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Human Factors
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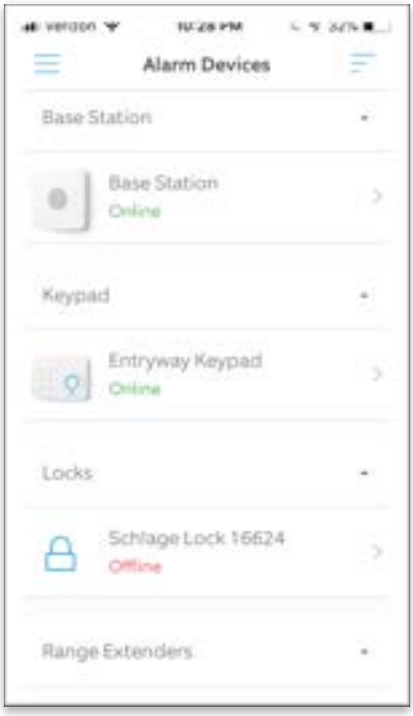
After being involved in the Web/UI/UX Design industry for around 14 years, it's easy to think that I am covering all of my bases when working on new or existing designs. Good design standards like color combinations, meta tags, alt tags, font types, font sizes, high resolution images and designing for mobile platforms are currently within my company's style guide. Catering to ADA compliancy by covering those things is a good start, but these things are only brushing the surface. The Human Factors class broadened my perspective on how much deeper this goes, especially when it comes to research. How everyday life is filled with products and experiences that could use improvements to overcome challenges. Recently, I discovered this when deciding to upgrade my front door deadbolt to a "more convenient" smart lock. Not only did I discover challenges, but my Airbnb guests did as well. I have chosen to review the Schlage Connect smart lock, Ring app, and instruction booklet, when applicable for each.

First, I will be discussing Visual Sensory for the Bottom-Up, Sensory System. When addressing the smart lock, first visual impressions were that it was of high quality by the look of the materials used. Also, the numbers on the keypad faded in and out, when the keypad was activated. The screen was said to be finger print proof, which proved to be true. There was a checkmark and an X to indicate if codes were accepted or not, which flashed and grabbed attention well. The checkmark and the X showed up after a code was entered every time, so the user got a response. However, they showed up green for the checkmark and red for the X (image taken from website, so style shown is different). While these colors

would make sense to most users with the U.S., would they give the same message to a user from another country? Also, the numbers on the keypad lit up in blue. This is concerning for the elderly or visually impaired users. Then, there was the issue of night visibility/usability. Although the blue numbers were a bit brighter at night, when deactivated, the keypad and numbers were both black. This may be okay if the functionality of the keypad was to first press any button to activate and light up the keypad. Instead, it wanted the user to put in the first number of their code while deactivated. Finding that first number was a challenge, even for someone young with good vision. Lastly, when inside your home, there was no visual indicator on the device when it was locked or unlocked. I would suggest that a light come on and stay on when the device is locked. This way a user can see from within their home when the lock is actually locked, without having to check the lock itself. Also, the instruction booklet used illustrations that were easy to follow and did not seem too elementary. Although, some diagrams could have been bigger and the blue text may present some issues in the elderly and visually impaired. Also, the image on the front varied a bit from the actual product. In addition, the smart lock used the Ring app, which was simple in design and provided help videos. The app did tell you whether the device was locked or unlocked, so this was nice since there was no visual indicator on the inside of the lock. Especially when a user is not near their front door or is physically unable to get to their door. Although, similar to the green checkmark and red X on the



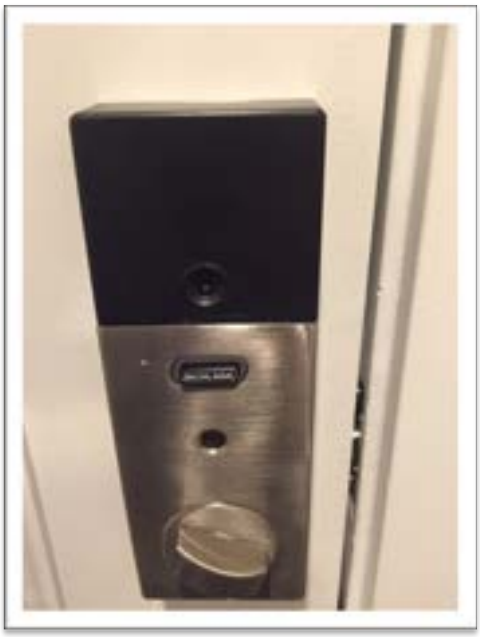
keypad, the app displayed “online” in green and “offline” in red. I would question the same here in regards to the color usage.

For Auditory Sensory when it comes to the smart lock, the user received beeps for different types of actions. There was one beep after each number was touched on the keypad. If the smart lock was locked or unlocked from the app, it also beeped once. It would be better to have 2 beeps instead, to differentiate from touching the keypad numbers. When locking or unlocking the device from the inside manually, no beep occurred. The same 2 beep response should happen for manually locking the device as well, to remain consistent. If the smart lock tried to lock when using the app, and didn’t complete the task, it beeped 3 times. This was effective by using a different number of beeps. It did also come with a built in tamper alert and forced entry alert to detect a break-in. A test feature in order to hear what these sound like would be great to familiarize a user. Also, the app provided voice activation through a few common devices, like the Amazon Echo, that made it very convenient to use when your hands were full or even for someone with physical disabilities.

Next, I will discuss Pre-Attentive Processing. The grouping or order of the keypad numbers was intuitive. There was more spacing vertically than horizontally, which resembled a cell phone keypad. The constancy of pushing the numbers, the number lights fading in/out, the

checkmark or X giving a response, and then the beep response when using the app or keypad proved to flow well. Due to this, habituation easily fell into place. The beeps and the fading in/out of the lights quickly became unnoticeable. Always the same expected action and given response. The device was attractive, sleek, modern, and high tech. Also, the same went for the app. Grouping was great with the use of icons and boxes. Spacing seemed to flow as well. It was fairly simple with the same expected action and response when it came to locking or unlocking the device.

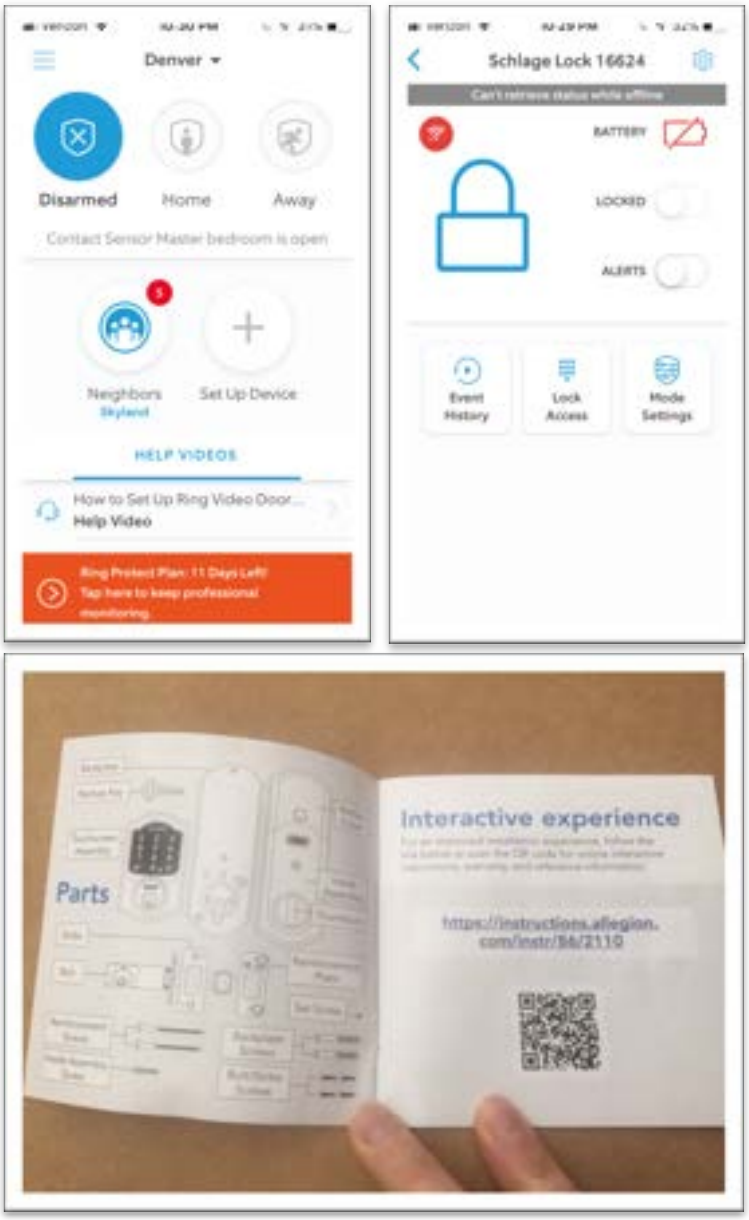
Now, I will talk about the Top-Down, Cognitive Perceptual Process, starting with Mental Models. For the smart lock, prior knowledge from using a basic deadbolt applied. The smart lock had a physical key option and locked and unlocked the same as a standard deadbolt. Also, the keypad looked similar to a cell phone keypad, as mentioned earlier, which also helped. For the app, prior knowledge with the Ring app or a similar smart device app helped as well.



For a novice, a major flaw with the smart lock was the lock button. From the inside, you could use the app or simply turn the lever. From the outside, it was not obvious how to lock the smart lock. The user was expected to push the Schlage logo at the top of the keypad. The use of a lock icon instead would be a great solution. Also, from the inside, there was a Schlage logo that did look like a button, but was non-functional. When it came to the app, it did a good job by providing helpful videos. However, this could be quite the learning curve for someone who has never or rarely used a smart device app or is not very tech-savvy. Even more confusing was the set-up of the voice activation. The voice

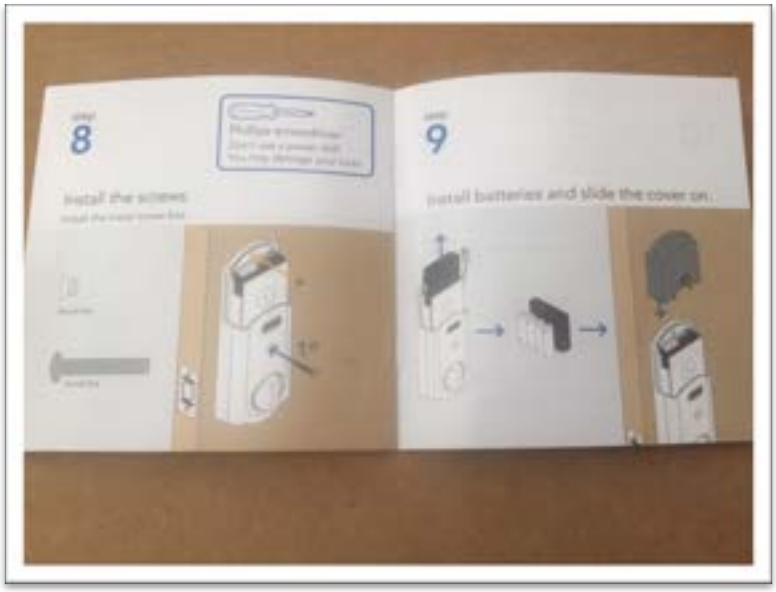
activation was not done through the Ring app. It was an additional skill that needed to be added to the Amazon Echo. Involving yet another app was unnecessary, in my opinion. This seemed to be an issue among smart devices in general. Each brand came with their own app. Hopefully, in the future, different brands can find a way to come together and all use one central app. Also, the instructions did a great job by providing easy to follow illustrations in a very small, simplified booklet.

For an expert, the smart lock, app, and instructions all passed the test. Although, the Schlage logo being the lock button on the keypad could still cause initial confusion. Otherwise, the keypad was easy to use. Most tech-savvy people know and use apps daily. The set-up of the smart lock was intuitive. The option to set up a device was on the home page and obvious with a large plus symbol next to it. All devices were listed clearly on your dashboard. Under the smart lock itself, were a few additional functions. The instructions had very simple, to the point descriptions to go with the illustrations. They also provided a QR code to additional online instructions.



Culturally, Schlage did a good job by providing instructions in French and Spanish. Also, the beeps, the use of the widely accepted color blue should work well for countries using the same numbering system. Although, I mentioned earlier that I had concerns about the red and green colors used on the checkmark and X. I would also question whether the checkmark icon and the X icon themselves would portray the correct meaning cross-culturally. Also, do all locks function the same in other countries? For the app, I am assuming it would automatically be displayed in their native language, since it did use GPS technology.

When it comes to cognitive skills, the smart lock did a good job by using a serif font for the numbers on the keypad. This would help children and poor readers. The instructions and app, however, chose to use san-serif fonts. These could be more challenging to read. The instructions did a good job with hierarchy, using large numbers for the steps and good sizing for headers and body text. They had good top-down flow and the illustrations catered to low literate users. Low literate users would also appreciate the videos in the app.



For the Sensory Memory System, the interaction with the smart lock and the app were good stimulus by keeping the user engaged. The Working Memory System would get a good

workout because the smart lock and the app force the user to interact regularly. Working to remember how to use these items on top of remembering the codes you have programmed. However, remembering these steps, codes, and even the app could be challenging for the elderly with decreased memory and for novice users. Fatigue and anxiety could become a factor in these situations. Otherwise, unique user codes and daily use of the smart lock and app should transfer over into the Long-Term Memory System over a short period of time.

From an emotions perspective, as previously mentioned, anxiety could become an issue for the elderly and novice users by lack of prior knowledge, visibility, and memory loss. Also, the beeping could be rewarding for some and could trigger anxiety in others. Otherwise, the smart lock, app, and instructions all were very minimal when it came to information density. There was a lot about this product that could be familiar from prior knowledge. In these ways, anxiety could be seen as low.

Lastly, motivation surrounding this product, mostly when it came to trust, could be a drawback to this product. The smart lock had a very odd feature where, if any resistance was felt while locking, it would automatically shift into "high-energy mode." This mode would drain the batteries on a daily basis. The existence of this mode was not mentioned in the instructions. There was no easy solution to put the lock back into "low-energy mode." The only solution was to reset the smart lock, which deleted all codes and the user had to start from square one. Also, the app tended to drop off of Wi-Fi often. So, the user was back to manually locking the smart lock. Now, the positive trust around this product came from the brand. Schlage is known to be high quality when it comes to locks. Also, it was a very attractive product. It looked elegant, secure, and expensive. The keypad felt and looked of top quality. It's ability to work with the Ring app and the Amazon Echo were very appealing, especially with the option of voice

activation. With the influence of positive emotions, this product could be very enriching and competitive. It is highly possible that users could overlook the hiccups of this product simply based on its trusted brand, fancy physical appeal, and rewarding emotional return.

In conclusion, the Schlage Connect smart lock, app, and instruction booklet formed a good product. I would like to see it be used in a test group to get more accurate feedback. However, from my observation, this product had its flaws, but mostly had a lot to offer. I did enjoy the look and feel of the product, simple instructions, and easy to use app. This product did make me feel more secure and it was nice to not have to carry around a physical key. It was also very convenient for my Airbnb guests. With that being said, I would recommend the use of this product.