Is stereotyping inevitable when designing with personas?

Phil Turner and *Susan Turner*, Centre for Interaction Design, School of Computing, Edinburgh Napier University, 10 Colinton Road, Edinburgh, EH10 5DT, United Kingdom

User representations are central to user-centred design, personas being one of the more recent developments. However, such descriptions of people risk stereotyping. We review the genesis and application of personas and kindred representations, and discuss the psychological roots of stereotyping and why it is so powerful. It is also noted that user stereotypes may be broadly accurate. This raises a number of questions. On practical level, as stereotyping is deeply engrained and resistant to circumvention, what are the instrumental approaches to its avoidance? Or, do we simply hope that its effects are not particularly prejudicial or detrimental? We argue that stereotyping in the design of interactive technology may be usefully thought of as comprising a number of tensions (or dialectics).

Keywords: design behaviour, design techniques, interface design, personas

User-centred design (UCD) is concerned with the design of interactive artefacts and systems with and for people. This paper discusses how people have been represented in UCD, with a particular focus on stereotyping in the representational process. In doing so we address the tension between the economy of stereotyping on the one hand and the potential for bias and loss of rich detail on the other. Unpicking this relationship is important, not just because accurate and inclusive representations underlie products and devices which fit a greater number of users more closely but because, as widely discussed in science and technology studies (STS), designs *inscribe* cultural values and notions of ideal users. Such values in turn *prescribe* and shape everyday activities and expectations. As the feminist scholar Wajcman observes, 'Domestic appliances enter a domain heavily signified in terms of traditional sex roles, and are already imprinted with gendered agendas or "gender-scripts" defining their appropriate operators' (Wajcman, 2010, p. 150). Similarly van Oost (2001, p. 195) also notes that 'Gender can be an explicit and an implicit element in the design process [...] Existing or stereotyped images of project gender identities are transformed into design specifications that are in accordance with cultural symbols of masculinity or femininity.' Sparke (1996) provides an extensive commentary on this in her

Corresponding author:
Phil Turner
p.turner@napier.ac.uk

www.elsevier.com/locate/destud
0142-694X $ - see front matter *Design Studies* **32** (2011) 30–44
doi:10.1016/j.destud.2010.06.002

As Long As It's Pink; The Sexual Politics Of Taste. Such effects were apparent even when interactive technologies were largely confined to the workplace: Hofmann (1999) cites the example of early word-processing software, whose design assumed that their female secretary users were permanent novices. The prominent place of interactive devices as consumer products, however, means that socio-cultural stereotyping, not only of gender but also of other user characteristics becomes an issue of much broader interest. Here the discourse around the commodification of technology (Borgmann, 1984) and the demand of institutions and producers for homogenenised clients and consumers (de Certeau, 1984) is very pertinent, a point to which we return in the discussion. For now, the remainder of this introduction presents a brief history of user involvement and representation in the design process, before moving on to the substantive treatment of personas and stereotyping.

People's involvement in the design process has varied dramatically from one of partnership in participatory design to a range of well established user-centred design approaches where user data is gathered and users themselves are present in the form of models, descriptions, or lists of characteristics. We discuss these in a little more depth later in this section. The classic text on user-centred design remains Norman and Draper's edited volume *User Centered System Design* where they defined the process, quite loosely, as being 'about the design of computers […] from the user's point of view' (Norman & Draper, 1986, p. 2). A user-centred design episode following the ISO standard (ISO13407, ISO, 1999) involves the design team conducting a stakeholder analysis, after which user representatives are recruited to work with the UCD team. These representatives help the designers define the requirements on the interactive system, to be constructed, in terms of who will use it and what the system will be used for. Faced with a body of competing and often contradictory social and technical requirements the designer needs to harmonise them to remove inconsistencies, consolidate, prioritise and so forth (e.g. Beyer & Holtzblatt, 1998). So despite placing the user at the centre of the design process, UCD by necessity must involve at some stage a representation of the different aspects of users and what they want. And, a representation is, by definition, less rich and detailed than the thing itself.

While how we represent the work domain and how people do their jobs is of considerable importance, our focus for the current discussion is the people with whom (and for whom) we are designing. So let us take a moment to consider how we treat people within user-centred design. The very first observation is, until very recently, that we call people *users,* which implies that we are primarily, and perhaps only, concerned with those aspects of their psychology and behaviour which is directly relevant to the use of interactive technology. This treatment of people has echoes of the language of 'scientific management' which arose in the early twentieth century when mass production and the assembly line began to appear and as such belongs to another age.

The early years of HCI and UCD were also dominated by cognitive accounts of users. At this time people were thought of in terms of simplified psychological models. For example, the *Model Human Processor* (MHP) was a purely cognitive account of human behaviour which argued that the mind was an information processing construct working in a manner analogous to that of a computer system (Card, Moran, & Newell, 1983, p. 24). It should be remembered that the MHP was only one of many different attempt to capture and model people from a purely cognitive perspective. While this, and similar approaches, certainly simplified matters their applicability was very limited. Cooper and Bowers (1995), in discussing the whole idea of user representation, identified these cognitive models of the user as the *first wave* HCI. Interest in wider *user characteristics* began to appear in the late 1980s and sought to identify and understand those factors beyond cognition which might play a part in our use of interactive technology. Such aspects were largely confined to those characteristics of humans as operatives, or direct or indirect producers or consumers of information which could then be directly mapped onto design features (e.g. Taylor, 1990). However Bannon (1991) was among the first to point out that to treat people merely as constellations of human factors or as passive components in a technical system was to miss much of what it was to be human.

Treating groups of people in these simplified ways has been problematic in UCD, while treating people as individuals has proven to be even more difficult. For example, Dillon and Watson (1996) in their review of the treatment of individual differences note that '[HCI] has yet to formulate reliable and valid characterizations of users beyond gross distinctions based on task and experience' and that 'HCI could gain significant predictive power if individual differences research was related to the analysis of users in contemporary systems design' (ibid, 616). Their approach to resolving this problem was to propose the use of personality research including, for example, Guilford's *Structure of Intellect Model* which has up to 120 distinct constructs (Guilford, 1959). The use of such research in dealing with individual differences in personality and cognitive abilities and styles *per se* is however yet to meet with successful application almost 15 years after Dillon and Watson's observations were published. Although dimensions such as familiarity with technology have now been much more thoroughly and systematically addressed (e.g. Blackler, Popovic, and Mahar, 2007; Langdon, Lewis, & Clarkson, 2007), a few minutes browsing will reveal the continuing ubiquity of simplified accounts of people throughout UCD and HCI, for example, - 'expert users'; 'novice users'; 'older users'; 'younger users'; 'power users'; 'occasional users'; 'technophobes'; 'Unix gurus'; 'technophile'; 'earlier adopters', 'silver surfers'; 'the C-generation'; 'the mobile phone generation'; 'the Internet generation' and so on.

So while UCD is committed, by definition, to involving people in every phase of development *in principle*, designers are compelled to construct and deal with

simplified accounts of people. While interactive technology remained largely confined to the workplace, as we have observed above, such accounts were correspondingly restricted to features which had some bearing on workplace tasks and their place in organisational life. Users might be more or less skilled, have differing degrees of background knowledge, and familiarity with technology (early UCD literature, *passim*) have concerns about deskilling and changing organisational roles (Mumford & Weir, 1979), and, latterly, operate as skilled actors in the social fabric which makes the work *work* (Bowers, 1994).

The form of such accounts varies considerably. Some are simple lists, such as those defined in Rich's 'user stereotypes' [sic] (Rich, 1979). Others are rich and detailed descriptions, as in the workplace ethnographies of the late 1980s and 1990s (such as the collections in Button, 1992; Heath & Luff, 1992). As UCD techniques develop further, users act out their roles in scenarios, vignettes which capture typical or critical uses of technology in narrative form. Scenarios begin to be reported as research and design tools in the 1980s (Young and Barnard, 1987 is a relatively early example), their proper use figures as the subject of expert debate in the early 1990s, as in the position papers introduced by Karat and Karat in the October 1992 ACM SIGCHI Bulletin (Karat & Karat, 1992) and are definitively documented as a design method in Carroll's seminal *Scenario Based Design* (Carroll, 1995). While people in early scenarios are generally shadowy characters exhibiting a limited repertoire of work-related traits, as technologies move out from the workplace they begin to acquire more rounded biographies. The extracts below are illustrative of users as depicted in scenarios for (1) work and (2) home contexts.

(1) ' *Anna is 45 years old and a nurse. She works at the surgical ward, where she is manager during five years. One of her responsibilities as ward manager is performing the final authorization of all the invoices. She has just met the last patient for the day and has now time left for some paperwork before going home for the day…*' [Scenario continues with Anna's interaction with the invoicing system.] (Johansson & Arvola, 2007, p. 4)

(2) '*Sixteen year old Becki is really excited. She's going to the Olympic Park Velodrome to see one of the cycling events with her two friends Alisha and Danielle. They get the overground from Streatham, where Becki lives with her mum and step dad, to London Bridge where they hop on the tube to the Olympic Park. Twenty minutes later they get out at a very crowded Stratford tube Station. As she's coming out of the tube, Becki's phone gets signal and she hears it beep…*' [Scenario continues with more biographical detail as Beck reads the text message and the phone is snatched from her hand.] (Technology Strategy Board, 2009)

However, towards the end of the last millennium, just as interactive technologies acquire full home and personal lives, so do user representations: enter personas.

1 *Putting a face on the users: personas in the design process*

Personas (to adopt the usual form of the plural), encapsulating users as rounded human beings, had their first public airing in the work of Cooper (1999) where it is observed that designers often have only a vague notion of their intended users. His practice-based approach to putting a 'face on the users' involves creating *characters* with multiple attributes and individual histories to replace the fairly one-dimensional, de-personalised, truncated *user*. These character sketches he calls a persona. In essence personas are fictional, composite descriptions of people, complete with names, gender, age, occupations, friends, and potentially all of the attributes of real people including membership of an ethnic group, likes and dislikes, particular educational attainments and the trappings of socioeconomic status. Their advocates argue that their construction should be an early, perhaps even first, step in the design lifecycle and that scenarios should constructed around them. In Cooper's method, personas are always closely based on ethnographic user research.

The use of personas may also help the designer engage with the people for whom they are designing. As, for example, Pruit and Grudin (2003) observe 'Designers and users are not truly engaged; social and political aspects are filtered out.' Personas, they argued, provide a foundation upon which to build scenarios and they are a 'technique that, if used in conjunction with other methods, can draw upon powerful psychological forces to restore these [social and political] dimensions'. Pruitt and Adlin (2006) in *The Persona Lifecycle* list three reasons why personas are successful: the first is that they help avoid self-centredness and promote user-centredness; secondly, as users are complex and varied [personas help] manage the process of understanding their needs and preferences; finally, they act as a proxy as users aren't always available, (pp. 5–6).

Unsurprisingly, personas have evolved from their Cooperian origins. The comprehensive survey in Floyd, Jones, and Twidale (2004) provide what the authors term a 'basic ontology'. In summary, this distinguishes personas which are strongly rooted in qualitative and or quantitative data, as advocated by Cooper (1999), Pruit and Grudin (2003) and Sinha (2003), among others, from those which rely largely on designers' experience and intuition, including Norman's *ad hoc* personas (Norman, 2004) and the 'extreme characters' suggested by Djajadiningrat, Gaver and Frens (2000) as a means of exploring the design space. Finally, it is recognised that some designers, e.g. Dantin (2005) prefer to conceptualise users as rather more generic archetypes. Archetype variants include the somewhat idiosyncratic 'archetype user research' described in Pierson, Jacobs, Dreesen, and De Marez (2008). Here archetypes are initially constructed from a priori assumptions, refined by reference to the literature. Subsequently real participants who match the archetypes are identified, who

become the subjects of ethnographic research. Finally 're-adjustment of the initial primitive categorization' takes into account the results of the ethnographic exercise.

The discourse of interaction design itself has also developed over the last decade or so from one of tasks, goals and usability to a practice (at least rhetorically) centred on broader user experience. Once experience becomes the focus, so there is a need to create compelling, rounded personas. In some instances these take literary or theatrical forms. 'Pastiche personae' (Blythe and Wright, 2006; Blythe & Dearden, 2008) adapt well-known fictional characters from fiction, including Dickens' Scrooge, and television's Abe Simpson and Victor Meldrew to create lively, recognisable characters for designing with elderly people. Blythe and Dearden also cite the use of actors to play personae described in Newell, Morgan, Gregor, and Carmichael (2006). Personas may also be used to evaluate user experience. In work reported by Swallow, Blythe and Wright (2005) to explore the experience of everyday phone usage, for example, researchers reversed the usual design process by finding users who matched marketing personas created by a mobile phone supplier.

However the derivation and use of personas have not been without criticism. Floyd et al. (2004) note a tendency among some members of design teams to construct personas who reflect their own favourite design ideas. As far as the effectiveness of personas is concerned, McQuaid, Aradhana, and McManus (2003) describe a customer-centred re-design of a public library. In addition to storyboards and scenarios they constructed narratives ('voices') of select personas. They found that while the persona-based narratives enabled better the exploration of tasks as compared to the storyboards which tended to focus on a single task, key stakeholders (the directors, librarians, and architects) were much more engaged by the storyboards than they were by the persona-based narratives. Rönkkö, Hellman, Kilander, and Dittrich (2004, pp. 112-113) chose personas as a means of addressing the lack of agreement about users' requirements. They found that in practice, the primary design influence turned out to be 'new technology, market- and competition-related issues'. Competing clients all had their own private technology priorities which effectively overwhelmed the use of personas. More recently, Massanari (2010) suggests in a similar vein that persona creation is dominated by internal political realities rather than user needs.

The particular focus for the present discussion is, however, the potential for stereotyping when creating personas. Stereotypes are exaggerated beliefs about a given category, in this instance, people. These beliefs might be accurate or might be mistaken and as we shall see, stereotypes and stereotyping appears to be widespread in user representations[1].

2 Stereotyping in personas and other user representations

2.1 The psychology of stereotypes

The concept of stereotypes was first introduced to social psychology by Lippmann who described them rather vaguely as 'the little pictures we carry around inside our heads' (Lippmann, 1922). Allport (1954) developed this further and described them as 'an exaggerated belief associated with a category' and this remains the dominant and defining characteristic of the term. In a detailed review, Hamilton and Sherman (1994) concluded that a stereotype is a cognitive structure containing our knowledge, belief and expectations of, in this instance, a social group. In this respect, stereotypes are not dissimilar to any other concept.

Stereotypes typically comprise abstract knowledge about a group, e.g. all politicians are liars, along with a number of exemplars of group members; and knowledge about the variability of the group – 'Seen one seen them all', 'the exception which proves the rule'. However as distinct from concepts *per se*, stereotypes often have a marked affective component, (Esses, Haddock, & Zanna, 1993). Stereotypes are thought to arise from the cognitive processes involved in categorisation and are a useful heuristic for dealing with everyday situations. The power of stereotypes lies with their *cognitive economy* (Conrad, 1972), that is, their use allows us to assess, sum up and engage with a situation with the minimum of cognitive effort. In everyday life the use of stereotypes allows us to make predictions and guide behaviour. If, for example, we are looking for the school caretaker we are more likely to speak to the older man rather than the young woman we encounter; and the reverse is true when we are looking for the child's carer. This is not in anyway to suggest that all school caretakers are older men and children's carers are always young women but non-prejudiced stereotypes may actually say something accurate about a group of people. In this respect, stereotypes are a central aspect of 'folk psychology' (Malle, 2004). As Schneider (2004) observes, they are simply generalisations about groups of people.

However stereotypes also have an insidious quality: they are too easily evoked and are at work even in people who would claim that this was not the case. Once a stereotype has been activated it can shape the predictions we make about people and situations. Stereotypes, as used in this context, can behave in a manner similar to scripts (Schank and Abelson, 1977). There are numerous examples of this in real world studies of the effects of stereotypes on judgements. Many of these studies have a strong racial or cultural element, for example, it has been observed that for some people, a nudge is interpreted as a *jovial shove* when performed by a white person, but as a *violent push*

when performed by a black person (Duncan, 1976; Sagar & Schofield, 1980). Other recent results have shown that the dimensions of stereotypes – in this instance competence and warmth – are consistent across cultures, although the placement of particular groups along these dimensions varies (Cuddy, Fiske, & Glick, 2008). It has been generally accepted that stereotypes are also persistent within individuals, although some recent work suggests that stereotypes are more flexible and situated in social context than had been thought (Garcia-Marques, Santos, & Mackie, 2006).

2.2 Stereotyping in user representation

Many accounts of personas and scenarios in use refer in passing to the potential for stereotyped user representations to arise, generally as a prelude to suggesting methods for minimising such effects (e.g. Avergerinou & Andersson, 2007; Tedjasputra, Sari, & Strom, 2004). In the case of personas specifically, Floyd et al. (2004) suggest that stereotyping is, unsurprisingly, more evident in personas based on designers' intuitions rather than on user data. It is also observed that efforts to enhance inclusivity of representation (in this case with regard to ethnicity) may simply result in a depiction of users of different skin colours but of bland, homogenised types (Nielsen et al., 2006). Further, interview data suggest that HCI professionals appear to stereotype user types differentially according to their own role (Clemmensen, 2004): 'Analysts' typify users as composed of one or more abstract personality dimensions; 'designers' as more fully rounded characters; 'programmers' as sources or consumers of data and 'bridge-builders' in terms of tasks. In the allied domain of product design, Hasdogan (1996) identifies the stereotyping of users according to experience as a widespread technique in household product design which, when used with user profiling, can be used (usefully) to create 'in stereotypical form the personality or lifestyle of the user'. He also comments on the tendency of the product designers surveyed to model users on themselves or their colleagues.

But it is not only in the written texts of personas, or of actors in scenarios, that stereotyping plays a part. Sharrock and Anderson (1994) note in their study of the ways in which users are referenced in designers' conversations that designers regularly employed stereotypes. In their study of a photocopier design team, users were stereotyped as particular social types with their own concerns, such as bosses or repairpersons; or as badly behaving users, e.g. those who made coffee cup rings on copiers; or as being entirely task focussed. As Matthews (2007) observes in a gloss on both Sharrock and Anderson's work and his own analyses of design team conversations, these oral user stereotypes are not just straightforward descriptions: they serve a discursive and social purpose in legitimating design arguments and 'pet' design features and softening refutations of others' contributions. Such observations are paralleled in our own analysis of design team activity, where members of a design team can be heard slipping in and out of impersonations of users and other

stakeholders, each with constrained and predictable sets of behaviours and attitudes (Turner & Turner, 2003). More insidiously, the very tools used to gather data from and about users may be permeated by stereotyped assumptions. Bredies, Buchmueller, and Joost (2008) describe how the effects of gender stereotyping and the cultural construction of gender in the design of cultural probes at Deutsche Telekom which were intended to inform the design of mobile phones. Notwithstanding an all female research team, gendered expectations influenced the choice of materials supplied to participants for inspiration and collage making – rubber, leather, fabric and fur, 'not steel or iron' – the questions posed, which included items referring to needs for security, and handbags, and emphasised the residential environment rather than the workplace.

Finally, we allude briefly to two investigations of our own which further illustrate the operation of stereotyping among interactive media design students and the widespread adoption of the 'I-methodology' (Oudshoorn, Romnes and Stienstra, 2004). The first group studied comprised 42 male designers, who were required to design an iPhone app for women. Almost all described successful, busy, socially active and attractive female users in their mid-twenties – people who could be regarded as idealised counterparts to their creators. A second study of an equivalent group of 51 one year later – this time with the gender design constraint removed – featured predominantly male, young, busy and socially active people.

2.3 *Countering the stereotyping effect*

While all critical accounts of personas in use emphasise the need to frame and re-frame their contents in data from real users, a number of other tactics have been proposed to counter the deeply ingrained tendency to stereotype. Both Aquino and Filgueiras (2005) and Avergerinou and Andersson (2007) argue it may be helpful to consider personas explicitly as archetypes, although it is unclear exactly how this mitigates against stereotyping. Ljungbland and Holmquist (2007) advocate 'transfer scenarios' – where 'marginal practices' are studied. Such practices involve people in situations analogous, but not identical, to that of intended users of the technology in question. This defamiliarization tool inspires design ideas based on alternative viewpoints, which are transferred to personas embodying the actual intended users. The authors describe a study of pet owners which informed the design of domestic robots. Tedjasputra et al., (2004) suggest writing scenarios and personas in pairs and note that personas written in bullet-point, rather than narrative style, appear to be more susceptible to stereotyping by designers who have little experience of the user group in question. Other methods include involving designers with different 'life worlds' in the team, coupled with education about the social science of stereotyping (Clemmensen, 2004) and techniques which aim to surface designers'

underlying socio-cultural assumptions (Bath 2009). Broadly, then, counter-stereotyping measures fall into two groups: the provocative and the educational. Evidence for the success of either approach can be considered patchy at best.

3 *Discussion*

It is quite clear that for many designers to create a user representation is, very likely, to create a stereotype. The psychological availability and 'cognitive economy' of stereotypes make stereotyping almost inevitable. It may also be concluded that the use of personas does not appear to solve the problem of bias in scenarios which Cooper sought to avoid. Further, Pruit and Grudin's (2003) expectation that the use of personas may serve to increase the engagement between designer and those designed for is not supported. The very cognitive economy associated with the use of personas implies a lack of engagement with the characteristics of the people for whom they are designing.

In short, as soon as we picture the kind of people for whom we are designing (*cf*. Lippmann's definition of a stereotype) we may well be committed to a stereotype. In the light of this, it is curious that Pruitt and Adlin write, 'you may be tempted to use stereotypes and common knowledge or cultural lore in your personas. If you do, do so carefully', (ibid, 242). However to use a stereotype is to use a form of shorthand which is necessarily missing the very detail we are trying to capture or include.

This, so far, is painting a fairly gloomy picture. Stereotyped user representations appear to constrain both design and use in many aspects of everyday life, and those who advocate universal design (e.g. Stephanidis, 2001) recognise that stereotyping is an obstacle to achieving design for all. For example, Stary (2001) argues that universal design cannot be achieved by stereotypical user properties and functional roles, but by accommodating the actual users' behaviour — an echo of earlier, largely unanswered, arguments for design for individual differences. Personas may be neither better nor worse than scenarios. Scenarios are task-based with a wrapper of 'context' — in all, descriptions of situated action. Personas are descriptions of people engaged in activities again with a wrapper of 'context' this time expressed as descriptions of situated people. The designer's choice is then people-centric or task-centric. Unhappily personas do not appear to be the panacea some had hoped for.

However, stereotypes are not necessarily bad. As other authors have commented, they are often disconcertingly accurate. Returning to the second cohort of novice designers we discuss above, the proportion of iPhone user personas who were male — 78.4% — is only slightly higher than the 75% reported for the actual iPhone UK user base in 2009 (comScore, 2009). The

same market report puts the age distribution as 'mostly' between 18 and 44: 87% of users described by the students were in this category.

Logically, stereotypes can be positive and accurate; positive and inaccurate; negative and accurate; and negative and inaccurate and from this we conclude that stereotyping in the design of interactive technology may be usefully thought of as comprising a number of tensions (or dialectics). These are:

Stereotypes as a design 'shorthand', e.g. 'the Internet generation'	⇔	Exclusion or mis-representation of groups – e.g. 'the elderly'.
Stereotyping being too available and to easily and uncritically employed ('the dream girlfriend')	⇔	Stereotyping as an accurate generalisation of a group of similar people ('young iPhone users')

While these conclusions are consistent with the evidence we have reviewed we are left wondering if a discussion of stereotyping ends here. To take this a little further, we will draw on the work of the American philosopher of technology Albert Borgmann. Specifically, Borgmann's concept of the *device paradigm* may be of some interest (Borgmann, 1984). The device paradigm is an account of technology use in which people treat it purely instrumentally, that is, as merely a means to an end, with little regard for the means. Technology, for example, makes the procurement of goods 'instantaneous, ubiquitous, safe, and easy' (p. 41). As part of this discussion, Borgmann also distinguishes between commodities and things: a commodity being a context-free entity isolated from traditions and customs. A thing, in contrast, is capable of engaging and connecting with us. So, for example, fast food bought from a chain is an example of a *commodity*, whereas a home cooked dinner is a *thing*. The former is selected from a standard menu, packaged and delivered while the other may be seasonal, spontaneous, error-prone and open to participation. In all, Borgmann is describing a treatment of technology in a manner which is quite similar to that of stereotyping. Technology is stripped of individual character and is reduced to a handful of attractive elements – not unlike an adolescent dream girlfriend. The French thinker de Certeau in his *The Practice of Everyday Life* (de Certeau, 1984) makes a similar point, observing that non-producers, non-artists and non-designers (which accounts for most of us) have become the passive recipients of homogenized, 'one-size fits all' commodities. We are suggesting that such 'design stereotyping' (*vide* variant design) has a complement in users who have been objectified into consumers, a shift which runs counter to the spirit, ethos and practice of UCD. We further speculate that the processes which have produced commodities rather than *things* and which have created consumers rather than active, opinionated, motivated users may not only be complementary but mutually reinforcing processes. Perhaps we should be wary of stereotyping after all.

Acknowledgements

Thanks are due to the students of the Practical Interaction Design module (2008 and 2009) for their kind permission to draw upon their work and to the anonymous reviewers of this paper for their constructive comments.

1. While representations of users are primarily written, designers frequently co-construct their intended users in design conversations. The design discussions exhaustively analysed by the contributors to Cross, Christiaans and Dorst (1996), for example, provide ample instances. We return to these more transient forms in the discussion of stereotyping below.

References

Allport, G. W. (1954). *The nature of prejudice*. Reading, MA: Addison Wesley.

Aquino, P. T., & Filgueiras, L. V. L. (2005). User modeling with personas. *Latin America CHI, 2005*.

Avergerinou, M. D., & Andersson, C. (2007). E-Moderating personas. *The Quarterly Review of Distance Education, 8*(4), 353–364.

Bannon, L. J. (1991). From human factors to human actors. In J. Greenbaum, & M. Kyng (Eds.), *Design at work: Cooperative design of computer systems* (pp. 25–44). Hillsdale: Lawrence Erlbaum Associates.

Bath, C. (2009) Searching for methodology: feminist technology design in computer science, presented at *Gender & ICT Conference 2009*, Bremen, Germany, elib.suub.uni-bremen.de [last retrieved 12.03.2010].

Beyer, H., & Holtzblatt, K. (1998). *Contextual design*. San Francisco: Morgan Kaufmann.

Blackler, A. L., Popovic, V., & Mahar, D. P. (2007) Developing and testing a methodology for designing for intuitive interaction. In: *International Association for Societies of Design Research 2007: Emerging Trends in Design Research, 12th–15th November 2007*, Hong Kong.

Blythe, M., & Dearden, A. (2008). *Representing older people: Towards meaningful images of the user in design scenarios*. Universal Access in the Information Society. Published online: 6 June 2008. DOI =http://dx.doi.org/10.1007/s10209-008-0128-x.

Blythe, M. A., & Wright, P. C. (2006). Pastiche scenarios: fiction as a resource for user centered design. *Interacting with Computers, 18*, 1139–1164.

Borgmann, A. (1984). *Technology and the character of contemporary life*. Chicago: The University of Chicago Press.

Bowers, J. (1994). The work to make a network work: studying CSCW in action. In *Proceedings of CSCW '94* (pp. 287–298), (22–26 Oct., Chapel Hill, North Carolina), ACM Press.

Bredies, K., Buchmueller, S., & Joost, G. (2008). The gender perspective in cultural probes. *Participatory design conference*. Bloomington, USA: Indiana University.

Button, G. (Ed.). (1992). *Technology and working order: Studies of work, interaction and technology*. London: Routledge.

Card, S. K., Moran, T. P., & Newell, A. (1983). *The psychology of human-computer interaction*. Hillsdale, New Jersey: LEA.

Carroll, J. M. (Ed.). (1995). *Scenario-based design: Envisioning work and technology in system development*. New York: John Wiley and Sons.

de Certeau, M. (1984). *The practice of everyday life*. Berkeley, CA: University of California Press.
Clemmensen, T. (2004). Four approaches to user modelling — a qualitative research interview study of HCI professionals' practice. *Interacting with Computers, 16*, 799–829.
comScore. (2009). *comScore releases first data on iPhone users in the U.K.* http://www.comscore.com/Press_Events/Press_Releases/2009/3/UK_iPhone_Users [last retrieved 12.03.2010].
Conrad, C. (1972). Cognitive economy in semantic memory. *Journal of Experimental Psychology, 92*, 149–154.
Cooper, A. L. (1999). *The inmates are running the asylum: Why high-tech products drive us crazy and how to restore the sanity*. Indianapolis: Sams.
Cooper, G., & Bowers, J. (1995). Representing the user: notes on the disciplinary rhetoric of human − computer interaction. In P. J. Thomas (Ed.), *The social and interactional dimensions of human–computer interfaces*. Cambridge: Cambridge University Press.
Cross, N., Christiaans, H., & Dorst, K. (Eds.). (1996). *Analysing design activity*. Chichester: Wiley.
Cuddy, A. J. C., Fiske, S. T., & Glick, P. (2008). Warmth and competence as universal dimensions of social perception: the stereotype content model and the BIAS map. *Advances in Experimental Social Psychology, 40*, 61–150.
Dantin, U. (2005). Application of personas in user interface design for educational software. *Proceedings of the 7th Australasian conference on Computing Education*.
Dillon, A., & Watson, C. (1996). User analysis in HCI: the historical lesson from individual differences research. *International Journal of Human-Computer Studies, 45*(6), 619–637.
Djajadiningrat, J. P., Gaver, W. W., & Fres, J. W. (2000) Interaction relabelling and extreme characters: methods for exploring aesthetic interactions. *Proc. Conference On Designing Interactive Systems: Processes, Practices, Methods, And Techniques*, 66–71.
Duncan, B. L. (1976). Differential social perception and attribution of intergroup violence: testing the lower limits of stereotyping of blacks. *Journal of Personality and Social Psychology, 34*, 590–598.
Esses, V. M., Haddock, G., & Zanna, M. P. (1993). Values, stereotypes, and emotions as determinants of intergroup attitudes. In D. M. Mackie, & D. L. Hamilton (Eds.), *Affect, cognition, and stereotyping: Interactive processes in group perception* (pp. 137–166). San Diego, CA: Academic Press.
Floyd, I. R., Jones, M. C., & Twidale, M. B. (2004). Resolving incommensurable debates: a preliminary identification of persona kinds, attributes, and characteristics. *Artifact, 2*(1), 12–26.
Garcia-Marques, L. A., Santos, S. C., & Mackie, D. (2006). Stereotypes: static abstractions or dynamic knowledge structures. *Journal of Personality and Social Psychology, 91*, 814–831.
Guilford, J. P. (1959). *Personality*. New York: McGraw-Hill Book Company.
Hamilton, D. L., & Sherman, J. W. (1994). Stereotypes. In J. R. S. Wyer, & T. K. Srull (Eds.), *Handbook of social cognition* (2nd ed.). (pp. 1–68) Hillsdale, NJ: Macmillan.
Hasdogan, G. (1996). The role of user models in product design for assessment of user needs. *Design Studies, 17*(1), 19–33.
Heath, C., & Luff, P. (1992). *Technology in action*. Cambridge: Cambridge University Press.
Hofmann, J. (1999). Writers, texts and writing acts. In J. Wajcman, & D. MacKenzie (Eds.), *The social shaping of technology* (2nd ed.). (pp. 222–243) Buckingham, UK: Open University Press.

ISO. (1999). *ISO 13407: Human-centred design processes for interactive systems*. Geneva: International Standards Organisation. (Available from the British Standards Institute, London).

Johansson, M., & Arvola, M. (2007). A case study of how user interface sketches, scenarios and computer prototypes structure stakeholder meetings. In L. J. Ball, M. A. Sasse, C. Sas, T. C. Ormerod, A. Dix, P. Bagnall, & T. McEwan (Eds.), *Proceedings of HCI 2007*. London: BCS.

Karat, C.-M., & Karat, J. (1992). Some dialogue on scenarios. *ACM SIGCHI Bulletin, 24*(4), 7.

Langdon, P., Lewis, T., & Clarkson, P. J. (2007). The effects of prior experience on the use of consumer products. *Universal Access in the Information Society, 6*(2), 179–191.

Lippmann, W. (1922). *Public opinion*. New York: Harcourt Brace.

Ljungbland, W. S., & Holmquist, L. E. (2007). Transfer scenarios: grounding innovation with marginal practices. In *Proc. of CHI 2007, April 28–May 3, 2007*, San Jose, California, USA, 737-746.

Malle, B. F. (2004). *How the mind explains behaviour*. Cambridge, USA: MIT Press.

Massanari, A. (2010). Designing for imaginary friends: information architecture, personas and the politics of user-centered design. *New Media & Society, 12*, 401–416.

Matthews, B. (2007). Locating design phenomena: a methodological excursion. *Design Studies, 28*, 369–385.

McQuaid, H. L., Aradhana, G., & McManus, M. (2003) When you can't talk to customers: using storyboards and narratives to elicit empathy for users. In *Proceedings of the 2003 International Conference on Designing Pleasurable Products and Interfaces*, 120–125.

Mumford, E., & Weir, M. (1979). *Computer systems and work design: The ethics method*. New York: Wiley & Sons.

Newell, A. F., Morgan, M. E., Gregor, P., & Carmichael, A. (2006). Theatre as an Intermediary between users and CHI designers. In *Proceedings of CHI 2006* (pp. 111–117). ACM Press.

Nielsen, J., Yssing, C., Levinsen, K., Clemmensen, T., Ørngreen, R., & Nielsen, L. (2006). Embedding complementarity. In *HCI methods and techniques – Designing for the 'cultural other'* (pp. 1–15). Department of Informatics, Copenhagen Business School, Working paper.

Norman, D. A. (2004). *Ad-hoc personas & empathetic focus*. http://jnd.org/dn.mss/ad-hoc_personas_empathetic_focus.html Available from [last retrieved 11th March 2010].

Norman, D. A., & Draper, S. W. (1986). *User centered system design*. Hillsdale, NJ: Lawrence Erlbaum Associates.

van Oost, E. (2001). Materialized gender: how shavers configure the users' femininity and masculinity. In N. Oudshoorn, & T. Pinch (Eds.), *How users matter*. Cambridge, MA: MIT Press.

Oudshoorn, N., Rommes, E., & Stienstra, M. (2004). Configuring the user as everybody. *Science, Technology & Human Values, 29*(1), 30–63.

Pierson, J., Jacobs, A., Dreesen, K., & De Marez, L. (2008). Exploring and designing wireless city applications by way of archetype user research within a living lab. *Observatorio (OBS*) Journal, 5*(2008). 099–118, http://obs.obercom.pt.

Pruit, J., & Grudin, J. (2003) Personas: Practice and Theory. *Proceedings of The 2003 Conference On Designing For User Experiences*, 1–15.

Pruitt, J., & Adlin, T. (2006). *The persona lifecycle*. San Francisco, CA: Morgan Kaufmann.

Rich, E. (1979). User modelling via stereotypes. *Cognitive Science, 3*, 329–354.
Rönkkö, K., Hellman, M., Kilander, B., & Dittrich, Y. (2004) Personas is not Applicable: Local Remedies Interpreted In A Wider Context. *Proc. Conference On Participatory Design*, Toronto Canada.
Sagar, H. A., & Schofield, J. W. (1980). Racial and behavioral cues in black and white children's perceptions of ambiguously aggressive acts. *Journal of Personality and Social Psychology, 39*, 590–598.
Schank, R. C., & Abelson, R. P. (1977). *Goals, plans, scripts and understanding: An enquiry into human knowledge structures*. Lawrence Erlbaum Associates.
Schneider, D. J. (2004). *The psychology of stereotyping*. New York: Guilford Press.
Sharrock, W. W., & Anderson, R. J. (1994). The user as a scenic feature of the design space. *Design Studies, 15*(1), 5–18.
Sinha, R. R. (2003). Persona development for information-rich domains. *CHI Extended Abstracts, 2003*, 830–831.
Sparke, P. (1996). *As long as it's pink; the sexual politics of taste*. New York University Press.
Stary, C. (2001). User diversity and design representation: towards increased effectiveness in design for all. *Universal Access in the Information Society, 1*, 16–30.
Swallow, D. Blythe, A., & Wright, P. (2005) Grounding Experience: Relating Theory and Method to Evaluate the User Experience of Smartphones. *Proc. ECCE 2005*, 91–98.
Stephanidis, C. (Ed.). (2001). *User interfaces for all: Concepts, methods, and tools*. Mahwah, New Jersey: Lawrence Erlbaum.
Taylor, B. (1990). The HUFIT planning, analysis and specification toolset. In D. Diaper, D. J. Gilmore, G. Cockton, & B. Shackel (Eds.), *Proc. IFIP TC13 third international conference on human-computer interaction* (pp. 371–376).
Technology Strategy Board. (2009). *Mobile phone security challenge*. www.innovateuk.org [last retrieved 2nd February 2, 2010].
Tedjasputra, A. B., Sari, E. R., & Strom, G. (2004) Sharing and Learning through Pair Writing of Scenarios. *Proc. of NordiCHI '04*, 229–232.
Turner, S., & Turner, P. (2003). Telling tales. *Design Studies, 24*(6), 537–547.
Wajcman, J. (2010). Feminist theories of technology. *Cambridge Journal of Economics, 34*(1), 143–152.
Young, R. M., & Barnard, P. (1987) The use of scenarios in human-computer interaction research: turbocharging the tortoise of cumulative science, *Proceedings of the SIGCHI/GI conference 1987*, 291–296.