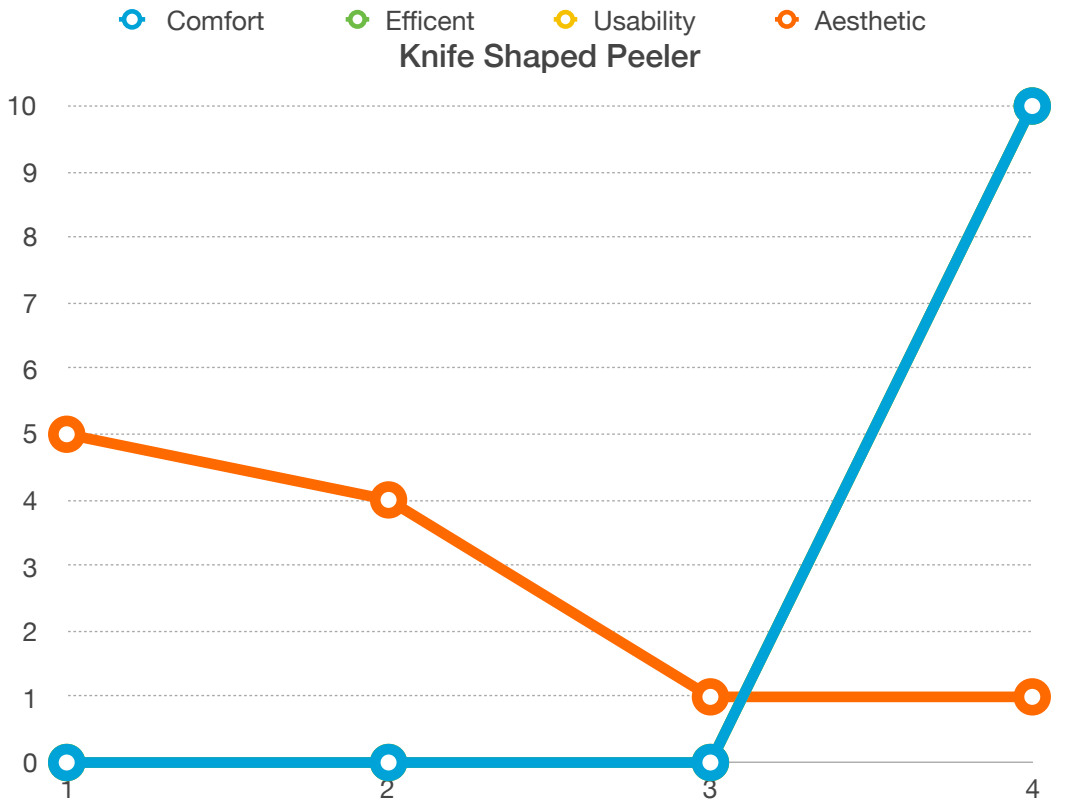
To gather reliable information and feedback I conducted a questionnaire that was given to 10 subjects that tested my prototypes. This information was gathered and relayed in a chart. Within the 10 people chosen to fill out my questionnaires, 2 people suffered from athritic hand conditions, I aimed to use a variety of people from different age groups; however, I ensure the genders of the participants to be even as I was interested in investigating their opinions as my pervious research suggested that females were more susceptible to the specific health condition I was basing my project around. The reason for include 5 males and 5 females is to compare their opinions to support that statement from the NHS (https://www.nhs.uk/conditions/rheumatoid-arthritis/causes).

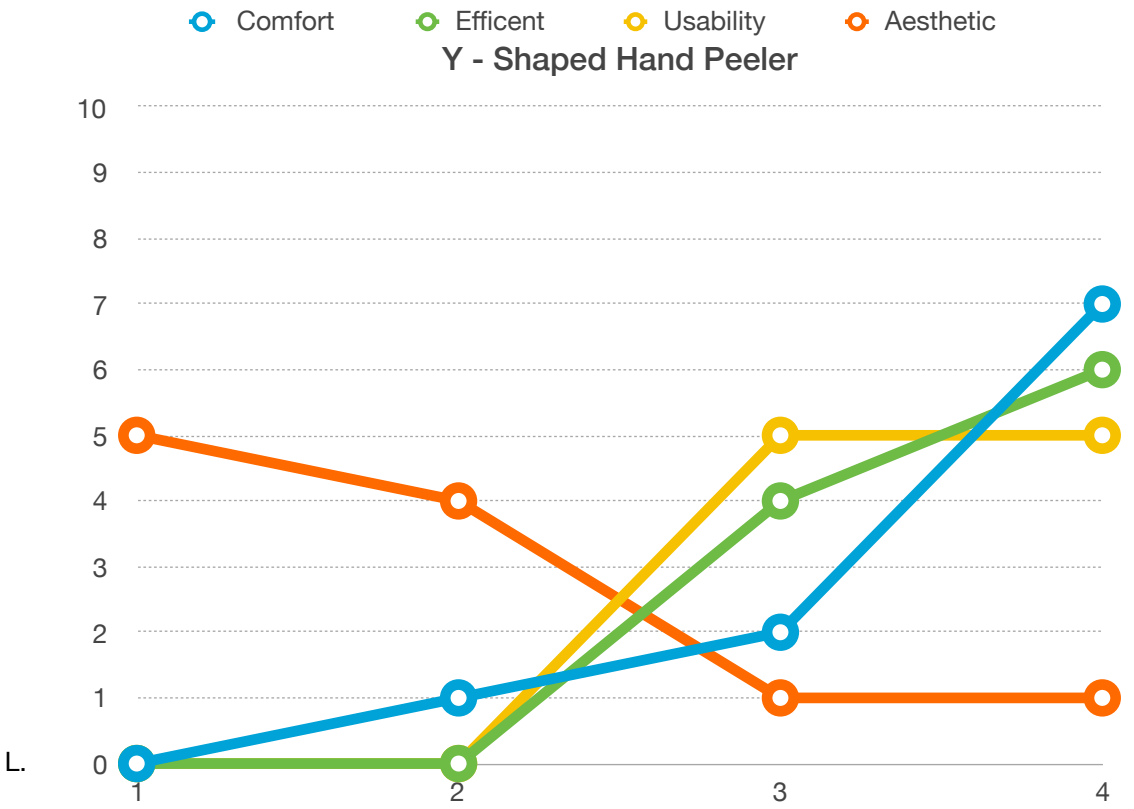
Each subject had a questionnaire each for type 1 and type 2 so that I can compare the results against each other. The first chart I made was to demonstrate the feedback I received for type 1 peeler, and the send was the representation of peeler 2. The third chart is to show the contrast of the two against each other which lead to the best choice of peeler for arthritic users.

J.


Y-Shape Peeler
Knife Peeler
10
9
8
7
6
4
3
2
1
0
Comfort
Efficient
Usability
Aesthetic

K.


Comfort
Efficent
Usability
Aesthetic
Knife Shaped Peeler
10
9
8
7
6
5
4
3
2
1
0
1
2
3
4



Based off the information given in the graphs, it is clear to see that the users preferred to use the knife styled peeler as it was most effective in terms of use and peeling, it is stated that this styled peeler is more comfortable to hold and use, it was aesthetically pleasing to those who tested the prototype.

Within the feedback given amongst the questionnaires for the Y-shaped peeler, one critique was raised based off the comfort of the index finger when holding the product.

"My finger was kind of squished in between the two arms holding the blade of the potato peeler" - Participant 1, questionnaire, Y-Shape peeler, 2018

I found that amongst the male to female ratio, two females suffered from arthritis and found that females were more interested in the aesthetics of a design as well as finding comfort an important factor.

Conclusion

In conclusion, based off the feedback receiver from my questionnaires and the information suggested in the graph, the Y-Shaped hand peeler was not a efficient product for those suffering from arthritic conditions such as rheumatoid due to the discomfort some users felt in their fingers during the process of testing. If I was to re-design my models I would consider widening the top of the peeler to a dimension comfortable for resting the fingers; however, not enough to cause even more discomfort when trying to hold the product. I found that all users found the knife peeler to be a better product on all accounts, comfort, efficiency, usability and aesthetics.

Appendix

A. APA, 2018, pg 1 - Arthritic representation (https://www.nhs.uk/conditions/rheumatoid-arthritis/causes)
B. APA, 2018, pg 2 - Arthritic representation (https://www.nhs.uk/conditions/rheumatoid-arthritis/causes)
C. APA, 2018, pg 2 - Empathy research
D. APA, 2018, pg 3 - In depth empathy research
E. APA, 2018, pg 4 - Design sketches for type 1 peeler
F. APA, 2018, pg 4, 5 - Type 1 peeler prototype
G. APA, 2018, pg 5 - Design sketches for type 2 peeler
H. APA, 2018, pg 6 - Type 2 peeler prototype
I. APA, 2018, pg 6 - Copy of questionnaire
J. APA, 2018, pg 7 - Comparison chart
K. APA, 2018, pg 7 - Knife peeler chart
L. APA, 2018, pg 8 - Y-Shaped peeler

Research material

- Handle Design Checklist Report, Michael Patkin, Department of Surgery, The Royal Adelaide Hospital, South Australia, http://ergonomics.uq.edu.au/eaol/handle.pdf
- Patkin, M. (2001). A checklist for handle design. Ergonomics Australia On-Line, 15 (supplement). (http://ergonomics.uq.edu.au/eaol/handle.pdf)
- Arthritis, NHS, https://www.nhs.uk/conditions/rheumatoid-arthritis/causes
- http://www.assh.org/handcare/hand-arm-injuries/nerve