

Relating to Things that Think

Animated Toys, Artificial Creatures, V-Avatars

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From music boxes to wind-up toys, from Tamaguchi to virtual Petz and Babyz, animated toys occupy a special place in children's lives. They are intriguing because they *do* things. Sometimes they even seem to have a mind of their own. They can be more or less responsive to a child's solicitations. In all cases, *objects that behave* are treated differently than inert toys. Obviously, toys need not be animated to behave in our imagination. In their pretense play, children endow things with life all the time, blurring the boundaries between animate and inanimate. Puppets, dolls, stuffed animals, and even sticks and brooms are made into living beings in their play. Children treat them as companions, with whom they talk and play. Adults too, interact with imaginary characters in all aspects of their lives. Fictional characters entertain us in books, films, plays, and TV shows. Yet, toys that actually behave elicit novel ways of exploring relational issues, like agency and identity. They engage our minds because of their ambiguous nature (between animate and inanimate). They intrigue us because of their relative autonomy (responsive but with a "mind" of their own), and because of their singular form of intelligence (a "mind" that can surprise us). Their hybrid nature allows to play out the fine line between objectifying minds and animating things, and come to grips with the hardships that identity formation involves.

We know from studies by Turkle (1995), Steward (1982), Inagaki and Hatano (1987) that people tend to attribute agency to objects that behave and to treat them "as if" they were animated, even if they know that these things are not really alive. Piaget in particular has long ago established that young children animate things that move, like clouds, water (Piaget, 1979). Humans also relate differently to objects that they animate in their imagination (personify) than to objects that they treat as merely reactive (objectify). What is less clear is the role attributed to personification as a lever for human cognitive and emotional growth.

Our own research on children and machines, children and robotics, and children and virtual avatars brings evidence to the idea that both *objectifying the subjective* and *subjectifying the objective* have a place in helping youngsters achieve a balance between embeddedness and separation, between empathy and autonomy. "To understand anything at all, we must envision it as having an independent subjective interior existence, capable of experience, obliged to a

history, motivated by purposes and intentions (...) Personifying helps place subjective experiences 'out there'; thereby we can devise protection against them and relations with them. Where imagination reigns, personification happens.” (Hillman, 1976, p.16). People’s abilities to treat fictional characters *as if* they were real and to personify things are important because they put empathy and creative imagination at the service of intelligence.

Kids and machines

In a pilot study on elementary-school children’s conceptions of simple machines, Brandes and I asked groups of children *what, in their eyes, makes something a machine, and how machines work.* (Brandes, 1992, Ackermann, 1999). We then presented individual children with a collection of images or toy models showing instances of machine-like objects. We formed clusters of objects with similar functionality yet different as far as their source of power, level of complexity, and control mechanisms are concerned (Fig. 1 a and b). Examples of collections include skateboard, bicycle, and car (all used for transportation); scissors, power lawn mower, and push lawn mower (all used for cutting). Other examples include a clock, a washer dryer, and a toy-robot (Fig 1).

Insert fig. 1 *Kids and Machine*

Although the children were far from unanimous as to which objects were machines, a number of regularities emerged. All the groups produced *definitions by use* 'A machine is something that helps you do your homework' or 'go places' or 'defend you against enemies', etc. Almost everyone drew a line between machines and non-machines in terms of an object’s level of autonomy, that is, its ability to transform an input in significant ways. Thus, an object is a machine if it can modify what you do in ways that make a difference. For one child, *scissors* are not a machine because “it’s you who cut”. A *push lawn mower* is a machine because “*you* push and *it* cuts”. For another child a *bike* is not a machine because “its you who pedal”, while an *aircraft with a bicycle mechanism* (as exhibited at the Boston Science Museum) is a machine because “if you pedal and it flies...then it’s gotta be a machine”. In the case of the bicycle, the transformation of a rotation into a translation (moving on the ground) is not perceived as being significant, whereas for the airplane, the transformation from rotation to taking off the ground is indeed significant. To conclude, elementary-school children’s criteria for 'machineness' remains to a large extent psychological / functional. The focus is not on *how the mechanism works* but on *what it achieves* and how it can be used to *add value* to an action.

Kids and Robotics

The Epistemology and Learning Group at the M.I.T. Media Laboratory has long been engaged in the design and evaluation of computer-based environments, or microworlds, to explore a variety of scientific concepts in children. Turtle geometry, for example, allows learners to draw geometric shapes by driving around artificial robots, or “turtles” (Fig 2a). Children teach the turtle how to move by programming it, using logo commands (Papert, 1980). In recent years, the group became more interested in exploring children’s cybernetic intuitions, their ideas about control and communication in humans, animals and machines. This has led to the design of a new generation of turtles that are more autonomous. Unlike their ancestors, these cyberturtles are equipped with sensors, which grant them greater self-regulating capabilities (Fig 2b).

Figures 2 a and 2b (*Kids and Robotics*)

In what became known as the LEGO Logo lab, we started exploring children’s ways of relating to, and describing the workings of, these new goal seeking or self-regulating cybernetic turtles. As in the case of simple machines, we noted that the question of significance, to many, was not *how does an artificial creature work?* But *what can it do on its own?* And *how should it be treated* so that it *responds* in interesting ways? It wouldn’t even occur to many children to *take apart* a creature to see what’s inside. Instead, they take their creature *as is* and explore *its* ways of evolving in its surrounds. Optimizing their 'dance' with the creature allows them to learn about *its* ways of being and relating to the child’s solicitations. The kids’ purpose, in other words, is to converse rather than construct, to mutually attune rather than break down, to empathize rather than analyze. What is true of children is also true, to a lesser extent, of adults (Grannott, 1991). Relating to artificial creatures *as if* they were partners enables people to experience / explore the dynamic of exchanges, the patterns of give and take, the degrees of mutual influence or control, so characteristic of human transactions.

Dialogues with Virtual Others

In all aspects of our lives, we engage in *imaginary dialogues* with a host of interlocutors, fictional or real, and through whose eyes we learn to see ourselves. Social Virtual Environments, or MUDs, even more than the previous robotics games, provide an unique occasion for exploring

kids' ways of relating to virtual others. And this time, the "others" in question are not *things that think* but *people behind masks*. They are real persons under disguise with whom the children talk and play via their own extended selves, or avatars (Fig.3.). Transactions among avatars occur *in real time* , an electronic *bal masqué* of sorts.

(Insert here Fig 3 (*Kids and Avatars*))

What's particular about MUDS, as compared to other role playing games, is the intricate connection between users and their avatars, and the immediacy and unpredictability of other player's response to one's virtual appearance. Attached to their avatars like a puppeteer to her string puppets, players act and feel through them. Avatars are both built by the puppeteer and brought to life by her. Projected outward, they act on one's behalf. It is the creator's strong connection / identification with their avatars that allows them to vicariously experience what the double "goes through". In MUDs, players often endorse multiple personae and launch them into different habitats at the same time. Putting on multiple personae is not new. What's different, is the ubiquity of self-appearances. It's like being in two "bal masqués" at once or maintaining parallel streams of conversation. Along with Turkle, I suggest that Social Virtual Environments indeed can be used to help people, young and old, work out intriguing mental events, foster projective imagination, and construct their inner and outer worlds.

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