The Anthropomorphizing of Technology

Jerald Belich

XD:MFA - ART 650

December 14th, 2016

Abstract

One of the incredible differences between humans and animals is our use of tools, or at least our drive to continue advancing the tools we use. Technology has gotten so advanced that we are able to start applying the attributes of living things to them, from the sad sounds of a Roomba stuck eating cords, to telling your apartment that it's a bit too warm with a response in kind. Anthropomorphizing, however, started long before now. From naming your firewood axe, to begging your old car to just make it home that one last time, we have been anthropomorphizing long before our tools could talk back. We grow fond, we negotiate, we focus our anger and gratitude, all upon objects never expecting to receive such a precious gift as life. Now, just as the Blue Fairy gave Pinocchio life, we are amidst the revolution of technology where designers can imbue their own ideas of life to the things they create, without the help of the user's imagination. This research is meant to assist those very designers in determining when and to what extent personality should be a part of their creations.

Contents

Introduction 4

Researchers 5

Methodology 6

Survey Data Breakdown 10

Interview Subjects 13

Results & Conclusions 14

Design Outcome 17

The Intervention 18

References 19

Introduction

This research project is a study into the anthropomorphizing of technology, and how users both provide personality and life to the tools they use, as well as how they react to technology with lifelike attributes already applied. Through surveys, interviews, and follow-ups, we aim to answer the following research question:

How do you determine if a piece of technology would benefit from "personality"?

It is only within the last decade that technology with the ability to talk to users and recognize responses has become widespread, primarily along with the advancement of smart phones and devices. The surprise, however, has not been users talking to their technology, but that it has started talking back. Although probably novel and exciting for the designers, users can find the new, more lifelike affectations anywhere from strange to downright jarring.

Certainly acclimation plays a part in attitudes toward new behaviors in tech, but there is also a danger that designers are putting the cart before the horse, more excited that they can create responsive tech than they are about finding out if it would benefit their users. Of course, this isn't a binary issue, and it isn't simply about whether or not human qualities should be part of our tech, and in fact it's important to distinguish the difference between making something more human, or simply adding personality. By focusing too much on human qualities, we run the risk of, as numerous interviews for this research revealed, finding ourselves in the "uncanny valley", where technology becomes uncomfortably close to human-like, while failing spectacularly to actually achieve that vital mark.

Any piece of technology can be roughly outlined by listing its various inputs and outputs, or in what ways a user can interact with the device, and in what ways it is able to communicate back to the user. This can be a great start in trying to determine how a given piece of tech, whether existing or theoretical, plays a role in the lives of its users. Designers have a responsibility to think beyond these obvious contexts, and try to take into account the grander scope of how people might live with their creations day to day. This is especially important with anthropomorphized tech as it deliberately steps into the territory of relationships, where bonds and trust are created, but if used irresponsibly, lost.

The scope of research extended to people within my personal network, as well as a much wider professional network. The goal was to find people that were users of modern technology, but to varying degrees; from tech literate with enough exposure to have opinions guided by firsthand experience, to having interest in exploring the latest interactive technology has to offer. Although this research was inherently limited in scope, I believe it was successful in finding a variety of subjects with valuable insights. With the data gathered, an initial framework has been developed in which to guide the thinking around applying personality to technology, specifically in aid the designers of future products, devices, and even services.

Researchers

The researcher who led this project was Jerald Belich, a graduate students in the Experience Design MFA program at Miami University in Oxford, Ohio. This research took place under the guidance of Dennis Cheatham, the graduate program director. Interviews were all conducted and coded by Jerald.

Jerald is also a professor of game design at Miami University, and an ongoing independent game designer specializing in alternative controllers and custom hardware games. Much of his work involves how people interact with technology, and the very tangible role in plays in our lives.

Methodology

In order to get an initial pool of data to help understand the landscape of how people typical use technology in their day to day lives, I created a public survey and posted it across varous forms of social media, specifically Slack, Facebook, and Twitter. The survey was signed to gather basic demographic information along with some details about how they currently interact with technology, both old and new, and an idea of the types of devices they own or use. It also provided survey takers a place to provide their email contact and permission to get in touch for a more detailed interview. This allowed me to examine the survey data and pick out subjects that would provide deeper context from a variety of sources, including gender, age, and how much technology appeared to play a part in their lives.

Below is the survey that was posted, which ultimately garnered fifty-nine responses.

Survey questions:

1. What is your age?
    a. Under 12 years old
    b. 12-17 years old
    c. 18-24 years old
    d. 25-34 years old
    e. 35-44 years old
    f. 45-54 years old
    g. 55-64 years old
    h. 65-74 years old
    i. 75 years or older
2. What best describes your household composition?
    a. Living alone
    b. Living with housemate(s)
    c. Living with significant other without children
    d. Living with significant with children

3. If you own any voice activated technology, how often would you say you use it?

    a. Daily

    b. Weekly

    c. Rarely or never

    d. I don't own any

4. When speaking with a voice recognition technology, do you ever use slang, colloquialisms, or nonessential etiquette (like adding 'please')?

    a. Often

    b. Occasionally

    c. Never

5. How often do you speak to technology that has no voice capability (ex: your toaster or car)?

    a. Often

    b. Occasionally

    c. Never

6. Have you ever named a piece of technology you own?

    a. Yes

    b. No

7. List the devices, and their names if you remember them.

8. Do you own or use any of the following technologies:

    a. Voice Controlled Smart Devices (Apple's Siri personality, Amazon's Alexa, Google's Ok Google personality, Microsoft's Kinect device or Cortana personality, etc.)

    b. Domestic Robots (robotic vacuum such as a Roomba, robotic mopping such as a Scooba, robotic lawn mower such as a Robomow, robotic alarm clock, gutter cleaning robot such as a Looj, robotic surveillance devices, robotic drink serving devices, etc.)

c. Robotic Toys (Sphero, Ollie, RoboRaptor, etc)

d. Please list specific devices from the categories above that you use.

The next step was picking out the subject to interview further. As timeline was a large consideration with this project, I made an initial list of viable candidates, around twenty of the fifty-nine, and contacted them all with a schedule of time blocks where I would be available for interviews. I ended up scheduling eight of them, and ultimately performing seven in-depth interviews.

Of the seven, three were female, four male, and the age ranges spread evenly across three primary age groups, ultimately between 25 and 54 years old. Data also indicated there was a reasonable range of more to less tech savvy within the group. Future research would highly benefit from a much larger pool of interview subjects, but as a pilot for such research, I believe a useful foundation has been laid for acquiring useful subject data.

The interviews were all conducted using Google Hangout video calling service. The audio was recorded, but not the video, though screenshots were taken as records of their environment during the interviews. Below are the interview questions used.

Interview questions:

1. How do you feel about using voice activated technology?

2. Can you recount any situations where you spoke to non-voice recognition technology? Examples being a toaster, or a car.

3. Do you think you are more likely to talk to technology using positive or negative language?

4. Can you discuss any technology that has ever made you feel less alone?

5. What do you think it is that makes you more or less willing to talk to a piece of technology?

6. Would you prefer technology stay clearly in the domain of tools, or that more human qualities should be applied?

7. Do you have any examples of nonessential language, such as ‘please’ or slang, you tried to use with voice recognition technologies?

    a. Did it respond to that language, ignore it, or did it’s disrupt function?

    b. How do you feel about that?

8. Imagine if technology was highly responsive to your feedback, for instance ‘please’, slang, or even insults like calling it ‘junk’, or reactions to nonverbal

feedback like touch, from petting or hitting a piece of technology. A reaction could be as simple as a change in responsive tone, performance time (slowing with negative language), or even temporarily discontinuation of service if 'offended'.

a. How does technology that could respond to your behavior in positive or negative ways make you feel?

The interviews were extremely revealing, I think even to the subjects themselves, insofar as their own behavior being highlighted in ways they weren't previously aware of. Although this research was interested in private behavior, it stayed outside what most would consider highly sensitive or private space which led to a far more collaborative exploration with the subjects. It was fascinating to work with the subjects to try and determine what it was that encouraged anthro behavior, and whether it was positive or negative expression that resulted.

I asked each subject if they would allow a brief, over email, follow-up to the questions I asked, of which all agreed. As the self-examination I was asking of the subjects was not something they were used to, I wanted to provide an opportunity to reflect, and even observe themselves with increased awareness. Approximately two weeks after the interviews I sent each subject an email with the following questions. At time of writing, five of the seven subjects have responded with additional thoughts.

Follow-up interview questions:

1. Please discuss any new or longstanding behaviors toward technology you have become aware of since our initial interview.

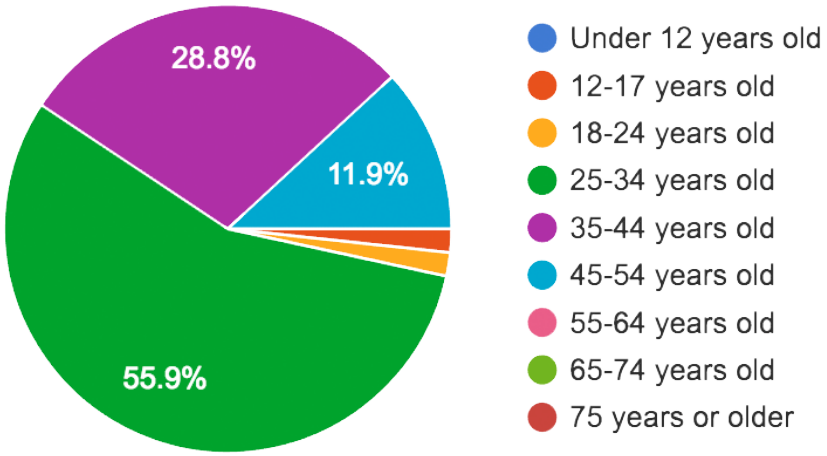
2. Have you recognized any new attributes of technology that affect whether you act toward a device as a living thing?

3. Do you have an updated opinion on whether or not technology should remain in the domain of a tool, or if applying personality is a good thing as it advances?

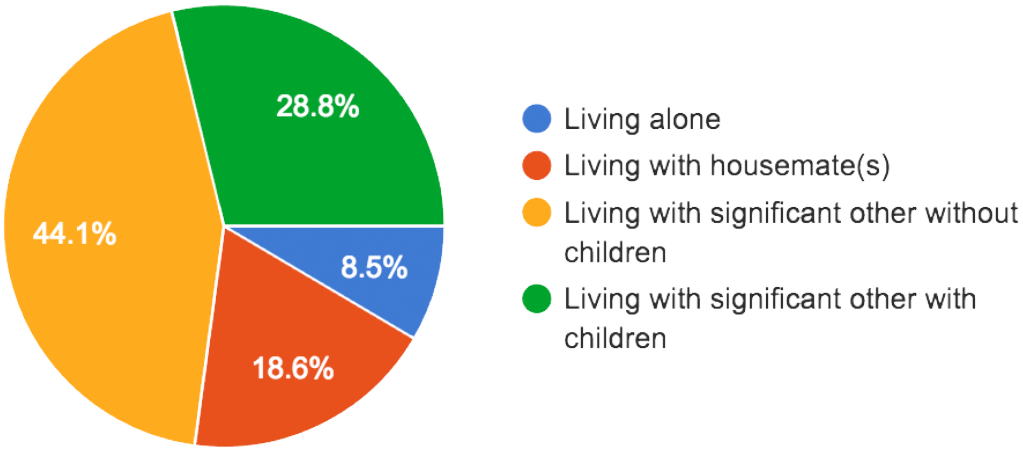
Of the five that responded with follow-up responses, three of them had valuable insights and even reported changes to their behavior. Based off the results, I think any larger study performed in this area should consider structured follow-ups in order to catch valuable responses that would otherwise be lost. The initial interview, no matter how thorough, cannot force deep introspection, nor provide a period of self-awareness.

Methodology:
Survey Data Breakdown (59 Responses)

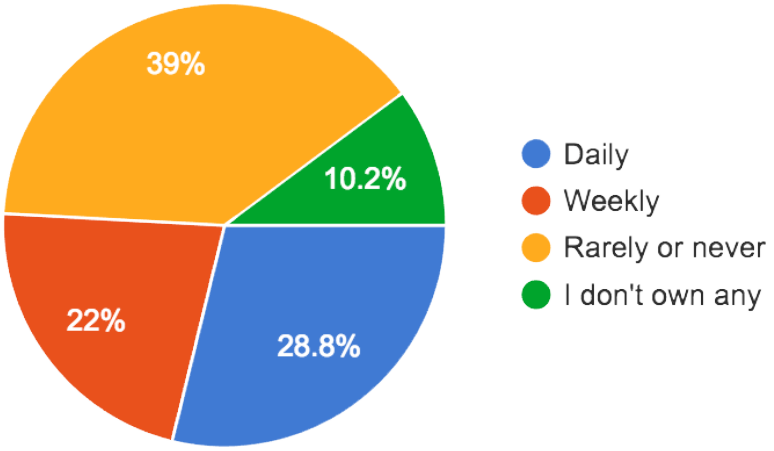
What is your age?



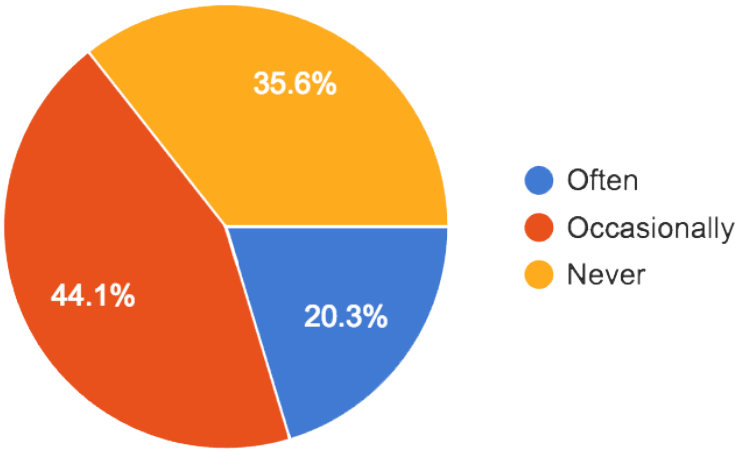
What best describes your household composition?



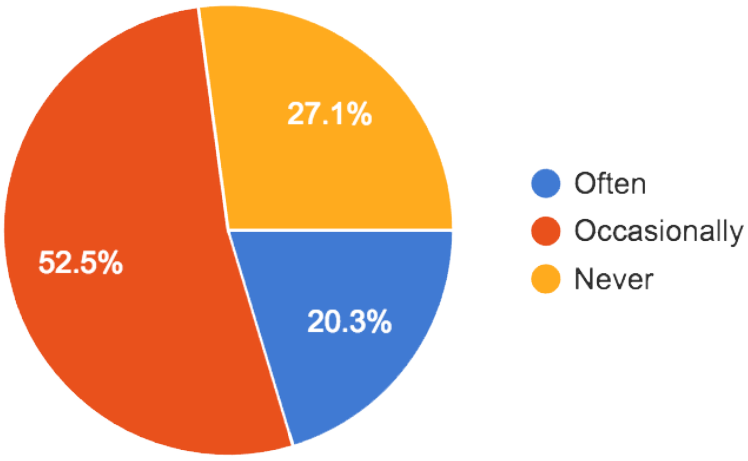
If you own any voice activated technology, how often would you say you use it?



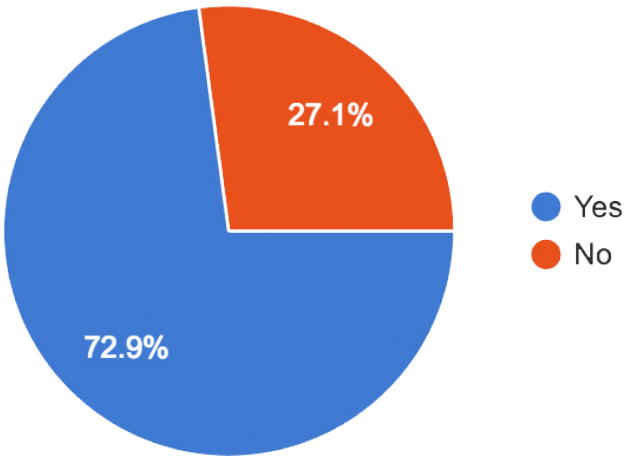
When speaking with a voice recognition technology, do you ever use nonessential etiquette?



How often do you speak to technology that has no voice capability?



Have you ever named a piece of technology you own?



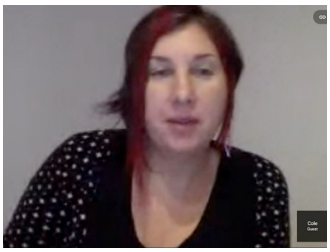
Methodology:
Interview Subjects

Google Hangout Screenshots

Age Range: 45-54

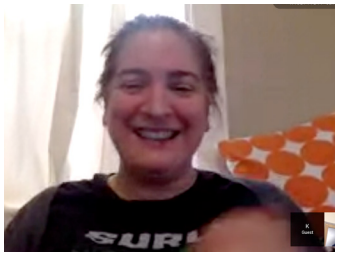
Age Range: 25-34

Age Range: 25-34

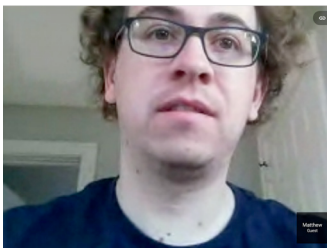


Age Range: 35-44

Age Range: 45-54



Age Range: 35-44



Age Range: 25-34

Results & Conclusions

One of the most fascinating results of this research, is how most subjects, despite age, living situation, or other variables, have a similar overall perspective. Subjects are all excited to some extent about the direction interactive technology is going, but deeply nervous about whether or not we'll get it 'right'. There is also consistency concerning the willingness of users to anthropomorphize their technology, especially 'dumb' tech, in a similar fashion as with a pet. In fact, it seems that 'dumb' tech is more often successful at being anthropomorphized that the new, more humanlike tech, especially interactive voice technology, which all subjects seem to find woefully lacking in emulating human interaction. I've found that it's the little things, quirks and a lack of perfection, and even frustrations that lend the technology to feeling more alive. To feel human is an additional feat, requiring depth that people are able to imagine, but have yet to encounter.

Alexa - Voice Control

Users, on the whole, appear willing to suspend their disbelief when it comes to the lifelike personality of technology, in order to provide themselves comfort or feel less alone. Adding simple affectations can reduce the barrier to that suspension, such as a support call robot playing the sound of someone typing, as recounted by one subject. The caller knows the automated system isn't actually typing, but it allows the user to easily imagine that there is in fact someone on the other end, that they are connected. Even the rhythm of artificial delays can be comforting, where instantaneous results, decidedly inhuman, may be jarring because the user feels unable to keep up.

There is a strong feeling across the subjects interviewed, not bound by age, that the more invasive a technology's personality becomes, the more important it is that users can disable or reduce the level of personality. There appear to be two reasons for this attitude. First, the feeling that the primary benefits of more invasive personality simply don't apply to them. If a microwave was given strong, human like personality, and the ability to understand the tone of its users, it could encourage those users to interact in healthier ways. Perhaps encouraging politeness, or rebuking foul language or being physically struck. This may be of great benefit to individuals that struggle with social cues or tempering their reactions to stress, but there may be many others that don't feel they need that sort of reinforcement while appreciating it can help others. Secondly, most subjects expressed a fear of technology simply gaining too much control. It is my belief that it is the combination of control and human qualities that cause this fear.

This shouldn't be surprising, as there is compelling evidence that we as a culture have some deep seeded fears about technology becoming more like us. It may be that it began simply through observation of our own history, and our self awareness in how terrible and destructive we can become, so it may not be such a leap that if we create advanced technology in our own image, we would become the designers of our own destruction. Modern media fills us with fatalist fantasies of artificial intelligence, and robot beings taking over such as in the Terminator films. Or more subtly and recently, stories like those told in the Black Mirror series are more disturbing in how much closer the future it depicts feels to where

we are now. We don't have to imagine all of the horrors of how technology could be used, because some of them are real, and some of the legislation that allows them to be spies rather than allies are real as well. It's no wonder we have these fears, and with the people that create these stories also consuming them, we have an Ouroboros compelled to continue the cycle. There is also the danger of falling into the "uncanny valley" when pursuing closely human personality, a concern expressed by numerous subjects. People become extremely uncomfortable around inhuman agents that are able to achieve closely human characteristics, but aren't quite there. Perhaps the problem is pursuing humanlike design at all, where the goal should instead be intelligent, but alien personality.

Roomba - Domestic Vacuum Robot

To imbue devices with personality at all is double-edged unfamiliar territory. The less familiar users are with a given technology, the more important it is to coordinate its meaning for them so they can understand its use (Bredies et al. 2010). There is a lot of frustration with current voice technologies, as they provide a breadth rather than depth of functionality, with users hitting the bottom of any given functionality quickly, and having little previous experience to know what else they can do. Despite being interactive voices, anthropomorphism is quickly diminished.

In contrast with voice tech, a device like the Roomba has been far more successful in feeling alive with the subjects interviewed. It expresses its 'feelings' through happy and sad bleeps and songs, and the color of it's lights. Anthropomorphism has been shown to aid in effectively learning how to use technology agents, and I believe it is the depth, not breadth, of functionality that best aids in achieving this (Fink et al. 2012). The Roomba teaches you quickly that a sad song means it needs help. It may be stuck somewhere or simply low on power, but it communicates with incredible clarity despite having no real voice. Even with voice, the capability need not be two way in order to be effective. Some of the awkwardness of voice interaction can be avoided by providing devices that are responsive to voice, but can't necessarily speak themselves. Afterall, when people talk to their pets, they expect a response, not a conversation.

If the more we attempt to integrate personality into our technology, the more users are put off by it, we are fundamentally misunderstanding what it is that users engage and bond with. The outcome proposed with this research is meant to help highlight the subtleties currently being glossed over. There isn't one simple solution, as adding voice has made abundantly clear. Ultimately, a service must be successfully provided, and those services are what drive the motivations of the user. An excellent example comes from one subject, who claims she was motivated to name and anthropomorphize her smartphone because it meant she would take better care of it, and be less likely to lose it. Upon reflection this makes perfect sense. If we draw once again from the pet analogy, wouldn't you be less likely to lose your dog than your phone? Even if the dog was just as small, we recognize the stakes to be higher, with an elevated responsibility.


AIBO - Robotic Toy Dog

Alexa - Voice Control

This research, though small in scale, has served perfectly as a pilot to outline a number of very strong research paths for larger studies. It is certainly a topic that subjects seem very willing, and interested in discussing, but haven't yet given much thought to. Further study would benefit from a number of interview follow-ups over a greater span of time, and even the addition of behavior tracking. At greater expense this could be done through observation in subjects homes or other primary environments, or much less granular data through subjects self-tracking by way of a simple device or mobile app. Finally, including subjects with little exposure to the technologies of interest and providing them with devices could be extremely enlightening, especially if the devices themselves could be augmented to provide usage data. Beyond how common smart devices already are, networked devices are going to increase even more rapidly, until full networks of devices, even traditionally low-fi tech, become standard. If our homes or offices become driven by personalities, whether fractured or unified, it will be vital that users, tech savvy or not, be able to seamlessly engage with and understand their use. The user must feel in control, and able to trust the tech.

Design Outcome

After data collection and coding was complete, effort was put into synthesizing multiple themes in order to frame different potential targets for intervention. Below is the path to the proposed vector for intervention, based on available data, resources, and time. The data provided insight into existing successes and failures for personality in existing tech, as well as the important clarity that the adding personality wasn't necessarily a positive attribute, for the users or the entities distributing the technology. It then seemed appropriate to attempt to improve this situation at the source, when the technology itself was being designed.

Theme

The implications of people anthropomorphizing their technology.

Intervening Question

How do you determine if a piece of technology would benefit from "personality"?

Actionable Statement

Examine the context (situation, emotional state, etc.), time spent with a device (how often, duration), and even the monetary value to determine if adding personality would provide a bonding with the device that benefits the relationship of user and device.

Design Outcome: The Intervention

Along with this document is a mockup to demonstrate how an interactive guide could be developed to help designers and developers think about the place their products have in their users lives. It is meant to integrate into the team's process, and assist with carving out design space for considering and iterating on the impact of personality.

At its heart, the proposed intervention consists of a list of attributes that any given design would have, where the designer would select from a corresponding list of values for each. These values could already be known, or simply be their current expectations. Designers would be encouraged to run through the guide numerous times with varying values for any attributes that are still in question. Based on the combination of answers provided, the designer would be provided areas of benefit and concern to consider while moving forward.

The guide would also allow the designer to provide information on the expected inputs and outputs their product would be capable of. This would allow the guide to also provide tips in how these inputs and outputs could be used for exhibiting the personality they may wish to add.

Example Attributes

Usage Context	Companion	Domestic	Work	Travel	
Purpose	Entertainment	Assistant	Chores	Health/Hygiene	Multi-Purpose
Physical Engagement	Passive	Intermittent	Active		
Mental Engagement	Distracted	Aware	Focused		
Time (minutes)	Minimal (1-5)	Brief (6-10)	Modest (11-25)	Lengthy (26+)	
Cost (dollars)	Cheap (1-5)	Low (6-20)	Modest (21-50)	Pricey (51-150)	Big-ticket (151+)

Example Inputs and Outputs

LEDs	None	Unicolor	Tricolor (Dual LED)	Full Color (RGB)
Speaker / Sound	None	Lo-Fi	Hi-Fi	
Movement Capable	No	In Place	Locomotive	
Wireless Connectivity	No	Short Range	Remote	
Speech Capable	No	Rudimentary	Phonetic	Natural
Voice Parsing	No	Keywords	Phrases	Conversational

References

Bredies, Katharina, Rosan Chow, and Gesche Joost. “Addressing Use as Design: A Comparison of Constructivist Design Approaches.” *The Design Journal* 13, no. 2 (2010): 156–79.

Fink, J., O. Mubin, F. Kaplan, and P. Dillenbourg. “Anthropomorphic Language in Online Forums About Roomba, AIBO and the iPad.” *2012 IEEE Workshop on Advanced Robotics & its Social Impacts (ARSO)* (2012): 54–59.