

Since the advent of Tamagotchi in 1996 the virtual pet industry has thrived. Whether the simple software-based pets like Tamagotchi, or the more complex physical robots like AIBO and Furby, these virtual pets have caused people to question what it means for something to be alive. These pets also prompt studies on what makes an interaction “real,” and whether these pets can be leveraged to make a difference in people’s lives, instead of just providing entertainment.

There have been numerous studies on the perceptions of children, including studies to determine if young children can tell the difference between what is alive and what is not. One of the earliest studies declared that children knew an object was “alive” or not based on if it could move of its own accord. Newer studies revealed that this was not the case, as children were quite aware that a garage door—an object that seemingly moved of its own accord—was certainly not alive (Hafner). However, virtual pet toys like Furby made the distinction a little more fuzzy. When asked, children described the Furby as being alive in a “Furby sort of way.” (Tuckle)

The strange alive-yet-not category brought forth by children had some devastating consequences. During a study with children and Furbys, there would be times when the Furby would break down. The children would be distraught at the untimely demise of the Furby, feeling betrayed when they realized that the pet was only a machine (Hafner). They would not settle for a new Furby either, as it was not the one they had grown to care for. This should not matter under normal circumstances, as each and every Furby is programmed with the exact same

software and is therefore only different in appearance. And yet, these children could not accept that their Furby was not a unique and somewhat-living being.

Examples like Furby show how virtual pets can affect the mental and emotional states of a child and have prompted the use of virtual pets in other business areas. For example, there are entire lines of virtual pets (such as Paro the Seal and the Huggable) dedicated to education and therapy (Danauta). A study that brought autistic children in to play with AIBO found the children acting uncharacteristically social (Danauta). In an experiment run by the University of Georgia, children were given an obese virtual pet dog that would become healthier as the children met their exercise goals. The study actually showed that the kids with a virtual pet were, on average, more active than those without (Bailey). Some parents also see the benefits of giving their child a virtual pet to show readiness for a real one (Polson Enterprises).

Timothy Bickmore discusses further applications of this new type of virtual reality in his paper “Friendship and Intimacy in the Digital Age.” He proposes that the advent of the Internet has not brought humanity together as originally predicted, but has actually isolated individuals from each other. Intimate relationships—relationships that go beyond shallow and frivolous interaction—have become a rare commodity. Psychology has proven that these relationships are very important to the ongoing health of individuals, and yet there are less and less truly intimate relationships. Bickmore’s solution is the “virtual friend,” much like a virtual pet but meant to be more of a conversational companion and outlet for emotions, in some ways a conversational diary (Bickmore).

With a virtual companion that could actually converse with a person, that person would invariably form an attachment, just as children form attachments to their Furbys, AIBOs, etc. While this could cause people to turn away from human interaction, it could also help people who are too nervous to talk to others get used to sharing their emotions verbally. A virtual friend could become the stepping stone to seeing a therapist or talking seriously with friends (Bickmore).

Bickmore also addresses the value of stability. People operate in such a way as to remain in a stable environment. When this stability is upset we look to something to re-center ourselves. Bickmore suggests that these virtual friends could fill this niche in a more satisfactory way than current solutions. The virtual friend would be an unchanging ally that could be relied upon for constancy and consistency in a world that very often lacks it (Bickmore).

Virtual pets are also affecting the “great Artificial Intelligence debates,” which originally centered around the question “could an artificial life (or computer) ever be intelligent?”. Intelligence used to be about how much the computer knew, and how it could use that information. But virtual pets are not necessarily knowledgeable. In fact, they usually do not know very much outside of their small environment. What makes a virtual pet like Furby feel intelligent is how it *responds to the owner*. If the owner sees emotions, actions, and reactions in the pet that look, sound, and feel like they come from a sentient being, then in some sense the pet is “intelligent” to the owner (Tuckle).

But not all virtual pets are successful. Certain traits of the pet change the way people interact with the pet and determine if an owner is willing to bond with the

pet in a meaningful way. Part of these traits involve the “uncanny valley,” a term coined by roboticist Masahiro Mori to describe the point where a robot is human-like and at the same time not human enough. Robots that fall within the uncanny valley are disturbing or disquieting to humans. Right before this uncanny valley is a peak where the robot holds some humanlike qualities but is definitely not human (for example: Mickey Mouse or Bugs Bunny) (Bryant). The same principle applies to virtual pets. This is why most virtual pets are beyond a doubt not human, but may share some human traits, such as emotive states or general anatomy.

Frédéric Kaplan speculates that virtual pets did not gain popularity because of any amount of realism or utility, but because of the exact opposite. Obviously Tamagotchi are not very realistic, but neither is AIBO. After all, most dogs are not metal-plated. They also hold no utilitarian value: they have no “greater purpose”. This makes them the complete opposite of what robots and software were originally envisioned to do: perform tasks for the benefit of mankind. This directly goes against Isaac Asimov’s Second Law of Robotics: “A robot must obey orders given it by human beings except where such orders would conflict with the First Law.” Pets like AIBO do not always do as they are told. They can get “tired” of play and decide to rest even if the owner does not want them to. Kaplan argues that this refusal of direct orders is what makes the AIBO feel alive, pointing out that as people we often ascribe intentionality to objects that behave in unexpected ways: the washing machine *decided* to stop working, the computer is being slow *on purpose*, etc (Kaplan).

But it is not just that the pet is a free agent. Any random free agent would not hold our attention as a virtual or real pet can. The success of these virtual pets, Kaplan argues, comes from the feelings they evoke in the owner. Essentially, a person feels responsible for their free-roaming virtual pet. There are consequences for not treating the pet well—in the case of Tamagotchi, the pet dies—and the owner feels wholly responsible for the pet’s welfare. Kaplan states that “[t]he trick is to create a positive feedback loop on the [owner] investment in taking care of the pet.” In other words, the more the owner interacts with the pet, the more positive outcomes there are for the pet and owner.

Basically, the pet is most effective when it is effectively useless (Kaplan). The pet should somehow motivate responsibility or inspire guilt in the owner to perpetuate the care of the pet as well, although finding the right balance between positive interactions (for example, pride in the pet’s growth) and negative interactions (such as the pet becoming ill from lack of care) can be tricky.

In this regard, I find virtual pet sites like Neopets are a fascinating case study. Neopets need to be interacted with and fed regularly to remain happy, but unfed neopets will not die. Instead, they may become sick or depressed. During my Neopet adventures as a child, I would spend a great deal of time with them initially, but I would eventually grow bored. The Neopets were not “pet-like” enough for me to feel a real bond, and therefore the pets would eventually be neglected.

The thin line between a charming toy and an engaging pet can be hard to pinpoint. There are many variables that come from the look, feel, and behavior of the pet. What is more important in catching the owner’s interest: looks or behavior?

Which of the pet's qualities keep the owner most engaged? Does customization of the pet increase the owner's affection? With my project I plan to tackle some of these questions.

For my project I am avoiding the question of look and focusing more on the question of behavior. I am designing a virtual pet square, called a Boxy, that a user can interact with. I chose a square because it seemed a neutral shape that on the "uncanny valley" chart would provide little to no starting affection. Thus, I can focus the affection of the user into the behavior and customization of the pet.

First: does customization affect the owner's levels of affection? In order to study this, when a user starts a new game and gets their pet for the first time, the program will randomly decide between generating the pet itself and allowing the user to customize the pet. Customizations will include the color, name, and "gender" of their Boxy. I expect users who get to customize their Boxy will be initially more attached to it than those that do not.

I will also be testing how responsive the pet should be for optimal affection and dedication from the user. The pet will have a "responsiveness" value initially set which will be used to calculate how the Boxy will move and react to user input. Higher values will result in more activity, while lower values will result in less. I expect that highly responsive pets will keep the attention of a user far longer than unresponsive pets.

The pet will also have a closeness rating. The more a user interacts with the pet in a positive way, the higher the rating. Higher ratings in closeness will raise the responsiveness value of the pet, while lower ratings can decrease the

responsiveness value. I think the “growth” component of virtual pets like tamagotchi is one of the positive feedback mechanisms Kaplan mentioned in his paper, and I want to see if a pet that grows more attached to the user as the user grows more attached to it is more appealing than a pet that does not change.

I will be tracking a few different metrics for this project. First, I will keep track of how much time the user has spent with their Boxy using Google Analytics. I will also track demographics using Google Analytics. Second, I will create a survey for users to fill out asking some basic questions about their experience with Boxy:

1. Were they allowed to customize their Boxy?
  - a. Did customizing Boxy make them feel more attached to their Boxy?
2. Could they understand when Boxy was happy, sad, angry, etc.?
  - a. Did they ever get bored of Boxy?
  - b. Did they feel an obligation to keep Boxy happy?
  - c. Did they care when Boxy was upset?
3. Was Boxy a burden?
4. What was Boxy’s best attribute?
5. What was Boxy’s worst attribute?
6. Would Boxy have been better if it was more than a square?

With these basic questions, I hope to gain an understanding of what makes a virtual pet successful. In turn, I think this could bring to light some interesting issues of the human psyche.

The psychological effect of the virtual pet on a person is less about the virtual pet itself and more about the way people form relationships. What makes a person

relatable? What base level of interaction is required for us to invest ourselves in another person? With a simplified example like Boxy, we can begin to address these questions. Boxy will provide a mechanism to measure investment based on interactivity, and provide a correlation between the two. If people are consistently more invested in livelier and more interactive Boxies, then perhaps that means people are more invested in others who are lively and interact in more noticeable ways. This could also be used to explain what factors allow us to anthropomorphize objects, and what kind of criteria must be fulfilled to anthropomorphize an object. At the very least, it will provide insight into what makes a series of pixels a loveable and endearing lifeform versus just another block of colors.

## Works Cited

- Bailey, April. Virtual pet leads to increased physical activity for kids, UGA research says. 14 May 2014. 11 March 2015 <<http://news.uga.edu/releases/article/virtual-pet-increase-physical-activity-for-kids/>>.
- Bickmore, Timothy. Friendship and Intimacy in the Digital Age. 08 December 1998. 11 March 2015 <<http://web.media.mit.edu/~bickmore/Mas714/finalReport.html>>.
- Bryant, Dave. The Uncanny Valley: Why are monster-movie zombies so horrifying and talking animals so fascinating? 23 June 2001. 11 March 2015 <<http://us.vclart.net/vcl/Authors/Catspaw-DTP-Services/valley.pdf>>.
- Danauta, Catrinel Maria. Virtual Pets: Interaction, Uses, Technology. 11 January 2012. 11 March 2015 <<http://mms.ecs.soton.ac.uk/2012/papers/21.pdf>>.



Hafner, Katie. What Do You Mean, 'It's Just Like a Real Dog'? 25 May 2000. 11 March 2015

<<http://partners.nytimes.com/library/tech/00/05/circuits/articles/25pets.html>>.

Kaplan, Frédéric. Free Creatures: The role of uselessness in the design of artificial pets. 28 May 2007. 11 March 2015

<<http://www.csl.sony.fr/downloads/papers/2000/kaplan-er.pdf>>.

Polson Enterprises. Tamagotchi as Simulated Experience and the Trajectory of Virtual Relationships. 20 June 2008. 11 March 2015

<<http://www.virtualpet.com/vp/farm/lleg/critical/cr1.htm#2>>.

Tuckle, Sherry. A new kind of object: From Rorschach to Relationship. 19 December 2012. 11 March 2015 <[http://edge.org/3rd\\_culture/story/101.html](http://edge.org/3rd_culture/story/101.html)>.