

Therapeutic Wearables: Responding to the Body and Anxiety



During my sophomore year of college I started seeing a psychiatrist to help me understand the anxiety and depression I was experiencing which he diagnosed as prominent symptoms of Post Traumatic Stress Disorder. While I learned many lessons from therapy, the most valuable and helpful aid my psychiatrist gave me was a grounding kit. The kit contained five sensory items that I selected based on objects that bring me comfort and remind me of positive experiences. While I truly benefitted from interacting with these items when anxious, I found that carrying the kit around was rather inconvenient, which prompted me to put it on the body in the form of wearables

with sensory grounding components. This initiated my research on the relationship between the body and anxiety. I wanted to find out how the body responds to and retains anxiety, so I can have better understand how grounding works, and how the grounding elements can be incorporated into jewelry. Mental health symptoms present the problem of being wildly unpredictable in terms of timing and can be fully immersive for the person experiencing them, leaving them in what can feel like temporary mental and physical paralysis. This sense of uncertainty can lead people to develop anxiety about their anxiety since they never know when it could emerge, which calls for an on-the-go solution. I researched supported coping mechanisms and investigated the physical symptoms of anxiety, as well as explored design practices and existing products that will aid the design process. By researching the body and anxiety, the design and function of the soothing wearables can be supported by psychological practices and design theory.

Contextual Background

Many people suffer from mental health conditions that can cause anxiety. What people don't realize is that there are many physical symptoms that accompany the mental symptoms of anxiety, leading to not just a stressed mind, but a stressed body as well. In fact, one in five adults experience mental illness within a given year, [and] 18.1% of adults have anxiety disorder (NAMI). On top of that, 7.7 million Americans suffer from Post Traumatic Stress Disorder (NAMI). This shows that there is a mental health epidemic. What is not clear is why we are still afraid to talk about it, and why we still are not doing anything about it as a society. This project aims to bring awareness about the physical side of mental health and the everyday necessity for a product, due to

seemingly unavoidable and unstoppable symptoms of anxiety and trauma, when without proper coping mechanisms. It is also intended to empower those with mental health conditions to accept themselves and work towards healing and gaining self control and self confidence.

Symptoms of Anxiety

According to the Mayo Clinic, there are many “common anxiety signs and symptoms including;

feeling nervous, restless or tense, having a sense of impending danger, panic or doom, having an increased heart rate, breathing rapidly (hyperventilation), sweating, trembling, feeling weak or tired, trouble Concentrating or thinking about anything other than the present worry, having trouble sleeping, experiencing gastrointestinal (GI) problems, having difficulty controlling worry, having the urge to avoid things that trigger anxiety” (mayoclinic).

This shows that anxiety is not just in the mind but experienced through out the body, and that those symptoms need to be treated just a much as the medical health issues. The symptoms are important to note in order to understand what needs to be addressed.

Psychological Practices

Grounding is a therapeutic coping technique that uses the five senses: sound , sight, scent, touch and taste to calm someone when they are anxious or triggered. Another way to think about it would be that the stimulus of any of the five senses can distract someone who is overwhelmed and help them to concentrate of a more comforting experience. Grounding is a technique that helps keep someone in the present. Grounding aims to reorient a person to the here-and-now and be in the moment. Grounding skills can be helpful in managing triggers, overwhelming feelings or

intense anxiety. They help someone to regain their mental focus from an often intense emotional state.

Grounding can be achieved by reaching out and interacting with the world around you. While every object expresses at least one sensory element, there can be challenges as well. Everyone experiences are different, and if you take something like music, for example, many people have emotional ties to music, and those are often paired with specific memories. The same song, or sensory element, can have very different emotional ties for people, for some it could be reminders of an old friend or of a place, while for others it could be a triggering reminder of a traumatic experience.

Supporting Psychological Practices

In addition to sensory grounding, there are many existing psychology practices that are used to help ease someone while anxious such as coping exercises. These self-care exercises can give someone a sense of control when overwhelmed by redirecting their feelings and attention with sensory and mental strategies. An example is using breathing techniques. Medical and psychological doctors have recommended the 4-7-8 breathing pattern as it has been found to bring people back to homeostasis, and neutralize anxiety's physical symptoms of hypertension and high heart rate. The breathing pattern is performed by inhaling for four counts, holding ones breath for seven counts and then exhaling for eight counts, the steps are to be repeated in reps of four until calm. 5-4-3-2-1 is another coping exercise which was originally intended for people experiencing flashbacks and dissociation from Post Traumatic Stress Disorder, but also works for those with general anxiety. Dissociation can be experienced on a wide range of levels rating from "daydreaming" to chronic conditions such as

Dissociative Identity Disorder, which is formally known as Multiple Personality Disorder, as it “is a mental process that causes a lack of connection in a person’s thoughts, memory and sense of identity” (www.mentalhealthamerica.net). 5-4-3-2-1 works by bringing the mind and body into the present by using your sense to note five things you can see, four things you can touch and feel, three things you can hear around you, two scents you can smell and repeating a positive affirmation to yourself. Sensorimotor Psychotherapy is another practice of psychology, it “is a method that integrates sensorimotor processing with cognitive and emotional processing in the treatment of trauma” (Ogden, PhD, and Minton, PhD.). This theory considers the body “as a primary entry point in processing trauma,” particularly when it comes to dissociative states or different modes of the fight-or-flight response and additional Post Traumatic Stress Disorder symptoms.(Ogden, PhD, and Minton, PhD) Fight or Flight response is activated by the autonomic nervous system responding to threat and reacting with fighting the threat, fleeing from it, or rendering utterly frozen in the moment action-less. In addition, there is Cognitive Behavioral Therapy which “focuses on exploring relationships among a person’s thoughts, feelings and behaviors” in order to “uncover unhealthy patterns of thought and how they may be causing self-destructive behaviors and beliefs(NAMI). By going through those processes it can help someone to pin point their actions and triggers in order to have better idea of how to manage them. Psychological practices such as these and sensory grounding can be relevant when designing a product, especially when it comes to what motivates the user to engage with the product, and how the materials and form can influence the interaction.

Elements of Design

When designing the actual forms and functions of the products one needs to investigate the different ways design can be used to create an experience for the user. While one aspect of the design is making the form pleasing and approachable, the other is to be able to communicate certain messages, intentions and functions. Several notable fields of design include; Discursive Design, Interaction Design and Haptic Design. Discursive Design can be understood as a thought catalyst that intends to “prompt self-reflection, ignite the imagination, and foment contemplation- to deliberately make the user think.” (What is Discursive Design?) With these ideals in mind, discursive designers often develop products that bring about awareness, reminders and provocation in order to make an impact beyond the interaction between the product and the user. Interaction Design elements are integrated into the feedback, feedforward and affordance of the forms. Feedback is when a user receives a reaction as an “outcome of their action” to aid their understanding of usability (www.interaction-design.org). Affordance is what initiates the interaction, whereas feedforward can preface affordance by serving as a indicator to inform the user to interact with a product. These three concepts behind interaction design can be used to develop the visual and formal communication between the product and the user, be it though shape, materials, imagery, symbols and so on. Haptic Design focuses on the relation to the sense of touch, be it relating to digital technology or in reference to the tactile sensations. Learning about the different applications of design led me to start thinking about possible ideas for the wearables, which led me to research what is already out there.

Mental Health Conscious Products



The Calming Stone is a product designed by Ramone Telfer based on coping mechanisms that he collected for his own use over the years. The form is supposed intended to reference a worry stone. (Telfer)

Ramon Telfer designed a palm sized, handheld product called the Calming Stone, which combines coping mechanisms such as scent through aromatherapy from essential oils, sound from recordings of positive affirmations and breathing exercises to help calm the user when they are anxious. The user must pick up and move the Calming Stone to make it function, which introduces the idea of self-care and mindfulness since the user needs to recognize

their bodies needs in order to be motivated to initiate use. Mindfulness is both a psychological process and a meditative practice that keeps ones focus on the present moment.

The design of the Calming Stone made me realize that the product doesn't have to be the solution to ease someones anxiety, but that the product can have certain elements of interaction that encourage specific behavior for the user to conduct in order to sooth themselves. This could give the users a sense of control, which is often lacking in those who feel that they can not pilot their own mind and body.

While the Calming Stone uses technology, there are artists who are designing products that focus on material choices and physical form to help relay an experience. Artist Nienke Helder designed what she calls therapy tools for women recovering from sexual trauma. (Helder) These products are intended to help the user gain comfortability and confidence with their body again, as well as aid the process of connecting intimately

with their partner. Two of the products are intended for personal use, while the other two can be use individually or with a partner. The artist states that these products invites women to explore what feels good to help relieve fear and pain and (re)gain a sense of security about what their bodies enjoy (Helder).

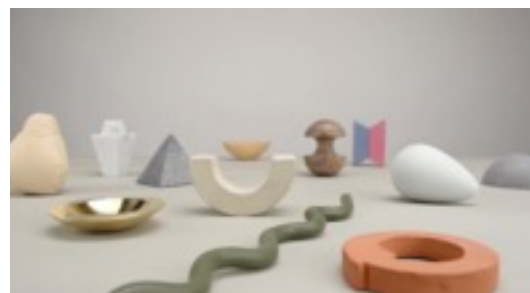
While Artist Nicolette Bodewes designed a series of twelve products intended to be used as visual aids during therapy appointments which are based on the “jungian Archetypes defined by Swiss psychologist Carl Jung.

Methodology

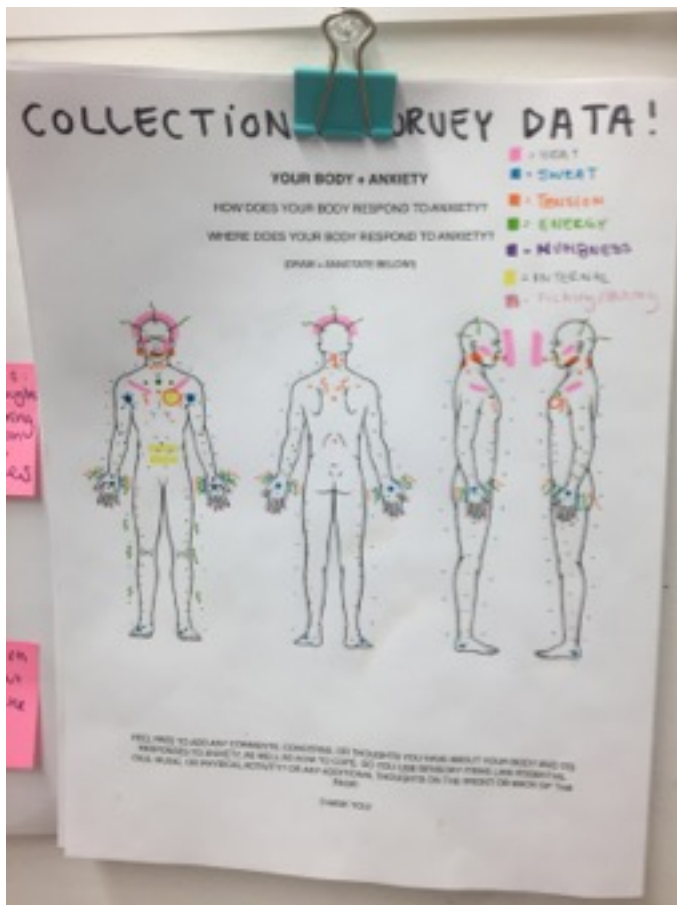
I conducted a visual survey amongst my peers, asking them to draw on a human figure where and how felt anxiety on the body in order to have a better understanding of how anxiety is physically experienced. I also inquired if they had any personal self care routines or certain sensory elements that help calm them when anxious. I receive a large amount of responses from my peers, I found that many of the individual responses seems to overlap, though there were a few outliers. I organized the data from over 50 responses into a master page by visually combining the data onto one survey page to have a better understanding of these overlaps and outliers. I categorizes the physical symptoms into seven categories including; heat,



Starting from the bottom left, the product intended for the users partner to brush them gently with the hair, as a way to slowly and gently introduce touch between the two. The top left is a physical aid to help a female with tension issues in their cervical region as a result of trauma. Similar to the top right product, a mirror for a women to view their body to be more comfortable with it. Last is an aid that is placed on top of the stomach to track pelvic floor exercises. (Helder)



The products help to express ideas, emotions, reference characters in a narrative to aid therapy sessions. (Bodewes)

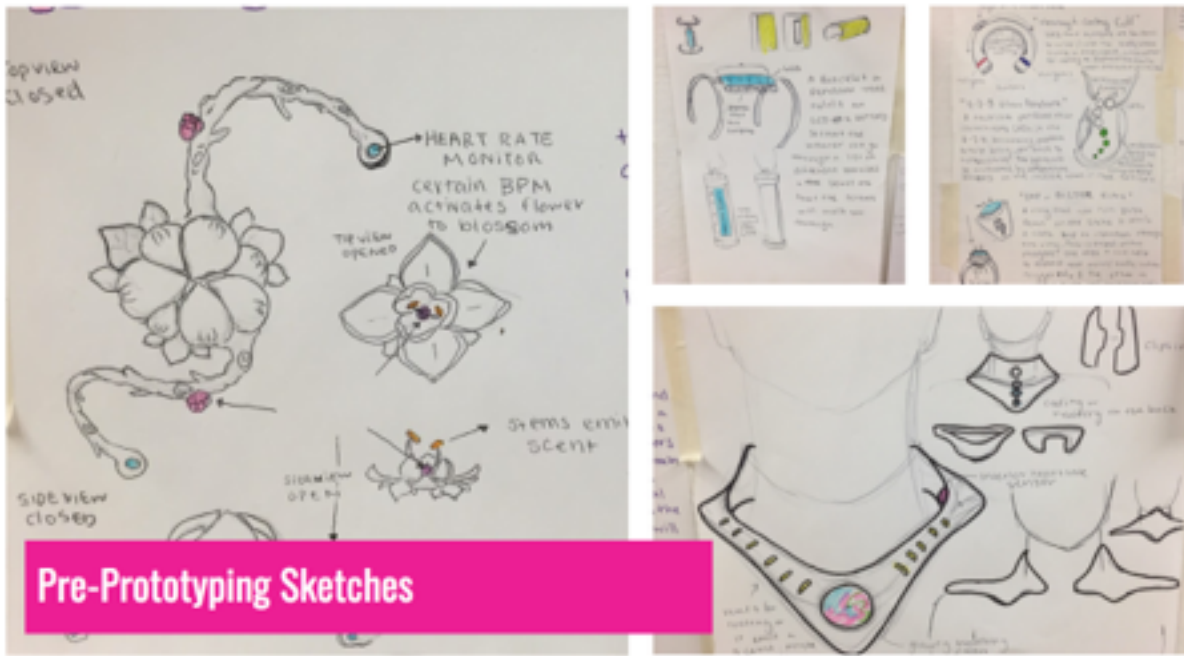


This is an image of my interpretation of the visual data taken from the surveys that depict the physical experience of anxiety. They provide information about which areas are effected the most. (Firoozi)

sweat, tension, energy, numbness, internal, and picking/itching. Some of the most common responses included over heating and sweating across the body, and pain and tension in the back and shoulders, as well as gastrointestinal issues. Reviewing the collection of data allowed me to consider the most beneficial placement of the wearables, it will also be a useful resource of physical symptoms of anxiety when designing the functions of the pieces.

In addition to the research I have been gathering, I have spent a lot of my time sketching and conducting material explorations. I have found that my explorations and prototyping have drastically

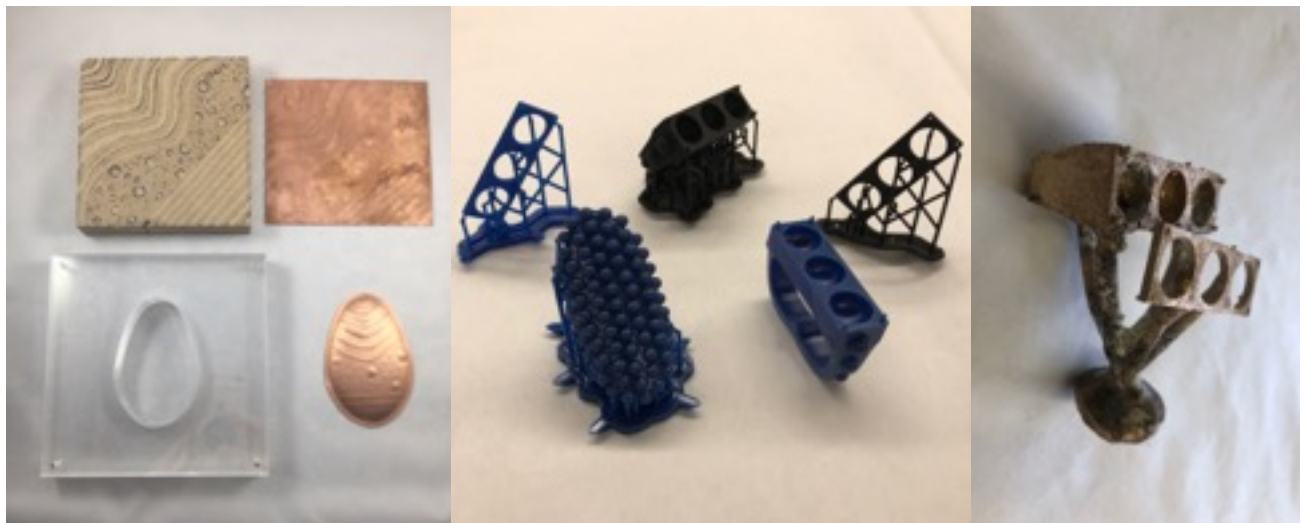
changed the forms and functions of the products I am sketching. While at first it was driven by incorporating technology, now I am more focused on the tactile experience that can be created through material selection and form. While prototyping I experimented with the sensory capabilities of Arduinos by having LEDs reflect the 4-7-8 breathing pattern and considered how sensors can be incorporated to respond to symptoms of anxiety like changes in body temperature or increased heart rate. I conducted multiple material explorations where I learned mold making processes, in



Work In progress images of the prototyping and exploration phase of smooth-on products

order to test out different Smooth-On products ranging from soft and flexible rubbers and silicones, to hard and rigid plastics and foams, to sample the different haptic experiences. Most recently, I have been combining these materials with thermochromic pigments which respond to changes in temperature, which in the case of wearables would respond to changes in body temperature.

Creative Work



Work in progress images of hydraulic press samples, 3D printed forms in black resin and in castable resin, as well as the bronze casted form.

After gathering secondary and primary research I was able to begin working towards the final forms. Another important aspect of the project for me as the designer, was to combine my passions of digital fabrications and metalsmithing, while furthering my production knowledge. The production processes that I had decided to work on, in addition to mold making and prior mentioned material explorations, include laser cutting acrylic to make die forms for the hydraulic press in order to form three dimensional shapes and textures out of sheet metal, and 3D printing with castable resin, then casting the 3D printed form in metal. I would also use a 3D rendering software called

Rhinoceros to design and gather the measurements for all of the pieces I am making to ensure precision and accuracy. This has become my primary method of planning out designs and projects in all different mediums and scales.

For the Stamps Senior Integrative Project I have designed a collection eight therapeutic wearables influenced by the research and inspired by the responses from the body and anxiety visual surveys. The *Touch Locket* has three soothing features



Made from brass, the shape was formed from laser cut acrylic dies on a hydraulic press.

curated to create a personalized experience. The form of the locket fits into the hand of the wearer allowing them to embrace the soothing ridge texture on one side, and the “worry stone” like thumbprint on the other. In addition, the chain is laced with three metal beads that the wearer can fidget. There is also a modular aspect to this locket, the locket comes with a variety of inserts, each which mimimic

the interior of the locket form and intended to provide a unique experience. The three inserts are made of three different materials to create individualized haptic experiences. One is a flexible silicon which I combined with thermochromic pigment so that the wearer can redirect their thoughts to focus on trying to use friction to turn the color of the insert. Another is beeswax for those who tend to pick at their skin or hair, this pieces replaces that unhealthy habit by providing an alternative to pick at. Lastly, for those who benefit from visual grounding, there is a crayon insert for the locket so the wearer can express themselves through written word or imagery.

The second piece from the series was the *Ball Bearing Ring* that can be worn on two fingers and used in one of two ways. The first being that it serves as an object to fidget with to release excess or unwanted energy, and the other is that the ring allows the wearer to use it for self massage along acupressure points that help relieve stress and anxiety.



Made from 3D printed black resin and steel balls

Another wearable from the series is the *Calming Collar*, which is inspired by a response from the body and anxiety survey, is a necklace that allows the wearer to pull the chain up and down, similar to pulling the string of a hoodie. Busy minds lead to busy hands, by tapping into the haptic experiences of touch, the wearer can redirect excess energy by fidgeting with the Calming Collar. You can distract your hands so you can be in the present moment.



Made from brass tubing, gold colored chain and Fluorite Crystals

The Soothing Grip Cuff is inspired by a common stress gesture; when someone is overwhelmed and they start to squeeze or grip their own arm, sometimes people even cause self harm injuries by digging into their arm with their nails. This cuff serves two purposes in response to the stress gesture, first to refrain and the other to remind. If the

wearer finds themselves reaching for the stress gesture, they can refrain from digging into their own arm by embracing the soothing gritty texture, or remember to reflect upon why they might be stressed and redirect to a healthier coping mechanism.

With in the series is a small collection of *Texture Trinkets*, they are made from flexible resin allowing the wearer to engage with the soothing texture. Each piece can be considered a haptic comfort object and can be used to activate acupressure points around the hands and body. In the *Texture Trinket* collection, there are two rings, one with a bumpy texture and other has long rubber spikes, there is also a necklace that as two face, each the same texture as the two rings. The rings are also printed with bumps on the sides for the wearer to fidget with.

The final wearable in the collection is the *Meditation Maze*, the wearer can step into the moment and step away from your stressors with the Medication Maze. This piece can allow the wearer to focus on a soothing repetitive motion of



Made from brass, color and texture is enamel. Finger points formed on a hydraulic press



Made from 3D Printed Flexible Resin. The necklace additional has brass.



Made from Brass, Steel Bead, Gold Beads, and glass. Maze was formed with wire and a hydraulic press.

guiding the steel ball through the Maze, falling into a tranquil trance.

Discussion and Conclusion

It seems as though there is a mental health epidemic considering how many people are weighed down by the numerous physically straining symptoms, and it is evident that there is a need for mental health conscious products based on the newly introduced products on the market such as the work previously mentioned. Additionally, there are endless studies and theories of psychological practice that address mental health and anxiety which aims to aid the mental symptoms of anxiety that often overlap with the physical ones. While these practices are beneficial, they are often hard to remember during an anxious stage which is why a more tactile approach might be beneficial.

It is evident that mental health effects the body just as much as the mind. While the body is affected, it is also possible that the body is the key to solve the problem by activating these sensory elements, therefore activating theming and body. In order to apply this to a product, design needs to be used to create an experience to communicate its intentions through its form and functions. Mindfulness, coping exercises & tracking triggers are elements from psychology that can help an individual to develop self-care and self-awareness to aid them better understand and live with their mental health.

In the future I plan to continue iterating upon this concept and develop additional series of therapeutic wearables. I also plan to sell the work in order to help those who have had similar experiences as myself and are looking for a way to reconnect with their mind and their bodies.

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