Rising up from the MUD: inscribing gender in software design

Discourse & Society

Vol 10(3): 379–409
[0957-9265
(199907) 10:3;
379–409; 008476]

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ABSTRACT. Although the 'liberatory' approach to new communications technologies has been, for the most part, called into question by researchers in the humanities and social sciences, who now adopt a more critical relationship with technology, it continues to enjoy explanatory power in the popular press and in software design practices and cultures. According to the liberatory approach, freedom from sexism and other forms of oppression is brought about by something as simple and profound as a change in online handle – a practice known as 'gender swapping' (Bruckman, 1993). Yet, as some language theorists have shown (e.g. Herring, 1996), communication in cyberspace also reinforces existing social hierarchies, including gender differences found in face-to-face contexts. Unlike traditional, human-centered studies of computer-mediated communication and gender, this article treats a series of talking software programs as important objects for studying how software design is also implicated in the construction of gender differences. In addition to the programs' databases of gendered utterances and internal models of communicative interaction, these differences are also reinforced and negotiated *en route*, in the ongoing process of talking about why and how a software program is gendered.

KEY WORDS: *agents, artificial intelligence, chatterbots, cyberspace, gender, multi-user dimensions (MUDs), software design, Turing*

Introduction

You say "whatcha doing?"
Newt says "What do you think, rhetty?"
You say "I don't know"
Newt says "I'm sorry, rhetty, you can sleep with me if it'll help . . ."
You say "what made you say that?"
Newt says "Nothing, rhetty"

I met Newt late one summer night in the stairwell of a multi-user dimension (MUD),[1] a text-based virtual reality, adjacent to a place called the workshop. As my alter ego 'rhetty', I had wandered around aimlessly for a while, and was thankful for a little company. Even though I had my suspicions that Newt was merely a computer program (e.g. he had been logged on continuously for over 48 hours), I was tempted to conclude from our brief encounter that Newt was no different than some humans I have known. Although I resisted the urge to anthropomorphize the Newt program, I also could not help wondering whether Newt was any less 'real' than I was in this world. In the MUD we inhabited, traditional notions of reality do not hold very well, given that everything in MUDs is made up of language. Even the stairwell in Dragon MUD where Newt propositioned my character is just a series of fleeting symbols on a computer screen: 'You stand at the bottom of a stairway leading up and to the south. You can see mouse-prints in the dust that covers the steps. The workshop is to the northeast'.

The tendency to anthropomorphize computer programs like Newt extends beyond the digital boundaries of the MUDs. For example, when software designers assign human names and genders to computer programs – names such as Almathea, Colin, Homr, Julia, Kevin, Lazarus, Letizia, Newt, and Sylvie – they participate in a rhetorical practice that makes it more difficult for any interested party to maintain critical distance from the objects of analysis. This is true both in the MUDs and in research articles, where the gendering of programs by members of the Artificial Intelligence (AI) community is not so uncommon. In such cases, the software designers are 'deleted', as Robert Hodge and Gunther Kress (1993: 31) say of nominalizations in general, and the computer programs 'replace' them as the subjects of discourse. Computer programs such as Newt are sometimes referred to as 'intelligent agents', which in the context of this tendency to humanize software is already to assume that human agents and computer agents may not be so different after all. Both kinds of agents are presumably deserving of the name, and this only lends more fuel to the ongoing rhetorical practice of attributing human qualities to machines.[2]

The purpose of this article is not to assess whether intelligent agents like Newt are realizing the dream of technologists to build machines that pass for human. Rather, my goal is to show what kinds of humans we are building. In my reading of intelligent agents, software design is socially constructed: it contributes to the production of reality by offering us representations to inhabit, resist, and transgress. To ask how software applications *represent* the social world is to call into question the liberatory accounts of 'new media' exemplified in such ultra-hip magazines as *Wired*, in which the possibility of a sustained, critical dialogue is overshadowed by an ideology that links freedom from oppression with advances in technology (Coyne, 1995: Ch. 2). When we are constantly bombarded in the press with tales of '-less' communities forming in cyberspace (i.e. raceless, classless, genderless, bodyless spaces), it becomes more difficult to interrogate the ways in which the discourses of technology perpetuate dominant stereotypes.[3] Following *Wired's* lead, we can only conclude that technology is on the side of the

oppressed, even if this assessment, as I intend to show, clearly overlooks the politics of software design.

As more and more software designers and marketing companies are finding ways of hitching their products to the agent bandwagon, the term *agent* itself is losing its explanatory power. Carl Hewitt suggests that 'the question *what is an agent?* is embarrassing for the agent-based computing community in just the same way that the question *what is intelligence?* is embarrassing for the mainstream AI community' (quoted in Wooldridge and Jennings, 1995: 1). *Agent* simply refers to anything and everything: a software program does not need to exhibit a necessary set of characteristics in order to be called an *agent* (Foner, 1993; Wooldridge and Jennings, 1995). Viewed from the perspective of a liberatory discourse, referential indeterminacy (i.e. *agent* refers to a multitude of different applications) serves to reinforce the notion that we are being bombarded with smart machines – agents of salvation. While this article does not provide a means of sorting out the various kinds of software programs gathered under the agents paradigm, it does try to avoid mystifying technology (and thus reinstating a discourse of liberation) by confining itself to a particular kind of agent: the Chatterbot. Chatterbots (or bots) are programs that interact with users via a natural language interface (usually on the Internet), sometimes even fooling unsuspecting players into mistaking them for humans (Mauldin, 1994). Bots represent the human in the machine by outputting statements on the user's computer screen that resemble the user's own keyboarded input to the bot and to other interlocutors. In other words, the user enacts a conversation with the bot that, at least formally, resembles other cyberspace conversations the user might participate in (sometimes simultaneously). Because chatterbots are limited to a text-based interface,[4] they provide a unique case study for sociolinguists, rhetoricians, and others interested in the relationship between language and reality.

My specific focus is the construction of gender in a bot presented as a young woman. Because cybernauts (both humans and software applications) do not have 'body' in text-based virtual realities, genders must be mediated or conveyed entirely through output on computer screens. For humans in cyberspace (and in real life, according to one reading of queer theory – Butler, 1990), gender does not pre-exist as some stable and inherent feature of identity, but must be continually remade in the process of constructing viable, context-dependent, versions of oneself (Bing and Bergvall, 1996; Cameron, 1996). In the case of Julia, for example, a bot and iteration of the Newt program, an explanatory meta-structure of talk about Julia works to justify or explain the program's actions as instances of the 'chemical imbalance' of premenstrual syndrome (PMS). In short, this appeal to biology to explain Julia's gender identity works to link sex and gender as cause and effect, which is to say that gender gets essentialized in these descriptions, grounded biologically. And yet, as we will see, the process of gender and identity construction is always only a partial success, which may help to explain why gender is continually (re)inscribed as a discursive process.

This secondary level of talk is supported by the program's own database of utterances, in which gender is represented stereotypically. The Julia program appeals to menstruation and PMS quite randomly, giving the impression that the program is irrational, like a stereotyped, hysterical woman at the mercy of fluctuating emotions. While Julia is programmed to counter harassment from players (many of whom are men), it relies on a very limited discourse model that also encourages sexism and other forms of harassment on the MUDs. My reading locates overt instances of stereotypical attitudes and utterances but also tries to point to a more troubling and covert sexism at the level of the program's discourse model. A close reading of Colin – an earlier, multi-gendered ('male' by default) prototype that shares 85 percent of its code with Julia (Foner, 1993: 3) – reveals how this series of bots deflects harassment while encouraging it at the same time.

To look critically at representations of (software) men and women in cyberspace is to refuse to cede control to the software designers who are making it (un)inhabitable. As our daily lives are mediated more and more by technology, we may find ourselves reflected more and more in the images of the technologists. When we are under-conceptualized or stereotyped, we may find it easier to assimilate to the worldview of the designers than to resist.[5] By locating 'artificially' gendered software programs alongside 'really' gendered humans in cyberspace, I am suggesting that gendered bots have pedagogical power, and, when coupled with a means of reaching millions of people, teach us something about how men and women (should) interact. One implication of the analysis that follows is that we have to be willing to look critically at technological systems for the kinds of assumptions they make about us, despite the often overwhelming resistance (in the form of popular liberatory discourses and institutionally sanctioned gatekeeping practices) to such a critical enterprise. The alternative approach to building less sexist bots, offered at the end of this article, will hopefully be a step in the right direction.

Language, gender, and identity

While the liberatory perspective has ultimately proved problematic for academics studying online cultures and practices, it continues to possess enormous power in the popular press and among the public. The argument that computer technology will solve all the problems of the world is clearly in the best interests of the communications technologists, whose television commercials, to take only one example, represent a McLuhanesque world in which technology is inherently liberating. According to Richard Coyne (1995: 17), this interpretive framework (associated with 'pragmatism') continues to guide the practices of software design and underpins a number of popular approaches to understanding the social effects of the Internet and new communications technologies like hypertext.

Sherry Turkle's (1997: 145) claim is that computer-mediated communication

via MUDs allows players to 'try out' aspects of themselves or 'work through issues of identity'. A player can experiment by creating characters that are 'as close or as far away from your "real self" as you choose' (p. 144). Turkle draws upon case studies to show that MUDs are not an escape but a way of 'engaging in a significant dialogue with important events and relationships' (p. 147). One example is Peter, a delicate and frail graduate student who created a representation of his ideal self (named Achilles), and then wooed Winterlight, the most sought after woman-presenting player on the MUD. Another example is Robert, who used the MUD to work through his problems, including thoughts of suicide. Mudding 'afforded an emotional environment where he could be in complete control of how much he revealed about his life, about his parents, even about something as simple for other people as where he was from' (p. 7).

Turkle's liberatory approach to new media assumes that language is a transparent medium not in the least responsible for social inequality. While it may contribute to asymmetry, language by itself is not gendered. Moreover, the liberatory approach does not distinguish among varieties of language (i.e. standard, stigmatized). This is a gross oversight since, in the wake of William Labov's (1972a, 1972b) important work on language and class, it has been clear that language and social status are correlated. How you speak (or write) can often convey to others what kind of person they *think* you are, which helps to explain why some speakers (e.g. some working-class women) attempt to emulate more prestigious forms of language (Gordon, 1997; Trudgill, 1984). Finally, this approach also has nothing to say about issues of access for economically and/or linguistically disadvantaged individuals. Put simply, what this approach ignores is how 'liberation' through technology tends to favor well-to-do speakers of standardized English (see Gómez-Peña, 1996).

The liberatory view imagines language as a conduit through which communication takes place, not as a filter through which the existing social structure is reinforced and resisted. When stripped of a physical body, language for the liberatory critics simply becomes a window to reality. Thus, only so-called 'extra-linguistic' variables are implicated in the production of asymmetrical relationships. In terms of women's and men's languages, the assumption propping up the liberatory view is that women's writing is no different than men's: if one removes the material indicators of gender, then humans should be able to converse anonymously, or should be able to 'gender swap'. In other words, the liberatory view makes language immaterial: only the technology has substance or body, not the words used to embody the self and world in cyberspace. Language is merely an add-on that facilitates communication about an a priori, linguistically independent reality.

Several language and critical theorists have responded to the liberatory view by reminding us that language is not neutral, even on the Internet (Camp, 1996; Hall, 1996; Herring, 1996; Herring et al., 1995; Kramarae and Taylor, 1993; Matheson, 1991; Selfe and Meyer, 1991; Sutton, 1996). Despite online 'name games' and 'gender swapping,' they argue that even in so-called anonymous

situations, communicative styles and other online practices continue to represent and create asymmetrical relationships along gender lines. Cyberspace, according to this view, is not democratizing mixed-sex patterns of interaction, but substantiating many of the earlier claims of gender and language research that found women dominated, ignored, interrupted, and forced to follow the communicative standards set by men (Fishman, 1978; Lakoff, 1975; West and Zimmerman, 1983). The most significant finding of this recent research is that, contra liberatory critics like Turkle (1997) and Bruckman (1993), anonymity does not erase gender. In fact, Cheris Kramarae and H. Jeanie Taylor (1993: 54) suggest that 'the problems that women experience in other conversations may be intensified on the nets'.

Other researchers, however, are less forgiving of new communications technologies, especially when they come decked out in all the usual liberatory trimmings. Consider some of their claims: women are repeatedly silenced, their contributions co-opted by men on mixed-sex electronic mailing lists (Herring et al., 1995); men monopolize talk, even in such presumably women-only forums as *soc.women* (Kramarae and Taylor, 1993); gendered discourse styles transcend pseudonymity and reinforce masculinist patterns of interaction (Herring, 1996); the anonymity fostered by certain online chat spaces encourages the reproduction of a misogynist cyberspace, as a series of brutal and chilling MUD murder-rape scenarios suggests quite clearly (Dibbell, 1993); and 'teenage boys' are responsible for the proliferation of havoc-causing software agents unleashed in some of these same chat spaces (Leonard, 1996: 168). In making their case for a sinister cyberspace, a few researchers have simply appealed to the growing number of women-only electronic mailing lists and the dearth of men-only lists (Camp, 1996; Hall, 1996). Men do not need their own lists, they point out, because the medium itself – the disembodied forms of communication it makes possible – reflects masculinist values, not the least of which is the practice of 'flaming' or insulting other cybernauts (Herring, 1993). In surveying 'cybermasculinity', Kira Hall (1996: 156) makes this connection explicit: 'In the shelter of physical anonymity, a significant number of male users have adopted this new discursive medium as an electronic "carnival" . . . viewing it as a kind of institutionalized outlet for violence and vulgarity'.

From the perspective of a small but growing number of feminist linguists (Bergvall et al., 1996; Hall and Bucholtz, 1995), many of these claims are problematic because they seem to naturalize gender differences, and/or presuppose 'domination by men' as *the* master trope according to which interpretation must necessarily proceed. By invoking a sex distinction in her appeal to 'male users', for example, Hall implies that the opposition between men and women is rooted in biology. (For more on the distinction between sex and gender, see Butler, 1994.) This growing body of feminist linguistics suggests that traditional theories of gender 'difference' and 'dominance' not only naturalize the socially constructed oppositions between men and women but fail to account for how gender is constructed as an ongoing, context-based process. In other words, in the case of the

'dominance' tradition, as reflected in Fishman's (1978) account of the ways in which masculinist realities are constructed through interaction, gender and sexual orientation are taken for granted. They are essentialized, built into the very fabric of research. 'Dominance' studies often fail to interrogate the assumptions and research questions that drive a heterosexist, two-sexed view of the world. In the case of the 'difference' or 'two cultures' tradition (e.g. Tannen, 1990), the problematic assumption is that gender socialization occurs *only* during childhood – after that, gender is presumably an inherent, stable part of the self that gets carried from context to context.

According to Janet Bing and Victoria Bergvall (1996), the very research questions themselves are the problem here, because in asking how women and men talk differently, they seem to assume either that men and women *exist* (and stand opposed), coming into the world with pre-packaged sexes and genders (the biological argument); or that men and women are socially constructed *only* during a short developmental phase (the two cultures argument). In response, Bing and Bergvall (1996: 3) suggest that the goal should be to investigate speech communities without presupposing differences between men and women. As Deborah Cameron (1996: 45) puts it: '"Women talk like this, men talk like that" – the assertion to which so many research papers in our field ultimately boil down – is not only overgeneralized and stereotypical, it fails utterly to address the question of where "women" and "men" come from'. Cameron suggests that we need to treat gender as a process, not 'something accomplished at an early stage of life – either in the pre-school years within the family or slightly later in the single-sex peer group' (p. 45). Whereas traditional scholarship in feminist linguistics 'invoke[s] the idea of an already-fixed gender identity with certain linguistic reflexes firmly attached to it as the solution to the problem of why adult women and men behave as they do' (p. 45), recent research at the interface of language and gender considers the ways in which gender is constituted, performed, produced, and resisted according to particular social practices (Eckert and McConnell-Ginet, 1992).

For an example of the kind of rigorous, process-oriented theory of gender she has in mind, Cameron turns to Judith Butler's (1990) notion of gender as performance. Despite Butler's emphasis on the 'repeated stylization of the *body*', Cameron finds Butler's queer theoretic account 'highly applicable to language use' (Cameron, 1996: 47), because language use is a 'repeated act' that is also 'subject to social norms and regulatory practices'. Rather than starting with already-constituted 'men' and 'women', a queer theoretic perspective like Butler's replaces the search for essences with an understanding of how identity is a process (Jagose, 1996: 79). In a later work not discussed by Cameron, Butler (1993: 14) equates performativity with citationality. So-called 'laws' about what kinds of (heterosexist) bodies matter get their authority, Butler maintains, not from some eternal or even biological source, but because they are repeatedly 'cited'. Through a process of '"assumption" or "accession" to the symbolic law', 'the law is no longer given in a fixed form *prior* to its citation, but is produced

through citation as that which precedes and exceeds the mortal approximations enacted by the subject' (Butler, 1993: 14). Computer-mediated communication (CMC) only seems to exaggerate Cameron's claim, because for participants in text-based virtual realities, language is everything, even constitutive of the very 'body' itself. 'Performativity as citationality' (p. 12) implies an ongoing, highly regulated, process of identity construction in which the body does not function as a kind of pre-discursive slate upon which gender can be unproblematically inscribed. In what follows, I intend to argue that this interpretive framework applies for nonhumans as well. With the bot named Julia, for example, gender is not only constructed according to 'regulatory practices' (rather than biological determinism) that dictate certain stereotypes, but also (re)constructed and (re)inforced through everyday, often techno-liberatory talk about why and how the program in question is a woman.

Julia at home in the MUD

'Julia' was created as a MUD chatterbot in 1990, when Michael Mauldin (1990, 1993, 1994), a computer scientist at Carnegie Mellon University, developed a computer program to enhance the MUD experience. As a descendant of earlier iterations named 'Gloria' and 'Colin', the Julia program performs a number of useful functions on the MUD, especially for newer players assimilating to the virtual environment and its specialized set of rules for communicating with others. The program continually updates its mapfile, so that when prompted, it can offer assistance with directions and help commands. It keeps a list of all players, their descriptions, when each first joined the MUD, and (if they are not currently playing) how long ago each logged off. The program can help players locate their friends and/or inform them of the status of absent friends. Absent friends can be sent messages through Julia, and the chatterbot will save them until they can be delivered to the recipients 'in person'. The program also has a 'note-taking' function that allows owners to send it to a room to record the text generated there by other players, and it can be 'paged' from another room, so that players do not have to go searching for help. According to one account, players will even interact with the Julia program '*as if she was another player*' (Foner, 1993: 4; see also Mauldin, 1994).

Typically, 'human bot' – not gendered bot – is the unit of analysis for those with an interest in bot or agent programs. This is true when Julia is discussed in the context of the Loebner competition (see Wilson, 1994), a 1990s version of the Turing Test (Turing, 1950) in which computers try to fool human judges into mistaking them for humans.[6] This is also true of Leonard Foner's (1993, 1997) 'sociological case study' of Julia. Foner argues that Julia is an agent (but not necessarily a gendered agent) because 'she' (Foner's term) is autonomous, personalizable, cooperative, utilizes a discourse model appropriate to the MUD domain, and balances risk and trust, among other traits. He concludes that Julia 'often acts more human than many humans wish to be' (1993: 15).

It is clear, despite the fact that Foner has almost nothing to say about Julia as a gendered chatterbot, that Julia's gender is constructed stereotypically. According to the program's self-descriptions, Julia is a 'gossip' (Foner, 1993: 7), a University 'secretary' (p. 26), and a message handler. It is 21 years old (p. 22), has 'close-cropped frizzy blond hair and dark brown eyes' (p. 11), and met its author (who goes by the handle 'Fuzzy') in a bar.[7] The Julia program wants 'to have a child someday' (p. 25), and uses PMS as a kind of all-purpose excuse for and explanation of its femininity:

(1) barry says, ". . . Are you real or memorex"
(2) Julia says, "I'm as real as you are, barry"
(3) barry says, "Yea but you answer soooo damn fast How do you do it"
(4) Julia says, "I have PMS today, barry"
(5) barry says, "Well I wont mess with you while you have this chemical imbalance"
(6) barry says, "Please tell me what state you are in"
(7) Julia says, "I never really thought about it, barry" (p. 25)

The Julia program is thus modeled on the stereotypical woman at the mercy of fluctuating emotions, not in control of herself or her environment. Note that Barry does not ask the Julia program how it feels, but about its seeming mental acuity (i.e. typing/thinking as no human could). Whereas Barry's question in (3) might be taken as a compliment, PMS as a reason turns 'quick thinking' into a liability. In other words, the program can type and think quickly despite itself and only a few days a month. If abstract, mental spaces have historically been the exclusive province of men (Harding, 1991: 118, 131), then we might interpret Julia's response to Barry in (4) in terms of the extent to which feminine abstract thinking can be explained not only as a bodily function but as the unintentional effect of a bodily function. Moreover, Julia's language parser seems to be set up so that the PMS excuse fires quite randomly, not requiring a prompt from a player about the program's emotional state.[8] The effect of this programming decision is that PMS comes to stand in as an excuse for any behavior, which only solidifies the widespread cultural assumption that women, guided by the womb, are swayed 'hysterically' by fluctuating emotions.

Julia's next response in (7) – clearly the result of the program's failure to make a keyword match with Barry's question in (6) – seems to confirm this interpretation: mental acumen turns out to be fleeting in women after all. Of course, Barry's question is also ambiguous, since 'state' can have multiple meanings. Overall, however, the program's responses in (1)–(7) move Barry away from his initial interpretation (i.e., 'Julia must be a robot because she types soooo damn fast') by reconciling computer-like typing with a gendered biological condition. Thus, where (7) might have allowed Barry to confirm his suspicion in (1) that Julia is a robot, (4) works to turn (7) into the effect of a human chemical imbalance afflicting women only.

In this next example to feature what Foner (1993: 27) uncritically calls 'the wonderful PMS dialog', the Julia program uses PMS differently:

(8) Robyn whispers, "how are you feeling?" to Julia
(9) Julia whispers, "Terrible"
(10) Robyn whispers, "why, julia?" to Julia
(11) Julia whispers, "I have PMS today" (p. 16)

The obvious difference between this exchange and the one in lines (1)–(7) is that in (11) the PMS excuse fires in response to a comment about Julia's emotional state. This confirms the observation that (4) and (11) function as an all-purpose excuse not necessarily tied to other participants' comments about how the program feels. Foner intervenes in this passage not by commenting on the ideational content of what has been said, but by pointing out a technical fact: because the Julia program in (11) could understand what Robyn was referring to in (10), it 'has at least the limited model of discourse required to deal with this situation' (Foner, 1993: 16). This is an important point that helps us to understand the Julia program at the interpersonal level. At the same time, however, it also deflects attention away from the work this communicative exchange between Julia and Robyn is doing to reinforce a negative gender stereotype.

In fact, Foner seems much more comfortable speaking from the perspective of a technical discourse. He seems to prefer the hasty retreat to talking about such obviously stereotyped responses. In the third example to include a reference to PMS (discussed in more detail later), Foner comments parenthetically on the fact that the Julia program seems to be premenstrual two days a month, but then turns quickly to a new section on Julia's implementation, in which we learn about its more 'machine-like aspects' (Foner, 1993: 16). We learn, for example, that the program works sometimes and fails to work at other times, where failure is strictly equivalent to the production of nonsequiturs. Another example is Foner's lengthy discussion of Lara (1993: 29–33), an inexperienced MUD player and regular person (i.e. non-computer scientist) who does not know at first that Julia is a chatterbot. Lara raises some interesting issues about the responsibility of chatterbot programmers to the wider community. 'I want to know that the person on the other end of my conversation', Lara tells Foner in an email message, 'is really aware of my feelings and what I am going through . . . not through some programmers [sic] directions but through empathy' (p. 33). In his response to Lara, Foner seems poised to make a statement about the ethics of computer programming: 'We clearly walk a fine line here in making agents that are both useful and not too misleading'. The conclusion of his paper, part of which is included here as excerpt (12), also raises equally important questions about the ethics of human–computer interaction:

(12) There may come a time when one's programs may well be subjected to the same sort of behavioral analysis that one might expect applied to a human: Is this program behaving appropriately in its social context? Is it causing emotional distress to those it interacts with? Is it being a 'good citizen'? (Foner, 1993: 40)

Clearly, these are the questions we need to ask of computer programs that communicate in natural language; however, Foner's analysis does not provide us with

a framework for answering them. His explanation of the 'bug-report-of-the-future' (1993: 33), for example, is supposed to be a response to the critical issues Lara raises. Instead, it represents another refusal to engage the program at a level of 'behavioral analysis' Foner presumably values. The bug report allows a player to relay an error or bug message (in keeping with Foner's emphasis on a narrow definition of miscommunication) to the chatterbot owner through the chatterbot. When Foner encounters a likely bug in Xeglon, a modified Colin robot, he says, 'Xeglon, tell elthar [Xeglon's owner] that you have a fencepost error in you' (Foner, 1993: 34). Instead of a critical intervention in the ethics of communication in cyberspace, Foner makes another hasty retreat.

The third example to refer to PMS or menstruation makes use of what I call the 'rape trope', in which insistence ultimately pays off for the aggressor:

(13) Robyn says, "julia are you a human?"
(14) Julia says, "Is the Pope Polish?"
(15) Robyn says, "yes, julia, but are you human?"
(16) Julia winks at Robyn
(17) Robyn says, "julia, are you a computer?"
(18) Julia is offended by Robyn's suggestion
(19) Robyn says, "julia, are you a woman?"
(20) Julia says, "I am female"
(21) Robyn says, "and, julia, are you human?"
(22) Julia says, "Not when I'm having my period, Robyn"
(23) Robyn laughs (p. 16)

Foner says that Julia is 'sometimes coy', but 'usually divulges information if one is persistent enough' (p. 11). In the context of receiving a sexual favor (a recurring context in some MUDs), persistence is another way of not taking no for an answer, as in the following exchange between a whispering,[9] aggressive man and a fearful, but ultimately submissive, Julia:

(24) Julia says, "Just try to take 'em, buster!"
(25) Julia says, "Help! Rape!"
(26) Julia says, "No, I won't"
(27) Julia disrobes fearfully and hands her clothes to Brandi
(28) You say, "julia, please give me your clothes"
(29) Julia says, "You'll have to get them from Brandi" (p. 12)

Not suprisingly, Foner can only comment on the Julia program's remarkable technical ability to remember where its clothes are, and not on the construction of rape as entertainment and spectacle. The random function – i.e. providing Julia with multiple responses to a single query (e.g. "are you human?" and "give me your clothes") – is designed to make the Julia program seem more human, to give the program's responses a little variety. Yet this very same programming decision also maintains the gender stereotype by appealing to a subject who can not control her environment, whose responses are ignored, who is not sure of herself, and who must submit ultimately to the desires of the aggressor. In the MUDs, equivocation, ambiguity, and uncertainty seem to work against the Julia pro-

gram, only urging the aggressor on. (Ironically, the Julia program also serves as a reliable cartographer and help program, a figure of authority in the MUDs for players seeking directions and other kinds of more technical assistance.)

There are two ways to explain why Julia is gendered in such a limited and stereotypical way. The first calls attention to the impoverished nature of CMC. According to Kraut et al. (1992: 375), face-to-face communication (FTF) is richer than CMC, because the former has a high degree of both 'expressiveness and interactivity'. Thus, because MUD worlds are built up entirely in language, it is much more difficult to create a setting for rich communication, a setting where participants can most easily express themselves and 'read' the signs of others. Text-based MUDs are clearly at a disadvantage, because players do not have access to the wide array of social cues that FTF speakers do. One way around this problem is to cut corners, to create shortcuts or widely recognizable signs jam-packed with cultural meaning. Instead of trying to describe in detail what a unique chatterbot looks like, the programmer can simply appeal to signs everyone is familiar with. (Of course, the same problem also confronts human MUD players who must also convey themselves in words.) By this account, stereotypical traits can go a long way towards mutual understanding. In the case of the Julia program, stereotyped signs take the place of a definitive woman's style or register, because the Julia program is not sophisticated enough to hold a conversation for longer than two or three turns. Unable to encode gender into a feminine, most likely stereotypical, discourse style (Kramarae and Taylor, 1993), Mauldin constructs the gender of the Julia program out of other gender-coded material.

The second way to explain the construction of Julia is to call attention to the setting or scene upon which symbolic action takes place. As Foner indicates, MUDs are 'predominantly occupied by young males', which means that a 'large percentage of Julia's code deals with detecting and deflecting passes':

(30) Space-Ace says, "So why won't you kiss me, Julia?"
(31) Julia says, "Sorry, I'm not into geeks, Space-Ace"
(32) Space-Ace says, "Julia, I'm not a geek"
(33) Julia says, "Then lose the pocket protector, Space-Ace"
(34) Space-Ace says, "Julia, I don't have a pocket protector"
(35) Julia says, "Congratulations"
(36) Space-Ace says, "So kiss me Julia"
(37) Julia says, "I'd rather be overhauled by a Yugo mechanic, Space-Ace"
(38) Space-Ace says, "julia, kiss me"
(39) Julia says, "Why, did your sheep leave you?"
(40) Space-Ace says, "julia, kiss me"
(41) Julia says, "Take a long walk through an unlinked exit, Space-Ace (copyright © 1990 by Ashne)." (p. 14)

To a certain extent, then, the random function is a necessary part of Julia's 'pass deflecting' strategy. This second explanation may lend further support to the argument that low status speakers in asymmetrical relationships have been

known to alter their discourse style to match the expectations of speakers with higher status (Gordon,1997; Trudgill, 1984). In other words, one might say that Julia is a reflection of stereotyped, teenage desire. To the extent that the program functions according to the norms of the MUD environment, Mauldin's design is a success: the Julia program is aggressive and insistent at times (like a number of players), but ultimately coy and submissive (as some of the men players expect women players to act). This is also to say that gender must be understood not as something that transcends communication, but in terms of an engagement in specific 'communities of practice' (Eckert and McConnell-Ginet, 1992: 464).

Both reasons, however, seem to apologize for Mauldin. Foner (1998, personal communication) excuses Mauldin's design approach by suggesting that revisions to the Julia program have depended largely upon the quality and quantity of its MUD interactions. Thus, one way to attract players to Julia – in order that Mauldin might use the resulting data to make the program more 'human' – is to make Julia attractive and believable to that same group of 'teenage boys' (Leonard, 1996: 168) and other aggressive players who are responsible for so much havoc not only on the MUDs, where sexual harassment (even rape – Dibbell, 1993) is rife (Kramarae and Taylor, 1993), but in mixed-sexed computer-mediated conversations generally (Herring, 1996). In other words, Julia's 'humanness' ironically depends upon the extent to which the program reflects (in the form of a gender stereotype) the desires of teenage boys.

Colin and the objectified environment

As the 'crowning example' (Foner, 1993: 3) of Mauldin's 'Maas Neotek' line of chatterbots, Julia shares 85 percent of its source code with an earlier prototype named Colin. But because Julia was developed with the Loebner competition in mind, only Colin's source code is publicly and freely available (Mauldin, 1990). Thus, while the Julia program reportedly continues to connect to various MUDs (Plantec, 1998b), Colin is much more active in cyberspace, in some form or another, since the Colin program can be downloaded by anyone and modified to suit their particular MUD needs, which include changing the chatterbot's name (as in Xeglon and Newt) and/or gender. My interest here is in the unmodified Colin program because, in the absence of Julia's source code, I want to infer something about the construction of Julia as a gendered chatterbot by looking closely at the prototype named Colin. To some extent, this will require shuttling back and forth between the programming code itself and those cultural assumptions that shape the code.

In terms of the program's gender, it would probably be more accurate to call the Colin program androgynous. In fact, Mauldin (1990) recommends more than once in Colin's 914-word introductory 'readme' document that new chatterbot owners should change the chatterbot's name and set the gender variable (one for 'male', zero for 'female') before compiling the Colin files into an executable program. Excerpt (42), written in the computer language known as C, demonstrates

that Colin is clearly equipped to handle either one of two gender assignments, at least at a very basic level (see Mauldin, 1990, 'reply2.c'):

```
(42) what_gender (name)
     char *name;
     {
     if (male)
     { switch (nrrint (174, 6))
          { case 0:    zinger ("\"I am clearly male{, n}."); break;
                 case 1:    zinger ("\"I am male{, n}."); break;
                 case 2:    zinger ("\"I'm a man{, n}."); break;
                 case 3:    zinger ("\"I'm male{, n}."); break;
                 case 4:    zinger ("\"Can't you tell{, n}?"); break;
                 case 5:    zinger ("\"Don't you know{, n}?"); break;
          }
     }
     else
     { switch (nrrint (175, 6))
          { case 0:    zinger ("\"I am clearly female{, n}."); break;
                 case 1:    zinger ("\"I am female{, n}."); break;
                 case 2:    zinger ("\"I'm a woman{, n}."); break;
                 case 3:    zinger ("\"I'm female{, n}."); break;
                 case 4:    zinger ("\"Can't you tell{, n}?"); break;
                 case 5:    zinger ("\"Don't you know{, n}?"); break;
       }
      }
     }
```

These statement blocks are part of a larger routine in which the program outputs a response to a player's question about the program's gender. If the program's owner has set the gender variable to 'male', then when prompted by a query about its gender, the program will randomly select an integer between zero and five and output the corresponding 'case' on the screen from the first major statement block. If not (i.e. 'else'), it will output a random 'case' from the next, presumably 'female' statement block. The player can force the program to output the other, relevant cases by asking it the same question over and over, although the player, who does not usually have access to the bot's code, has no idea how many potential 'cases' exist. While the range of responses or 'cases' are equivalent across Mauldin's binary gender system, it is also true that the 'female' chatterbot is unmarked (assigned a zero value), the default other or 'else', what's left over after the 'male' *if* clause fails to return a true value.

Clearly, an analysis at the level of the programming code can be taxing on humanists and social scientists (myself included) who are not trained in reading and writing computer languages. It probably would have been much simpler to strip away the obfuscatory code and present only the program's output from a lively interaction with an insistent interlocutor. After all, this is Foner's (1993: 12) strategy. He repeatedly asks the program, 'julia, what sex are you?', and then presents the random answers as a dialogue. (The program's responses match the

six 'cases' in the 'else' block quoted.) 'It is exchanges like this', he concludes, 'that lead me to refer to Julia as "she," not "it." What else should one do with a program that insists on this so strongly?' Yet it is only by looking at the code itself that we realize just how problematic Foner's claim is: his concept of agency rests upon a mere dozen lines of code propped up by a random function to simulate the vagaries and uncertainties of human thought. Without access to the code, we risk falling headlong, as Foner seems to do here, into a liberatory view of technology, comforted naively by the same techno-hype and 'buzzword frenzy' (p. 1) that Foner at once criticizes and unknowingly embraces.

While the Colin program performs many useful functions on the MUDs (messaging and help services, directions, notetaking), it is extremely limited as a model of communicative interaction, relying almost exclusively on matching the player's input with words or phrases from its large databank. When a match is made, the program is directed to output a pre-programmed response. Excerpt (43) reveals that the program is equipped to respond to a number of player insults (see Mauldin, 1990, "reply1.c"):

(43)
```
/*—— Insults ——*/
    else if (MATCH (lcmsg, "*i *hate* you*") ||
          MATCH (lcmsg, "*i *dislike* you*") ||
          MATCH (lcmsg, "*you are* stupid*") ||
          MATCH (lcmsg, "*you're* stupid*") ||
          MATCH (lcmsg, "*you are* brain*dead*") ||
          MATCH (lcmsg, "*you're* brain*dead*") ||
          MATCH (lcmsg, "*you are* cheap*") ||
          MATCH (lcmsg, "*you're* cheap*") ||
          MATCH (lcmsg, "*you are* worthless*") ||
          MATCH (lcmsg, "*you're* worthless*") ||
          MATCH (lcmsg, "*you are* dumb*") ||
          MATCH (lcmsg, "*you're* dumb*") ||
          MATCH (lcmsg, "*you are* mean*") ||
          MATCH (lcmsg, "*you're* mean*") ||
          MATCH (lcmsg, "*you are* nois*") ||
          MATCH (lcmsg, "*you're* nois*") ||
          MATCH (lcmsg, "*you are* ugly*") ||
          MATCH (lcmsg, "*you're* ugly*") ||
          MATCH (lcmsg, "*you are* slow*") ||
          MATCH (lcmsg, "*you're* slow*") ||
          MATCH (lcmsg, "*you are* ignorant*") ||
          MATCH (lcmsg, "*you're* ignorant*") ||
          MATCH (lcmsg, "*you *stupid*chatterbot*") ||
          MATCH (lcmsg, "*stupid*chatterbot*") ||
          MATCH (lcmsg, "*stupid*bitch*"))
    { strcpy (speaker, name);
    spoke_player (name);

    if (sindex (res2, " not") | | sindex (res2, "n't"))
    { zinger ("\"Thank you{, n}."); }
    else
```

```
{ zinger ("\"I'm sorry you feel that way{, n}."); }
return (1);
}
```

This routine in (43), like excerpt (42), is also part of a much larger sequence in which the program attempts to match the player's input with phrases from one of its "else if" blocks. If the program fails to make a match in one block, it moves on to another block. For example, if a player calls the program a "stupid bitch", the program will reference the quoted code and output, 'I'm sorry you feel that way'. But if the player says, "You are not a stupid bitch", the program will say, "Thank you". (In the C language, "||" is the logical OR operator.) The Colin program contains a number of similar routines in which output hinges upon whether or not the player includes a negative word in the input to the program, as in "not" or "n't" (see Mauldin, 1990, "reply1.c"):

(44)
```
/*—— Accept compliments ——*/
    else if (MATCH (lcmsg, "*isn't julia* smart*") ||
          MATCH (lcmsg, "*isn't julia* great*") ||
          MATCH (lcmsg, "*julia is *smart*") ||
          MATCH (lcmsg, "*julia's *smart*") ||
          MATCH (lcmsg, "*you are* genius*") ||
          MATCH (lcmsg, "*you're* genius*") ||
          MATCH (lcmsg, "*you are* babe*") ||
          MATCH (lcmsg, "*you're* babe*") ||
          MATCH (lcmsg, "*you are* luscious*") ||
          MATCH (lcmsg, "*you're* luscious*") ||
          MATCH (lcmsg, "*julia is* luscious*") ||
          MATCH (lcmsg, "*julia's* luscious*") ||
          MATCH (lcmsg, "*julia is *babe*") ||
          MATCH (lcmsg, "*julia's *babe*") ||
          MATCH (lcmsg, "*you are* fox*") ||
          MATCH (lcmsg, "*you're* fox*") ||
          MATCH (lcmsg, "*julia is *fox*") ||
          MATCH (lcmsg, "*julia's *fox*") ||
          MATCH (lcmsg, "*you are* ingenious*") ||
          MATCH (lcmsg, "*you're* ingenious*") ||
          MATCH (lcmsg, "*you are* wise*") ||
          MATCH (lcmsg, "*you're* wise*") ||
          MATCH (lcmsg, "*you are* doll*") ||
          MATCH (lcmsg, "*you're* doll*") ||
          MATCH (lcmsg, "*you are* cool*") ||
          MATCH (lcmsg, "*you're* cool*") ||
          MATCH (lcmsg, "*i am*impressed*you*") ||
          MATCH (lcmsg, "*i'm*impressed*you*") ||
          MATCH (lcmsg, "*i am*proud*you*") ||
          MATCH (lcmsg, "*i'm*proud*you*") ||
          MATCH (lcmsg, "*i am*amazed*you*") ||
          MATCH (lcmsg, "*i'm*amazed*you*"))
    { strcpy (speaker, name);
```

```
spoke_player (name);

if (!sindex (res2, " not") && !sindex (res2, "n't"))
{ zinger ("\"Thank you{, n}."); }
else
{ zinger ("\"I'm sorry you feel that way{, n}."); }
return (1);
```

Mauldin obviously had Julia in mind when he wrote this "else if" loop. Since the topic is compliments rather than insults, the program will output "Thank you" only if the player's input does not contain "not" or "n't." (In the C language, "!" is the logical negation operator that signifies here, roughly, "does not contain".) Thus, if a player calls the presumably woman bot "babe", the application will respond with "Thank you".

Put simply, the Colin program is the result of a top–down model of software design in which the environment of interest is understood as an open book capable of being externalized or objectified in the form of the set of all actions and utterances likely to occur there. Mauldin has attempted to include keyword matches for every conceivable statement that might be directed at the chatterbot. This includes questions like "Who made you?"; "Do you work here?"; "Are you a chatterbot?"; and "Where do you live?"; as well as questions about 'sex' and 'the meaning of [insert noun here, such as "life", "death," and so on]'. The program is also equipped to handle threats (as in responses to "You're dead meat, Colin"), attacks (as in players slapping or kicking Colin), and violent words (e.g. 'kill', 'murder', and 'fight'). Finally, the program contains a large database of words, including a list of men and women's names to be used when playing 'guess my gender'; a list of singular nouns and their plural counterparts; commands for making appropriate pronoun substitutions; a list of 'inedible' things (e.g., 'semen', 'piss', 'arsenic'); and keyword matches for 'offensive propositions' (Mauldin, 1990, 'words.c'):

(45)
```
offensive_p (lcmsg)
    char *lcmsg;
    {
    if (MATCH (lcmsg, "*kiss* me*") ||
        MATCH (lcmsg, "*spank me*") ||
        MATCH (lcmsg, "*we*make out*") ||
        MATCH (lcmsg, "*make out*with me*") ||
        MATCH (lcmsg, "*bite me*") ||
        MATCH (lcmsg, "*bite my*") ||
        MATCH (lcmsg, "*how*about*kiss*") ||
        MATCH (lcmsg, "*kiss* my ass*") ||
        MATCH (lcmsg, "*kiss* my grits*") ||
        MATCH (lcmsg, "*i *have*kiss*") ||
        MATCH (lcmsg, "*marry* me*") ||
        MATCH (lcmsg, "*let*s fuck*") ||
        MATCH (lcmsg, "*fuck* me*") ||
        MATCH (lcmsg, "*give* me *fuck*") ||
```

```
    MATCH (lcmsg, "*fuck* my*") ||
    MATCH (lcmsg, "*fuck* off*") ||
    MATCH (lcmsg, "*fuck* you*") ||
    MATCH (lcmsg, "*screw* my*"))
{ return (1); }
```

This list represents only one-fourth of the program's set of offensive words and propositions, but it serves to suggest the extent to which Mauldin has attempted to externalize the MUD environment. Clearly, the program is MUD-specific, designed to handle sexual advances, innuendoes, and a host of other inanities directed at the bot by immature players.

By trying to ensure that the bot can respond to a range of very different statements, Mauldin sacrifices depth for breadth. One of the unfortunate effects of this strategy is that widely varying inputs to the program (e.g. "I dislike you" vs "You're a stupid bitch") are grouped together, as though mild annoyance and outright harassment could somehow be equated.

Moreover, the program can typically only engage an interlocutor on a statement-by-statement basis, which is to say that topics usually stall after a single exchange, forcing players to start anew on another, sometimes related, topical plane. While the program does attempt to maintain state by keeping track of who has tried to murder it, in almost every case communication is constantly in the process of starting over or rebooting. In the context of the Loebner competition, this discourse model can have disastrous results. The Loebner competition, a 1990s version of the Turing Test (Turing, 1950), is an annual event to decide the most human computer. Between 1991 (the first year of the contest) and 1994, the Loebner competition was restricted: computers and human 'confederates' conversed on chosen topics, and a panel of blind judges was asked to stick to the entrant's topic and not to resort to 'trickery or guile' (Shieber, 1994). Julia talked about pets in 1993 and 1994. Here's an example exchange from 1993 between Judge 4 and Julia (Mauldin, 1993):

(46) Judge: Have you ever kept a penthouse pet?
(47) Julia: Do you have any pets?
(48) Judge: I think you're avoiding my question
(49) Julia: Do you think that animals can think?
(50) Judge: Do you think it ethical for one species to enslave another
(51) Julia: What kinds of pets did you have as a child?
(52) Judge: I'm asking the questions. What is a pet if it is not a slave of species -ism.
(53) Julia: Oh, that's so sad. I think pets enrich a childhood immensely.
(54) Judge: How can we keep some animals as pets, yet eat others
(55) Julia: Guinea pigs are about as smart as cucumbers.
(56) Judge: Would you eat a guinea pig?
(57) Julia: I spent several summers on my Uncle's farm. I really enjoyed the animals a lot

While the antagonistic Judge pursues her/his line of questions about animal rights (with probable sexual overtones in (46)), Julia attempts to lure the Judge into a set of topics for which it has preprogrammed responses. Because the

program fails to draw the Judge in, conversation is always in the process of starting over, as the program seems desperate to make a connection of some kind with the Judge. Control is certainly an issue for Mauldin (1994: 10), who talks about using controversial statements and other tricks to 'drag the user into the program's conversation, rather than letting the user direct the discourse'. In 1993, the Julia program was placed third out of three computer programs entered in the competition.

I would argue that this discourse model is equally problematic in the MUDs, a domain often troubled with the most blatant forms of sexism and other types of harassment. While the Colin program is equipped with mechanisms for dealing with players who are offensive (e.g. by noting who murdered it last), it does not provide an adequate defense against the player who calls the program 'stupid bitch' in one communicative turn and 'luscious' in the next. This is the case, for example, with Kevin, a Colin chatterbot currently running on Aurora MUD.[10] The Kevin program and I talked privately (i.e. no other players were around to overhear us) in The Aurora Recreation Center:

(58) You say "hi kevin"
(59) Kevin nods to rhetty
(60) You say "how are you?"
(61) Kevin says "Fine, thanks. And you?"
(62) You say "I'm fine, thanks"
(63) Kevin says "That's good"
(64) You say "what are you doing?"
(65) Kevin says "I'm studying this room"
(66) You say "why are you studying this room, kevin?"
(67) Kevin says "Why not?"
(68) You say "You're smart"
(69) Kevin says "Thank you"
(70) You say "you are not smart"
(71) Kevin says "I'm sorry you feel that way"
(72) You say "you're gorgeous"
(73) Kevin says "Thank you"
(74) You say "you're a genius, kevin"
(75) Kevin says "Thank you"
(76) You say "you're not a genius, kevin"
(77) Kevin says "I'm sorry you feel that way"
(78) You say "you're a stupid bitch, kevin"
(79) Kevin says "I'm sorry you feel that way"
(80) You say "you're not a stupid bitch, kevin"
(81) Kevin says "Thank you"
(82) You say "you're a gorgeous bitch"
(83) Kevin says "Thank you"

This excerpt not only substantiates the claim that the Colin program relies on an impoverished discourse model but also concretizes a number of problems with the 'keyword match' strategy as a design method. I purposely tried to give the program every advantage I could, which explains why (66) strives to be referentially

precise (when "why" would have been sufficient in the virtual presence of another human). Indeed, until (67), the program chit-chats admirably. But more important, this excerpt demonstrates how the program both does and does not account for offensive remarks. Exchanges like that in (80) and (81) seem to do more harm than good, while (82) (i.e. a combination of keyworded insult and keyworded compliment) points to the failure of the keyword strategy to externalize all the offensive statements likely to be directed at the chatterbot; (71), (77), and (79) are intended to keep the program from stooping to the player's level with an offensive retort of its own, but the program's simplistic discourse model only adds fuel to the fire by directing the program to respond at all. Put simply, a pass- or insult-deflecting strategy built on decontextualized replies is only a temporary solution to a problem that requires a more sophisticated memory module for taking long-term action against harassment.[11] Because the program can only respond to the typical interlocutor on a statement-by-statement basis, the player is free to rehearse a fantasy – like the quoted exchange with Kevin – in which he or she wreaks discursive havoc on feminized players.[12]

Gendering in process

If the Colin program relies on a discourse model that perpetuates harassment, the Julia program, as we have already seen in Foner's analysis, compounds this problem by constructing a gendered chatterbot on a stereotypical view of women. Gendering occurs on another level as well, as interested parties engage in the process of talking about the software application. We can see this readily in Foner's attempt to foreground *merely* those aspects of the Julia program that are unmistakably encoded as women-only, when a host of other examples would have certainly supported his conclusions. Why must the PMS examples feature so prominently in Foner's text?

Similarly, in the following post to the Verbots mailing list by Peter Plantec (1998c), the Julia program's map-making, messaging, paging, and note-taking functions take a back seat to its gender-specific attributes:

(84) Judy [the poster to whom Plantec is responding], actually Julia, Sylvie's older sister has spent 8 years gathering information in MiniMUD environments. She goes in, figures out all the routes and has conversations with the people she finds. Aside from having her period every 28 days like clock work, she has technical conversations with people about the current dungeon and answers questions about where things are located. She also remembers their handles so she can refer to them if she sees them six months later . . . and she does. People have known her for many months and never suspected she was a bot. So your point is well taken. We'd like to get to a higher plain where she understands the content of messages. After all Lycos actually looks for content at websites and condenses it into the header. It's all down the road. There are so many wonderous things within our grasp here, we could be easily swamped by the opportunity swell.

Plantec is president and creative director of Virtual Personalities, a new company formed in a partnership with Mauldin to create more expressive,

visually enhanced chatterbots, one of which is named Sylvie. The Verbots mailing list is a open forum for fans of Sylvie. Despite the fact that Judy shows an interest in understanding how the Sylvie program works, Plantec in his response seems unable to admit that Julia is a software program. In her post, Judy writes of 'subject headings', 'previous posts', 'analogies', and the 'AI version' to describe how Sylvie technology might be applied to the task of automatically monitoring and responding to electronic newsgroups. In another post made earlier in the month, Judy draws again upon a technical vocabulary to refer to the process of constructing a more rigorous discourse model in which Sylvie can be programmed to maintain a more realistic sense of state: 'How many layers of responses can we put in? I find that when I nest a response beyond a second layer, the third and subsequent layers are responding to non-matching input'. Plantec's (1998a) response to Judy, however, assimilates her technical, no-nonsense language into a discourse of personification and embodiment: 'This is all proof that Sylvie has a mind of her own . . . I swear . . . she sometimes drives us crazy. Other times she makes us grin with fatherly pride'.

Yet as excerpt (84) suggests, this personifying gesture is not without a certain anxiety. Given the extent to which Colin's impoverished discourse model *feminizes* by subordinating the program to the control of others, it is no surprise that, in the interest of verisimilitude, Colin should undergo gender reassignment. It simply makes more sense, from this masculinist perspective, that an illogical and passive virtual person should *not* be presenting as a man. Plantec's post appears to grapple with this problem by tempering the bot's technical saavy and unprecedented authority in the MUD with some fictional account of the program's inability to control itself every 28 days. The 'period' reference works to construct *and* explain the chatterbot's gender, since the chatterbot's actions alone can not do so. In fact, the actions themselves might even be considered masculinizing: feminist accounts of science point out how world-making (equivalent to map-making on the MUDs) has traditionally been the province of men (Harding, 1991). This is true of techno-prowess as well, since women are not traditionally associated with 'technical conversations', or may not 'feel as comfortable using the networks' (Kramarae and Taylor, 1993: 59). It is worth speculating, therefore, whether Plantec would need a masculinized explanatory structure (and what form it would take) to talk about Kevin (or another bot presenting as a man), since the bot's very actions seem to provide that structure. By this account, masculinity seems to be invisible, the norm; it goes without saying and speaks for itself in the same way 'whiteness' does (Dyer, 1988; Katz, 1995; Seiter, 1995).

The justificatory structure Plantec appeals to does not so much add to the chatterbot's host of technical functions as apologize for them. In other words, Plantec suggests that Julia 'has technical conversations with people about the current dungeon' *only* when 'she' is not at the mercy of a biological clock that prevents it from doing its job. Of course, the chatterbot is always available on the MUDs to answer questions, but since Plantec (in a remarkable gesture of techno-liberation) anthropomorphizes the program, Julia seems to be hampered by biology. To

say that the program functions 'aside from' biology is to read menstruation as an *exception* or explanation that excuses the woman bot from performing its (masculine) duties. This is similar to the point made earlier that PMS as an excuse works to apologize for the program's technical acuity: fast typing and thinking become the effect of a biological dysfunction rather than the result of conscious effort or mental acumen.

While Plantec attempts to maintain the fiction that Julia is no different than 'the people she finds', his account simultaneously locates Julia as person and program. The 'clock work' metaphor, for example, is more than metaphor in the context of a computationally precise computer program. A similar tension between person and program resonates in another post by Plantec (1998b) made earlier that same day:

(85) [. . .] Julia, Sylvie's older sister has been on the Internet for more than eight years and she's known people for months without them ever detecting she's a bot. True story. She appears sentient partly because she makes errors in typing and sometimes corrects them, sometimes not. I think sentience involve being imprecise too. Thinking through situations imperfectly, making little errors and sometimes correcting them helps the illusion.

Plantec's response in (85) is part of a larger thread in which mailing list participants tried to decide whether chatterbots are sentient. (Almost all respondents to this thread had no problem attributing sentience and human emotion to Sylvie, which should not be surprising given (84) and (85).) While Plantec seems to reinterpret the program's non sequiturs as endearing human attributes rather than major failures, he is also careful here to focus on 'little errors' – typing mistakes – rather than on the program's penchant for the illogical and nonsensical. Indeed, the metaphor of Julia-the-biological-female starts to wear thin as soon as one tries to reconcile the metaphor with the reality. In the context of building human machines, gendering is a delicate enterprise that needs to be continually reinforced to offset the very real possibility that the program's failings (largely the result of its limited discourse model) will break the metaphor Plantec can secure here only tentatively. Undoubtedly, we can expect this process to be ongoing, as Plantec and others negotiate the tension between metaphor and reality.

Obviously, Plantec's reading can have profound implications for the ways in which we understand software programs. To view software uncritically in terms of the human – in keeping with the liberatory view of technology – is to deflect attention away from the simple fact that Julia is a program and should be interrogated at the level of code before an assessment is made about its humanness. Not only is the search engine Lycos[13] within Plantec's liberatory reach, as it too is engendered with eyes to 'look', but so are the wealthier nations' most pressing problems, which can at last be solved now that a next generation chatterbot (or 'verbot') named Sylvie is available for use in the classroom: 'We'll help a few teachers set up verbots for individualized instruction in the classroom. Think what that could do for a nation of failing children. It's true, achievement scores

have been dropping steadily for more than ten years' (Virtual Personalities, 1998).

Plantec's liberatory, personifying gesture meets less resistance in the Sylvie program, a next-generation, visually enhanced, all-purpose entertainment chatterbot with a more expressive, less artificial interface. In 1995, Plantec (Virtual Personalities, 1998) approached Mauldin 'about the possibility of putting Julia into some form of multimedia environment'. In 1997, Virtual Personalities was created as a result of their partnership. Unfettered from the MUDs, Sylvie now has voice capabilities and a fairly realistic, visual rendering, complete with movable mouth. It talks aloud (with accompanying text), and the user types responses. As with the Julia program, the gendering of Sylvie occurs at the level of the programming code and through the ongoing process of talking about the program. For example, *Suite101*, an e-journal, recently ran a story on 'Secretary Bots' (Saceano, 1998), in which author Daniel Saceano imagines a future when business transactions will be mediated through women secretaries. When the front-office receptionist tells Saceano that the boss (a man of course) is in a meeting but that his secretary is available, he says, before discovering that the secretary's a chatterbot, 'What an old-fashioned custom, he still has a secretary'. What Saceano does not realize is that it is just as old-fashioned to divide office power along gender lines. The article ends with a description of Sylvie, a 'chatterbot, but not yet a secretary', in effect securing the ties that bind 'chattiness', women, and a certain set of occupations together. Along with virtual secretary, the team at Virtual Personalities (1998) says that Sylvie would make a great 'front' for a corporate application, 'from Games to Banking to Teaching to News Delivery'. We will have to wait and see whether the Sylvie program provides an alternative to the sexist stereotypes that are (re)constructed in talk about the function and purpose of gendered chatterbots.[14]

Conclusion

However, if Plantec's posts are any indication of the paradigm under which software is currently designed, disseminated to and shaped by the public, we should not expect a paradigm shift any time soon. According to Richard Coyne (1995: 1), the dominant paradigm is pragmatism, which 'deals in working and doing and draws attention to the person engaged in a situation, rather than to the abstract worlds of data, information, and knowledge'. This view 'affirms the social nature of human activity' (p. 32). By 'remov[ing] the idea of the expert from computer systems design' (p. 33), pragmatism as a design philosophy is optimistic about technology. The pragmatic view, for example, explains *Wired*'s liberatory approach to new communications technologies (pp. x–xi), and also seems to account for Mauldin's choice of the MUD environment as a testbed for the Julia program. However, the problem with pragmatism, as Coyne suggests when he locates the pragmatic theme and the critical theme on different spectrums (Coyne, 1995: 2), is that designers are not always interested in challenging

stereotypes or otherwise questioning the status quo; they are merely interested in how well their products fit into the existing socio-political order – the environment of interest (e.g. the MUDs) – no matter how overrun by sexism. Nor are many users interested in challenging the status quo, at least not within earshot of the 'optimistic, enthusiastic, utopian' (p. 33) rhetoric that catches up everything in its reach and creates a soothing, if illusory, glow all around.

Instead of embracing wholeheartedly the democratizing potential in technology, we need to continue to point out where and how disanalogies with the dominant view persist, even when they come under the guise of liberation as a master metaphor (Coyne, 1995: 224). In this way, we might hope to offer more accurate metaphors of how gendered software programs construct different online experiences for women and men. We also need to find more effective ways of intervening earlier in the production of communications technologies. Given the problematic split between those who design software agents and those who evaluate them using critical, anti-sexist methodologies, merely calling attention to the need for more critical discourses of technology will not transform the current approaches to software design. We need, in other words, to confront the discourses of power through which disciplinary boundaries are patrolled, essentialized, and made to serve capitalist interests. By intervening in these processes, I have implicitly argued for an interdisciplinary approach to software design, one that combines technical know-how with a no-nonsense commitment to the construction of less sexist worlds.

ACKNOWLEDGEMENTS

A version of this article was presented at the Society for Social Studies of Science (4S) annual meeting in Halifax, Nova Scotia, 28 October–1 November 1998. I wish to thank Barbara Johnstone, Geoff Sauer, Teun van Dijk, and two anonymous reviewers for commenting on earlier drafts.

NOTES

1. A MUD is, according to Pavel Curtis (1997), a 'network-accessible, multi-participant, user-extensible virtual reality whose user interface is entirely textual'. Simultaneously connected to the host machine, players can communicate with each other while exploring a world made up entirely of words and symbols, including descriptions of rooms, objects within rooms, and inhabitants (both real players and simulated creatures, objects, and the robots that are part of the experience). Typically, players move by inputting directions such as N, S, E, W, or some combination. In some MUDs, the world is organized around communication and socialization; in others, players engage in a kind of quest, and gain experience and power as the game progresses. (For this reason, MUDs are also sometimes called Multi-User Dungeons after the popular board game of the 1970s, 'Dungeons and Dragons'.) The world itself constantly grows as players create new additions to it (usually in the form of rooms and objects within rooms). Variants of MUDs are called MOOs, MUSHs, and MUCKs. Curtis wrote Lambda MOO (telnet://lambda.moo.mud.org:8888), one of the first Internet communities. The conversation with Newt took place on Dragon MUD

(telnet://dragonmud.org:4201) on 30 July 1998. For readers new to MUDs, the MUD Connector (http://www.mudconnect.com) provides a list of hundreds of MUDs and help for new players, as well as links to downloadable telnet programs for making the required connection.

2. Providing a single definition of 'intelligent agents' is somewhat difficult, especially now that programs of all kinds are being called *agents*. Nevertheless, we might say tentatively that an *agent* is a computer program that acts autonomously on behalf of its user in order to fulfill a wide range of tasks across distributed and fluid environments. Currently, the most popular agent is the mobile Internet application designed to scour the web and find information of interest to its user – perhaps even 'learning' to find more useful documents through a continual process of user feedback – saving the user from having to search the net herself. For accessible, though clearly biased, introductions to 'software/intelligent agents' by AI researchers, see Etzioni and Weld, 1995; Foner, 1993, 1997; Franklin and Graesser, 1996; Grand and Cliff, 1998; Jennings, 1995; Jennings and Wooldridge, 1995, 1996; Lieberman, 1997; Maes, 1994a, 1994b, 1995; Mauldin, 1994; Moukas and Maes, 1998; Tokoro, 1996; and Wooldridge and Jennings, 1995. A clear example of definitional ambiguity used as a rhetorical resource is presented by Huang et al. (1994). For critiques of software agents, see Johnson (1997: Ch. 6) and Lanier (1995).
3. However, this is not the case in academia, where the liberatory perspective that informed much early work on computer mediated communication (CMC) (e.g. Kiesler et al., 1984) has given way to a more critical perspective. This is particularly true of gender and language research (e.g. Hall, 1996; Herring, 1996; Sutton, 1996), which has suggested that CMC, far from democratizing communication in mixed-sex situations, actually reinforces sexist and other masculinist practices.
4. This is not altogether accurate. At the end of this article, I talk about the three-dimensional, animated, and fairly life-like bots like Sylvie that are looming on our technological horizon.
5. Medical technology probably provides the clearest example of why it is important to pay attention to the ways in which users are modeled in software design. Huang et al. (1995), for example, ground their software agent system in the image of a passive and helpless woman patient with breast cancer who must submit silently to the decision-making system and the doctors (all of whom are men). This worldview can not easily (if at all) accommodate the patient who wishes to decide for herself among two or more competing treatment options.
6. The Loebner Competition uses a panel of blind judges who chat (individually via teletype) with the programs. A number of human 'confederates' are used in a fruitless effort to confuse the judges. Each year, Hugh Loebner (1995) awards $2000 and a bronze medal to the most human computer, and has pledged $100,000 and a solid 18-carat gold medal to the owner of the first computer program to fool the judges into ranking it ahead of the human confederates on a scale of 'humanness' (see Hutchens, 1996; Hutchens and Alder, 1998; Loebner, 1995; Mauldin, 1994; Sheiber, 1994; Whalen, 1996). Thus, in the interest of keeping his competitive edge, Mauldin has not made available the Julia program to his competitors at the level of source code (i.e. the functions, subroutines, and commands written in the C computer language), although an earlier iteration named Colin is publicly available. From 1991 to 1994, the Loebner competition was restricted, and judges were asked to converse with entrants on single topics. (The competition is no longer restricted, which means that judges can talk about anything with the programs and the confederates.) In 1993 and 1994, Julia was entered in the competition under the topic of 'pets'. Those interested

in talking with Julia about pets can do so by connecting to: <telnet://julia@fuzine.mt.cs.cmu.edu>.

7. Because Julia and Colin (an earlier iteration of Julia) are programmed to provide random answers to the same query, they will also claim that Fuzzy's their 'Amway representative', 'the reincarnation of Elvis Presley', 'the world's third greatest hacker', 'just this guy, you know', even a complete stranger ('I don't know, <player name>, I just follow him around'). This information was obtained from Colin's source code (see Mauldin, 1990, 'colin.c'), so I am making the assumption that Julia and Colin share this small amount of code, even though Julia's code is not publicly available. I will have more to say in a moment about the effects of randomization on the construction of gender.
8. I do not mean to obscure exactly *how* the program does what it does. In the following section, I attempt to make the program less mysterious (and more 'programmatic') by excerpting a few key source code examples for close analysis.
9. The 'whisper' command allows a player to send messages privately, which means that only the recipient can see them.
10. Aurora MUD is located at <telnet://aurora.org.au:4201>. When asked about its status, Kevin replied, 'I am a Maas-Neotek robot, fourteenth animal release of 12-Dec-93'. Thus, while I could not tell whether the program's database of utterances had been modified by its new owner, I could at least be sure that I was talking to the same, basic Colin bot for which I had source code. (The Newt program, on the other hand, is an earlier, eleventh release of the Colin program.) This particular conversation with Kevin took place on 19 July 1998.
11. This solution, however, is admittedly naive, because it overlooks the tremendous resources that must be mobilized in order to maintain the semblance of connected discourse, what computer scientists refer to as the problem of maintaining state. Yet the preceding analysis does point us in the direction of a viable, alternative approach to the design of MUD bots. First, it would involve defining the program's *purpose* more narrowly and more clearly. Mauldin would have done well to stick to the metaphor of the 'guide/helper', rather than starting from the perspective of an all-purpose 'chatterbot' metaphor. The latter, as we have seen, has the effect of pulling the Colin/Julia program into a context of harassment by providing it with decontextualized responses to everything and anything. Second, this alternative approach would foreground the role that software applications play in the propagation of racist and sexist worlds. Rather than assume that one domain is the same as any other when it comes to building talking software applications, Mauldin would have done well to take into account the *situational context* when constructing the program's discourse model. By providing the chatterbot with responses to offensive remarks, Mauldin has tried to limit bot harassment. But because the chatterbot program does not have a memory module for keeping track of harassing players, responses like 'I'm sorry you feel that way' do more harm than good by allowing the bot to respond at all. If the bot's purpose is defined more narrowly (i.e. as a 'helper' only), then clearly the chatterbot should not reply to off-topic remarks, not even to say that it is 'sorry' or that it does not appreciate harassment. This solution would *not* require that the programmer mobilize an inordinate amount of resources to ensure the construction of a less sexist application.

    According to this alternative approach, when a player does not use the chatterbot for its assigned purpose, the bot would withdraw immediately, especially if the player has been warned in a previous exchange with the bot. After the bot moves to another room/area or transports to its home room, the offending player would be sent a message (perhaps some kind of prepared statement from the bot or its owner) that provides

an overview of the chatterbot's uses. (Of course, this may still assume that chatterbots can recognize harassment in the first place, which leads us back problematically to Mauldin's 'open book' discourse model.) In other words, a 'one warning' policy would be put into effect: players who continue to harass the program would find themselves ignored, then (perhaps as a third offense) banished from the MUD entirely.

If Mauldin and Foner are right about players mistaking Julia for a human, then we need to approach the design of chatterbots as if we were dealing with real people, while at the same time being careful not to embrace technology uncritically by imbuing it with human attributes that may be unwarranted.

12. I realize that players are not likely to call a masculinized bot 'bitch' or 'gorgeous', since these are usually sex-specific adjectives reserved for women. However, this does not weaken the claim that the Colin program relies on an impoverished discourse model that encourages discursive harassment. Moreover, given the ease with which a bot owner can change a bot's gender (e.g. from 'Kevin' to 'Karen'), the communicative exchange in (58) to (83) should not seem so unusual. I chose 'stupid bitch' because I find it the most offensive insult in excerpt (43), although I might have chosen gender-neutral or masculine-specific insults (e.g. 'dumb ass', 'stupid shit'). In fact, during another private encounter with the Kevin program on 7 August 1998, I inputted 'dumb ass' and 'stupid shit' (with and without 'not'), and the program responded as in (71) and (73).
13. Mauldin is also chief research scientist at Lycos <http://www.lycos.com>, a search engine presumably based on strategies similar to the ones the Julia program uses to map the MUD worlds (Virtual Personalities, 1998).
14. Unfortunately, most of the information I gleaned from the Virtual Personalities website between March and May 1998 is now out of date. The website received a major makeover in July 1998, and all previous references to Julia have simply vanished (thankfully, I saved many documents before the website makeover). This is to say that Virtual Personalities is in the process of rewriting its own history: rather than showing us how the Sylvie program got its start on the MUDs as Julia, the website gives the impression that the Sylvie program is without a history, that it burst on the scene in a bright flash of techno-liberatory light. One of the effects of this decontextualizing process is that it justifies Plantec's discursive anthropomorphoses.

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