Skeuomorphic Reassurance: Personhood and Dementia

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Abstract. User interface design needs to be revisited for people with dementia. This paper introduces 'skeuomorphic reassurance' as a guiding principle for human interfaces in technological design, particularly for older people and people with dementia (PwD). Skeuomorphs exhibit decorative design elements reminiscent of 'parent' objects that incorporated such design elements because they were structurally integral.

The philosophy of personhood is discussed in the context of dementia, concluding that the subjective character of conscious mental processes is an irreducible feature of reality, and the persistence of personhood in PwD supports this assertion.

Assistive technologies that aid carers, as well as PwD, need to ensure that skeuomorphic reassurance is incorporated in their design, not least because older people and PwD need recognisable interfaces today, but because the problems today's over-65s have with digital technologies may not go away, but re-present themselves generation after generation, unless skeuomorphic reassurance is built into their design.

Keywords: Person centred care · Family centred care · Applied ethics · Personhood · Dementia · Digital inclusion

1 Introduction

As the literature grows concerning older people with neuro-cognitive declines, user interface design needs to be revisited. This paper aims to promote the concept of 'skeuomorphic reassurance' as a guiding principle for human interfaces in technological development and design, seen most recently in Apple's smart watch design [10]. It does so set in the context of a number of developments in the contemporary social landscape: (i) an ageing world population, (ii) the persistence of personhood amidst the occurrence of dementia in otherwise physically healthy older people, (iii) the accelerating rapidity of technological development, (iv) the importance of combating digital exclusion of the elderly as an on-going, and not merely a one-off imperative. We shall address each of these issues in turn. This constitutes, of necessity, a position paper, rather than one presenting results of research, laying out the conceptual background behind a planned

research programme aimed at discovering what the guiding principles - and associated techniques - of skeuomorphic reassurance might be.

A skeuomorph is any object that exhibits decorative design elements reminiscent of 'parent' or antecedent objects that incorporated such design elements because they were structurally integral [67]. The moulded stitching on a plastic jacket recalling the actual stitching on a leather one is a good example, because it also includes both the implied technological advance - from traditional materials to modern materials - and the implied 'retro' chic that makes the old materials, and the old ways of making jackets, seem somehow more attractive than the new, which need no stitching at all. Increasingly, the old materials alluded to in skeuomorphs, are simply no longer in use - or only in expensive artisan shops -but the aesthetic nonetheless remains. In the context of digital interfaces, such skeuomorphs are everywhere, from the floppy disk icon one clicks upon to 'save,' to the Super-8 film reel icon one clicks upon to shoot digital video.

The key concept of this paper - skeuomorphic reassurance - is built upon the knowledge already embedded in much technological design that the human interface adopted by new technologies needs to be carefully balanced between novelty and recognisability.

For older people with neurocognitive disorders, for whom long term memory often remains intact significantly longer than short term memory, the use of skeuomorphs promises a more meaningful and memorable means of engaging with, in particular, innovative technologies which aim to augment disease-related declines in cognition. What we bring to this is the assertion that this balance is inevitably a moving target: the digital exclusion of the elderly is not a one-off problem that will be overcome once those currently over 65 have all died. As has been shown in other work, given the frequency of technology changes, it is important to re-examine design principles [3, 12, 15, 60]. Those who are today's tech-savvy twenty-something digital natives - who may have never seen a floppy disk let alone a Super-8 camera - will in forty years' time be faced with the self-same problems as today's elderly population, unless inclusive design principles are embedded into the education of technologists and interface developers by the educators of today.

2   Contemporary Ageing, Cognitive Decline, and Dementia

According to the UN's 2013 report on World Population Ageing, "The global share of older people (aged 60 years or over) increased from 9.2 % in 1990 to 11.7 % in 2013 and will continue to grow as a proportion of the world population, reaching 21.1 % by 2050" [61]. These are big numbers, and the coming 'second machine age' of automation and robotics promises a host of technological solutions for the care and social engagement of the elderly [6, 11, 51, 62, 63].

Health and welfare are an extremely important part of the wider economy, and many technologists will make their living from providing technologies specifically to meet the needs of older people. Being economically productive is not restricted to being part of the working population. Whole new markets are already opening up catering for the interests and activities of the growing population of economically active individuals who are no longer in work, but whose (pension and asset-based) incomes are still being

spent. The focus for the authors of this paper is one very special feature of ageing: the phenomenon of neurocognitive disorders, particularly dementia.

Defined loosely as a disorder of the mental processes marked by problems with memory, personality changes, and impaired reasoning, dementia is a spectrum, described as "a set of symptoms that may include memory loss and difficulties with thinking, problem-solving or language" [2].

A common misconception of dementia - that as the mental processes gradually collapse an individual's 'personhood' also vanishes - has long been challenged in the medical literature [20, 22, 23, 25, 29, 37, 40, 44, 57]. Others challenge the stigma against older people even more broadly, at the same time welcoming the deconstruction of 'senility', in the 1970s and 80s, as a treatable disease (Alzheimer's as the most common among many) and yet pointing out how the public information campaigns concerning Alzheimer's have heightened, not lessened, the stigma, through generating even more fear than the less-well defined condition of senility ever did [4].

The stigma translates all too often, moreover, into poor care. There are numerous examples in the literature of unsafe, dehumanizing and disrespectful behaviour toward PwD, which deny personhood [8, 44]. For instance,

> They had a habit for a while of taking off her diaper and pulling down her pants and leaving them around her ankles [at nap time] and it bothered me. One time when I happened to be there when she was waking up from her nap, she was just squirming and moving all over that bed and frowning. I kept saying, "Mom, what's wrong?" "Nothing". "Does something hurt?" "No". I finally figured out that she's trying to move her legs and can't. Who of us would lay down for a nap and pull our pants down around our ankles and leave them there? None of us.[1]

We would argue that the view that personhood vanishes as dementia increases relies upon a philosophical definition of personhood that has itself been robustly challenged. The challenge is taking place on several fronts, but of most interest to this discussion are the arguments in political philosophy, in the biological and mechanical understanding of life, and in the philosophy of personhood.

3 'Rational Man' and the Philosophy of Personhood

Much political philosophy rests upon a renaissance understanding of the 'rational man' of Descartes [18], who with Locke's [32] rights of accumulation of unowned resources, Rousseau's social contract [50], and Kant's morals [24], establishes himself in the liberal world. Even Rawls' more contemporary notions of social justice rest upon this same foundation [49]. This definition of the human has come in for a good deal of criticism in recent years - not least from feminists (e.g. [39, 41, 42, 48]) - for its depiction of personhood in terms suited to a (male) capitalist political settlement concerned with protecting itself from royal and aristocratic appropriation [19, 33, 34]. It may have been useful in the 17th and 18th centuries, it is argued, but is today responsible for creating its own new aristocracies of billionaires at the top of a very unequal society [30].

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[1] [44 p. 226].

Similarly, there is renewed distrust in the 'rational' man's more contemporary depiction of the human as biological automaton. Wiener's cybernetic understanding of life in terms of feedback processes [66], was challenged by the second-order cyberneticists of the decades following his work [5, 36, 46, 47] for whom the observer became integral, and has been largely debunked by the complexity theorists in contemporary evolutionary biology [9, 21, 26, 31], for whom life is a spontaneous self-organised order at the edge of chaotic network dynamics.

Thought experiments in the philosophy of personhood, meanwhile, such as Parfit's [45], have suggested that 'persons' might be surgically transferable in half-brain portions between different bodies, if only we were to understand such personhood as mere eliminable epiphenomena, dancing flame-like upon the 'real' activity of synaptic electrochemical pulsations. All that makes us human, for such 'eliminativists', is mere illusion, an insubstantial froth upon the reality of biochemical predetermination. To Churchland and his followers, "our common-sense conceptual framework for mental phenomena"[2] should be seen as a tacit theory that we absorb in childhood and make use of every day. This is to suggest that mental-state terms, ('I feel happy', 'I want to dance' etc.) in short, are theoretical terms. This folk psychology 'theory,' for Churchland, - known as FP - is both tacit and empirical - we don't think about it, and it is neurological in origin. In its harshest form - 'eliminative materialism' - FP is, however, regarded as a seriously mistaken theory - a "degenerating research programme" in Lakatos' terms[3]. We have rested upon its tacit use for millennia without it seeming to progress. Churchland argues, moreover, that the posits of seriously mistaken theories - such as Stahl's phlogiston[4] for example - do not exist. His conclusion, therefore, is that mental-state terms refer to things that do not exist, or in other words, that mental-states do not exist. Folk psychology, for Churchland, will eventually be "displaced, rather than smoothly reduced, by completed neuroscience"[5].

Here we are at the fulcrum of the debate between compatibilists and incompatibilists - the stand-off between free will, for which read mental-states that have meaning in the world, and determinism, for which read scientific materialism. Free will may be compatible with determinism, in which case all is determined only up to a point, or incompatible with it, in which case either nothing is determined, or there is no free will. Without going too far into the debate, the authors suggest that the evidence of personhood amongst dementia sufferers may have an important impact upon its outcome, and that skeuomorphs are a key aspect of that evidence.

For Parfit, and, by extension, for some of the eliminativists, 'memories,' once re-imagined as 'q-memories' - simple neural firings and synaptic chemical exchanges - could be transferable, and thus personhood transplantable, and if these neurobiological processes deteriorate, personhood vanishes. This acknowledges what is known as the 'supervenience' of physical science, from the dynamic forces of mechanistic physical properties all the way up. In contrast to this supervenience stand three other possibilities:

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[2] [16 p. 68].
[3] [16 p. 75].
[4] [16 p. 81].
[5] [16 p. 67].

(i) that of emergent properties, faculties that come about where the whole is greater than the sum of (in this case neurochemical) component parts; (ii) panpsychism, wherein such faculties as subjective consciousness are apparent everywhere, in everything, only to varying degrees [35]; and (iii) the possibility that the 'supervenience' of physical science is a veil covering science's ignorance of the processes of subjectivity, which are - must be - as real as any others, but for which the sciences of our day are as yet inadequate to the task of understanding. For all these views opposed to supervenience, memories could never be ever anything other than 'my' memories, and the memory triggers encoded in skeuomorphs powerful handles for those struggling to retain personhood in the face of neuro-cognitive decline.

Nagel [38], and other philosophers, have supported the subjective character of conscious mental processes; as he says: "The subjectivity of consciousness is an irreducible feature of reality - without which we couldn't do physics or anything else - and it must occupy as fundamental a place in any credible world view as matter, energy, space, time and numbers."[6]. This view, the authors argue, is compatible with the notion of the emergence of such a faculty, and could equally well be situated within what Skrbina [52] would describe as a 'panpsychist' understanding of consciousness, but is perhaps closest to the processual view of Whitehead [65], for whom our concept of nature - originating in Descartes' division of mind and body - is what needs to be healed. Bergson [7], whom Whitehead acknowledged as a major influence, was perhaps a supporter of both emergence and panpsychism, and seemed to suggest our intellectual faculties could not - by definition - appreciate the nature of the subjective, which is more properly the domain of our intuition [31]. The fundamental reality of the subjective, which biological science and a 20th century philosophical tradition wedded to physics seem intent on denying has any existence, nonetheless, as well as finding support in the philosophical approaches of emergence, panpsychism, and process studies, perhaps also finds support in the real-life experiences of those suffering from dementia, and their carers.

For example, in dementia studies, Kitwood [28] and those that followed him have seen personhood in relational terms. That is, there is not only the individualistic view of personhood prevalent in western philosophy, outlined above, but an understanding that for millennia has been evident in other cultures of the value of community (e.g. [59]). The interpersonal, relational, social aspects of personhood are seen to continue, even as the neurological disorder worsens. This is why with 'person centred' care, nursing staff are encouraged to relate to the person with dementia as they are now, whilst using photos and objects of that person's past to make relational connections between that nurse and the older person [22, 23, 25, 37, 58]. Such physical props as are in current use by professional caregivers of PwD can be adapted into forms of skeuomorphic reassurance, for new assistive technology devices (ATD) that augment rationality.

The philosophy of personhood, in sum, is a debate, and not a consensus. For all the importance and usefulness of the biological and medical sciences in maintaining our physical health, our mental health and the subjective reality of our selfhoods remain beyond the understanding - because it is outside the constraints that define what they

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[6] [38 pp. 7–8].

mean by 'understanding' [56] - of even the most accomplished of neuroscientists. Our detailed knowledge of the behaviour of synapses, and, indeed, of the deterioration of the brain in diseases such as Alzheimer's, still does not even begin to approach an understanding of who we are, or how it is we come to be who we are, because our sciences persist in a "bifurcation of nature into two systems of reality"[7]. Nor do we know how it is, even when the biological functioning of the brain is coming to a close, that we still are who we are - even if only in flashes through the clouds of confusion that gather in our minds. Such episodes of lucidity - even in quite late stage dementia - and the evidence within the relationships between those with dementia and their carers, strongly suggest that "in dementia personhood can be understood as increasingly concealed rather than lost." [53]. One may, indeed, conclude that the 'individual rational man' approach to understanding personhood, with its unpalatable political ramifications and the resulting rather nonsensical arguments of the eliminativists, is being superseded by the evidence supporting Nagel's assertion of the irreducibly subjective character of personhood, and that a 'general' (in Whitehead's sense of the word) understanding of the nature of Nature - our perception of it combined with, rather than merely added to the constituents of it - may finally be approaching fruition. Skeuomorphic reassurance, in this context, becomes a key handle upon reality.

4 Towards a Principle of Built-In Skeuomorphic Reassurance

Although in recent years Kitwood's [27] attempts at defining personhood for dementia have received attention [22, 25], little has so far been developed that examines the connection of personhood to the role of assistive technology [1]. ATD have been used extensively for PwD, from home sensors, to lifting devices [1], to telehealth [43] and much more. Increasingly artificial intelligence (AI) ATD are augmenting memory, spatial and temporal orientation, and providing other forms of cognitive assistance [60]. Thus the concealment of personhood for PwD is being increasingly overcome.

The rapidity of such technological advance since the 1970s has not only been striking, but continues to accelerate. The so-called Great Acceleration [54, 55] of the Anthropocene has produced effects such as Moore's Law that have helped to radically transform our societies and our expectations. However, most older - and many younger - people have problems working with and accessing digital technologies, due to issues of accessibility, pricing, and the ever changing functionality of the devices available, and the software that runs on them [13, 14]. Although it was thought that more serious health conditions would impact these difficulties more negatively, the reality is proving far more nuanced. As the costs of catering to an ageing population escalate, governments around the world are looking to technology to reduce the costs of institutionalisation. Frequently such technologies also serve, moreover, to enhance quality of life, by enabling people to live independently in their homes and communities for longer.

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[7] [64 p. 30].

Mobile technologies, and the connectivity they provide for all manner of devices, alongside GPS functionality for location-awareness, have encouraged a shift from the pathology of illness toward support for continued wellness in healthcare systems, using technology to help care workers provide their services to people in their own homes, when needed [60]. One of the most relevant of these developments, with respect to PwD, is a new field of technologies clustered around the notion of 'augmented rationality,' including reminiscence games, reminders to take medicine, geofencing, smart homes, and so forth. In its simplest form, in an age where augmented reality permits people passing by a historic building to see it as it was in, say, the 1920s on their mobile device (e.g. Museum of London smatphone app, 'Streetmuseum'), 'my' memories - at least in photographic facsimile - can be stored and retrieved, such that it becomes possible to augment memories, and by extension, the rationality of PwD.

One issue with all these new technologies that this paper wishes to highlight, is of the usability - the 'user experience' - of these new devices, the interfaces they offer, and the functionality of their software. Issues of designing for the whole population have begun to rise to the forefront of people's minds [17], and it is to this debate that we wish to add the notion of skeuomorphic reassurance. The problems today's over-65s have with digital technologies may quite likely not go away. The nature of those problems will change as technologies change, but those of us familiar with today's technologies, as we grow older and join the over 65s, may likely find the new technologies coming onto the market difficult to engage with - let alone the likely impact of on-going convergence whereby technologies we are familiar with today become replaced by new functionalities of other technologies. The assumption that because current generations will be familiar with technology, they will cope better when older is thus flawed - not only because technology is itself constantly changing - but because as Burmeister [13] points out, it fails to account for an understanding of ageing, and the cognitive limitations that the ageing process brings to usability of technology. To avoid this problem, we believe, technology developers need to embed into their design processes a principle of skeuomorphic reassurance. This principle moreover, needs to be a 'rolling' one, that keeps skeuomorphs (like the film reel and floppy disk icons) for roughly 30–40 years, and drops them gradually as time goes by, and piecemeal rather than wholesale.

Skeuomorph design needs to consider the particular needs of the user population. Not only does it need to be person focused, respecting their autonomy, recognising the limits imposed on such autonomy by their debilitating disease, but for PwD there are also further interfacing considerations. Research in socially assistive robots has revealed that the most effective technology for PwD has proven to be natural speech [6]. However, that does not apply to all PwD because of four frequently occurring problems: long pauses or no response to questions, problems with word finding, confusion, and confabulation (the user provides non-factual information). As suggested above, in relation to adapting the skeuomorph design to the personal history of the PwD, so too the skeuomorph design needs to be adaptive. Flexibility in the mode of input may be required, given that the intentionality of some user behaviour will need to be selected based on the user's remaining abilities. Skeuomorphs, moreover, should not only be dynamically adaptive to the user, but should lend themselves to interaction that does not require manual dexterity. That is, although the display might be visual, user interaction might

involve speech or gestures. Apple's smart watch, again, with its range of options for interface, is a good example.

5   Conclusion

In this article user interface design has been revisited with a particular focus on PwD. We have considered (i) the ageing world population, (ii) the persistence of personhood amidst the occurrence of dementia in otherwise physically healthy older people, (iii) the accelerating rapidity of technological development, and (iv) the importance of combating digital exclusion of the elderly as an on-going, and not merely a one-off imperative.

We have seen that "The subjectivity of consciousness is an irreducible feature of reality"[8] and that personhood is concealed rather than reduced in the context of dementia, often at its most visible through the relationships with family and carers that persist even in later stages. We have found, in particular, that the person-centred care model, which arose from consideration of the philosophy of personhood [27], arguably takes its place among other robust challenges to the more traditional Western philosophical definitions of personhood discussed in this paper. It has been applied in many areas, including that of dementia. Similarly, a special form of person centred care has been that of family centred care, which has focused on the care of young children who in many cases, due to their age related cognitive limitations, need family carers to make decisions for them. Arguably family centred care, with its roots in the philosophical consideration of personhood, could also be applied to the care of older people with neurocognitive disorders, such as dementia. This suggests new areas of exploration that have not previously been considered in the literature on personhood. Crucially, the memory triggers incorporated into skeuomorphs, are a key assistive technology in their own right, helping to ensure that personhood is less concealed than it might otherwise be.

The implications for design of ATD, and for policy makers, suggest much more collaborative approaches: right from the inclusion of subjectivity in the understanding of the nature of Nature, up through the applied sciences into the technologies of support our highly technologised societies are now capable of producing - on unprecedented scales - for the improvement of the welfare of the increasingly large segment of our societies over the age of retirement. Technology companies need to expand their workforces to include social scientists as well as technicians, user experience specialists as well as coders.

Most importantly, with the principle of skeuomorphic reassurance, the authors enjoin technologists to remember that the balance between novelty and recognisability is inevitably a moving target: the digital exclusion of the elderly is not a one-off problem that will be overcome once those currently over 65 have all died.

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[8] [38] pp. 7–8].

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