

Beyond objectification: From robots as sex toys to a new theory of personhood

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Abstract. Robots as sex toys are commercially available now. When – and how – will they stop being glorified dolls and become not our sexual playthings but our partners? And what effect will that have on our understanding of ourselves? In this paper I suggest that sexual objectification is based on a fundamental misunderstanding of our physical nature that has filtered down from academia into popular discourse, reducing people to “nothing more” than physical objects. The antidote is an updated form of *neutral monism*, in contrast to the prevailing (reductive) *physical monism*. Although the current state of the art in robotic sex is indeed primitive, nevertheless, in contemplating the possible future development of robots as sex workers, one finds powerful opportunities for them to play an increasingly transformative role in our understanding of ourselves and what it means to be human.

1 INTRODUCTION

The currently available possibilities for erotic liaisons with robots are as limited as they are lacking in subtlety. That is, indeed, the selling point for the 5,000 or so robots off the RealDoll (<https://www.realdoll.com>) assembly line, even as the company plans for adding AI routines to give their products a greater authenticity of interaction. (Maybe one wants to forget, at least for a moment – but not too long lest one be creeped out by the Uncanny Valley [1]! – that one *is* just playing with a glorified doll.) Calling to mind Chalmers’ philosophical zombies [2], the RealDoll girls (oddly enough, they all seem to be “girls”) and their kin are all about physical appearance, with no one at home.

Back in the late 1980s, I heard Aaron Sloman give a talk on civil rights for A(G)Is. Sloman is long associated with the view that cognition – including conscious and reflectively self-conscious cognition – is essentially computation. Since he further sees those computations as tractable ones, civil rights for AIs – along with the potential for what amounts to “racial” discrimination against AIs – are very much on the table. Consider this passage from a volume of commentaries on Karl Popper [3]:

If a robot were to be made whose internal design and verbal and non-verbal behaviour indicated decisively that computational processes structurally similar to typical human mental processes occurred within it, this would still leave some people saying: but it is only a *machine* and so,

by definition ordinary mentalistic language is inapplicable to it.... At that stage, with the machine, pleading or “pleading” for friendship, for civil rights, for a good education, for a less uncomfortable elbow-joint, or whatever, we’d be faced with what I can only describe as a moral or political disagreement between those who asserted or denied, that it was conscious and suffered.

Sloman’s opinion is that Popper would be among those denying rather than affirming, using more or less the arguments that John Searle famously makes in [4]. However:

I see no reason to share this conviction, and neither would many people who had grown up with such robots as playmates, nannies, house-servants, etc. Thus for me, and for such people, it would seem morally right, to attribute subjective mental states, processes and events, to an individual with sufficiently rich and human-like internal computations.

Although I am suspicious of what, exactly, Sloman and others mean by claiming that thinking is computation (a seemingly straightforward yet notoriously underdefined word!) – not to mention what is “internal” about them – and although I think there are aspects of human and, indeed, conscious cognition that go beyond that which is even in principle algorithmically describable (a position I share with Roger Penrose [5], even though I come to otherwise very different conclusions by it [6]), I do think – *per* Sloman and *contra* Searle and (perhaps) Popper – that if the agent interacts with its environment in all the rich ways we expect of a (self-) conscious agent, then we should, for good practical and moral reasons, treat it as conscious – however it arrives there. How ironic then that the commercial pressure for richer, more “authentic” interaction should come from manufacturers of sex toys, interested not in the (re-)creation of consciousness but only the appearances of it.

Commercial sex toys aside, what researchers are doing now with robots and so-called machine consciousness³ is likewise modelling life and consciousness (in a still crude sort of way), not creating it – with no guarantee whatsoever that the former will lead to the latter⁴ (and with often a great deal of confusion about which activity the researchers are pursuing: witness the claims from several in the machine consciousness community – notably Uma Ramamurthy and Stan Franklin (see e.g. [8])⁵ – that their

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³ For a good introduction, see [7]. The author reflects the very ambiguity I present here: between modelling consciousness and attempting to (re-)create it.

⁴ Consider that, however sophisticated a model of an airplane I build, it will never become a passenger airplane. Likewise the most sophisticated of maps will never likely be confused with the territory it depicts.

⁵ The paper is from the proceedings of a symposium where many of the speakers described their creations as “minimally” conscious; Ramamurthy’s and Franklin’s contribution is notable for being the only one to make that commitment explicit in print.

creations are “minimally” conscious or “close” to being conscious). That said, at some point the models may cease being models, or cease being just models. At that point, the robot companions – their current status far below that of the sex workers polite society loves to look down upon even while paying for their services – may truly become human, in whatever sense matters outside the narrow confines of biological study, and truly need the civil rights protections that Aaron Sloman envisions for them. It is the consequent possibilities to re-conceive humanity/personhood that constitute, arguably, their greatest potential contribution.

Section Two puts forward the case for objectification – as the term is commonly used – being perhaps the most visible sign for a deep-rooted misunderstanding of human nature. Section Three offers my preferred alternative: a metaphysical position, based on neutral monism (as associated with the likes of William James, Bertrand Russell, and Spinoza) that I call *perspectival dualism*, emphasizing the essential role played by point-of-view. Section Four sketches out where all of this is meant to be going: toward a new theory of personhood, where the lines between the human and the non-human and between the individual and her physical and social environment both become blurred.

2 OBJECTIFICATION, DUALISM, AND THE REDUCTIONIST AGENDA

One finds, in popular discourse and academia, much discussion of the widespread tendency to “objectify” people, by which is meant, roughly, to reduce them to physical objects devoid of substantive cognitive dimension. So one hears e.g. “what a fine ass”, “what a pair of boobs”, “what a basket he has”, etc., along with pejoratives like “cunt”, “dick”, and “asshole”. Though the connection with (philosophy of) cognitive science on the one hand or robotic sex companions on the other admittedly may not be immediately clear, it is nevertheless – as I will attempt to argue – critical, revealing a basic misunderstanding of the nature of both persons (human or otherwise) and machines.

Not only does such objectification represent a perverse form of metonymy or, more precisely, synecdoche whereby the part stands for the whole and the whole is consequently reduced to the part; more importantly, it derives from what I see as a fundamentally misguided response to so-called *Cartesian* (substance) *dualism*: one that takes as its starting point the priority of the physical over the mental, an idea that has started out in the academic and philosophical spheres and filtered down into popular discourse and thinking, fuelling the tendency toward objectification. If bodies really are nothing more than biology and minds nothing more than neural firings – as such researchers as Paul and Patricia Churchland seem so keen to suggest – then aren't we all really “just” objects?

That the world around us should be composed of one basic substance rather than two is, indeed, *ceteris paribus*, the preferable way to view things, on guidance from Ockham's razor. The potential for confusion lies in the nature of that unifying substance and the means by which we approach and describe it.

In particular, the mistake lies in the conflation of two important-to-distinguish ways of understanding *personhood* (on

which point I wish to draw explicitly on Peter Singer's [9] explication of that term, as I will proceed to explain): namely, as biological organism and as cognitive entity. This conflation is made because of a mistaken assumption that there must be one and only one correct way to understand human nature, and that is in terms of what currently is understood as “physical” whereby, in principle if not in practice, mental reduces to physical and nary the other way around. Furthermore, and importantly, holistic explanations may be reduced to piecemeal ones: the whole is no more than the sum of its parts and, in a pinch, the part may well stand in for the whole. Such I take to be the agenda of reductive physicalism.

The common assumption among many a reductive physicalist, from Igor Aleksander [7] to Jaegwon Kim [10], is that physicalism just is *and must be* reductive physicalism. In that article, Kim is particularly striking for his failure even to acknowledge the existence let alone intellectual soundness of non-reductive physicalism.

Certainly reductive physicalism is a respectable and widely held metaphysical position – I take metaphysics here to be about starting assumptions that can neither be proven nor disproven but only shown to have greater or lesser explanatory value; but it is hardly the only possible such position. I take to heart Thomas Nagel's concern [11] that reductive physicalism seems empty in lack of a clear and generally accepted understanding of what “physical” stuff is, never mind what a “physical” explanation is (a point one finds echoed in contemporary quantum mechanics, with its ineliminable observer whose observation changes the observed⁶). Indeed, it is precisely such a concern that I take to be motivating David Chalmers' formulation of the so-called “*hard*” problem [12]. As Nagel so eloquently argues, it is not that the reductive physicalist case cannot be made; but the reductively inclined researcher is nevertheless obligated to give some substantive account of the “what it is like to be...” of experience and not simply wave it away.

All that human beings are is physically realized: that seems difficult to argue against – and, indeed, no non-reductive physicalist (as I consider both Nagel and Chalmers) seems the least inclined to do so. Their argument, and mine, is not with physicalism (as Frank Jackson attempted with his colour-blind Mary thought experiment [13, 14]) but with one narrow interpretation of it: one that gives inappropriate priority to “physical” explanations and assumes that the appropriate explanations for such physically instantiated entities as mind and consciousness are *precisely physically localizable* ones, defined by clear physical boundaries.

Meanwhile, even existing artefacts – primitive as they are – are more than “just” objects. That is not because – *pace* the arguments from Ramamurthy, Franklin, Aleksander and others – there is any reason to ascribe to them either cognition or consciousness or otherwise think that “anyone is at home”. (Cf. Aleksander [7]: “a robot conscious of the needs of an exploratory mission on Mars may not have the complex consciousness of a human being immersed in daily life, but may have a higher level of consciousness than a bee on a pollen-finding mission”.)

Rather, all that we observe about these agents – whom we design, in many cases, to act and even look like us – we do so

⁶ Even within conventional physics, a reliance on “physical” as *explanans* rather than *explanandum* suggests an oversimplification of a more complex picture, where physical matter and physical energy are

somehow two sides of one coin, as are matter and antimatter. Somehow the common “stuff” that is presumed to compose the entire universe is both matter and antimatter, both matter/antimatter and energy.

through one or another perspective, and perspectives are, by their nature, subjective, which is to say cognitive. This is played out in the ways in which we inevitably anthropomorphize our creations. Consider the very powerful emotional reactions provoked by Kismet with a few simple tricks, including a pair of mechanical eyebrows [15]. Meanwhile, the problem with existing artefacts is not – as is commonly claimed – that they “only do what they are told” (as any programmer of artefacts will tell you, they not infrequently behave in ways their designers never intended!) nor that they exist somehow independently of their environments. Penrose’s [5] claim to the contrary notwithstanding, *no* physical computer or computer-driven system is, in fact, equivalent to a universal Turing machine (an abstract mathematical entity that *can* be considered “strictly” independently of environment). The problem is not that the artefacts in question do not interact with their environments; clearly they do. Rather, it is that they fail to interact with their environments in anything like the richness of ways of even the simplest of living organisms.

A word of caution: even though, if I am right, no existing artefact can be attributed even “minimal” consciousness, that is *not* an excuse in any way for abusing that artefact. This is not only because of the way that certain existing artefacts inevitably remind us of ourselves – though that is important [16]; it is also because, as artefacts develop, the lines between appearances and actuality may be seen to become blurred. Consider Gigolo Joe and the other robot sex workers in Stephen Spielberg’s film *A.I.*, whose exploitation (along with that of their robotic kin) is certainly meant to make us uncomfortable. As interactions become increasingly sophisticated, at what point must we let go of any pretensions that these are “just” objects, to do with as we please? When, as in that film, does it stop being okay to ignore the robot’s pleas for mercy?

3 PERSPECTIVAL DUALISM

I am not in any way embracing Cartesian substance dualism – nor the (in my view) similarly problematic alternative of property dualism, which retains perhaps too much of what Daniel Dennett [17] has called Cartesian materialism. But dualism comes in a surprising number of flavours, from Chalmers’ “naturalistic” dualism (often mistakenly dismissed as substance dualism) to Jerry Fodor’s predicate dualism (which makes the dualism a linguistic matter) to various more exotic species, all of which are all too frequently lumped together under the single, despised label of “dualism”, as if dualistic thinking could and should be rejected altogether – something that I am inclined to think is impossible (what would “fully” non-dualistic thinking look like?... would it be able to make any distinctions at all between what is *X* and what is not *X*?) even were it desirable. I read Dennett as inclined to this what I take as extreme anti-dualistic view.

My own preferred flavour of dualism is one I call *perspectival dualism*, which has its roots in neutral monism, as opposed to physical monism (which often gets glossed simply as “physicalism” or “materialism”), where the nature of the unifying substance composing the universe is neither physical nor mental but something of both. I call it perspectival dualism to emphasize that the dualism in question is a dualism of perspective – of how one encounters and interprets the world – with a focus on limitations of perspective, rather than an attempt to address the “actual” nature of underlying reality. In this way it is a more epistemologically than ontologically oriented dualism: it is about

what we understand and how we come to understand it. At the same time, perspectival dualism is critically distinct from what is commonly referred to as epistemological dualism [18], with its bias toward metaphysical indirect realism and a form of representationalism; in the representationalist vs. anti-representationalist debates, my sympathies, though not entirely aligned with the anti-representationalists (I have someone like Dan Hutto or Shaun Gallagher in mind), are emphatically *not* with the representationalists, as they are usually defined. My role model here is Inman Harvey, who writes of representationalism [19]:

The underlying assumption of many is that a real world exists independently of any given observer; and that symbols are entities that can ‘stand for’ objects in this real world -- in some abstract and absolute sense. In practice, the role of the observer in the act of representing something is ignored.... The gun I reach for when I hear the word *representation* has this engraved on it: ‘When *P* is used by *Q* to represent *R* to *S*, who is *Q* and who is *S*? If others have different criteria for what constitutes a representation, it is incumbent on them to make this explicit. In particular I am puzzled as to how they can reconcile (if they believe it is not necessary to specify *Q* and *S*) the same symbol representing different things to different communities.

In brief: yes to representations, no to ontologically distinct “mental” representations and no to such ill-defined entities as “neural” representations. What makes something a representation is not where it is located – “in” the mind or “in” the world – but the (intentional) perspective that one takes on that something.

Perspectival dualism stresses that what one calls “mental” and what one calls “physical” reflect two competing, complementary, yet ultimately irreconcilable views on one and the same world – perspectives that people shift constantly and, for the most part, effortlessly and unselfconsciously between, to the extent that they remain largely unaware of them until their attention is drawn specifically to them and their differences. Either view without the other – when it comes to objectifying people or objectifying the world itself – is not just incomplete (missing half the picture) but fundamentally wrong. Echoing the point I made earlier, the mistake that is commonly made is to conflate these two perspectives – “mental” and “physical” – or to try to give one or the other some unwarranted ontological status. Likewise, I see a widespread but fundamentally mistaken faith that there is one *and only one* correct perspective on the nature of or explanation for any observed phenomenon. Instead, most phenomena of sufficient complexity will likely afford multiple, seemingly mutually exclusive explanations that line up remarkably well alongside one or the other of these perspectives.

Whether one is thinking of them as sexual beings or otherwise – and sexual drive truly is fundamental not just to human life but, seemingly, all of life that reproduces sexually, shaping every part of the human psyche, including its loftiest intellectual pursuits – people are *more than physical objects*; and their sexual drive is simultaneously and irreducibly “mental” and “physical”, of the mind and of the body, where “mind” and “body” are not co-referent. *Both* are physically instantiated. *Both* are mentally experienced. *Neither* explanation or perspective is or can ultimately be primary, the other derived. The reason why the so-called *mind/body problem* arises in the first place is because of this mistaken assumption that one “must” be reducible to the

other, creating an explanatory gap that somehow “must” be bridged. But the gap, thus created, truly is unbridgeable. Once one acknowledges the basic limitations of human cognition and the inevitability of competing perspectives, the gap dissolves; while acknowledging what one cannot do – namely, create a single unified perspective on “everything” (or, indeed, much anything of sufficient complexity) – opens up a universe of new possibilities for what one *can*.

To borrow a line from Nagel [11], the bottom line is that human cognition is knowably bounded in ways that the universe seemingly is not. An awareness of such limitations might be well to keep in mind when people debate – as they very possibly will – whether robotic sex workers of the future deserve human rights or some diminished level of rights or no rights at all.

4 PERSONHOOD REINVENTED

Presuming one does not simply dismiss the idea out of hand as absurd – as many, perhaps taking a cue from Searle, have tried to do – what would it take to be able to fall in love with a robot (or other artefact)? When does a sex toy become *not* a sex toy at all but another conscious being, with desires and needs and fears and impulses of its own – albeit one with a non-biological or at least non-standard evolution? Is it ever okay to treat such an agent as a sex toy to use for one’s pleasure, even if it did come off the assembly line an hour ago? If one believes – as I do – that such an attitude is profoundly morally wrong, then what must one do?

One needs – in short – to de-objectify the artefact. One needs to be able to look at the artefact *and not see an artefact*, not see it *as* an artefact but rather as another human being, with “human” understood in a wider than biological sense: i.e., to ascribe it what Singer [9] calls *personhood*, with his explicit intention to move personhood beyond (perhaps well beyond) the realm of the biologically human. Of course Singer’s target is other reflectively self-conscious species, as Gallup’s mirror test suggests chimpanzees [20], orangutans [21], bonobos [22] and with varying degrees of evidence dolphins [23], magpies [24], and elephants [25] to be; but there is no obvious principled reason not to extend the same notion to so-called *artificial life*, which – following the lead of Jordan Zlatev with his *semiotic hierarchy* [26] – I consider a necessary prerequisite for artificial agents achieving personhood (see also [16]). Neither is there any principled reason not to extend it to extraterrestrial species [27].

To truly “fall in love” – as I interpret that phrase – one must look at the Other – in this case, the robot – and see it as fundamentally “like me” rather than unlike, with similar needs and motivations, perhaps similar strengths and weaknesses, despite the outward differences of appearance. One needs, that is, to look through the veil that is superficial “external” appearance: the outward differences that mask the underlying similarities, hiding them from view with an aura of strangeness. Perhaps the veil disappears altogether; or perhaps it remains but as an incidental thing: no longer important. The veil discarded (or disregarded), one sees the artefact both as seemingly inert physical object *and* as living cognitive entity, both as observed *and* observer, both as stranger or alien *and* as friend, companion... lover.

The idea of one’s creations taking on a life of their own has a long history in speculative fiction. So prominently featured in *A.I.*, based on a short story by Brian Aldiss [28], it dates back at least to H.P. Lovecraft [29]. Of course, as both Aldiss and Lovecraft

would remind us, that need not mean that things turn out well – never mind “happily ever after”.

As our robotic companions, sexual or otherwise, become increasingly sophisticated in their interactions with us and ours with them, as we become increasingly uncertain whether we are modelling conscious intelligence or creating it – as we play, perhaps, at being gods – so two lines are likely to become blurred. The first is, of course, the line between the human and the non-human. Not so long ago – and in certain quarters still – inspired, perhaps, by religious ideas about a “separate creation”, there was seen to be an absolute divide between human beings and all the rest of the animal kingdom. As various skills and cognitive capacities once thought to be exclusively human have been found in other species (see e.g. [30]), there has been a not unrelated movement to extend elements of humanity and of human rights to other species through the expanding animal rights movement. Where, in the not-so-distant past, certain groups of human beings treated other groups of human beings as less than fully human – defining personhood more narrowly than the biologically human – now one finds movement the other direction, something it is perhaps hard not to see as a good development.

But there is another line I see likely to become blurred, and this one I see as potentially the more revolutionary. That is the line where one person stops and the next begins. It remains quite common to assume, as Singer for example does in writing that “we can never directly experience the pain of another being” [9], that one’s own conscious experience is strictly private – even as someone like Nagel [11] – for all his talk about the impossibility of imagining what it’s like to *be* a bat without in fact being a bat – seems careful to avoid requiring or assuming that; for Nagel’s arguments to go through, it is necessary only that conscious experience be *relatively* private. This is the way I think that phenomenologists, who like to talk about the “direct perception” of another’s feelings, without any need for theory of mind to mediate – here I have in mind someone like Joel Krueger [31] – should cash that direct experience out. The idea, for which I find inspiration in Andy Clark [32] – for all his desire to avoid any remote hint at extended consciousness within extended mind – is, as he expresses it, that “profoundly embodied agents” are “able negotiate and renegotiate the agent-world boundary itself” (p. 34). As the original extended mind paper asks: “where does the mind stop and the rest of the world begin?” [33] In this, I see three conceptual distinctions that are really one, and that, if the child development psychologists are correct, likely form the basis for all our other conceptual distinctions we proceed to make:

- self vs. world
- self vs. non-self
- self vs. other

When people fall in love, they often talk, if metaphorically, about losing themselves in the other. They often talk as well about creating a new whole, a new identity together, that is more than the sum of its parts. (This idea, too, finds its counterpart in speculative fiction: see e.g. [34], which concerns a romantic bond between two terrestrial but very alien-to-human entities, whose shared dreams play out in the waking human world.) Now, imagine crossing the seemingly unbridgeable divide, not simply between human and non-human, but between human and human-created artefact, creator and created. If that gap can be crossed, then why not the gulf between the self and the other? It is a longstanding if purely anecdotal observation that love that overcomes the greatest

obstacles tends to run the deepest. And in that case, what happens once one lets go of understanding individuals as isolated islands of consciousness? ...Once one starts seeing each individual both being substantively defined by and helping to define the other individuals around her? How much more should this be true in the most intimate of relationships that we form? Once one certainty falls – namely, that no human being could ever fall in reciprocal love with an artefact – what other certainties may follow?

RealDoll's creations are unlikely to change our thinking about ourselves in relation to our world – but their eventual robotic offspring very well might. At least, there seems no obvious reason why such agents cannot come to pass. Among all of the profound philosophical challenges that these agents are likely to provide us, it is the opportunities they raise for reconceiving personhood that constitute, perhaps, their greatest potential contribution. As the Marc Almond song goes, “tell me if you can / what makes a man a man”.

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REFERENCES

- [1] M. Mori. The uncanny valley. Tr. K.F. MacDorman and N. Kageki. *IEEE Robots & Automation Magazine*, 19(2): 98-100 (2012).
- [2] D. Chalmers. *The Conscious Mind: In Search of a Fundamental Theory*. Oxford University Press, Oxford, UK (1997).
- [3] A. Sloman. A suggestion about Popper's three worlds in the light of artificial intelligence. In P. Levinson and F. Eidlin (eds.), *ETC: A Review of General Semantics* (special issue), 42(3): 310-316.
- [4] J. Searle. Minds, brains, and programs. *Behavioral and Brain Sciences*, 3(3): 417-458 (1980).
- [5] R. Penrose. *Shadows of the Mind: A Search for the Missing Science of Consciousness*. Oxford University Press, Oxford, UK (1994).
- [6] J. Parthemore. *Concepts Enacted: Confronting the Obstacles and Paradoxes Inherent in Pursuing a Scientific Understanding of the Building Blocks of Human Thought*. PhD thesis. The University of Sussex, Falmer, Brighton, UK (2011). <http://sro.sussex.ac.uk/6954/1/Parthemore%20Joel.pdf>.
- [7] I. Aleksander. Machine consciousness. In M. Velmans and S. Schneider (eds.), *The Blackwell Companion to Consciousness* (87-98), Blackwell, Oxford, UK (2007).
- [8] U. Ramamurthy and S. Franklin. Self-system in a model of cognition. In: *Machine Consciousness 2011: Self, Integration and Explanation, Proc. Symp. AISB -11 Convention* (51-54), R. Clowes, S. Torrance and R. Chrisley (eds.). The Society for the Study of Artificial Intelligence and the Simulation of Behaviour, 4-7 April 2011, York, UK (2011).
- [9] P. Singer. *Practical Ethics*. Cambridge University Press, Cambridge, UK (2011).
- [10] J. Kim. The causal efficacy of consciousness. In M. Velmans and S. Schneider (eds.), *The Blackwell Companion to Consciousness* (406-417), Blackwell, Oxford, UK (2007).
- [11] T. Nagel. What is it like to be a bat? *The Philosophical Review*, 83(4): 435-450 (1974).
- [12] D. Chalmers. Facing up to the hard problem of consciousness. *Journal of Consciousness Studies*, 2(3): 200-219 (1995).
- [13] F. Jackson. Epiphenomenal qualia. *The Philosophical Quarterly*, 32(127): 127-136 (1982).
- [14] F. Jackson. What Mary didn't know. *The Journal of Philosophy*, 83(5): 291-295 (1986).
- [15] C. Breazeal and B. Scassellati. A context-dependent attention system for a social robot. In *IJCAI'99 Proceedings of the 16th International Joint Conference on Artificial Intelligence - Volume 2* (1146-1151), Morgan Kaufmann, San Francisco, California, USA (1999).
- [16] J. Parthemore and B. Whitby. Moral agency, moral responsibility, and artifacts: What existing artifacts fail to achieve (and why), and why they, nevertheless, can (and do!) make moral claims upon us. *International Journal of Machine Consciousness*, 6(2): 1-21.
- [17] D. Dennett. *Consciousness Explained*. Penguin, London, UK (1993).
- [18] R.W. Sellars. Epistemological dualism vs. metaphysical dualism. *The Philosophical Review*, 30(5): 482-493 (1921).
- [19] I. Harvey. Untimed and misrepresented: Connectionism and the computer metaphor. Cognitive Science Research Paper (CSRP) 245, University of Sussex, Falmer, Brighton, UK (1992). <http://www.sussex.ac.uk/informatics/cogslib/details.php?id=7602>.
- [20] G.G. Gallup, Jr. Chimpanzees: Self-recognition. *Science*, 167(3914): 86-87 (1970).
- [21] S.D. Suarez and G.G. Gallup, Jr. Self-recognition in chimpanzees and orangutans, but not gorillas. *Journal of Human Evolution*, 10(2): 175-188 (1991).
- [22] G.C. Westergaard and C.W. Hyatt. The responses of bonobos (*Pan paniscus*) to their mirror images: Evidence of self-recognition. *Human Evolution*, 9(4): 273-279 (1994).
- [23] L. Marino, D. Reiss and G.G. Gallup, Jr. Mirror self-recognition in bottlenose dolphins: Implications for comparative investigations of highly dissimilar species. In S.T. Parker, R.W. Mitchell and M.L. Boccia (eds.), *Self-awareness in Animals and Humans: Developmental Perspectives* (380-391), Cambridge University Press, New York, New York, USA (1994).
- [24] H. Prior, A. Schwarz and O. Güllürkün. Mirror-induced behavior in the magpie (*Pica pica*): Evidence of self-recognition. *PLoS Biol* 6(8): e202. doi:10.1371/journal.pbio.0060202.
- [25] J.M. Plotnik and F.B.M. De Waal. Self-recognition in an Asian elephant. *Proceedings of the National Academy of Sciences USA*, 103: 17053-17057 (2006).
- [26] J. Zlatev. The semiotic hierarchy: Life, consciousness, signs and language. *Cognitive Semiotics*, 4: 169-200 (2009).
- [27] J. Parthemore. The 'final frontier' as metaphor for mind: Opportunities to re-conceptualize what it means to be human. In D. Dunér, G. Holmberg, J. Parthemore. And E. Persson (eds.), *The History and Philosophy of Astrobiology: Perspectives on the Human Mind and Extraterrestrial Life* (67-92), Cambridge Scholars Publishing, Newcastle, UK (2013).
- [28] B. Aldiss. Supertoys last all summer long. In B. Aldiss, *Supertoys Last All Summer Long: And Other Stories of Future Time*, St. Martin's Griffin, New York, New York, USA (2001).
- [29] H.P. Lovecraft. *At the Mountains of Madness*. Start Publishing LLC, Jersey City, New Jersey, USA (2014).
- [30] M. Osvath and E. Karvonen. Spontaneous innovation for future deception in a male chimpanzee. *PLoS ONE*, 7(5): e36782. doi:10.1371/journal.pone.0036782 (2012).
- [31] J. Krueger. Direct social perception. In L. De Bruin, A. Newen and S. Gallagher (eds.), *The Oxford Handbook of 4E Cognition*, Oxford University Press, Oxford, UK (2016).
- [32] A. Clark. *Supersizing the Mind: Embodiment, Action and Cognitive Extension*. Oxford University Press, Oxford, UK (2009).
- [33] A. Clark and D. Chalmers. The extended mind. *Analysis*, 58(1): 7-19 (1998).
- [34] T. Sturgeon. *The Dreaming Jewels*. Vintage, New York, New York, USA (1999 [1950]).