



Article

The gender binary will not be deprogrammed: Ten years of coding gender on Facebook

new media & society

2017, Vol. 19(6) 880–898

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DOI: 10.1177/1461444815621527

journals.sagepub.com/home/nms



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Abstract

A February 2014 iteration of Facebook's software upgraded the number of options for gender identification from 2 to 58. Drawing on critical theoretical approaches to technology, queer theory, and insights from science and technology studies, this iteration is situated within a 10-year history of software and user modifications that pivot around gender. I argue that the gender binary has regulated Facebook's design strategy while the co-existence of binary and non-binary affordances has enabled the company to serve both users and advertising clients simultaneously. Three findings are revealed: (1) an original programming decision to store three values for gender in Facebook's database became an important fissure for non-binary possibilities, (2) gender became increasingly valuable over time, and (3) in the deep level of the database, non-binary users are reconfigured into a binary system. This analysis also exposes Facebook's focus on authenticity as an insincere yet highly marketable regulatory regime.

Keywords

Advertising, application programming interface, code, database, gender binary, queer theory, software-user relationship, social media software, sociotechnical, transgender

Introduction

On 13 February 2014, mainstream news organizations reported a change to the popular social media site, Facebook. Instead of two options for users to choose from when identifying their gender ("male" and "female"¹), users were given a third option ("custom") that, if

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selected, offered 56 additional options. A few examples include agender, gender non-conforming, genderqueer, non-binary, and transgender (Goldman, 2014). These options are dependent on a user's selected language and were initially rolled out only for the English (US) version of the site, which any user can select to gain access.² Before confirming a "custom" gender selection, users are required to select a preferred pronoun: "he," "she," or "them." Reactions have ranged from cautious optimism and joy to surprise, confusion, and mockery (Ferraro, 2014; Jones, 2014). Many lesbian, gay, bisexual, transgender, and queer (LGBTQ) organizations have praised practical implications for non-binary users, while several news anchors and anonymous commenters have instead sought to reassert the hegemony of the gender binary.

This software modification represents one tweak during a decade of iterating. Some changes are detectable through the user interface while others operate "under the hood," embedded in software elements that are not as readily accessible. This is not the first time that gender-related concerns have led to modifications. For example, during the 2011 controversy over the existence of "rape joke" pages, the company eventually tweaked their algorithms to remove ads from the offending pages (Rape Is No Joke, 2011). The modifications detailed in this article draw attention to a broader socio-cultural context in which ideological struggles take place over social constructions of gender. These struggles have very real consequences: people who do not conform to a binary of masculine and feminine are disproportionately affected by discrimination and violence.³ As Butler (2004) puts it, "This violence emerges from a profound desire to keep the order of binary gender natural or necessary, to make of it a structure, either natural or cultural, or both, that no human can oppose, and still remain human" (p. 35).

While many queer theorists have focused on the code of language to explore these dynamics, a "resistance to the regimes of the normal" (Warner, 1993: xxvi) can also be applied to the code of software. By extending queer theory to the realm of software, the power of Facebook's code can be interrogated as yet another structural arena through which social life is regulated. This article maps the ways in which design decisions related to gender become embedded and materialized in Facebook, becoming powerful, in Foucault's (1982) sense, as a productive force in the broader software-user relationship (Bucher, 2012). From this Foucauldian perspective, we can explore how software can produce the conditions for gendered existence. Facebook's software configures, constructs, and attempts to impose a menu of gender identities (Nakamura, 2002) onto the users it interacts with. These users can also resist and hack these configurations. Ultimately, users and software designers mutually shape these programmed configurations of gender, severing and opening up possibilities for gendered life. The litany of other human actors who shape these interactions—programmers who wrote the code, superiors who managed design decisions, advertisers who desire increasingly granular data, and many other stakeholders—become specters in this software-user relationship, invisible on the front-stage, graphic user interface displayed by the software.

This analysis is restricted to a 10-year history, beginning with Facebook's original release in 2004 and ending with the 2014 custom gender settings. I demonstrate that the relationship between Facebook's software and its users is deeply structured by the gender binary while simultaneously productive of non-binary possibilities. The binary exists and does not exist at the same time. Considering both surface and deep software levels

(the graphic user interface and the database), Facebook's software has always existed somewhere between a rigid gender binary and fluid spectrum.⁴ This is emblematic of the complexity of Facebook as a sociotechnical artifact. The programmatic possibility of stretching outside of the binary has always been materialized in the code, but as this analysis will show, the binary continues to dominate and regulate 10 years later, and it is Facebook's business model that influences this binary-driven design strategy.

Methods

To examine Facebook's user interface as a historical artifact, I collected screenshots from different iterations of Facebook ranging from 2004 to 2014. Online image-based search engines were used for this purpose (including Google Images, Yahoo Image Search, and Flickr) since Facebook is inaccessible through archival engines like the Wayback Machine. Search terms included Facebook, thefacebook (the original name of the software), sign-up, register, profile, news feed, mini-feed, new, re-design, change, specific years (2004–2014), gender, pronoun, hack, and trans*. Similar online searches were conducted to explore news reports from 2004–2014 that detailed changes to Facebook's user interface, protests from the queer and trans community, and information about monetization strategies over time. An academic literature search for "thefacebook" also offered information about mandatory fields from early iterations. My searches focused on instances where gender was displayed and/or assigned to users through sign-up pages, profiles, and the news feed.

Access to the database was more complicated. In 2006, Facebook became the first major social media service to open limited access via its Application Programming Interface (API) (Yadav, 2006). APIs are software-to-software interfaces that allow third-party developers to interact with a site so that they can create programs that access, share, and exchange information. Facebook's use of open APIs has been financially motivated, geared toward "achiev[ing] market dominance and user dependency" (Bodle, 2011: 335). In 2011, Facebook released new tools intended for third-party developers (and increasingly exploited by marketers) to ease navigation of the programmatic interface. By using the Graph API Explorer tool, I was able to query the database to gain information and make inferences about how gender is stored.

The following analysis and descriptions about the internal mechanisms of Facebook are based on my own exploration of Facebook's software in conjunction with online archival research. To confirm technical aspects of the analysis, I also conducted a telephone interview with Lexi Ross, a Project Manager at Facebook who was involved in the custom gender project. The analysis begins with a discussion of how gender is coded, resulting sociotechnical problems, and how programming decisions relate to monetization strategies. The next section, "Designing non-mandatory gender in year zero and custom gender in year 10," compares the non-mandatory gender design in 2004 with the custom gender project released in 2014. I then demonstrate how the binary has dominated design decisions with access to non-binary possibilities increasingly restricted during this 10-year history. Next, I explore how users have resisted Facebook's control by hacking their gender, followed by a discussion of surveillance, authenticity, and interoperability.

Coding gender, sociotechnical problems, and monetization

Just as there is more than one way to conceptualize gender in society, there is more than one way to code gender in software. Science and technology studies, software studies, and critical code studies have richly illuminated the many ways in which technological design is a social and political act. With the help of these scholars, we have come to see technology as “never merely technical or social” (Wajcman, 2010: 149). Since “[c]ode is never found; it is only ever made, and only ever made by us” (Lessig, 2006: 6), it is clear that “lines of code are not value-neutral” (Marino, 2006). Nakamura (2002) offers a compelling analysis of the programmed limitations of how race can operate online, concluding that “if it can’t be clicked, that means that it functionally can’t exist” (p. 120). Yet, as this analysis shows, it might continue to exist within deeper levels of software, even while rendered invisible on the surface. At the same time, technology is constantly in flux. Each software iteration incorporates different code, which means it is always possible to expand the conditions for existence. In this sense, technology succumbs to “an ‘ambivalent’ process of development suspended between different possibilities” (Feenberg, 2002: 15).

In our non-binary world, choosing to code gender as a binary echoes the societal status quo and is in line with other practices that “code” gender, such as sex or gender identification on surveys and official documents. When restricted to a binary, all of these practices erase non-conforming genders and create sociotechnical problems in the process. It is technically (and legally) impossible for a non-binary user to register for a service that demands mandatory binary gender identification. If the user submits the form with a blank gender field, the software—in this case, Facebook—is programmed to reject the submission, demanding that the user “select either male or female.” Having likely encountered similarly frustrating scenarios many times before, the user may resolve the technical error by misrepresenting their gender. Yet, in doing so the user violates Facebook’s Terms of Service. Facebook’s Statement of Rights and Responsibilities is flagged immediately above the “Sign Up” button: “By clicking Sign Up, you agree to our Terms.” Section 4, titled Registration and Account Security, requests that real names and information are provided, and 4.1 explicitly states: “You will not provide any false personal information on Facebook” (Facebook, 2013).

While the spirit of the Terms is up for interpretation, Terms are subject to change, and (un)intentional violations occur, Facebook has been heavy-handed in its search for the “authentic selves” (Associated Press, 2014) and “real names” of its users. Yet, “real name” policies do not work for the queer community or Native American communities,⁵ but they do work for Facebook since there is a direct, inverse relationship between fake accounts and financial success. When Facebook announced that the estimated 5–6% of fake accounts detailed with the company’s initial public offering (IPO) on 18 May 2012 had grown to 8.7% (by 30 June 2012), Facebook’s stock dropped to less than \$20 (from \$38 3 months earlier) and the company faced a lot of criticism (Rushe, 2012; Tavakoli, 2012). In part, this is because Facebook’s marketable product is a user base of “real” people that can be targeted with the help of increasingly granular data. Leading up to the IPO, Facebook’s (2012) prospectus, filed with the US Securities and Exchange

Commission, highlighted “authentic identity” as the first of three elements forming “the foundation of the social web”:

Authentic identity is core to the Facebook experience, and we believe that it is central to the future of the web. Our terms of service require you to use your real name and we encourage you to be your true self online, enabling us and Platform developers to provide you with more personalized experiences. (p. 2)

By positioning the social web as the future of business and defining it for businesses, Facebook’s owners want to secure the “future of the web” and their place within it. Gender is included as one of four examples of how Facebook (2012) “creates value” for advertising and marketing clients (p. 3).

In more public-facing spaces, Facebook’s rhetoric about authenticity becomes more about morality. Facebook’s (former) Chief Privacy Officer, Chris Kelly, once argued that “Trust on the Internet depends on having identity fixed and known” (Kirkpatrick, 2010: 16) and Facebook creator Mark Zuckerberg has said that “Having two identities for yourself is an example of a lack of integrity” (Zimmer, 2010). These attempts at regulating identity erase and delegitimize the many authentic experiences of people who question their identity, people with identities that change over time, and people who depend on aliases for safety.⁶ Ultimately, this regulatory regime forecloses everyone’s capacity to inhabit fluid identities.

Designing non-mandatory gender in year zero and custom gender in year 10

This 10-year analysis begins and ends with two important design decisions. In February 2004, Facebook’s software was programmed with: a genderless sign-up page, a non-mandatory, binary field on profile pages, and three possible values for storing gender in the database. By February 2014, each of these elements had been modified: a mandatory, binary gender field on the sign-up page; a mandatory, non-binary field on profile pages; and four possible values for storing gender in the database. Both of these snapshots include software layers regulated by the binary and others that generate non-binary possibilities.

The early, 2004 design decision that programmed gender as non-mandatory on Facebook’s profile pages created an important fissure for non-binary possibilities. At a deep level of the software, in the database, Facebook’s gender field type was originally programmed to accept more than two values: 1 = female, 2 = male, and 0 = undefined. While a zero is inadequate in many ways, it is still a value beyond the binary of ones and twos. From a user’s perspective—looking only at the user interface, not the database—the only non-binary option was to leave the field blank. This coding practice grants validity to binary genders while erasing non-binary genders, but it also produces conditions that allow for existence outside of the binary. The material reality of three accepted values in the database transgresses a rigid binary, yet falls short of a fluid spectrum, positioning the database somewhere in-between.

Coding a field type as non-mandatory is a design decision based on whether the data being collected are vital to the functioning of the software or, in the case of Facebook,

the functioning of the company. Design decisions for profit-oriented companies encapsulate broader monetization strategies. In other words, if information about gender is advantageous for Facebook's monetization strategies, there will be pressure to code it as mandatory. Yet, there is always a trade-off between annoying users and enforcing data collection by making it mandatory. At this early stage of Facebook's development, data about gender were not considered vital to the functioning of the software or the company. In contrast, my interview with Ross reveals Facebook's contemporary, profit-focused, view: "gender is a fundamental part of the product" (27 February 2014).

By 2008, gender had been added as a mandatory, binary field on the sign-up page. Even in the February 2014, iteration—when the company finally capitulated to user demands for more gender options by reprogramming profile pages—the mandatory, binary field remained on the sign-up page. Meanwhile, deep in the database, users who select custom gender options are re-coded—without their knowledge—back into a binary/other classification system that is almost identical to the original 2004 database storage programming. The 2014 custom gender project offers the illusion of inclusion since surface changes to profile pages mask the binary regulation that continues underneath, at a deeper level of the software. Drawing on Foucault and Butler's insights, we see that conditions for gendered existence beyond the binary are activated on the software's surface. Yet, underneath the surface, these conditions are severed in favor of the binary. The design strategy that generates these conditions simultaneously reconfigures gender into data that conforms to the hegemonic regime embraced by marketing and advertising institutions. By actively employing divergent gender schemas within these two software levels, users and clients are satisfied simultaneously. Consequently, Facebook exercises power over its users by invisibly re-inscribing the binary. This technique maintains public-facing progressive politics while bolstering hegemonic regimes of gender control.

To explore this in more detail, consider the updated profile pages. In 2014, it is noteworthy that "custom" appeared as a third option, positioned only in relation to a normalized binary (McNicol, 2013). The binary is inscribed as dominant and "normal" while any "other" genders are positioned somewhere else in the hierarchy, only visible after the user clicks on "custom." Upon typing in the "custom" text-field, a list of possible gender options is revealed. Users can select more than one, which resolves Nakamura's (2002) critique of menu-driven identities that deny the programmatic capacity to straddle more than one clickable category, rendering intersectional identities unintelligible.

In the database, however, the code forces users back into a binary logic. To explain this finding, I will revisit Facebook's Graph API Explorer. My use of this tool involved navigating to the online website for Graph API Explorer, signing in to my Facebook account, retrieving an access token, and selecting fields to explore (see Figure 1). To test how custom gender options are stored, I selected gender, along with identity (ID) and name fields to help determine which user was being tested. I also manipulated a test account. Each selected field became part of a "get" request that I submitted to obtain a response to my database query. When I queried the names and genders of my Facebook "friends" and test account, information was returned in the format displayed in Figure 1.

Through these queries, it became clear that the database was programmed to store gender based on a user's pronoun, not the gender they selected. For instance, a user who

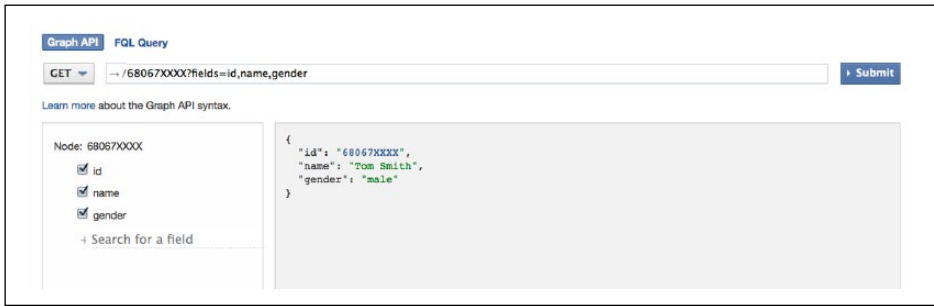


Figure 1. Example Query using Facebook's Graph API Explorer Tool.

selects “gender questioning” and the pronoun “she,” will be coded as “female” in the database despite having selected “gender questioning.” A query will identify the user’s gender as “female” (see Figure 2). The pronouns “he” and “she” equate to male and female, but when querying a user with the pronoun “them,” only name and ID are returned without any information about gender—as if the user has no gender at all (see Figure 3). The gender field actually turns gray, as seen in Figure 3.

All users are reassigned as male, female, or custom (or retain an undefined value). With the February 2014 iteration, the value 6 became operational (equating to custom),⁷ yet 0 (undefined) and 6 are indistinguishable since neither displays gender information when querying the database. Since undefined and custom effectively collapse into a null category from the perspective of API users, this storage system is nearly identical to how gender has been coded since the original 2004 iteration of Facebook’s software. Facebook’s software effectively begins and ends this decade in the same way: regulated by a binary logic but productive of non-binary possibilities. By 2014, however, a more marketable and “authentic” (yet, paradoxically, misrepresented) data set is produced, as I analyze in more detail later.

Binary by design: restricting access to non-binary possibilities

The original design decision to program gender as a non-mandatory field eventually became a thorny issue. As Facebook grew up—as a social network, a company, and an advertising hub—gender became an increasingly valuable data point. Monetization strategies became more sophisticated and design strategies revolving around gender turned interventionist. To move the user base more fully toward the binary, one might expect a strategic re-design of the entire user interface to a mandatory binary, and the removal of undefined values in the database, restricting viable gender values to ones and twos. In 2008, two software modifications attempted to accomplish these goals: (1) the shift to a mandatory, binary sign-up page and (2) a special request for users with an undefined gender to select a binary gender.

While there have been several changes to Facebook’s sign-up page over the past 10 years,⁸ the first 4 years were genderless. By 2008, “I am” appeared, followed by a

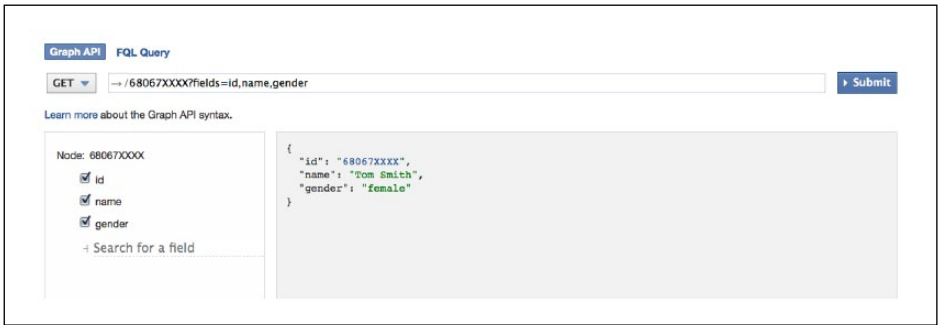


Figure 2. Example Query with “She” pronoun selected.



Figure 3. Example Query with “Them” Pronoun Selected.

drop-down list populated by male and female (see Figure 4). The field was mandatory and it has continued to be mandatory ever since. The only significant modification has been to replace the drop-down list with two radio buttons.

While the persistence of the binary on the sign-up page in 2014 despite the new custom gender options is puzzling, it highlights the continuing tension between the software’s production of binary and non-binary conditions for existence. From a queer theory lens, we see the software’s production of gendered subjects in distinct spaces and the co-existence of multiple gendered subjects as individual users are morphed by binary and non-binary affordances. This tension facilitates Facebook’s relationships with both users and advertising clients, but at the software’s roots, Facebook continues to comply with society’s hegemonic norms.

With the release of the custom gender project, Facebook representatives declared that the company “want[s] you to feel comfortable being your true, authentic self” (Facebook Diversity, 2014). Director of Growth, Alex Shultz, said, “It was simple: not allowing people to express something so fundamental is not really cool so we did something. Hopefully a more open and connected world will, by extension, make this a more understanding and tolerant world” (Associated Press, 2014). I asked Facebook’s Ross about this inconsistency, to which she replied, “There are some complex issues with the sign-up page but it’s

| Year | Sign-Up Page | | |
|------|--------------|---|-----------|
| | Gender Field | Description | Mandatory |
| 2004 | No | N/A | N/A |
| 2005 | | | |
| 2006 | | | |
| 2007 | | | |
| 2008 | Yes | "I am: Select Sex/Male/Female" (drop-down list) | Yes |
| 2009 | | | |
| 2010 | | | |
| 2011 | | | |
| 2012 | | | |
| 2013 | Yes | "male" & "female" (radio buttons) | Yes |
| 2014 | | | |

Figure 4. Timeline of gender-related changes to Facebook’s sign-up page.

something we can consider in the future” (27 February 2014). While we can speculate about the nature of these complex issues, ultimately user registration is the first moment when Facebook can police the “authenticity” of its users, satisfying investors by limiting fake accounts. This verification process continues to be regulated by the gender binary.

Beyond these binary-driven modifications to the sign-up page, profile pages have undergone far more changes over this decade long history. Profile pages fundamentally structured Facebook’s original 2004 design: navigating from one profile page to the next was the predominant user activity. In 2006, the software was re-designed to highlight user activities. “Mini-feed” and “news feed” were introduced and gendered pronouns were eventually added to describe the user activities that populated these feeds. For instance, “Tom commented on his photo.” To deal with users with an “undefined” gender, the software was programmed to use the pronoun “them.” This “solution” was formally revisited in 2008, which brings us to the second major binary-driven software modification related to gender.

Forcing a database into a rigid binary by removing pre-existing (undefined) zero values is not an easy feat. In fact, from a practical perspective, it becomes increasingly difficult to make modifications to a database as it grows, entangles, and becomes mutually dependent on multiple software processes. With each new user registration, the database expands while undefined values continue to accumulate in the gender field. Facebook’s “solution” involved targeting undefined users and asking them to select a binary pronoun. Yet, the consequences of selecting a binary pronoun were concealed (re-coding gender from 0 to 1 or 2 in the database and obstructing future access to non-binary programmatic possibilities).

This is how it happened. On 27 June 2008, a post on Facebook’s company blog noted growth in non-English users and pronoun translation problems. The neutral “them” pronoun was deemed grammatically problematic: “Ever see a story about a friend who tagged ‘themselves’ in a photo? ‘Themselves’ isn’t even a real word” (Gleit, 2008). As an aside, the singular “they” has an extensive history in the English language (Santos, 2013), and is commonly used in trans and queer communities along with ze, zir, and other non-binary

pronouns. There was also concern expressed for users who may be misgendered in some languages since a neutral pronoun is unavailable. Since undefined users do not provide gender-related data, the software uses a default that is not based on any specific details about the user: "People who haven't selected what sex they are frequently get defaulted to the wrong sex entirely in Mini-Feed stories" (Gleit, 2008). Of course, selecting "sex" is only possible if one's "sex" is programmed as one of the selections, which means non-binary users have no option but to be "defaulted to the wrong sex entirely." Yet, interestingly, Facebook also recognized problems presented by the gender binary:

We've received pushback in the past from groups that find the male/female distinction too limiting. We have a lot of respect for these communities, which is why it will still be possible to remove gender entirely from your account, including how we refer to you in Mini-Feed. (Gleit, 2008)

Yet, Facebook's design decisions did not extend programmatic possibilities beyond the binary nor move to a genderless design (remove gender as a category altogether). Either of these decisions could have offered a more respectful solution to this sociotechnical problem. "Removing gender entirely" equated to hiding gender from the surface level while retaining a gender value in the database. Even this binary-driven compromise was incomplete, with leaks occurring in unexpected places. For example, the pre-populated labels "son" or "daughter" appear when familial relationships are expressed between users. Non-binary alternatives are unavailable and users cannot select the label themselves.

Ultimately, Facebook's "solution" involved prompting undefined users to indicate a preferred (binary) pronoun:

we've decided to request that all Facebook users fill out this information [about their "sex"] on their profile. If you haven't yet selected a sex, you will probably see a prompt to choose whether you want to be referred to as "him" or "her" in the coming weeks. (Gleit, 2008)

Shortly following this announcement, a user posted a screenshot of this prompt, received upon log-in (http, 2008), as seen in Figure 5.

Targeting users who have previously decided not to offer gender data, requesting that data under vague circumstances (obfuscating the consequences by drawing attention to a "confusing" pronoun), and positioning the binary as the only way forward is ethically suspect, concealing the surveillance and opaque data collection practices that accompany binary selection.

Two programmatic consequences were also obscured. Selecting "her" or "his" equated to: (1) binary gender assignment in the database, and (2) restricted access to the full range of database values. To explain the latter, it is important to understand that design changes related to gender that took effect in 2008 created a de-facto two-tiered user database. I will refer to the subsets as "legacy users" and "binary-ID users." A legacy user meets the following requirements: joined the site prior to 27 July 2008, and, at the precise moment when the software was identifying which users to prompt, had (1) an undefined gender selected, and opted to (2) refuse a binary pronoun, selecting "close" instead. For various reasons, and at any time, users might alter the gender field on their profile,

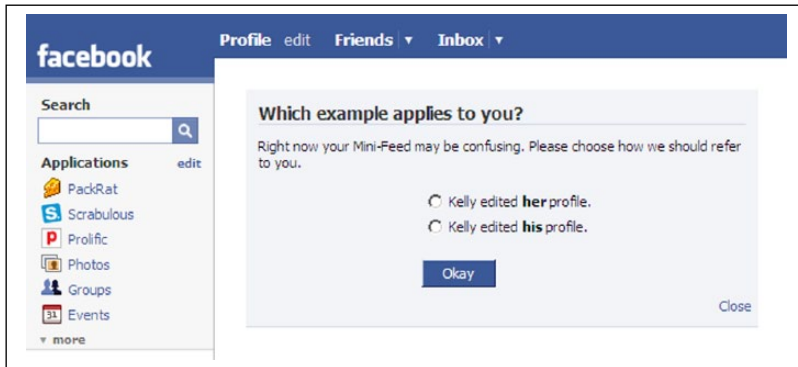


Figure 5. Request to select gendered pronoun, 2008.

but a user's legacy status would be revoked if they chose to binary-ID after the binary-driven 27 July 2008 pronoun request. A revoked legacy status meant assignment to the binary-ID user tier. Binary-ID users were produced by the software if they fulfilled one of the following requirements: (1) joined prior to 27 July 2008 and selected male or female on their profile at the precise moment when the software targeted undefined users for pronoun prompts; (2) joined prior to 27 July 2008, had an undefined gender selected, but responded to the software's prompt with a binary pronoun selection; or (3) joined after gender became a field on the sign-up page (and thus forced to binary-ID).

To reiterate, legacy users maintained the non-binary zero that has always been available as a programmatic possibility, along with its affordances, while binary-ID users were obstructed from non-binary existence. Suddenly, being a legacy user mattered: users who joined prior to 2008 could maintain their pre-intervention selections (such as "undefined" gender), even if those selections no longer existed in new software iterations. At the same time, a legacy user's power over the software (and company) was ultimately precarious since their status would expire upon selecting a male or female gender.

The invisible consequences of selecting "her" or "his" as an undefined user in 2008 only make sense in the context of a design strategy that sought to reduce undefined database values. Targeting a set of users and requesting data is not a decision that a company takes lightly. This intervention was part of a broader, binary-driven design strategy that afforded Facebook greater control over the conditions under which gendered subjects could be produced. It strengthened binary regulation and reduced (Facebook's definition of) "inauthentic" users. Along with the mandatory, binary gender field on the sign-up page, these 2008 modifications operated as a productive force geared toward normalizing the gender binary.

Resisting control by hacking gender

Despite these binary-driven design strategies, there was a loophole that was highly dependent on the early-2004 decision to code gender as a non-mandatory field. In defiance of

Facebook's regulatory regime, a hack was developed. As Galloway (2006) writes of hackers, "They care about what is true and what is possible. And in the logical world of computers, if it is possible then it is real" (p. 168). The non-binary value materialized in Facebook's software represented an important possibility to be exploited. While designers of social media software have the greatest capacity to exercise power over the production of gendered subjects in and through their coding of gender, Feenberg (2005) argues that "[s] ubordinate groups may challenge the technical code with impacts on design as technologies evolve" (p. 47). The gender hack represented both a challenge and an important resistance to the binary regulation imposed by Facebook's design.

The experience of Facebook user Rae Picher⁹ offers a useful illustration of how the gender hack worked. As Picher explains in a public post on 27 April 2011, "I recently lost my carefully preserved genderless status on Facebook due to an April Fools' Day joke where I came out as a heterosexual woman." As a legacy user, when Picher selected "female," the software replaced the 0 associated with Picher's user ID in the database with a value of 1. This simple click erased Picher's legacy status. Picher (2011) explains what happened next:

When I tried to switch BACK to not having my gender identified, Facebook threw a hissy fit and demanded that I binary-gender ID for them, and proceeded to use gendered pronouns for me on my wall and in my friends' news feeds. Now that's just not cool.

Luckily, Picher discovered an online video that taught users how to hack their gender. Most web browsers offer access to developer tools including one that interrogates and manipulates the source code of rendered web pages. When using this tool, a user is shown the code related to the page displayed in the browser, as seen in Figure 6.

The bottom portion of Figure 6 is the Web Inspector tool. This hack required users to navigate to the "edit basic info" page on the mobile Facebook website through a desktop computer. The tool exposes hyper text markup language (HTML) code from Facebook's profile editing page. Users would then edit the HTML code to add a third option associated with the value 0 (labeled "Hack my Gender" in Figure 6, but any text works), which would then become selectable. As a result, users could override Facebook's obstruction and store a 0 in the database.

This hack directly challenged the binary-driven design strategies previously articulated. Hacking allowed users to obtain (or regain) legacy status, with all of its attendant affordances, particularly the capacity to exist outside of the binary. Prior to the 2014 release of the custom gender project, this technical loophole had been patched by Facebook's programmers and is no longer functional. Permitting the growth of undefined users was antithetical to the company's business model. Clearly, the "anti-commercial bent" of the hacking community (Galloway, 2006) was at odds with Facebook's profit-orientation.

More invisible layers: surveillance, authenticity, and interoperability

The host of invisible consequences for undefined, legacy users are reminiscent of the opaque/transparent nature of code that Chun (2013) explains as "invisibly visible, visibly

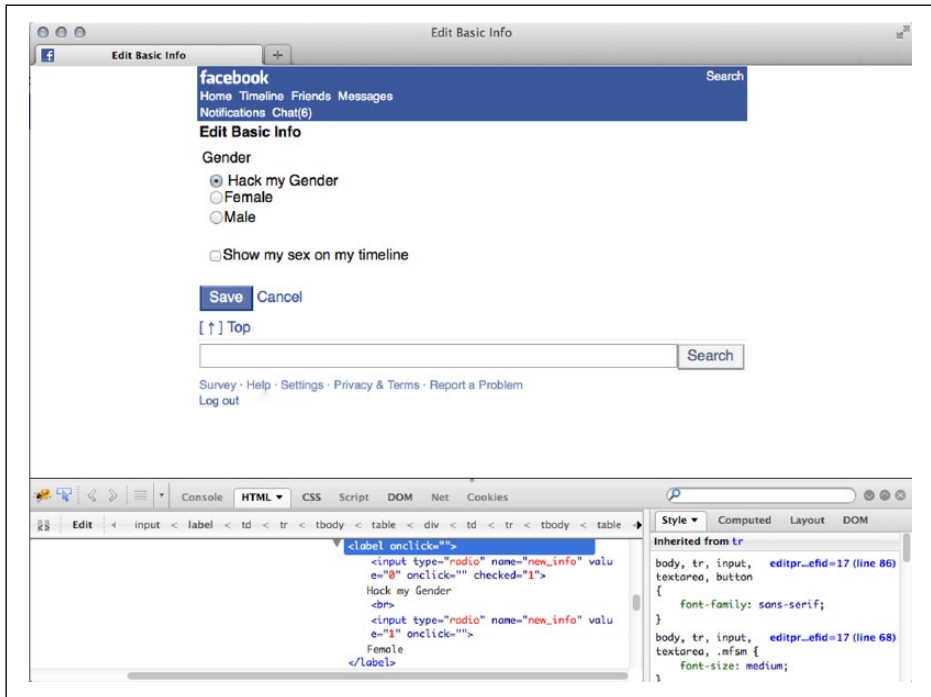


Figure 6. Hacking gender using HTML code.

invisible” (p. 15). Not only is code hidden from view, but it also requires a level of technical expertise to comprehend. According to Chun, computing’s appeal rests on its “combination of what can be seen and not seen, can be known and not known,” which “makes it a powerful metaphor for everything we believe is invisible yet generates visible effects” (Chun, 2013: 17). The 56 new gender options have already generated visible effects, such as public discourse on the topic of non-binary genders, and the capacity for users to more accurately represent their gender. Yet, this representation does not exist without data collection, which is typically “framed as being valuable” for users even though the system also benefits (McNicol, 2013: 203). “These sites want to know *what you are* so they can best figure out *what they can sell you*” (Nakamura, 2002: 116, original italics). Increasingly granular data about niche markets is conducive with a business model that is dependent on selling these markets to advertisers, marketers, and developers. Documenting and surveilling vulnerable populations are largely invisible practices—with unknown data beneficiaries—that include a great deal of risk. Even when someone willingly discloses their non-binary identity, danger can be lurking: “There are people out there that target trans/gn-c [gender non-conforming] people, and having that publicly listed on your profile can set you apart as a target” (Haimson et al., 2015: 1184). Privacy settings accompanying custom gender demand savvy and organized users who take the time to group their network into categories, yet the system does not permit preferred pronouns to be private. The custom gender project has received many critiques,

including the argument that a braver move for Facebook would involve a genderless design, particularly since data about gender is of little value apart from marketing contexts (Fae, 2014; McNicol, 2014).

Another invisible process with important implications is the computational re-classification of custom gender selection on the user interface back into what amounts to a binary (1, 2) system in the database—with custom (6) as a limited non-binary transgression, and an undefined category (0) populated by (a shrinking number of) legacy users. This programming decision reifies hegemonic gender norms that directly oppose the company's public statements ostensibly supporting the dismantling of this same hegemonic regime. Facebook's deep binary regulation of gender through code does (invisible) work in the world, just as Butler's (1997) "psychic operation of the norm" (p. 21) permits the gender binary to (invisibly) act on society. Facebook's advertising clients are clear beneficiaries of this arrangement: the custom gender modification and the addition of the value 6 assists the company's creation of a data set calibrated toward the needs of advertisers who flock to Facebook for their "authentic" and highly granulated users. Facebook can now at least presume to more accurately classify their users' gender.

Facebook's early design decisions lumped together everyone who left the gender field blank, regardless of their reason, and classified the rest as a binary. Ten years later, any remaining undefined users in the database are legacy users who have resisted all programmed attempts to collect their gender data. They are the only users who retain the value 0. The number of undefined users must be quite limited and, given Facebook's rhetoric, they are deemed inauthentic. The value 6, on the other hand, captures only a sub-set of non-binary users: any custom gender user who selects the pronoun "them." As a result, all binary users and all remaining custom gender users (anyone with a binary "she" or "he" pronoun preference) can now be easily classified as ones and twos—"females" and "males." Indeed, no other users have a gender from the perspective of the 2014 API. As a result, Facebook can now supply advertisers, marketers, and developers with a tidy (albeit misrepresented) set of female, male, and non-binary users. News reports have noted that "ads will be targeted based on the pronoun [users] select for themselves" (Associated Press, 2014), which maps perfectly onto the "he," "she," "them" pronoun system, even though "them" is not currently accessible to advertisers.

Along with reducing the set of allegedly inauthentic users and improving Facebook's capacity to market its user base by gender (despite the misgendering that results), the custom gender project can also be read as an exercise in public relations. When I asked Facebook's Ross about the absence of significant change to the coding of gender in the database, it became clear that financially motivated relationships between Facebook's software and external websites and services that access, share, and exchange information are of great value. As Ross notes,

Most of our third-party apps of course do not support custom gender and we wanted to really make it a frictionless experience for those developers ... Basically it was sort of a decision for simplicity sake to not break other parts of the product. (Interview, 27 February 2014)

While workarounds could be introduced in future API releases, Ross highlights Facebook's fear that a fundamental change to the storage of gender could disrupt current interoperability requirements, thereby sabotaging important financial relationships.

Conclusion

This analysis of the materiality of antagonistic constructions of gender in social media software offers important opportunities for nuanced and dialectic insights into the “invisibly visible,” shallow/deep capacities for the production and enactment of power in and through software-user relationships and the regulation of social life through code and design decisions. Despite the addition of 56 gender options in February 2014, the gender binary has not been deprogrammed from Facebook’s software. The software-user relationship continues to be deeply structured by the gender binary at the same time that it is productive of non-binary possibilities: from the genderless sign-up page turned binary and mandatory; to the permanent presence of non-binary possibilities in the database versus the cumulative, binary-driven design strategy that impeded, reduced, and patched access to those possibilities; to the forward-facing custom gender project that reconfigures gender into three insincere, but marketable, categories based on preferred pronouns. Overall, Facebook’s software exists somewhere in-between a rigid binary and fluid spectrum. Yet, within this liminal space, and at a deep level, Facebook’s software normalizes a binary logic that regulates the social life of users. The conditions for binary existence are easily produced while any meaningful non-binary existence is severed, even though the capacity to move beyond the binary has always been a programmatic possibility.

Within this 10-year history, “authentic” representation of a user’s gender identity reaches a peak with the 2014 custom gender project. Yet, the conditions for this non-binary existence are restricted to the surface of the software (and continue to be denied on the sign-up page where the binary remains an important regulator in the user verification process). Inauthenticity looms large in the deeper level of the database through the misgendering of custom gender users who select a binary pronoun and, as a result, are produced by the software as “female” or “male” instead of the custom option they selected. Paradoxically, Facebook’s rhetoric and business model re-interprets these inauthentic, misgendered users as highly marketable, “authentic,” and “real” while rendering the only users who have managed to escape Facebook’s binary-driven design interventions—limited in numbers as these legacy users must be—as inauthentic. In the end, authenticity does not have to be authentic to be financially viable, as long as your clients perceive it as authentic.

Given that Facebook continues to dominate the social media industry, at least in the United States (Duggan et al., 2015), the company’s design choices, coding practices, and business model are well-positioned to influence new start-up ventures and as such are important sites of critique. While more research is needed that critically examines how gender, race, and other salient social categories are produced within both surface and deep layers of software, it is clear, in this case, that Facebook has actively governed the formation of its users as gendered subjects. From a Foucauldian perspective, embedding a hegemonic regulatory regime constitutes a technique of power. By invisibly re-classifying non-binary users into a binary-based gender schema within the database and employing this reconfigured data set as a mechanism of income generation and connectivity, Facebook secures “the desire to keep the order of binary gender natural or necessary” (Butler, 2004: 35).

To be clear, the issue at hand is not supplying advertisers and marketers with better data about gender. Since corporate data collection comes with serious risks, including

surveillance of marginalized populations, our efforts should not be geared toward creating more “authentic” and “real” data sets by programming more inclusive (and granular) categories on surface or deep software levels. Facebook’s attempt to ally with trans and gender non-conforming communities resulted in programming practices that actively misgender them. This misgendering reinforces hegemonic regimes of gender control that perpetuate the violence and discrimination disproportionately faced by these communities. The capacity for software to invisibly enact this symbolic violence by burying it deep in the software’s core is the most pressing issue to attend to.

Acknowledgements

I am indebted to the Feminism and Social Media Research workshop organized by Libby Hemphill, Ingrid Erickson, Ines Mergel, and David Ribes for the 2014 Computer Supported Cooperative Work and Social Computing conference and the initial experimentation using Facebook’s Graph API Explorer that J. Nathan Matias and Marie Gilbert conducted during the workshop. I also thank Oliver Haimson and the very helpful feedback from anonymous reviewers, as well as the programmers in my life, Christian Holz, Rocky Bivens, and Uri Bivens, who helped me explore the code and think through programmatic possibilities. All images are from www.facebook.com.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Notes

1. Facebook’s software offers no affordance for distinguishing between sex (sexual organs, represented as male, female, and intersex) and gender (feelings and expressions associated with gender identity). Both terms appear interchangeably within the user interface and policy documents over time.
2. Custom gender remains under development and has been incrementally released for other languages with varying sets of gender options. As of June 2014, English (UK) offered over 70 options; English (US) was modified to a free-form text-field in February 2015. Meanwhile, Français (Canada) still offers a mandatory binary as of July 2015.
3. Transgender people, particularly people of color, continue to be disproportionately represented in homicide and hate violence statistics (NCAVP, 2015).
4. A fluid spectrum can be crudely understood as a continuum between masculinity and femininity, including every shade of masculine-femininity and feminine-masculinity, along with genders existing closer to the center (such as genderqueer) and gender-questioning identities. It also represents possibilities not yet fully imagined or embodied.
5. Recent implementations of Facebook’s “real name policy” have involved deactivation of user accounts, requests for legal names, and insistence on photographic ID as evidence to reactivate accounts. While Facebook spokespeople cite safety as a concern, the queer and drag queen community cite the ability to identify in ways that differ from “legal” identities as essential to their safety (Sylvan, 2014). These policies and the algorithms that determine inauthentic names have also disproportionately targeted Native Americans (Holpuch, 2015).
6. Consider victims of sexual abuse, people who keep their sexual orientation private from family or colleagues, and people who have careers that require anonymity.
7. Facebook’s Ross explained that, although “not 100% certain,” the value 6 is

an artefact of, not custom gender but just various kinds of projects that have been worked on in the past that ended up using up those other constants. So it wasn't by design it was just by default that was the next number that we could use. (Interview, 27 February 2014)

8. Originally restricted to Harvard students, Facebook's 2004 sign-up page included name, student status, email address, and password. By September 2006, anyone over the age of 13 with a valid email address could join. In 2007, "birthday" became a mandatory field. By 2008, "status" (previously modified to allow non-students to join) had been removed.
9. I obtained permission from Picher to include this experience.

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