On Language, Gender, and Digital Technologies

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This reflection explores issues at the interface between the digital humanities (especially linguistics, philosophy, and art: Berry and Fagerjord, *Digital Humanities*), information and communication technologies (ICTs), and "development" through a focus on the use of language and symbols in the field of ICT for Development (ICT4D) (Unwin, *Reclaiming Information*). As a young geographer, I was fascinated by the relationships between language, meaning, and reality. Nurtured by Habermas's Critical Theory, I could not avoid avidly reading Wittgenstein's *Tractatus Logico-Philosophicus* and *Philosophical Investigations*; I even ventured in one of my early books, *The Place of Geography* (1992), to struggle with the balance between the extent that reality structures our languages and how language itself also shapes our understanding of the world. My more recent research and practice in ICT4D has made me acutely aware of how words are used to shape, but also to constrain and control, not only the way that issues at the interface between digital technology and development are spoken about, but also the reality of how such technologies are used in attempts to alleviate poverty. Drawing on my distant recollections of *Philosophical Investigations*, I raise questions here about the use of language, focusing first on gender, and then on the idea of the frontier.[1]

On Language, Gender, and Technology

The fundamental premise of this section is that *in the broad field of digital technologies, most practitioners have been blind to the gendering of language and thus perpetuate a male-dominated conceptualization of ICT4D.*

THE GENDERING OF ELECTRONIC PARTS

Words for electronic parts have long been gendered. Why, though, has this all too often been ignored? What are the consequences? Take, for example, the account of male and female connectors in Wikipedia:

each half of a pair of mating connectors or fasteners is conventionally assigned the designation male or female. The "female" connector is generally a receptacle that receives and holds the "male" connector. . . . The assignment is a direct analogy with genitalia and heterosexual sex; the part bearing one or more protrusions, or which fits inside the other, being designated male in contrast to the part containing the corresponding indentations, or fitting outside the other, being designated female. Extension of the analogy results in the verb to mate being used to describe the process of connecting two corresponding parts together. (Wikipedia, "Gender")

Not only are different electronic parts gendered, but such gendering leads to an association with heterosexual intercourse—mating. Moreover, it is often the male part that is seen as being "active" in digital systems: keyboards and mice (male) are the active elements "plugged into" a female socket in a computer. Yet, in reality it is the processing power of the computer (perhaps female) that is most valued. Moreover, the use of USB "sticks," often phallic in shape, can be seen as a clear example of this male/female gendering associated with heterosexual sex. The use of such sticks to infect computers with viruses can also be likened to the spread of sexually transmitted diseases in humans.

This raises important questions about the ramifications of such a binary division in digital connectors for LGBTIQ (lesbian, gay, bisexual, transgender/transsexual, intersex, and queer/questioning) identities. Perhaps the shift away from the use of such male and female connectors to the increasingly widespread use of Wi-Fi and Bluetooth can in turn be seen as one way through which traditional binary gendering might be getting broken down.

THE USE OF LANGUAGE IN ICT4D

Far too often, the language associated with the use of technology in international development carries with it subconscious, and perhaps unintended, meanings. The term "internet penetration," for example, is widely used to refer to "the percentage of Internet users in any country" (IGI Global Dictionary, https://www.igi-global.com/dictionary/digital-divide-framing-mapping-phenomenon/15438). Is anything surprising, unusual, or problematic with such usage?

In the context of the above discussion on the gendering of digital parts, it can clearly be interpreted in rather a different light: might the "desire" to increase internet penetration in poorer parts of the world be a largely male, North American, and European wish to "penetrate" and "conquer" weaker female countries and cultures? Whereas normally, countries are "seduced" into accepting such internet penetration, the forceful and violent approach sometimes adopted can be seen as akin to rape (Griffin, *Rape*), an analogy that is occasionally applied to the wider process of imperialism—and its successor, international development—when considered to be

exploitative of "weaker" (female) countries or economies (de Jong, Icaza, and Rutazibwa, *Decolonization and Feminisms*).

Great care is therefore needed in the choice of particular words or phrases in the practice of ICT4D. It is also important, though, that the complex subconscious and gendered structures that underlie our understanding of technology and development are better understood. Why do we not just talk and write about the *spread* of the internet, internet *share*, or internet *distribution*? Does the use of the word "penetration," especially by men, not condone an inappropriate, but subconsciously deeply significant, dimension of the digital technology sector, especially in its practices relating to poorer and more marginalized people and communities?

DIGITAL TECHNOLOGIES REPRESENTED BY MALE NOUNS

Languages—often though not always derived from Latin—that differentiate between male and female nouns usually consider ICTs to be male. Thus, a computer is *un ordinateur* in French, *ein Computer* in German, *un computer* in Italian, and *un ordenador* in Spanish. Likewise, a mobile phone is *un téléphone portable* in French, *ein Handy* in German, *un cellulare* in Italian, and *un celular* (or *un móvil*) in Spanish. Not all digital technologies are always male (the French for a microchip, for example, is *une micropuce*), and some can be either male or female (as with *un cable de fibre optique* and *une fibre optique* for fiber optic cable in French),[2] but it seems that at least in languages derived from Latin, most nouns are male.

What are the implications of this for the mental construction of technologies in the minds of different people and cultures?

COMPUTER CODE: BITS AND QUBITS

Computer code is usually based on a binary number system in which there are only two possible states, off and on, usually represented by 0 and 1. Binary codes assign a pattern of binary digits (or bits) to each character or instruction, and data is encoded into bit strings. The distinction between male and female is similarly binary: there is a parallel between "code" and "gender."

However, it is now increasingly realized that such a simple binary division of gender and sexuality is inappropriate. The recognition of LGBTIQ identities challenges traditional notions of binary distinctions that have long held sway in scientific thinking. In particular, this plurality of identity is closely aligned to many of the concepts in quantum computing, most notably the use of quantum bits (qubits) that can be in superpositions of states, in which any quantum state can be superposed, or added together, to produce another valid quantum state (BBC, "Quantum physics really helped"). This fluidity of gender, paralleling new notions in quantum

computing, is particularly interesting, and may be one way through which the traditional maleness of ICTs and digital technologies can be fragmented.

REFLECTION

These are but four of many possible examples of ways that the language of ICTs has traditionally been gendered. They also point to how such gendering might be fragmented, or perhaps changed. Does this matter? If so, why? If a largely male ICT or digital world is being constructed in part through the way that it is spoken and written about by both women and men, is it surprising that it is often difficult to engage and involve women more widely in the technology sector? We urgently need to rethink the use of language in the theory and practice of digital technologies to make the world of ICT4D less male-dominated. Work by Robertson ("Gendering Humanoid Robots"), Søraa ("Mechanical Genders"), and O'Donnell and Sweetman ("Introduction") point to some of the growing body of literature that is at last beginning to address this.

On "Frontier Technologies"

The term "frontier technologies" is increasingly widely used to refer to the latest generation of technologies, especially digital technologies, and provides another interesting example of the complex relationships between language and technology.[3] The UN in particular has latched on to the idea of "frontier technologies," mainly in the context of the impact of artificial intelligence (AI) and machine learning, as for example in the UN Chief Executives Board for Coordination's series of papers on *Frontier Issues* (https://unsceb.org/ceb-survey-frontier-issues), and the work by the Economic Analysis and Policy Division of the UN Department of Economic and Social Affairs on *Frontier Issues: The Impact of the Technological Revolution on Labour Markets and Income Distribution* (https://www.un.org/development /desa/dpad/publication/frontier-issues-artificial-intelligence-and-other-technolo- gies-will-define-the-future-of-jobs-and-incomes/). However, much of this work is ill-informed, and reflects a particular set of interests. While there is indeed some interesting academic work on the potential of so-called frontier technologies for international development (Ramalingam et al., *Ten Frontier Technologies*), most such research fails satisfactorily to consider the problems with the notion and the interests that underlie it.

The first important issue to note is that terms such as frontier technologies and the "Fourth Industrial Revolution" (Schwab, *Fourth Industrial Revolution*), which these terms propel forward, are used largely by or about the "heroes" of these revolutions in the hope of a self-fulfilling future: they invite no critique, nor any consideration of those left behind. For example, the notion of frontier

Figure 23.1. John Gast, *American Progress,* 1872. Library of Congress Prints and Photographs Division.

technologies draws heavily on the deeply embedded idea of the American frontier in which US "civilization" was forged westward, in large part through the use of new technologies.

    This is visually portrayed, for example, in the painting *American Progress* by John Gast, completed in 1872 (Figure 23.1). The American Frontier is here conceived heroically, with the "savage" Native Americans, or First Peoples, being pushed westward, to be replaced by "civilized" people, mainly of European origin. To the east the sky is light, but to the west it is dark. While the frontier was seen as being positive for the white Europeans, carrying with it images of heroism and taming of the wilderness, it was anything but that for the Native Americans. This painting also very powerfully shows that it is men who are the prospectors, hunters, stagecoach drivers, and farmers, and they almost certainly also drove the trains (a new technology) that permitted the "opening up" of the West. In contrast, the central figure is of a woman, clad in a diaphanous gown, wearing the Star of Empire on her head and carrying in her right hand a book, the emblem of education and national enlightenment, literally to bring light from the east to the dark West (Sandweiss, "John Gast, American Progress"). The latest "frontier technologies" of the twenty-first century can similarly be seen as a vehicle through which US-led neoimperialism is being further enforced on "peripheral" peoples and states beyond the "frontier."

This image, though, is much more complex as far as its gendering is concerned, because a careful perusal shows that in her left hand the woman (progress) is also unraveling a telegraph wire. As George Crofutt, a publisher of Western travel guides in which the image was reproduced, described it, "she unfolds and stretches the slender wires of the telegraph, that are to flash intelligence throughout the land" (Sandweiss, "John Gast, American Progress"). Here, then, in contrast to the arguments above about the masculine language of much contemporary digital technology, there is a distinctly feminine representation of the spread of the telegraph that could hardly be described as "penetration." An explanation for this difference might be found in Crofutt's words, which suggest that it is perhaps not so much the technology that is being emphasized here, but rather its use by "intelligence," and associated with the book, for information and education.

A second basic problem with the notion of "frontier technologies" is that one person's frontier can be someone else's backwater. A 2G phone may indeed be novel to someone who has never had one before, while even a chip implant is now becoming passé for the digital human who has everything. It is therefore strongly to be recommended that such terminology is rejected by those organizations and entities concerned with the beneficial use of new technologies in these poorer, more deprived contexts. Why do they need to be called "frontier?"

I have presented a diversity of examples to illustrate important connections between language and digital technologies, particularly through a gendered lens. These, I hope, provoke questions that demand responses. If we are to change the neoimperial, US-led, masculine practices of digital penetration, we must change our use of natural language, and perhaps even of artificial languages. However, we respond from within our own cultural contexts: we all need to struggle with these issues in the places in which we find ourselves. Above all, we need to explore in much more depth the ways through which our gendered languages and artistic representations shape both our understanding of digital humanities and our implementation of digital practices in international development.

Notes

1. This contribution builds on ideas first shared in two of my blog posts in 2018: "The Gendered Language of ICTs and ICT4D," https://unwin.wordpress.com /2018/10/07/the-gendered-language-of-icts-and-ict4d/; and "Why the Notion of 'Frontier Technologies' Is so Problematic," https://unwin.wordpress.com/2018/09/04/why-the -notion-of-frontier-technologies-is-so-problematic/.

This has been precipitated in part by the collective work undertaken through the TEQtogether initiative (http://teqtogether.org), which promotes changes in men's attitudes to the interface between women and technology.

2. Thanks to Serge Stinckwich for sharing this additional insight.

3. This section draws heavily on a report written in 2018 for UNICEF on the future relationships between digital technologies and learning, especially among the poorest and most deprived children.

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