

Standing On Your Feet

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Introduction

Elevators are almost synonymous with boredom and waiting, as exemplified by the phrase “elevator music” being used to describe any particularly bland pieces of music that fail to hold the attention and work only as mere background. In the present pictorial, we attempt to alleviate some of this expected boredom by changing up the way one interacts with an elevator and bringing attention to the somatic experiences that go unnoticed along with the subdued piano jazz tunes heard on the way to one’s desired floor. Specifically, we are interested in how standing in the elevator affects bodily experience in the feet as the large machine moves up and down, often at a considerable speed and with noticeable force. We think that this experience can not only be focused on the floor and in the feet but also enhanced by our proposed interactions, which bring attention to it and make riding the elevator a less mundane affair. This pictorial will discuss two such interactions, which we arrived at by exploring the design space through several different exercises described in detail later on. The first interaction, tied to the force of movement felt by the body as the elevator accelerates up or down, is a malleable floor which swells and sinks in the

direction of that force, thereby bringing the attention to it and making the user think about their balance. The second interaction also involves the elevator’s floor: a shapeshifting material responds to the pressure of feet onto it and becomes coarser or softer depending on how heavily one steps. Our hope is that the introduction of these interactions will make the experience of riding an elevator more interesting and create some less-than-expected somatic experiences for the users.

Related work

Coelho and Zigelbaum [1] explore the different ways of interacting with shape-changing materials in their paper *Shape-changing interfaces*. It discusses the ways of categorizing and structuring shape shifting materials and inquires how different materials can be combined and interact in regards to topology and texture.

In his paper *From responsive to adaptive and interactive materials and materials systems: A roadmap* [3], Andreas Walter explored what different interactive materials could look like in the future and how we could interact with and adapt to them once they are available on the market.

Feltham and his colleagues [2] interrogate walking as a form of self-awareness and creative expression. The interactive surface - Slow Floor - was designed and evaluated to discover the relationship between movement and the response of the surface, as well as how it can promote awareness and an examined experience. The results show that the Slow Floor encourages participants to show unique creative agency and learn better through the use of pressure data and auditory feedback.

Design brief

The main purpose of this project is to enrich the somatic experience of taking an elevator, which is usually designed for functionality only, not for being pleasurable or interesting, resulting in a rather dull part of daily life. This is why we decided to riff on the brief provided by Boris Design by focusing on the floor in particular and adding some curiosity and fun to it. There were two distinct products presented in the brief: first, a fully enclosed cabin lift wherein all aspects of the space can be controlled while the elevator is moving; second, a platform lift in which everything but the floor moves, meaning that the space is changing constantly as the walls and ceiling move while traveling. The opportunities emphasized in this experience design were those of working with time, space, safety, and feedback. The soma-design qualities should be explored and defined in the process.

- The elevators move slowly, so questions about how to utilize the time necessarily spent inside arise,

opening up opportunities for designing a temporal aspect of the resulting somatic experience.

- The way the body relates to or functions in the design space changes depending on which of the two variations of the elevator (enclosed vs. open) is chosen.
- Due to the fact that these elevators require the user to continually hold down a button until the desired floor is reached, letting go of it when it is time to get off, one can easily imagine that the experience could feel unsafe, disconcerting, or confusing. The usual solution is to provide a multitude of visual cues such as stickers and instructions to inform the user of the correct and safe way to use the elevator. However, this presents a design opportunity to make the process more intuitive and less prone to causing worry.
- The elevators are not particularly interactive in their “usual” form, bar the use of the button while traveling. This provides us with a chance to explore somatic feedback and bodily experiences that could be appropriate in the context of the moving machine.

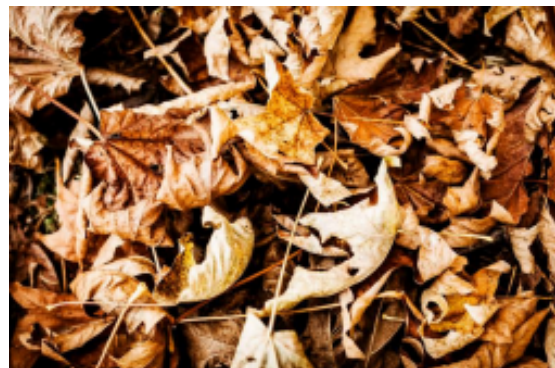
Design process

Slow walk

We decided to perform a slow walk individually since we were trying to explore the design space of bodily

experiences without being limited by the opportunities we had already discussed. A forest or beach was chosen as a potentially inspirational environment. We walked at a very low pace, tried to explore the multimodal sensations of our bodies, and recorded the highlights through photos, videos and audio recordings. Body maps were completed before and after the activity. The experiences we paid attention to were often quite personal and unique to each walker, but there was still a lot in common. Since the weather was excellent that day, we all felt warm, calm and relaxed. There were multiple interesting sounds, including bird chirps, waves, wind noises, and the crunchy leaves we were stepping on.

The interactions between feet and ground caught our interest, such as the sensation of walking on noisy leaves and sharp seashells: how our movements affected the leaves, crushing them and leaving them in a different state than before the interaction. There was also the sensation of walking on top of the leaves, the soft texture giving way under the pressure of steps upon it. That sensation was also present in other aspects of our walk. One group member talked about walking on the beach and being able to visually see where they had walked earlier by the footsteps, like a short story in the sand. After a group-wide discussion, we became determined to focus on the sensations in the feet and the different textures: the feelings of pressure, of creating imprints, and of balancing on uneven ground became the next steps in our exploration.



Images: A selection of our inspiration pictures after the slow walk in the woods/beach

Magic machine

We conducted a magic machine workshop based around the theme of unusual transportation. The decision to run the workshop was made in an effort to explore new aspects of the design space. The workshop began and ended with filling out body maps in order to track if the exercise had evoked any new bodily experiences or feelings.

The finished machines had a variety of different applications and uses. The first image (Owl transport) is of a necklace that the user can wear and (with the help of

the knobs) be transported through both time and space. The second image shows a control panel for a magical transportation vehicle (The Spacetime Relativizer) which has buttons with varying functions that help make the experience more enjoyable while moving from A to B. Even though all four are different, we found that they all adapt to the user and their needs through different adjustable elements, for example travel duration and swiftness. The flexibility of the different elements of the experience was our key takeaway from this exercise.



Images: The Magic Machines created in our unusual transportation workshop.

Feldenkrais

Feldenkrais is a type of body practice. All body practices have a particular way of training us in bodily awareness, for example attentiveness to our breathing. Feldenkrais aims to make us aware of how to move in ways that are not painful. For example, if we harm a leg, we need to figure out ways to walk that are not painful. Another aspect of the practice is that, for anything that we do habitually (e.g., sitting, walking, turning our heads over, and so on...) we should have multiple different ways of doing each action. In other words, it is about performing habitual actions in more than one way so that we may explore and remind ourselves of the alternatives.

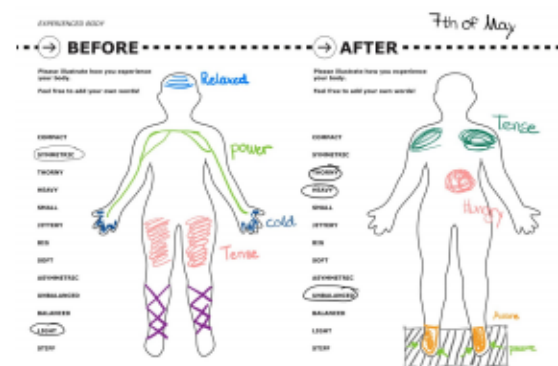


Image: A body map from the Feldenkrais exercise

In our group we decided to individually follow a Feldenkrais lesson which was available online. The theme of the lesson was “standing.” What interested us was the playfulness of engaging with our bodies and our own movements which was both enjoyable and engaging. For example, one of our group members mentioned how standing up and balancing on their toes made them more aware of their weight as they were leaning

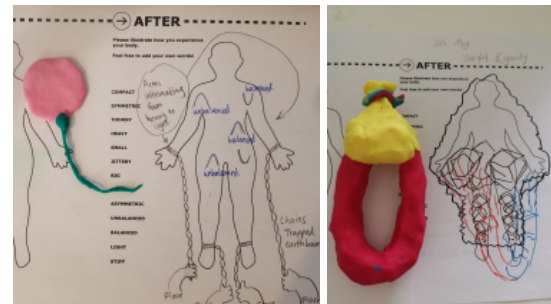
forwards and backwards. Ultimately, the Feldenkrais exercise made them more aware of their own feet and their whole body balance. They also mentioned that the experience became more enjoyable and safe when they tried to do it with shoes on. Another group member had sore thighs from exercising, which in turn made the standing up exercise painful for them. They tried to minimize the pain by alternating between swaying their hips and standing on their feet.

The main takeaways from this exercise was that standing could vary a lot from person to person, depending on your soma, and that there are a lot of different ways to perform the habitual action of standing, including standing in an elevator, that could be explored.

Focusing: session 1

The first of our two Focusing sessions was centered on the theme of gravity and weight. There were a variety of quite distinct experiences within the group. One person expressed thoughts of chains and heaviness, while on the contrary, another imagined the feeling of weightlessness in zero gravity and thought of a space walk where an astronaut is connected to the space vessel by nothing more than a cable. Going in yet another different direction, the remaining group members' impression was of changing one's shape and being pulled by magnets. In the discussion that followed, we also brought up body limitations associated with the theme of gravity and weight, e.g. the experience of climbing a very steep, forested hill vs. the ease of walking through a flat, endless field of soft grass.

The exercise informs our design by raising questions about how different body weights will feel and interact with the textures we're working with and about the differences in experiencing weight and gravity normally as opposed to in an elevator that is affected by upward acceleration.



Images: Some of the body maps and tangible body maps after the first focusing session

Focusing: session 2

The theme of this focusing session was “balance”. We thought that balance would be a fitting theme because we wanted the theme to be related to our project topic, i.e. “standing”. One of our group 5 av 11 members summarized their focusing experience with the words “tight rope”, “elephants on a spider web” and “toddlers”. It was clarified that “tight rope” was reminiscent of funambulism which is the skill of walking on a thin rope or wire. “Elephants on a spider web” was brought to mind because of an old Swedish song for children, which is about elephants balancing on a thin spider web (similar to funambulism). “Toddlers” was thought of because children tend to be unstable when they learn to walk. Another group member thought of the word “marionette”. It was explained that “marionette” came to mind because any time they would

realize that they were balancing they would lose control and fall. Ultimately, the final group member did not come up with any word, but during their focusing session they experienced floating in the sky with birds and balancing on their feet. The result of the second focusing session was interesting because we all had different words representing our experiences. The main takeaways of the focusing session were that balancing was related to stability and control which, once achieved, could lead to harmony and peace.

Adjusted Material A-lab

Since our group was not co-located, we decided to each have an individual exploration of the materials available to each of us and then share the results with each other, providing ways to replicate the experience such as stepping on top of a certain kind of material with a particular kind of shoe or even barefoot. We defined materials broadly in this exercise since we wanted to encompass a wide range of textures and feelings: we included more “regular” materials such as a hardwood floor, carpets, and cardboard, but we also considered outdoor textures, for example pavements, forest floors with roots, fallen leaves and pinecones, as well as objects one does not often step on such as pillows and mattresses. We noted the difference between stepping on these materials with different shoes: from heavy boots to light sandals, and for some of them e.g. the mattress and cardboard - bare feet.

For this activity, one member tried some materials of different roughness. Different

shoes might affect the roughness experience, so the same pair of sneakers was used. Stepping and standing on those materials several different times resulted in the takeaway that the coarser the material is, the better one can balance. The stronger friction may prevent people from slipping. For a safe elevator riding experience, a relatively rougher surface would probably be preferable.

Experiences with elevators

The group had several different experiences with elevators throughout the creative process in order to make sure that each element of our design made sense when placed into context. Trying out ideas for the prototypes in an elevator and/or closet was a rewarding experience. We tried different materials to simulate the sinking sensation and how it would feel in the moving elevator.



Images: a) Shoes against the elevator floor
b) Shoes on the soft texture in the elevator
c) Added soft book between surfaces
d) Hard tray between the surfaces

One group member, who took the photos in the series above, found that standing on a soft surface without any support wasn't pleasant, since sinking too far down made it hard to move or step away.

Adding the paperback in between the surface and the shoes did not improve the experience and made it even harder to balance and move. Finally, the addition of a hard tray between the materials made it more pleasant, distributing the weight along the surface. Moving around provided the nice sensation of the floor responding to actions taken by the feet. Therefore, the key takeaway was that the weight needs to be more evenly distributed along the surface in order for the person to be able to move around more freely while not feeling trapped, and that a responsive surface can be quite fascinating to work with.

Prototyping

Different-sections prototype

The earliest prototype was based on the experiences from the materials A-lab where the idea was to have four sections in the elevator with different materials on the floor. The “materials” we chose were grass, gravel, tile and soft carpet, as they were the most interesting ones explored during the A-Lab. This prototype was discarded due to lack of interactivity and the unrealistic elements of the surface. The key takeaway from the early prototyping stage was the aspect of shifting shape and texture, which can be seen throughout the later prototypes.



Image: Four textures to be explored in the Different Sections elevator

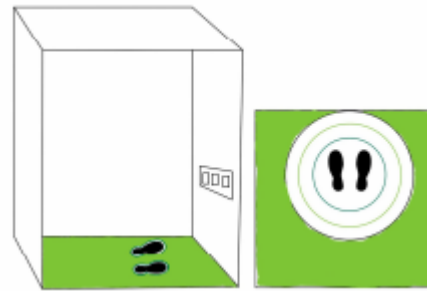


Image: Sketch of the Ripple Effect prototype showing how the texture is centered on the feet

Ripple-effect prototype

Based on some group members' early experience with shape changing materials with applied pressure, a prototype (above) was sketched up. The basic idea of the prototype was that the floor of the elevator would react to the person standing on it by changing its form, letting the person feel a slight sinking/hugging sensation from the floor, and the floor giving visual feedback. The visual part was not explored in depth but was sketched out as a plain colorful floor that would change as the user moves around, creating a ripple effect around the feet to bring awareness to them and the floor interaction.

Entire-experience prototype

Following from the previous basic idea, a more functional prototype was developed, involving more interactions. Since the feet and floor are the main focus, interaction with the walls and the ceiling is not considered here. The whole experience is divided into 3 steps, including waiting, stepping into, and standing inside the elevator.

- Waiting

While one is waiting in the area in front of the elevator, the persisting pressure can be detected so the floor “knows” that there is someone waiting on this floor - this is indicated to the user by an LED lighting up. If the elevator is going up, the user will feel their body being slightly pushed up by the swelling floor, with a red LED light coming on simultaneously; if going down, they will instead feel a sinking sensation and a blue LED will be on. Thus the body will feel more connected with the elevator and make the waiting process more explorative. The instruction color is chosen to signify high and low temperature, as red can symbolize thermal expansion and blue - thermal contraction.



Images: Idle elevator -> Activated elevator going upwards -> Soaring sensation on feet -> Activated elevator going downwards -> Sinking sensation on feet

- Stepping into the elevator

Stepping into the elevator could be made more calming and relaxing by the addition

of a grass or crunchy leaves texture reminiscent of the soft nature textures we encountered on the slow walk. When the feet touch the soft but supportive texture, there can be a sound of soft grass or crunchy leaves accompanying the experience.



Images: walking on grass and on leaves

- Standing

For a safe elevator-riding experience, handles are included. To move upwards, one should hold the red handle, and the texture will change into leaves. Sinking into thick leaves can be a way to create balance when moving upwards. To move downwards, one should hold the blue handle, and the texture will change into grassland. The coarse surface and strong friction strengthen the balance and support, preventing one from slipping. Shifting weight from one foot to another controls the soundscape, which includes audio cues reminiscent of the texture the floor currently has, e.g. crunchy sounds for the leaves. The sound from the texture is produced continuously and changes in accordance with the weight and placement of one's steps. The elevator will stop if one ceases to hold the handle or shift weight. The idea of this addition is

to simulate the sensation of really compressing textured ground and make the user feel connected with the texture as well as enjoy balancing.



Images: Holding handle to go upwards and downwards, with the corresponding textures

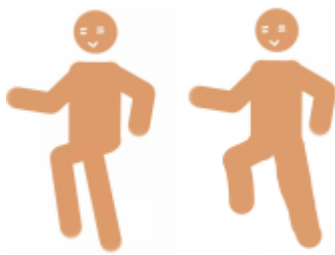


Image: Stepping on one spot to move the elevator

Final Prototype

One flaw of the prototype above is that it requires the user to shift and control their weight continuously, which is tiring and not obvious enough as an interaction. For the final prototype standing inside the elevator was considered the most important aspect, while the consideration of waiting outside of it was cut for time's sake, being moved instead into being part of the interaction happening inside. We aimed to consolidate all previous conclusions and experiences into one final prototype, shown in our video.

The experience is based around the sensation of sinking and soaring while experiencing the elevator's acceleration. When going up in the elevator the floor will ever so slightly sink around the feet making the user aware of the upwards acceleration. The sinking is subtle so as not to scare the user with the unexpected movement and spread out around the feet to stimulate a more holistic feeling of sinking.



Image: Series showing the feet sinking into the floor

The soaring sensation on the other hand is present when the lift is accelerating downwards to make the user feel like they're getting caught by the floor and stabilized by the force of gravity. The soaring sensation is also subtle since it could be experienced as uncomfortable if the movements are big or fast. The sinking and soaring of the floor is downplayed even more when a wheelchair, heavy baggage or a pram enters the elevator; sensors in the floor will detect the weight distribution and soften the experience, either by making it extremely subtle or turning it off entirely.

Texture changes in the elevator can be controlled by the user when applying more pressure/weight with their feet and moving around, making the texture of the floor coarser and coarser.



Image: Series showing the floor soaring under the feet

Conclusion

Completing this design has been a three-month-long journey of learning to apply Soma Design methods in order to achieve a complete and coherent end product. As shown in the previous sections, each aspect of the final elevator design is grounded in one of these methods and exercises and subsequently in our own somatic experiences and our understandings and interpretations of them. The process of collecting the bits and pieces of the finished product from exercises such as magic machines, aesthetic sensitization labs, slow walks, Feldenkreis and Focusing was fascinating and also at times confusing and challenging, especially given the fact that due to the continuing pandemic, we were

not in the same room for any of them. Nevertheless, we are confident that the design is backed up by the summation of our experiences, which we integrated into a coherent whole. We believe that a good next step could be considering more different/ edge cases such as multiple people riding the elevator simultaneously, pets who might get spooked by the interaction, and so on. There is always something to be honed and further thought about.

References

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