

Digital Puppetry and Talking Toys

Ten emerging theses involving talking toys and technology

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Abstract. Digital artist and lecturer Ian Grant will outline developing trends and scenarios where talking and listening to the speech of humanoid and non humanoid objects, toys, robots is a part of play and other imaginative work. Working from an expertise in puppetry, automata and the emerging new field of 'digital puppetry', the author will take concepts from many disciplines, embedded computing, voice synthesis, performance studies and educational drama (metaxis, role-play, absorption, projection, performativity) and apply them to the world of interactive toys and 'will see what happens'.

To organise the discussion, the author discusses ten emerging ideas in relation to speaking puppets, digital technology and talking toys.

1 INTRODUCTION

"Do dolls have souls? All children talk to their toys, says Charles Baudelaire, and 'the overriding desire of most children is to get at and 'see the soul' of their toys'. Rainer Maria Rilke would agree, with the difference that his child expects the doll to answer back and is disgusted when it doesn't." (Parry, 1994, v) [9]

When artificial objects speak, the presence of breath is intimated and an illusion of life should be more or less guaranteed. However, from our everyday experience of talking technology, we experience alienation, self-consciousness, strangeness, a sense of artificiality or spookiness ('uncanny valley' like feelings) or an acute sense of dysfunctionality.

"In so far as a sound is recognised as a voice, rather than a sound, it is assumed to be coming from a person or conscious agency." (Conner 2000:24) [4]

I will refer to key moments in the history of mechanical and digital talking toys with special reference to the emergence of talking virtual 'creatures', not only as surrogate pets, but as kinds of digital puppets. I will draw on insights from the field of performance studies, particularly: puppetry and digital puppetry, and relate emerging ideas to the human computer interaction of talking digital toys and play objects. I intend to explore how the current technologies of computer based speech synthesis and recognition are being applied in the creation of talking toys and games.

I am interested in what happens to the perception we hold about objects when they 'talk' and are seen to be talking, either through human agency or through embedded technology, like voice chips and facial animatronics. For example: I will discuss the relationship between non-animate talking dolls and different kinds of animated puppets like the 'mouth' puppet and 'character' toys. Other examples of digital talking toys range from objects like talking greetings cards, Texas Instruments 'Speak and Spell' to humanoid or anthropomorphised talking toys like the MP3 playing storytelling bears, like

Teddy Ruxpin or the *iTeddy*. What seductive, alluring pleasure and magic is lost when our play-things talk back at us? Or gained ²?

"[The doll] remained silent, not because it felt superior, but silent because this was the established form of evasion and because it was made of useless and absolutely unresponsive material. It was silent, and the idea did not even occur to it that this silence must confer considerable importance on it in a world where destiny and indeed God himself have become famous mainly by not speaking to us." (Rilke 1913/1914 in Parry 1994,33) [11]

1.1 Key Questions

Some key questions and issues:

- What happens to imaginative play and art when 'things' speak?
- What anthropomorphic role does voice, or en-voicing, have when we create virtual creatures or digital pets?
- What are the emerging models of HCI in speech activated and speaking objects?
- How have embedded speech recognition and learning systems been used to devise 'dialogical' digital toys?
- How is digitised speech used in contemporary toys?
- How are talking toys used to create narrative based experiences?
- What is the current state of voice activation and command recognition in toys and how is it being used to stimulate or constrain imaginative play?
- What happens when talking toys automatically move or have facial animation?
- Do talking digital toys enhance 'imaginative' play, story-making and children's role play? What happens to improvisational play when toys both speak and move and are, in effect, programmed automata?
- What are the trends in the interaction design of 'innovative' toys that embed digital speech technologies?

In order to discuss these questions effectively and include historical and contemporary references to key toys, companies, critical voices, theory, technology, design trends and other ideas, I propose ten emerging theses in section 2 as starting points for discussion.

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² See: <http://www.romanceher.com/talkingteddybear.htm> - "A digital message player inside the bear lets you record a 10 second message in your own voice. Each time the bear is hugged, the message plays back. This cute teddy bear is 12 inches tall. The white teddy bear is holding a bouquet of roses and the hidden pocket in the back which holds the recorder can also hold a note, ring, small gift etc. Batteries are included with it. Out of Stock Indefinitely."

1.1.1 SCOPE

In researching this paper, I have uncovered a quantity of talking technology issues and experiments, both historical and contemporary, that cannot be fully discussed or included here due to space. These include the role of talking technology in deaf and special needs education, patents and animatronics in the techno-entertainment complex, linguistic and semantic modelling in a-life simulations and screen-based games, experiments in analogue and digital voice synthesis in computer games and chat-bots and the like. Emerging trends like the use of embedded audio recording devices to included player voices in games and tangible objects (in "Nintendogs" and "Talking Teddy" from "romanceher.com") This paper is very much an early exploration that, hopefully, will establish and discuss useful questions around the complex of multi-disciplinary issues involved: these areas include developmental and social psychology, learning and play theory, computer science and AI, HCI and design, and creative writing.

For reference purposes, here is a list of the talking toys and objects I've considered for this paper:

- Hasbro's "T.J. Bearytales™", "Talking Furby™", Talking 'Aloha Stich™', "FurReal™" (they are as the blurb states "for real")
- Mattel's "Teen Talk Barbie™"
- Backpack Toys' "Teddy Ruxpin™"
- Thinkway Toys' "Interactive buddies" (their slogan "I'm a thinking toy ®", e.g. "the Buzz LightYear room guard")
- Microsoft's Actimates™, particularly "Barney the Dinosaur".
- Crying baby simulators (used in UK health trusts to dissuade teenage pregnancy). "Baby Think it Over" in the USA (Stanford University).
- Various Greetings Cards with embedded speech (some recordable).
- Mattel's "Diva Petz™" with Voice Signal's Speaker-Independent Speech Recognition Technology.
- "Talking Nano™" (non-representational 'Tamagotchi')
- "Yo, Dude™", from DSI Toys, Inc.
- "Rock Buddies™", from MGA Entertainment.
- "Amazing Amanda", "P.O.D.Z.™", from Playmates Toys Inc.
- "Hey, Man™", from Wow Wee
- romanceher.com's "Romeo" Talking Teddy
- Dr Allison Druin's "P.E.T.S".
- Justine Cassell's "StoryMat".

2 TEN EMERGING THESES INVOLVING TALKING TOYS AND TECHNOLOGY

1. Embedding talking technology in toys is more about control than play or exploratory learning.
2. Talking toys are first technological experiments, second, playthings.
3. Talking toys are monologic rather than dialogic.
4. Talking character-based toys, that are dependent on other media, are derivative and closed narrative systems.
5. Talking Toys represent an adult intervention into child-play.
6. What talking toys say is more important than how they say it.
7. Talking toys are of greater value when they are programmable and configurable by children.
8. Animated facial mechanisms attempt to re-embody disembodied voice and, in turn, over-concretise and limit imaginative play.
9. Talking toys are extraordinary simulators of intelligence and presence.

10. Talking toys, traditional and digital puppets and animated media forms are more inter-connected than we may first think.

2.1 Embedding talking technology in toys is more about control than play or exploratory learning

Puppetry, the emerging forms of digital puppetry and puppet like talking toys are all about 'control' in two important senses. There's the good old fashioned sense that such toys are 'cybernetic' systems where there is a feedback loop with the 'movement - action' chain and in the sense that such toys embed pedagogical rules and structures.

"The thing about playing is always the precariousness of the interplay of personal psychic reality and control of actual objects" (Winicott 1971 cited in Cassell and Ryokai, 1, 2001 [2])

Certain talking toys, the interactive series of 'Actimates' from Microsoft, have been criticised for the empty way they encode, like passive vessels, content from other media channels. 'Barney the Dinosaur', for example is controlled by signals from PCs, TV broadcasts and video tape. The dolls mouth syncs and sings with the representation of Barney on screen. *"Most commercial applications in the domain of tangible personal technologies for children are variants on dolls, with increasingly sophisticated repertoires of behaviours. Microsoft Actimates' "Barney" and Mattel's "Talk with Me Barbie" have embedded quite sophisticated technology into familiar stuffed animals and dolls. These toys, however, deliver adult-scripted content with thin layers of personalization, and do not engage children in their own fantasy play. In both cases the toy is the speaker and the child is firmly in the position of listener."* (Cassell and Ryokai, 2001) [2]

Microsofts learning toy theorist and actimate guru, Erik Strommen positions Barney as a mate, a learning pal, a friend.

But another aspect of 'control', is the propensity of talking toys to lie:

An extended extract from an interactive toy conference review, *"Interactive Barney: Good or evil?"* : *"When I hear Barney say, 'You're my special friend' – that's a disingenuous statement," said Allen Cypher, a founder of Stagecast Software, which designs children's programs. "It's a fraudulent claim. It deceives kids into believing that Barney has some emotional attachment to them, and that's not true." Other panelists worried about Barney's "authoritarian tone," or that he discouraged imaginative play. And some said that, while Barney himself was basically harmless, he may be a harbinger of worse to come: an interactive Cartman from "South Park," perhaps, spewing expletives and insulting his owner"*³

And one member of the audience asked if a child could take Barney apart and "reprogram him to say, 'Please slap me.' " "These products are designed to prevent that," Strommen said." [7]

When discussing 'control' it is important to note that it is not meant in a purely sinister, ideologically manipulative, way. Play, and particularly play where children animate and give voice to objects that surround them, is about children asserting control and (dis)order over facets of their environment: *"One essential aspect of childrens' spontaneous storytelling play is that it is child-driven. And this is important since children feel a sense of achievement and empowerment when they know that they can create and control the content of their play objects. So, if technology is to encourage childrens' creativity and, in particular, play a role in childrens' storytelling play, it must not dampen that child-driven aspect of their play."* [2]

³ See Hasbro's 'Aloha Stitch Doll' for an example of such a moody toy.

2.2 Talking toys are first technological experiments, second, play-things.

The history of talking toys and automata is clearly a story of technical innovation and development for the purposes of celebration, entertainment and play. According to Jasia Reichardt talking statues have been known since 2500 BC: "Some incorporated concealed speaking trumpets through which someone hidden could address a gathering. The idea was that gods communicated through the statues which represented them" (Reichardt, 1978, 9)[10] Of interest here, Jacques de Vaucanson created a number of mechanical automata including a 'flute player and defecating duck' (circa 1737-1738). On the 'flute player': "This automaton 'breathed'. Even though the art of mechanics was sophisticated enough by then to make the machine perform many other movements, and even though Vaucanson unveiled the fact that this breath was created by bellows, the very act of breathing, seen in an inanimate figure, continued to cause a stir well into the following century." (Wood, 2002, 21-22) [19]

The first talking doll was patented by Johann Nepomuk Maelzel in 1824. According to Gaby Wood "He designed a pair of bellows that, when attached to a tube, a widening oral cavity and a set of valves, could say 'papa' or 'maman'". (Wood 2002, 118-119) [19]

Thomas Edison's 'Talking Doll' (1891) - conceived as an advertisement for his sound recording device - embedded a miniaturised phonograph mechanism that played wax cylinder recordings of nursery rhymes, prayers and stories: "[The phonograph] began by speaking the words of a child, and it was not long before a child was invented to give it shape, or to give it life. So the capturing and reproduction of speech were accompanied by a casing for it in human form" (Wood, 2002, 18) [19]

The context around Edison's toy development has shaped the industrialised processes surrounding technical innovation and toys ever since. There is little perceived difference between Edison grafting a mechanical phonograph into a toy and *iTeddy's* implanted mp3 / mp4 playback device. Yet the former was an exercise in creating perfect representational forms of human (female) life, and the other a toy to placate media hungry children.

"Edison's colleague, W.K.L. Dickson, wrote that it was 'perhaps the daintiest and most suggestive of all the multiform uses to which the phonograph has been put.' He described 'roseate lips' which would 'lisp out the oft-conned syllables of nursery rhymes, pipe the familiar of Mother Goose's ballads, and give forth the cooing and wailing sounds of baby life Under such auspices into what enchanted realm will our ordinary toys be transformed." (Dickson cited in Wood, 2002, 114) [19]

Duncan Bannatyne, on a recent broadcast of BBC TV's venture capital reality show ⁴, said of *iTeddy*: "I'm so sad. Reading bedtime stories is a father's [sic] job. I don't want to be replaced by a teddy bear."

Talking toys that emerge from University research labs and university start ups are philosophically worlds apart from corporate toys from the likes of Microsoft, Disney franchises and the enormous toy companies like Hasbro and Mattel. The work of Justine Cassell at MIT with "StoryMat", Dr Alison Druin with the "PETS" projects ⁵ (from the Human Computer Interaction Lab at the University of Maryland) are distinct in pedagogy and interactive strategy from most commercially available toys. The toys have a clear philosophy of use as 'learning technologies' rather than simply embedding the

latest speech recognition and synthesis chips in order to maximise rich play or to aim for 'realism', or to service a franchise.

It should be noted that sponsorship relationships exist between the toy companies and innovative research groups in universities. An extended quotation from David Shenk's article *Behold the Toys of Tomorrow* illustrates the connections between technological innovation, the toy corporations and the University researcher. It also connects:

"The computerisation of toys also dovetails nicely with the ambitions of computer evangelists, those whose life's mission it is to deliver the power of computation into every aspect of every person's life. Nicholas Negroponte, the director of MIT's famously innovative Media Laboratory (the Vatican of techno-evangelism), noted last year in his *Wired* column that toys are the "fastest evolving vehicles on the infobahn," meaning that because of their astonishing turnover rate (each year, 75 percent of the toys on shelves are newly designed), they're the only class of objects that can truly keep up with the rapid pace of hardware and software innovation. That, combined with the tantalizing prospect of winning young, impressionable children over to the virtues of computers, has catapulted toy technology into high-priority status for the Media Lab. While researchers there have been exploring the issue for decades, they substantially upped the ante earlier this year with the formation of an industry-research consortium called "Toys of Tomorrow." A dozen or so companies, including Mattel, Tomy, Intel, and Bandai (makers of the infamous Tamagotchi "virtual pets"), have signed up, committing to at least three years of the \$250,000 annual sponsorship fee. In return for the funding (a modest R&D investment for any sizable company), sponsors get first crack at the new technology and ideas - a head start that seems bound ultimately to be worth many times that sum.

The Media Lab is a Willy Wonka factory for technophiles, where the only limitations are in the creators' imaginations. Intoxicated by the MIT fumes, one thinks: How could this not be a boon to society?" (Shenk, 1999) [12]

It should be noted that talking toys and animated toys are often adult orientated, rather than for children. This may be because such devices express the extraordinary fascination with what contemporary technologies can do. Jacques de Vaucanson's 'defecating duck' was not a toy - but a remarkable exploration of what clockwork and air power could do. Likewise, Edison's talking doll:

"One can only conclude that the [Edison's] dolls were not for children, and adults like [Albert Hopkins (Editor of 'scientific american' c1890)] were not alone in picking up on their aggressive horror. Formanek-Brunell quotes a survey taken at the time Edison's dolls were manufactured, in which a four year old girl, fusing the animate with the inanimate in a way that recalls Vaucanson's duck, said she didn't like talking dolls, because 'the fixings in the stomach are not good for digestion'." (Wood, 2002, 118) [19]

2.3 Talking toys are monologic rather than dialogic

Talking toys are rarely conversational agents, and interaction is heavily pre-determined. Randomising responses is one strategy that provides an illusion of knowing, active conversation. Such illusions are broken when the pattern or repetition is noticed.

Arguably, talking toys fix patterns and structure play and are, in nature, didactic and instructional. However, structured or programmatic experiences are crucial to learning, play and language development. I am not simply dismissing such toys dogmatically from some valorised over-emphasis on the value of 'free play'. Lev Vygotsky:

"Let us turn now to the role of play and its influence on a child's

⁴ See <http://www.bbc.co.uk/dragonsden/>

⁵ P.E.T.S. - "Personal Electronic Teller of Stories" robotic pets that support children in the storytelling process

development. I think it is enormous. I think that play with an imaginary situation is something essentially new, impossible for a child under three; it is a novel form of behavior in which the child is liberated from situational constraints through his activity in an imaginary situation." (Vygotsky, 1933) [18]

I would argue that more 'situational constraints' are imposed by over-structured, adult led, media influenced play, than child centred play. It may be a useful moment to introduce the term 'metaxis' used in education drama contexts for describing the 'dualness' of perception during role-play and 'as-if' contexts. Metaxis has been defined as *"the state of belonging completely and simultaneously to two different autonomous worlds"* (Boal 1995, 43) [1]. This definition has interesting resonance when considering the virtual realities created by digital talking toys.

2.4 Talking character-based toys, that are dependent on other media, are derivative and closed narrative systems

Often talking toys become extensions of pre-existing media that project ideas outwards, from toy to child, rather than being empty vessels that facilitate projection from child to toy. This is particularly acute in any toy that represents known characters from other media productions, the huge so-called 'character toy' market.

What difference does it make if the imaginary topic of make-believe style play with talking toys is sourced from existing media, rather created from within than the child herself?

Justine Cassell creates story environments and interactive objects to research the quality of technology assisted spontaneous play and story creation. She [2] carefully documents and quantifies the generative, creative effects of certain (I would call 'dialogical') interactive technologies. Using quantitative and visualisation methods, she carefully annotates the original spontaneous vocal contributions offered by children while playing with interactive toys. She also transcribes and qualitatively analyses the text of stories children create using her 'environment'.

2.5 Talking Toys represent an adult intervention into child-play

First, adults buy toys and design toys, and their associated pedagogy, for children. Children of a certain age exert pressure and express desires for certain toys, stoked by the marketing messages of the larger toy companies. Most talking toys enshrine messages and pedagogy from adults to children and on occasion seek to replace or act as surrogates for social parental contact: A selling point of a recent the UK designed toy, *iTeddy*, a strange 'Tellie-Tubbies' and iPod hybrid, a bear with a media player embedded in it's stomach, was the 'comforting' effect the toy had to placate children during the absence of a peer, buddie, parent or supervisor. The surrogate suckling / child rearing function of childrens media and TV are transferred into the toy itself. Like many toys of this ilk, *iTeddy*, refreshes its onboard content of nursery rhymes and stories using networked connectivity to a custom web-site. Interactive toy guru, Erik Strommen is having a fascinating career that takes in companies as diverse as "The Childrens Television Workshop" creators of educational puppet-fest *"Sesame Street"*, several game companies and Microsoft, where he worked on and promoted the Actimate series of interactive toys. In his 1999 paper *Learning from Television With Interactive Toy Characters As*

Viewing Companions" [16], and in later work ⁶, builds an extended theory of how talking interactive toys can act as 'scaffolding' for learning interactions, act as 'buddies' and simulated co-learners. In more recent work, Strommen clearly delineates between interactive toys as surrogates for adult interventions, toys as establishing shared contexts for extended social interactions (i.e. such toys need parental supervision and interaction) and pure play without any pedagogical intent: *"Whos in charge? If the children are the ones setting things up not just physically but conceptually, if they are showing each other what to do, collaborating, its play. If the children are being told what to do, led, directed, or tested, its not play"* (Strommen, 2004,) The more interesting counter-examples of toys not obviously promoting language acquisition are speaking toys that babble and create their own non-human languages that parody child language. Such toys do not induct nor reinforce the adult designed language structures of nursery rhymes, alphabet led rote learning and traditional language learning games. Such toys and characters, eg. the Norns in the Creatures series 'language' [3] and the talking Furbies native language 'Furbish', communicate through prosody and gesture and are not limited by the need to process real language structures. Bizarrely (and wonderfully - in terms of creativity and useless play) such toys have lead to the players acquiring and learning nonsense languages.

On developing "Nornish":

"We decided to look for a way of converting anything the Norns said into sounds, in such a way that a) the words sounded like speech, and b) a word would sound the same every time it was spoken, and c) different words should have different pronunciations. Just to make life difficult for myself, I also added d) similar words should sound similar. The first step was to record some speech. Luckily, one of the artists working on the game had something of a gift for making bizarre noises, so we gave him a script full of gibberish and recorded him babbling away. This was then chopped up into individual syllables, and electronically treated to give male and female voices. Having been presented with a large collection of syllables, I went through them and decided whether they sounded like the start of a sentence, the middle of a sentence or the end of a sentence. Having established these groups, I let "nature" do the tricky bit for me. I came up with a way of using a random set of numbers to convert any group of three letters into one of these syllables. I then let these random numbers "breed" until I had a vocabulary that fitted all my requirements - all groups of letters had a corresponding sound, similar groups sounded similar, and I could recognise the starts and ends of sentences. Norns have a very small vocabulary, so in principle, it should be possible to learn to understand "Nornish" - I confess I've never had the patience, though I'd love to hear if anyone has." (Peter Chilvers, no-date) [3] People have learnt "Nornish".

2.6 What talking toys say is more important than how they say it

Talking toys enshrine a pedagogy that has, in effect, remained unchanged since Edison's 'talking doll' of the late 19th Century'. The pedagogy is built on cautionary tales and stories, wrote learning of nursery songs and instruction led play.

Elsewhere in this paper, I have mentioned Microsoft's Actimate 'Barney the Dinosaur' being accused of lying - mainly because he doesn't have a consciousness yet talks freely of love. The ideological

⁶ *When the Interface is a Talking Dinosaur: Learning Across Media with ActiMates Barney* (1998) [13] *Learning from Television With Interactive Toy Characters As Viewing Companions* (1999) [14] *Interactive Toy Characters as Interfaces For Children* (2000) [15]

function of what talking dolls say is critical when evaluating talking toys.

The New York based Barbie Liberation Organisation (BLO), a group of feminist hactivists formed circa December 1993, undertook a remarkable operation to swap the voice boxes of 300 Barbie and G.I. Joe dolls.

"When Barbie speaks, little girls listen, which is why controversy erupted in 1992 when Teen Talk Barbie exclaimed, "I love shopping," "Meet me at the mall," and "Math class is tough." This last phrase struck an especially sour note, given the under-representation of women in the sciences" (Dery 1994) [5]

"The Simpsons" episode *Lisa vs. Malibu Stacey* is a wonderful parody of the 'Teen Talk Barbie' controversy. The episode explores issues of what dolls are programmed to say and activist / feminist responses to such things.⁷ There is even a subtle reference to the underground work of the *Barbie Liberation Organisation* when the girl doll "Malibu Stacey" is heard to say *"My Spidey-sense is tingling. Anyone call for a webslinger?"*.

Although the technologies of embedded speech are fascinating, whether using the latest embedded microprocessors for speech recognition and synthesis processors⁸, bellows and air, miniature phonographs, it seems that whenever toys talk the meaning of the iteration outweighs the possibilities inherent in technical act of production.

2.7 Talking toys are of greater value when they are programmable and configurable by children

2.8 Animated facial mechanisms attempt to re-embodiment dis-embodied voice and, in turn, over-concretise and limit imaginative play

"Phenomenologically, there is a close relationship between the voice and the face; both the voice and the face are parts of us that are turned outwards and by which the world knows us, but which we can ourselves only see or hear partially. They signify intimacy and vulnerability. We are our faces and we are our voices . ." (Conner, 2000, 401) [4]

It is a trend in recent talking toys, to have complex animated faces. This is in part due to a desire to create an illusion of an 'embodied' voice. Disembodied voices tend towards the 'uncanny'.

In the history of puppet theatre, there is a pronounced difference between forms that attempt to locate the voice 'within' an object by rhythmically mapping gesture and movement to voice and articulated face parts, and those forms that rely on the play of light on static sculpted forms of faces to suggest expression and facial motion. The misbegotten primary aim of 'more' articulation is 'more' realism - greater verisimilitude in the imitation of living forms.

This is echoed in the aims of makers Hasbro and Voice Signals recent technology expressed in a press release. The seek to offer a more interactive, 'richer' play experience through speech activation and recognition:

"We are extremely pleased that Hasbro has selected Voice Signal's MicroREC speech recognition software for this product [Aloha Stitch], commented Stewart Sims, Voice Signal's executive vice president of marketing. 'Hasbro has a well-deserved reputation for creating fun, innovative, quality products, and we are delighted that they have chosen Voice Signal to supply the speech recognition software

that increases the interactivity of their toys and brings 'Aloha Stitch' to life." [17]

In Hasbro's 'Aloha Stich', the Voice Signal voice chip creates a 'bi-polar' toy, that varies its responses to a set number questions according to one of two moods. I quote an online review of the toy by a parent at length as it is hard to access information about the performance and interactive sequences of most of the toys under consideration in the present paper:

"So just what kind of smack does Stitch talk? Here's a rundown of cues and replies

You say - "What's your badness level" He says - "Mostly Good Today" or a sheepish, "I'm having a pretty good day" when he's nice and Naughty! Blarrrtghll! when he's rotten.

You say, "Are you hungry?" He says, "Coconut cake and coffee, please." when he's nice and "Not anymore, I ate your dinner" when he's rotten.

You say, "Sing a Song." He sings Aloha Oe when he's happy and burps it when he's rotten (way too funny).

You say, "I know you can talk." He says, "Okay Okay" when he's nice and "Doggies cannot talk" or "Bark! Bark!" when he's rotten.

You say, "Got to Sleep" He says, "Very Sleepy. . Snore" when he's nice and barks, "No, make me a sandwich!" when he's rotten.

You say, "Where are you?" He says, "I'm with my family" or a very sad, "I'm lost" when he's nice and "Stinky Planet Earth" (which comes out yarth) when he's rotten.

You say, "Will you play?" He replies, "Surf's Up! Cowabunga!" or "I can't I have nothing to wear." when he's happy and "I'm busy get lost!" or "I'm busy you go away, okay?" when's he's rotten."

(anon, 2004) [8]

Inanimate children's toys, which the child enlivens with movement and either unspoken or spoken voice are, to me, more enduring playful simulations - as the mutability, the changeability, the fluidity of roles are emphasised through imaginative projections on a static face, rather than the repetitive 'fixed movements' of most automated articulated movement.

In an article on 'Mike the Talking Head' (an extraordinary head mounted facial performance capture system and CG digital puppet documented circa 1988), Valarie Hall comments: *"When it all comes together, the quest for realism in character animation is but a test for the animator to find out how good he/she is at using the tools they have at their disposal."* (Hall, nodate) [6]

Any aesthetic assessment about 'realism' in talking toys and how it effects play needs to balance manufactures promotional excitements with an assessment of the whole interactive system.

3 CONCLUSION

By means of conclusion, I will simply state the two remaining theses and leave them hanging for further cogitation. Also, this study has uncovered a topic richer and more varied than I had initially speculated and it is a pregnant ground for future research.

⁷ First broadcast: in "The Simpsons" Season 5, September 30, 1993 May 19, 1994

⁸ See the wonderfully named E.L.V.I.S. "the Embedded Large Vocabulary Interface System platform" from VoiceSignals Technologies. [17]

3.1 Talking toys are extraordinary simulators of intelligence and presence

3.2 Talking toys, traditional and digital puppets and animated media forms are more inter-connected than we may first think

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