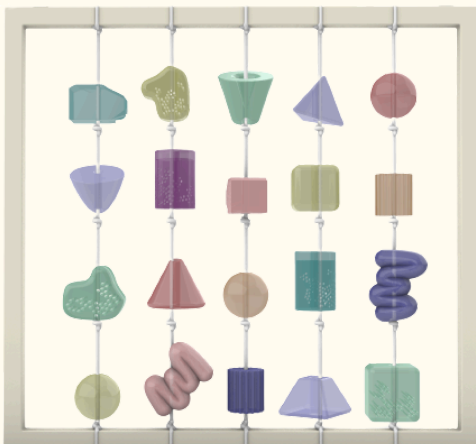
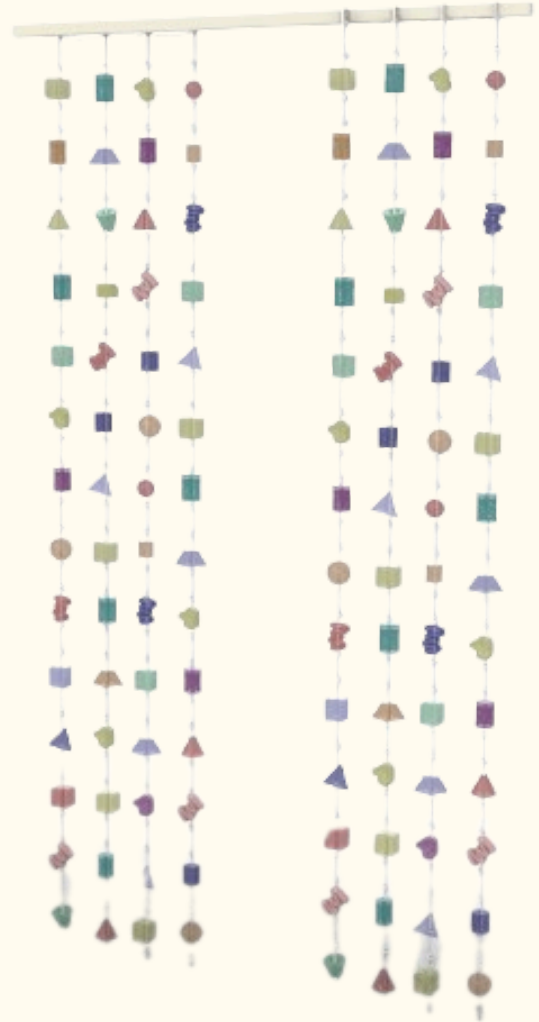




# SCENTS-ORY SERIES

The Scents-ory series is a collection of interactive decorations created using various shapes and materials to allow babies and young children to play and stimulate their senses of sight, sound, touch, and smell. The Scents-ory series also aims to eradicate odors around the house using scented beans in shapes.



03.24.2023  
ZOE PUNO  
AURY FERNANDEZ  
GAETANO HAMILTON

## USER STATEMENT

These children's sensory toys are designed for parents who want to entertain their children while incorporating beauty and pleasant aromas into their homes. These toys focus on creating an engaging sensory experience for children while also catering to the parents to have something hanging in their home that they are not ashamed of showing off. Families with toddlers are often unable to spend a lot of time cleaning and tidying up and do not want another thing to have to deal with. These toys are also decorative pieces, so instead of adding to the clutter and stress of the home, it adds to the beauty. The toy is designed to keep young children engaged and entertained without ruining the room's aesthetic.

There are two main user groups of the design, the children who will engage with this toy in a hands-on manner, and the parents purchasing this item for their home and children. Toddlers are likely to hurt themselves if the design is not made in a very safe way. Young children need sensory toys to learn about the world and how they can interact with it. The most engaging toys incorporate a combination of sensory experiences. A variety of colors, textures, smells, sounds, and even tastes help to keep children engaged and learning. Children also appreciate being surrounded by beauty and often gravitate towards novelty. Scents can have a huge effect on a child's subconscious mood, depending on the scent and the intensity, children can be calmed or energized. While the child may not be aware of this, it could affect how entertaining they find their toys.

Good parents know this and so will be inclined to look for products that their children will enjoy and learn from. But parents also have other reasons for appreciating a scented toy. Many homes can have unwanted smells, especially when a child is living in the home. A well-scented piece of furniture could have a positive impact on the quality of smell in the home. Parents are also concerned with the overall layout of the home. No parent wants a big ugly toy cluttering up the home. Or worse, a loud toy disrupting the peace. Therefore, parents will also be very interested in the aesthetics, sounds, and smells that this toy produces. Parents would love a toy that does not have to be packed up and hidden after every use. A toy that adds to the mood of the home would be ideal. If toys complimented the home, parents would not have the added worry of cleaning up after their children so guests will not be appalled by the mess. Most parents are not able to spend exorbitant amounts of money on toys for their children, but they could justify spending slightly more if they feel like this toy could add beauty to the home even after the toddler is done playing with it.



# PROCESS STATEMENT

## BRAINSTORMING

Given the broad problem theme “Our House smells”, our team began by mind mapping different **problem spaces** within the home. Then, we narrowed each problem space to more **niche reasons related to the problem** and the space. Finally, we curated **problem statements** with the most fruitful ideas.

### MIND MAP



(Fig no.1: mind map)

Our team wanted to focus on how we can create a series of objects that will allow an infant to develop their sensory skills, while still being able to produce a pleasing aroma around the home.

We began by putting to paper the best ways that we can eliminate odors in homes, which included cleaning supplies, candles, incense, and scented materials. We also discussed how we can create an item that differentiates us from other odor-eliminating products. By narrowing down the source of the odors, being

babies and infants, we could decide that creating a stationary toy that creates a nice aroma would best fit its purpose. We narrowed down our target audience to infants as they are a market that is always present, growing, and niche yet diverse enough to make creative products.

We ultimately chose the problem statement:

**How can we create a natural sensory experience for my infant that is easy to maintain and adds a pleasant aroma to the space?**

We believed a solution to this issue was most fruitful because

1. Many infant toys on the market disregard scent as part of the sensory experience because of safety concerns.
2. Many infant toys create an artificial sensory experience using plastic and sound boxes that can annoy parents over time
3. Many infant toys are stored and then taken out when it's time to play because they don't fit with the nursery's aesthetic
4. Infant toys are usually outgrown after 1-2 years of being used.
5. Hella Jongerius' aesthetic fits seamlessly with the infant toy industry

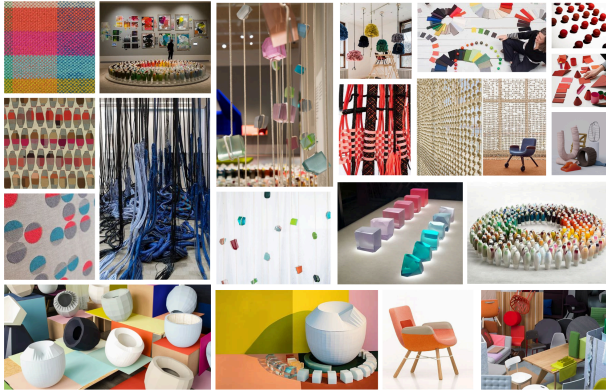
With the above possibilities in mind, we identified certain traits our design would need to create a natural sensory experience for an infant that is easy to maintain and adds a nice aroma to the space:

1. aesthetic should function as room decor as well
2. safe for an infant to play with
3. easy to clean
4. "nice" aroma that isn't overpowering

## **Meanwhile, MOODBOARDS**

Similar to our problem theme, we randomly selected Hella Jongerius as the designer that would inspire the aesthetic of our products. Gaetano and Zoe

gathered images of Jongerius' work and drew inspiration from the continuous, organic forms she used knotted arrangements, and experimental use of color that would gravitate toward new parents.



(Fig no.2)  
mood boards 1 & 2 - Our inspiration from Hella Jongerius's work and the various sensory toys and canopy/curtain designs that inspired us.



(Fig no.3)  
mood board 3:  
color swatches,  
Jongerius crystal  
forms, floating  
shapes, and infant  
toys with natural  
elements

## Meanwhile, RESEARCH PLAN

To keep our team on top of weekly deadlines, Zoe created a research plan in Figma with weekly task designation, research questions, considerations, & subject sources.



(Fig no.4: research plan - task designation and sources)

Questions we wanted to explore throughout the brainstorming and prototyping process include:  
(Fig no.5) Research questions

What main environmental, behavioral, and sensory stimulus predict whether an infant will develop cognitively, and how can these elements be best established in a nursery room?

What are parents most concerned about when their infant is in the crib?

What parts of the product will infants gravitate to?  
The string, rattling, shapes, etc?

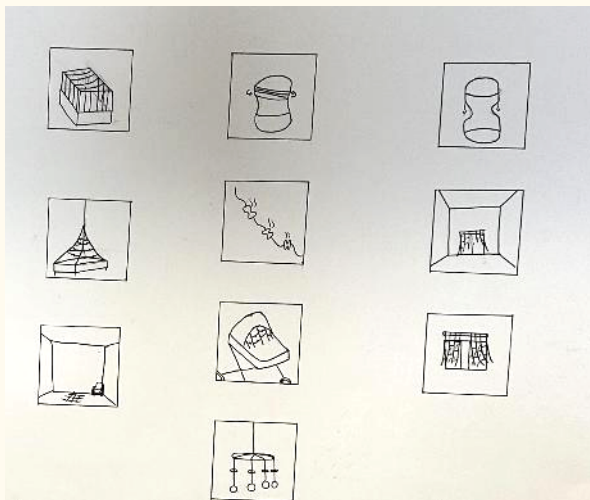
How will the introduction of a built-in sensory product effect the relationship between infant and parent within 2 days of using it?

Does the use of a built in sensory product within a nursery make the job of the caregiver easier?

What scents provide a calming atmosphere between the infant and caregiver, and the nursery?

As a parent, what are some personal belongings or cherished products you've found essential during parenting within the nursery?

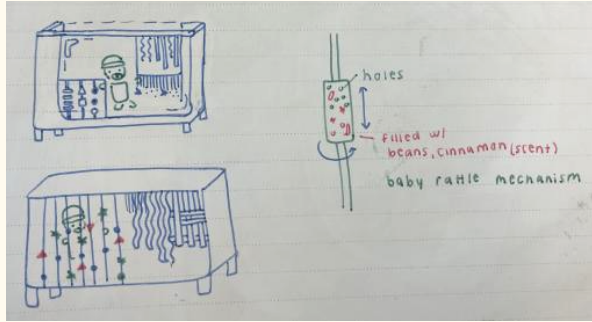
## THUMBNAILS



(Fig no. 6)

THUMBNAILS: Aury sketched several thumbnails that had the characteristics derived from our problem statement, including rattling shapes that diffuse a scent, and canopy designs for the crib, stroller, and windows.



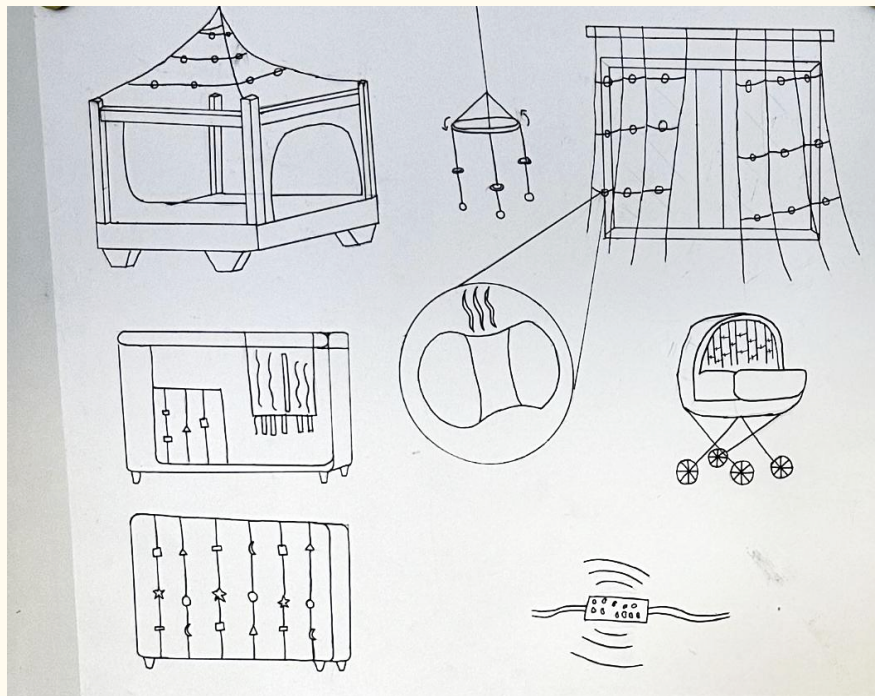


(Fig no. 7)

Sketches: drawings by Zoe that inspired the crib design in our 1st pin-up

## PIN-UP I

In our first pin-up, we focused on the variety of areas where the Scents-ory can be placed. Areas where the infant may spend the majority of their time, such as the stroller and cribs. We want the series to be adaptable around the home, so the scents coming from the shapes will spread evenly throughout the home. To fit the design aesthetic of Hella Jongerius, we wanted a series of products that would hang around the home, so we opted for curtain-inspired designs that served as drapes for multiple locations around the home.



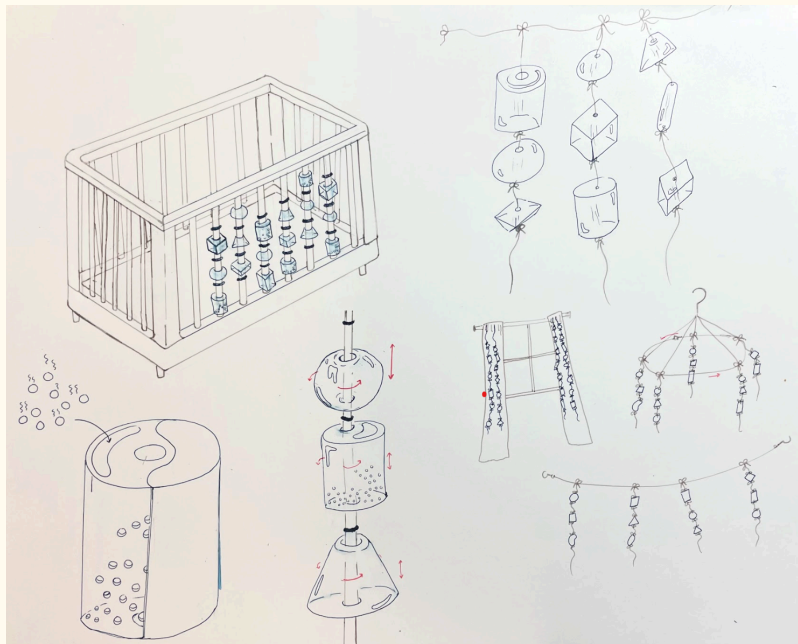
(Fig no. 8) PIN UP 1: Aury sketched several thumbnails that had the characteristics derived from our problem statement, including rattling shapes that diffuse a scent and canopy designs for the crib, stroller, and windows.

## POST-PIN-UP CRITIQUES

After presenting the pin-up, we received positive feedback on how versatile infants could interact with the series. Some questions we received were how we can allow access to the scented beans so the user can replace them when necessary. It would also allow for an easier way to clean the toys. They also mentioned that the rattling sound from the toys might become a nuisance for the parent, so being able to access the beans to take them out temporarily may be a good option.

## PIN-UP 2

Since we only had one initial pin-up, Zoe created a 2nd pin-up with higher fidelity designs before our rough prototype. We considered the feedback from our first pin-up and implemented more aesthetic inspiration from Hella.



(Fig no. 9) PIN UP 2: Zoe sketched new iterations of the infant toys with Jongerius-inspired knots and resin shapes

## ROUGH PROTOTYPE

Before creating our rough prototype, we developed questions following our pin-up critiques, including (1) What scents provide a calming atmosphere in the nursery, (2) What parts of the product will infants gravitate to - the string, rattlers, shapes?, and (3) are there any parts of the toy you're concerned may harm your baby? Our rough prototype consists of three parts: a rod of shapes for the crib design, a 3D-printed rattler with scented beads, and the transforming canopy. ,



## CRIB DESIGN



Since the design of the crib was pretty generic we focused on the function of the shapes on the rods. We experimented with natural materials in our rough prototype in hopes to get feedback on material preferences. We used oak wood to make the shapes for the crib design. We also decided to use oak wood rods that served as the rails for the shapes. We sanded down the wood so that the user would have a safe interaction with the wood.

(Fig no. 10) Crib final rough prototype

Since we were testing a high depth of function which includes safety, we had to make sure there were implied constraints on the rattlers with scent beads. Zoe created a CAD model of the rattler with a closing mechanism that requires a twist and lock cap.

(Fig no. 11) CAD model of scented rattler



To enhance the visual fidelity of the rattler we arranged the holes in a way that was inspired by a vase designed by Hella Jongerius.



(Fig no.11)  
Jongerius Vase  
Inspiration



(Fig no.12)  
CAD model  
with the new  
hole design



We printed the model in HIPS, which is non-toxic and more rigid than PLA. Zoe filled the rattler with wood beads that would mimic the sound of scented beads. Unfortunately, the twist and lock shield around the rattler broke while printing, so we only tested the sensory experience provided by the scented rattler and not its safety functions.

(Fig no.13) 3D-printed scented rattler assembly

### Scent research:

During Aury's Walmart run, he asked prospective parents what scents they preferred in the nursery. Based on research, and feedback from parents, they preferred calmer scents like lavender and Sea Breeze and stayed away from artificial fruity scents. Many parents also said they'd keep their baby away from scents completely.

Scents are a touchy subject. Even a good scent can become an unbearable smell if it is too intense, but if it is too weak, it will not do its job. From our research, we found that different scents can affect children's moods and actions. Some scents such as lavender and jasmine can have a calming effect while others such as lemon and orange boost energy and focus.

To create the scented beans used in the rattlers, we used materials like pre-made fragrances, rubbing alcohol, and beans. We liked that beans were a natural material, unlike plastic. Using the alcohol to cleanse the beans, Aury let the beans marinate in a small amount of the fragrance. The alcohol caused the beans to have a very strong and irritable smell. So Aury redid the process but used water instead to not only avoid the implications caused by the alcohol, but to water down the strong smell of the fragrance making a calmer scent.

We asked our peers to choose which scented beans they preferred and the beans with Sea Breeze fragrance and no rubbing alcohol were what we ultimately used to add fragrance to the rattlers



(Fig no.14 & 15) Blind scent test with normal beans, beans + fragrance, and beans + fragrance + alcohol

## CANOPY

To have a cohesive series of toys, we planned to implement the same shapes with the same material for the canopy design. Because it was difficult to create wood shapes of smaller sizes in a short time, Zoe 3-D printed shapes inspired by Jongerius' designs out of PLA.

For the canopy, we wanted to use a string that would prevent tangling and choking and was aesthetically pleasing. Between the paracord and cream ribbon, we found in the studio; we chose the ribbon as it fit a softer aesthetic. We used a wire and created hooks at the end so the canopy could open and attach to a stroller or hang in a chandelier shape. Finally, we drilled holes into the shapes and used a knotting technique inspired by Jongerius (Fig. 16) to secure the shapes.



(Fig no.16)

UN North Delegates' Lounge – Knots & Beads Curtain

Year: 2013

Material: yarn, beads of partly glazed porcelain

Hella Jongerius



(Fig no.17 &18)

A final rough prototype of the canopy

## ROUGH PROTOTYPE USER TESTING

### In-Class User Test:

Since the in-class user test consists of users that aren't part of our target audience, we treated them as if they are the guardians of the child and we focused on our 3rd research question, are there any parts of the toy you're concerned may harm your baby and feedback about aesthetics. Some users wanted a simple design that still grabbed the user's attention through the bright colors and shapes.

Some concerns with the canopy design stemmed from the potential dangers the product can be to babies. The thick wire of the ring may be good for durability or preventing the swinging shapes from hitting the infant with too much force. However, the wire may puncture the child if grabbed onto with great tension. Also, the maintenance of the beads inside the shapes may be an issue, so being able to switch the beans or take them out entirely was a suggestion.



(Fig no.19) user testing with canopy



(Fig no. 20)  
user testing  
with crib rods

### External Test 1 - Survey:

We sent a Google Survey to parents and received five responses from parents with children aged 5 months to 2 years. We wanted answers to all three research questions since this was data from our target audience. After asking about parents' toy preferences, safety concerns, and nursery essentials, we found out many parents preferred non-toxic toys that are fragrance-free and incorporated all sensory aspects but mainly texture and color. They also had no preference for toy material.

Parents mentioned they were most concerned about their child falling out of the crib, toys shouldn't be small enough to risk ingestion, and "The crib should have nothing in it (see SIDS), the stroller is pretty bare min too" (user test 2).

## External Test 2: Baby test

To answer question 2 from our prototype - what parts of the product will infants gravitate to - the string, rattlers, shapes? We had an infant interact with the crib shapes. We noticed the baby gained interest in the shapes on the top and middle rows.



(Fig no.21)  
Infant playing with crib rough prototype

(22)

However, we noticed the infant tended to grab and pull on the wooden rods, which nearly snapped.

(Fig no.22 & 23) Infant-gripping wooden rods



(23)



## Challenges and Changes:

During the prototyping process, we asked "What would Hella do?" to determine many of our aesthetic decisions - including the assembly of the shapes on the string, rattle shapes, and hole designs. We also noticed the top wood beads on our crib prototype served no purpose in the experience and would be taken out in our next iteration.

Because safety concerns were heavily emphasized in the parent survey, we designed our next iteration of scented rattlers to be fully constrained from opening due to the risk of an infant ingesting the beads.

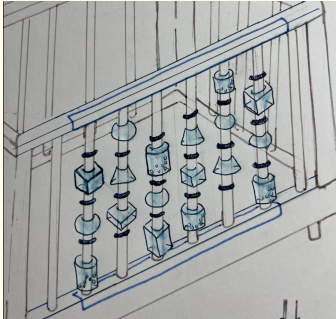
## DETAILED PROTOTYPE

For our detailed prototype, we aimed still to maintain a high level of functionality for the product. We also aimed to increase the fidelity of the baby gate so that parents who buy the product will better understand its purpose and how it is supposed to be used. The question of what materials we should use also became an issue. The wooden rods used in the previous prototype, although had a clean and high-fidelity feel to the product, were still too weak to withstand the strength of an infant.



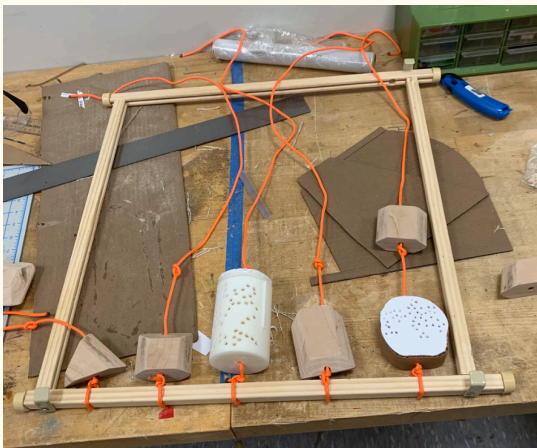
### Iteration II - Baby Gate:

During the construction of the detailed prototype, we aimed for the original crib design to be more versatile and utilized around the house. Hence, we changed it to serve the purpose of a baby gate. Additionally, cribs come in various sizes, and making a crib for our target audience spawns new considerations regarding safety and aesthetics within the space. Therefore, we redrew our pin-up so the crib toy was a removable frame that could be added to any crib or play area.



(Fig no. 24) We changed the crib design from our second pin-up to a removable frame.

We repurposed oak wood planks to create the frame for the baby gate. We also decided to use paracord for the rails due to its durability and flexibility, and would visually fit with the rest of our series, which used string. While we intended for all the shapes in our series to be made from resin, we did not have



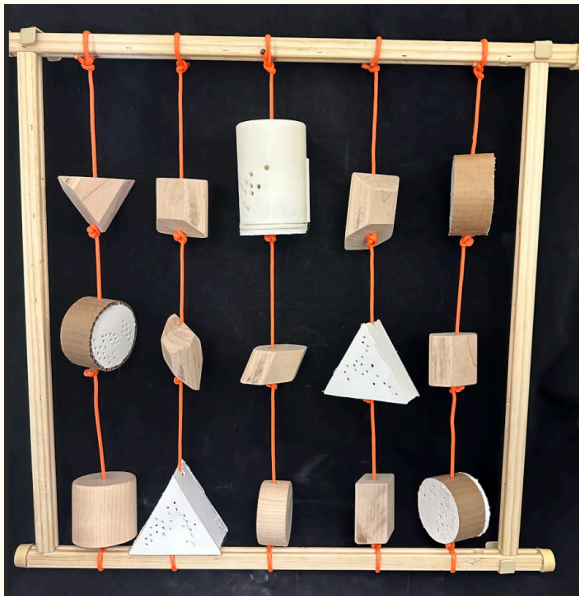
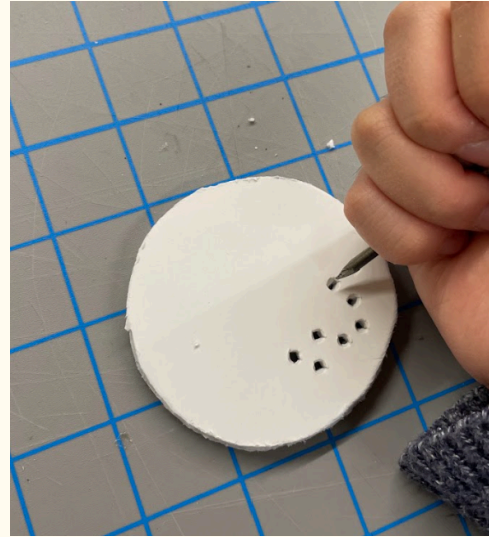
the resources to make that many large shapes out of resin. Therefore, we repurposed our wood shapes from the rough prototype and experimented with final materials in our 2nd iteration of the canopy, where the shapes were smaller.

(Fig no.25) Scents-ory crib assembly

(Fig no.26) Scents-ory crib scented rattlers

We repurposed our 3D-printed scented rattler from our rough prototype.

However, we wanted the frame to have more scented shapes in various sizes. To save on cost, we made more scented rattlers with foam core punctured holes in a pattern inspired by the Jongerius vase, and filled them with scented beans of various sizes. That way, every shape sounded different.



(Fig no.27)

Scents-ory frame for cribs final detailed prototype



## SCENTS-ORY FRAME FOR CRIBS USER TESTING

### In-Class User Test:



The users enjoyed interacting with the shapes, rotating them, and moving them vertically. They also like how the gate redesign is now valuable for multiple locations, such as on stairways or a play area.

Additionally, many users questioned whether it was safe for a child to put their mouth on the scented rattlers we'd design for in future iterations.

(Fig no.28)

Scents-ory frame for cribs playtest

### Challenges and Changes:

For future models, we would want the product to be usable in outside spaces while offering infants more textures on the shapes. Also, sealing the shapes so that the child won't have the opportunity to ingest any of the beans seems to be the best route.

### Iteration II - Canopy turned Chandelier:

Based on our survey, parents said they wouldn't put a canopy in the stroller because they'd rather have their child be stimulated by nature around them, and the toy would become a distraction. "It's one more thing I have to worry about... the only other stroller accessory I'd take with me is a blanket in case my kid falls asleep" (Survey user 1).

Therefore, Iteration II functions solely as room decor for the nursery. It would be a passive sensory experience for the infant and parent while in the nursery.

We decided to use non-toxic epoxy resin as the final material for the detailed prototype because it was easy to mold into shapes and drill holes into. It would create a high-quality transparent look that reflected light nicer than plastic. It's a more natural material than plastic and safe for children to slobber on.



(Fig no.29) Resin shapes being poured into silicon sphere mold



(Fig no.30) Completed resin shapes



(Fig no.31) String replacement from Daiso

Zoe went to Daiso and found various string options. We switched the ribbon to a metallic-like soft string because it fit the Jongerius aesthetic more and was easier for parents to clean or detangle. The visual fidelity of the chandelier would also improve without the frayed edges of the ribbon.

To assemble the chandelier:



(Fig no.32)

We drilled holes into the resin shapes



(Fig no.33) Aligned the strings and tied knots around the shapes as inspired by Jongerius' bead and knot curtain (16).



(Fig no.34)

Arranged strings with shapes around a wire frame and attached with a hook to the top with a double knot and glue.



(Fig no.35) Final detailed chandelier prototype



(Fig no.36) Prototype in the sunlight

## Iteration II - Canopy turned Curtain



The chandelier mainly functions as room decor, providing a passive sensory experience for the parent and infant. Because many users that tested our prototypes mentioned they were afraid an infant may get hit by the floating shapes when playing with them. The chandelier and curtain's main function as room decor would keep them safe from these objects. Following this idea, we decided to make longer strings with shapes and arrange them into a curtain as the 3rd part of our series.

(Fig no.37) curtain prototype in the sunlight

## CHANDELIER USER TESTING



(Fig no.38) chandelier user testing

We got many comments about how the resin shapes fit the high visual fidelity we were going for. They believed epoxy resin was a good final material because the sun's reflection through shapes added to the natural sensory experience, and it was easy to clean. They could see the chandelier as a permanent piece of the nursery. Many people gravitated towards the unique resin blocks, such as the cylindrical cog shape, and were prompted to spin the chandelier.

sun's reflections user test for our first iteration, the in-class user test consists of users that aren't part of our target audience, so we treated them as if they were the guardians of the child and asked if there were any parts of the toy they're concerned may harm their baby. The pointy edges of the resin blocks were heavily mentioned. Therefore our next prototype we would smoothen the edges and replace some geometric forms with more organic forms.

## NEXT STEPS

After reviewing the feedback given to us by our user testers in both iterations, we would have to make a few changes to the functionality of the products, along with incorporating a more diverse set of colors and shapes. The mobility of the baby gate is on the right track but as we continue to develop the project, we want to provide adjustability so that users can relocate the toy to a more significant number of places around the house.

We would also like to research more productive ways of manufacturing the resin shapes. For the chandelier and curtain design, we would want some of the resin shapes to be modeled like our 3D-printed scented rattler. That way, the curtains and chandelier would defuse a scent as well. Vice versa; we would like the shapes from our sensory frame to be made from colored resin instead of wood. Since the shapes are transparent and fully enclosed, we are interested in developing scented beads that are also transparent so the transparency would still be there.

We'd also test for a greater variety of scents, colors, shapes, and materials inspired by Hella Jongerius; that way, infants are more engaged with our product, leading to more content parents. To improve the safety of our product, we would also test for a safer chandelier frame made from a cork or wood ring, that way, infants could safely interact with the chandelier without being punctured by any sharp objects.



(Fig no.39)  
Hella Jongerius, Breathing Colour, 2017,  
installation view  
Inspiration for more organic forms

A concept of our 3rd iteration included complete resin shapes with more organic forms and unique shapes. We would also prototype the breath of function of the scents-ory curtains.

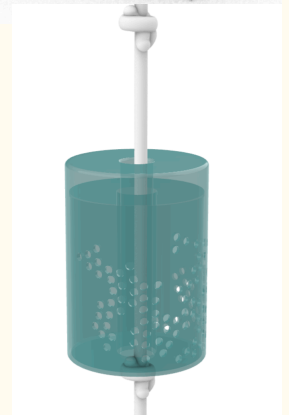
(Fig no.40)  
CAD rendering of iteration 3



(Fig no.41)  
Curtain weaving close up.  
Looped cotton rope, knotted on wood  
rod



(Fig no.42)  
Scented shapes made with a colored resin





## CONCLUSION

After designing the scents-ory series, we remain optimistic about our product's design. Its multipurpose functionality and natural sensory experience will engage children while adding a nice aroma to the home. Making our low-fidelity prototypes allowed us to play with the aesthetics and overall form of the design. The final prototype was extremely rewarding, and we got to experiment with different materials and the final form of the series. Overall, this report covered our ideation and prototyping process as we completed Design Challenge 2: Studio Object Design History Redesign Series. We discussed what we learned, needed to improve on, and the steps we would like to take while further developing our Scents-ory toy series.