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# IVF So White, So Medical: Digital Normativity and Algorithm Bias in Infertility on Instagram

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#### **Abstract**

Increasingly, women experiencing infertility are turning online to social media platforms, like Instagram, to engage with a support network and foster empathy. However, Instagram is also noted for its augmentation of White, cis, and heteronormative femininity through a process of silencing and minoritizing alternative, non-White voices. Through an inductive analysis of the most frequently used infertility hashtags, we collected and analyzed 252 Instagram posts to investigate how these algorithmic practices may socially construct the idealized IVF experience through communicating normative expectations. We identify predominant patterns of use that reinforce stratification within infertility treatments as primarily accessible to White women and best handled through expensive, expert medical procedures. Ultimately, we argue for increased attention to how algorithms may communicatively constitute and socially construct existing health disparities.

**Keywords:** digital normativity, infertility, shadow banning, algorithm bias, medicalization

#### Introduction

Search #Infertility on Instagram and nestled at the top of the approximately 1.9 million posts published in 2021, you are likely to find infographics on the best foods to avoid lest you risk miscarriage or artistically displayed felt letterboards with adages such as "Infertility

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taught me that life's too short for fake butter, cheese, or people." Similar patterns emerge if one was to search among the top of approximately 2 million posts using the hashtag #IVF; there is the post that helps you avoid burnout during treatment and an endless feed of images depicting artfully positioned felt letterboards sharing everything from "We got two more embryos," to "IVF cycle canceled," to the more celebratory, "Officially pregnant." Ultimately, these posts shape the discourses of infertility, reifying dominant assumptions of treatment success through connections to medicalization while also silencing and shadowing non-White stories.

Affecting an estimated 12% of women in the United States, the World Health Organization (2018) defines infertility as "the failure to achieve pregnancy after 12 months or more of regular unprotected sexual intercourse." Treatment options range from in-patient to out-patient services, with many investing thousands of dollars into treatment. This financial burden, coupled with the intense physical and emotional toll, led researchers to suggest infertility treatment may be one of the most stressful events of a woman's life (Schwerdtfeger & Shreffler, 2009). While infertility is likely to affect men as equally as women, the brunt of the physical, emotional, and psychological toll often falls most heavily on women (Kumar & Singh, 2015).

The religious (Akarsu & Beji, 2021), cultural (Ullah et al., 2021), and familial (Ergin et al., 2018) stigma that surrounds infertility only serves to compound the frequently hidden grief and bereavement. Considering the taboo and socially isolating nature of stigma, many women undergoing infertility treatment have trouble finding others to adequately empathize with their traumatic and grief-riddled experience (McBain & Reeves, 2019). Yet, research continually highlighted online forums, support groups, and social media engagement as a haven for women experiencing infertility, offering empathy, information, and fostering resilience (Jarvis, 2021a; Johnson et al., 2020).

Much is written regarding the unique affordances of social media and online support groups utilized by women experiencing infertility. Of note is the social networking platform Instagram, which offers empathetic support and educational resources and serves as a means for women to document their daily experiences with infertility (Perone et al., 2021). Instagram's unique combination of linguistic (e.g., captions, comments, and hashtags) and paralinguistic feedback (e.g., photos and emojis) creates the opportunity for an array of different types of support, including emotional, informational, tangible, and interactive support, to be exchanged (Johnson et al., 2020). However, women experiencing infertility are not passive victims of the sociocultural environment that constrains and stratifies them. Instead, they actively construct infertility by integrating fatalism within agentic capabilities (Bell & Hetterly, 2014; Greil, 2002). For example, Johnson and Quinlan (2016) illustrate a shifting history of empowerment surrounding conception, locating infertility as dually constructed by medical clinics and on social media through lay experts and alternative practitioners.

Beyond online discourses, a master narrative persists that convenes infertility as a White woman's problem, filtered through presumptions of wealthy, well-educated, cis-gendered, heterosexual couples (Inhorn et al., 2009). As Greil and colleagues (2011) overview, infertility has shifted from a personal problem privately shared between couples to a socially constructed phenomenon shaped globally and within Western societies by varying degrees of pronatalism, medicalization, and patriarchy.

# A History of Infertility

Interwoven with the medical development of treatments, the historical and social construction of infertility has long shaped access to and awareness of treatments. Jensen (2016) provides a thorough review of the rhetorical shaping of infertility, illustrating how the medical and scientific attention to infertility is entangled with racial and moral discourses. For example, beginning in the 1960s, just as feminists started advocating for a woman's right to choose motherhood, the mainstream medical establishment also shifted attention to the urgency for women to seek medical treatment when struggling to conceive. That is, as Jensen (2016) notes, "this view of reproduction was grounded in a risk- or harm-reduction model of health that positioned individual women—specifically middle- to upper-class, white, professional women—as personally responsible for, and capable of 'choosing' their reproductive health and fertility" (p. 151). As advancements in treatment options emerged, so too did women become seen as increasingly responsible for maintaining their reproductive health.

However, while attention once focused on women as *individually* responsible for maintaining reproductive health, more recent developments in treatment have led to the medicalization of infertility, which serves to decenter agency and reconstitute treatment through the lens of the medical establishment. Thus, infertility is underscored by "hegemonic" medicalization (Greil & McQuillan, 2010); it has become nearly synonymous with the need for medical treatments (Wilcox & Mosher, 1993). Given the prominent value medicalization places on technical expertise and scientific progress, medicalization also tends to enforce the perception that a disease, illness, or social action is free of embedded values (Mishler et al., 1981). As Bell (2016) contends, medicalization only serves to further stratify reproduction by de-politicizing treatment as neutral while not considering the structural imbalances which preclude women of lower socioeconomic status from attaining care. Additionally, this imbalance is racialized; whether due to the high cost of treatment or social-cultural stigmas, evidence suggests that African American and Hispanic women are 50% more likely to experience infertility when compared to White women, and these women are less likely to seek immediate treatment (Jain, 2006). However, deeper insight is needed to understand how social media interactions amplify this reproductive stratification through normative communication and underlying algorithms.

#### **Human-Machine Communication**

Given the multi-level construction of infertility, as shaped by medical textbooks, socioideologies, political policies, and interpersonal interactions online, this study seeks to understand how rhetorical practices of the infertility community constitutively normalize the infertility experience through the lens of White, cis-gendered, heteronormativity. A constitutive perspective regards social media technologies, like Instagram, as the "conduit for a story" (Veil et al., 2012, p. 331) with strong agentic and performative capabilities. A recent surge of research began examining the constitutive capabilities of online images, text, and hypertext as rhetorically constructing the infertility patient, medically and socially. For example, Johnson et al. (2019) illustrate how engagement with the hashtag #ttc (i.e., trying to conceive) enabled patients to circumvent medical expertise and embrace lay expertise. Thus, hashtags do not merely transmit information; they also serve a constitutive purpose

in building community, engendering support, and challenging dominant medicalized presumptions within infertility treatment (Jarvis, 2021b; Johnson et al., 2019). Moreover, a constitutive orientation to communication affords a metatheoretical perspective that not only holds generative world-making capabilities but also enlivens embedded and unacknowledged power structures that empower some while inhibiting others.

In considering the constitutive function of these online hashtags and forums, we also consider the persuasive capabilities inherent in human-machine communication. In human-machine communication, technology shifts from a mere medium or channel of communication to serving the role of communicator, a critical meaning-making function of humans and machines (Guzman & Lewis, 2020). Beyond meaning-making, Coleman (2021) argues that machines emerge as a locus of rhetorical practice as they manifest "visceral responses entangled with material culture to enliven discourse" (p. 14). While technology does not hold feelings or beliefs, it can still manifest "rhetorical energies" that shape the dissemination of health information and medicinal communication (Coleman, 2021). However, we extend and build upon Coleman's argument by considering the constitutive biases that may augment existing reproductive disparities and rhetorically reinforce the pronouncement of the ideal infertility patient.

This constitutive construction is underscored by digital normativity, a concept rooted in anthropological and ethnographic studies that explain how digital technologies render material consequences through an illusion of the immaterial (Blanchette, 2011; Kirschembaum, 2008; MacKenzie, 2009). Horst and Miller (2012) contend that this illusion of immateriality may create opportunities for equality in online communication and render oppressive consequences, as digital technologies can obfuscate structural and physical inequities. For example, Ginsburg (2012) illustrated how disability activists congregate in online communities to escape ableist discrimination and gain greater agentic control over their offline environment. Drawing on digital normativity, we recognize how technologies like Instagram are normatively socialized to privilege conception without medical intervention within the context of infertility.

#### Algorithm Bias

Responding to Johnson and colleagues' (2019) call, this study investigates the digital silencing of women of color, queer women, trans women, and women of lower socioeconomic status through interrogation of multimodal online discourse (i.e., textual, visual intertextual, and hypertextual data). Rachel Cargyle (@rachel.cargyle) and others termed the silencing of minoritized and alternative voices on Instagram as being shadowed banned, wherein Instagram restricts individual users' content from appearing in searches without their knowledge. While social media users overwhelmingly believe that purposeful human actors target their content, it is much more likely that the underlying algorithms inhibit the spread of alternative experiences (Myers West, 2018). However, as Noble (2018) contends, discriminatory and biased algorithms are produced when tech companies are primarily populated by White men who create technology that reflects their image while ignoring and rendering silent women's experiences.

Research has begun to consider online algorithms' racist and discriminatory biases. Noble (2018) identified recurrent negative biases that were perpetuated through search engines, like Google, specifically comparing 6 years of search results for "White girls" versus "Black girls." Similarly, Are (2020) identified the algorithmic censorship enacted by social media platforms, like Instagram, as replicating sexist and misogynistic power structures that deplete a woman's agency and render her invisible online. Researchers began to recognize the varying ways algorithms automate racism and reproduce existing social networks (see Eubanks, 2018; Noble, 2018; Sandvig et al., 2016); however, few considered how these practices might be constitutively communicative through normativity.

In considering digital normativity and shadow banning, we critique the established and predictive algorithms trained to influence how social media participants come to understand their individual and collective lives. For example, Fourneret and Yvert (2020) argue for an ethical reflection on how algorithms shape social values, particularly within the subjectivation process, a socially constructed process through which individuals become aware of the responsibility they subjectively hold in their actions and judgments (Wieviorka, 2012). Because artificial intelligence, like algorithms, is developed by human actors and shaped by human engagement, it ultimately reflects the biased and racist subjectivation communicatively constituted by malignant belief systems. Thus, in considering the malignant social and discursive implications of biased algorithms, we articulate our methodological decisions to critique power structures and historical hierarchies that have engendered stratification within treatment. Thus, we pose the following research question: How does Instagram reify raced, classed, and medical stratification within infertility treatment?

### Method

Considering the insular nature of tech companies and the proprietary value of algorithms, studying algorithms and their associated practices, including shadow banning, is a nonlinear and subjective process. F. Lee and Björklund Larsen (2019) establish five ideal types of practices useful for studying inequity and bias within algorithms, which include looking under the hood (e.g., analyzing the algorithms themselves) and working above the hood (e.g., examining the human input that constructs algorithms), or a combination of the two. Focusing our collection and analysis "above the hood," we shifted attention to how infertility is constituted through user input vis-à-vis top-ranked posts and comments. However, F. Lee and Björklund Larsen maintain that research must critique algorithm normativity regardless of the approach. Thus, as we explain, we centered our analysis on identifying the normative discourse within our multimodal data as constitutive of infertility.

#### **Data Collection**

The data analyzed in this study were collected as part of a large-scale research project attuned to algorithmic bias and digital normativity within infertility online. After receiving IRB approval, the first author and an undergraduate research assistant began data collection by searching and saving the top nine Instagram posts and comments from two of the most frequently used infertility hashtags, #infertility and #ivf, for 14 days. It is important to note that when searched in a browser rather than in the app, Instagram auto-populates the daily top nine posts for each hashtag; thus, this served as the basis for exploring the algorithmic normativity. Each post was saved to a Word document. We strategically collected data while avoiding major holidays, including Mother's and Father's Day. In total, we collected 252

Instagram posts over 2 weeks; however, as many of these posts were repetitive, we analyzed 165 unique posts.

## **Data Analysis**

To analyze and critique the normative tendencies of the infertility hashtags, we adopted an inductive and cyclical coding process to immerse ourselves in the data while also identifying overarching patterns and frequencies. As researchers, this iterative approach to data analysis draws on our existing understanding of infertility narratives and reproductive disparities while also considering the evidence of emergent themes within qualitative data (Tracy, 2019). Thus, rather than grounding our understanding solely in the data, we remained reflexively attuned to recognize hegemonic and ideological discourses of infertility. We began with an inductive process of analyzing and reanalyzing the data, examining images, captions, and hashtags for commonalities and deviances.

Through this iterative process, we developed codes as they began to capture themes of "summative, salient, essence-capturing and/or evocative [...] language-based or visual data" (Saldaña, 2009, p. 3). The first author led the data analysis process, conferring with the second author to discuss emerging themes and observations. In a spreadsheet, the authors tracked reoccurring imagery and evaluated the salience of captions by assigning first-level codes to each post (Tracy, 2019). For example, some posts were thematically marked as "motivation" while others were described as "everyday life" or "cycle announcement."

We sought to organize and synthesize these categories during the secondary coding cycle, diving deeper into their representation and critiquing their alignment with dominant and hegemonic discourses of infertility. Through this process, we developed theoretical saturation (Glaser & Strauss, 1967), wherein the relationship between our data and codes was focused and established. Our second level of coding was attuned to how these primary codes were representative of the medicalization, classism, and racism that plagues infertility experiences. For example, second-level codes focused on the images' racial dynamics and emotional displays. Specifically, we categorized posts as depicting White-passing individuals or individuals that appeared to be White and those that evidently represented people of color. In the following section, we identify salient patterns that continually reemerged on Instagram's daily top nine, arguing that the presentation of infertility on Instagram is inextricably and toxically situated within the bounds of race, class, sex, and medicalization.

# **Analysis and Discussion**

Data revealed two prominent patterns of normativity within the infertility hashtags. First, top posts amplified the Whiteness of infertility, shaping the visibility and resilience of White women experiencing infertility with limited illustrations of women of color who might struggle to conceive. Second, top posts are often constructed through medicalization. Posts that gained the most traction on Instagram privilege medical intervention and expertise, primarily through a Western lens. Ultimately, we argue, these two patterns of digital normativity reinforce a hegemonic stratification of infertility treatments that are primarily accessible to White women and best handled through expensive and expert medical procedures.

## Infertility So White

Whiteness has historically constructed infertility through medical rhetoric and racialized ideologies that depict women of color as hyper-fertile with limited access to reproductive health care options (Jensen, 2016). Yet the conspicuous presentation of White bodies on Instagram validates Whiteness within infertility overwhelmingly. For example, 114 of the 252 posts depicted White women, couples, or children. Comparatively, only six posts showed women of color or children of color. However, these limitations do not map on to what is known of Instagram users, who are primarily people of color. For example, in 2018, it was found that 45% of Instagram users were Latino, 38% were Black, and only 30% were Non-Hispanic White (Statista, 2018). Yet, while not the primary users, the most prominently displayed figures are White women whose image serves to cyclically reproduce dominant perceptions of infertility as primarily a White woman's problem.

Overwhelmingly, top posts centralizing White women were characterized by pain juxtaposed against happiness. Not merely does this presentation align with normative gendered expectations of (White) womanhood, whereby women are expected to enact positive emotions despite hardship, but so too does it speak to the racialized performance that allows for emotions expression by White women but not women of color (Hamad, 2019). Thus, sanctioning the emotional performance of White women provides a pathway toward resilience; that is, their ability to sustain forward and withstand setbacks (Jarvis, 2021a). For example, Figure 1 depicts a White woman wearing a White sundress, holding up a letterboard with a bright smile. In her caption, she writes about her excitement and underlying pride at retrieving double the number of expected eggs during her recent egg retrieval while also explaining her tempered hopes:

On average, our IVF clinic retrieves 16 eggs during retrieval, so our doctors were very excited that we doubled that. Also, it makes sense why I was in SO much pain in the days leading up to our retrieval. Even though we are very excited



FIGURE 1



over these numbers, we are not getting our hopes up because we know with infertility there are so many curveballs, so much unexpected defeat and heartache that comes up on this journey. We have learned that the hard way over the last 2 years.

Her comment, which speaks of heartbreak, is juxtaposed against optimism and pride in her retrieval. Similarly, in Figure 2, a young woman smiles from her hospital bed after her egg retrieval. She writes of her nerves and the hope she continues to hold, despite her setbacks and treatment failures, as she finds solace and resilience in life not going according to plan. Like many of the posts analyzed, Figures 1 and 2 exemplify resilient femininity as acutely available to White women (Jarvis, 2021a). Compared to those which center a woman of color and their children, these posts are attuned to pain and resilience. In this way, White women's pain gains precedence and women of color are, as has been deeply entrenched within racial discourses of infertility, presented as hyper-fertile. Ultimately, these patterns continue to reify infertility through the lens of a White woman's pain.

Further, Figures 1 and 2 illustrate a yearning for motherhood as these women grapple with their femininity and fertility. As the caption of Figure 2 goes on to read, "I want to tell YOU that you, and only you, determine your happiness. Your wholeness. Your fulfillment. Your feminism. Everything happens FOR us, not TO us. You are strong enough and are not alone." As previous research has attested (Whitehead, 2016), women experiencing infertility struggle to maintain a cohesive gender identity in the face of infertility, as womanhood is socially and culturally conditioned on motherhood. However, in sharing their pain and resilience online (primarily White, middle class, and partnered), White women gain social validation for their experiences and intrinsic worthiness of motherhood (Whitehead, 2016). Thus, the White femininity amplified on Instagram is evidenced not only through

emotional expression and resilience but so too through sociocultural systems that validate a White woman's deservedness for motherhood (Jensen, 2016). As (White) women cheerfully smiled through heartbreak, they affirmed their preparation and readiness for motherhood in so much as they were able to withstand hardship.

In contrast, the few women of color featured in the top posts were most frequently shown with young children, further enforcing the belief that Black women are uniquely hyper-fertile. These stereotypes persist throughout infertility clinics and across social and cultural bonds, ultimately reducing the visibility of Black women seeking treatment (Jones, 2013). For example, posts picturing a Black family often included several children, including multiples. In Figures 1 and 2, resilience was strongly connected to a woman's ability to withstand involuntary childlessness; this resilience is made less readily available to women of color. Instead, women of color are seen as already having achieved motherhood and thus may be excluded from the homosocial network of sharing and support (Whitehead, 2016).

## Infertility So Medical

As illustrated in Figure 1 and further evidenced throughout the data, the posts most prominently featured in the infertility hashtags often depicted a woman celebrating a continuum of success through the assistance of medicalization. These successes ranged from a bountiful egg retrieval, as evidenced in Figures 1 and 2, to pregnancy announcements that gleefully declared a "graduation" from the infertility clinic to the celebratory births of multiple healthy babies. As previous research attested (Johnson & Quinlan, 2016), the ideal fertility patient achieves success through the assistance of medical intervention. This idealism becomes evident in the algorithmic construction of infertility, as 48 of the 257 posts evidenced medically validated success, whether through a positive pregnancy test, a healthy pregnant woman, or young children. Further, 9 of the 48 postnatal posts included a healthy set of twins or multiples. And while there are an intense number of variables to consider, some estimates predict that assisted reproductive technologies only result in a successful live birth 52% to 78% of the time, although this is largely dependent on age and personal health (Malizia et al., 2009). In other words, success is not a guaranteed nor easily achievable outcome of infertility treatment.

Posts that gained an above-average amount of engagement and thus were more frequently circulated to the top of the algorithm search exhibited success in myriad ways, ranging from high-graded embryos to a glowing pregnancy to bouncing toddlers. The trend within the infertility community to document pregnancy and motherhood while reflecting on the trials of infertility reinforces linearity within treatment. Thus, not only do these most popular online discourses naturalize presumptions of success through IVF, but they also narrowly construct the medical pathway of treatment.

<sup>1.</sup> In considering our ethical commitments to privacy we decided not to include any posts featuring children as figures. Thus, given many of the posts featuring Black women also featured children, we did not include any example images. While this decision may reinforce the stratification we seek to critique, it nonetheless also exemplifies the limited and narrow diversity found within the infertility hashtags.

#### FIGURE 3



FIGURE 4



For example, many of the posts reiterate the value of medical intervention. Consider, for example, Figure 4, which celebrates the "3 high graded beautiful embryos that were created." The embryo grading system is akin to eugenics, as embryos are subjectively evaluated on their ability to result in a successful pregnancy and genetically typical life (Regalado, 2017). Many clinics will opt only to transfer (or freeze) embryos with a higher perfection

score and avoid transferring embryos with a statistical risk of physical and mental ailments, including diabetes, dwarfism, and schizophrenia. As Collard (2020) claims:

At work in these calculative measures is a process of bipolarization that naturalizes perceived social differences as pathologies. Racialized, colonized, and sexualized others; women; the neurodiverse and disabled: each of these categories represents a group subject to exploitation, degradation, disposability, and violence on the basis of social differences (re)produced as biological inferiorities. (p. 12)

Users in the infertility community do not merely celebrate the creation of their embryo, but so too do they post their hopes for high-graded embryos, thus further constraining what is considered ableist success within infertility.

However, these images of pregnancy success and highly graded embryos are drawn in contrast to the limited representation of non-White and non-Western stories, which typically rely on a more holistic and spiritual approach to health (Greil et al., 2011). For example, among the top posts were three images from a Middle Eastern infertility clinic, which provided diet advice, information on reproductive health, and congratulated patients who had experienced success. The clinic often responded to questions or concerns that anonymous members would submit. While this type of discourse is not intrinsically different from what White users presented, it shows this social construction's global and transcendent ramifications. In Figure 5, an anonymous user asks the clinic if they can pull hookah after an embryo transfer, which the clinic advises against. While not all posts gained the same level of traction, the few posts from this clinic included in the top post algorithm illustrate the algorithm's global influence. Thus, while not a prominent facet of the top posts, non-Western and non-White voices were present, helping to diversify alternative approaches to infertility.

FIGURE 5



# **Conclusion and Implications**

In highlighting the digital normativity inherent within these infertility hashtags, we seek to showcase the algorithmic bias which may socially construct and reify existing reproductive disparities. However, in doing so, we do not seek to critique the individual users who have shared their strength, their pain, and their resilience online, but rather the posts studied in this project represent those that continue to circulate among the top posts—and thus become the most prominent images women see as they enter the virtual world of infertility. Essential questions can be raised about the means and freedom some women feel in sharing their infertility journey compared to others. For example, as within African American and Latinx communities, there exists a social expectation of motherhood (hooks, 1981), research suggested that women of color may be more inclined to maintain silence around the experience of infertility treatment (Ceballo et al., 2015). Thus, it may not be merely the algorithm itself but the individual means of freedom that allow White women to engage more freely with the Instagram infertility community.

Theoretically, this study draws focus and engagement to dominant patterns of normativity within algorithms. We seek to revitalize attention to how algorithms are both shaping and shaped by the sociopolitical realities of infertility. Through this critical engagement with automated tools, we move deeper toward the "rhetorical energies" that reshape health and medicine through persuasive processes that stratify the medical system (Coleman, 2021). As women engage with these hashtags, they are continually presented with information that rarely counters an infertility patient's White, heteronormative, and middle-class idealization. For example, the minimal representation of Black women and women of color on Instagram may be indicative of shadow banning. While not an explicit nor intentional silencing, the erasure and/or the typified representation of women of color in the top posts only reinforces bias and racist presumptions. As the algorithm advances and recirculates images of traditionally feminine White women, these posts, in turn, gain increased engagement and traction on the platform. Replete of the human-oriented subjectivation process, these patterns highlight the deconstructive potential of automated algorithms to normalize dominant ideologies of infertility. As Fourneret and Yvert (2020) expend, the consequences of this automation on subjectivation are untold; however, within the context of infertility, these automated processes may begin to disembody the patient further, especially those most vulnerably at risk of being ignored by the medical system.

Similarly, symbols of socioeconomic success are evident in the linguistic and paralinguistic presentation of various medical procedures. While some posts discussed the financial reality of treatment, more often the data reflected an unending investment in treatment and blurred the financial and material consequences of multiple rounds of IVF and embryo testing. This pattern only serves to advance medical expectations (Wardrope, 2015) of early intervention and success. While not uniquely American, this pressure for success is undoubtedly influenced by United States-centric values of persistence and risk-taking. Women are urged to expend material resources and pursue lasting medical solutions to successfully end any number of obstacles (Becker & Nachtigall, 1994; M. Lee, 2017). Thus, it is not merely the silent yearning for motherhood but so too the social and cultural pressures of motherhood that may urge women experiencing infertility to pursue motherhood regardless of cost.

Through the repeated privileging of White voices and White pain, this study reveals how the material realities of infertility treatment—that is, the wealth, Whiteness, and cisgendered-ness enmeshed within treatment—become the dominant means through which experiences of infertility are presented online. However, as research on digital normativity would be quick to highlight, these patterns of sameness can quickly become the default standard for who counts within infertility treatment. Horst and Miller (2012) maintain that humanness becomes reconfigured virtually through the digital erasure of the material. Ultimately, as Whiteness and heteronormativity are amplified in top post algorithms, they only serve to regurgitate and fortify social construction and medicalization.

We argue for increased attention to how algorithms may communicatively constitute and socially construct existing health disparities. As illustrated in our analysis, algorithms hold communicative capabilities as they disseminate information and engender a particular worldview, reinforcing algorithmic bias through the unquestioned objectivity of AI. Future research should consider how algorithms communicate with users and explore the ample opportunities for advancements in methodological approaches. While the methods utilized in this study are grounded in a strong tradition of feminist and qualitative sensibilities, researchers should continue to push boundaries as they investigate and critique the role of algorithms in constituting the everyday.

# **Author Biographies**

Caitlyn M. Jarvis (PhD, Purdue University) is a postdoctoral teaching associate in the Communication Studies department at Northeastern University. Her research addresses the intersection of organizational and health communication through attention to new media, identity, and resilience. Jarvis's research examines the interdependent social and structural contexts that shape gender inequities and health disparities through online engagement. In addition to academic research, Jarvis also works within medical and financial industries to conduct market research and derive consumer insights.

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## References

- Akarsu, R. H., & Beji, N. K. (2021). Spiritual and religious issues of stigmatization women with infertility: A qualitative study. Journal of Religion and Health, 60(1), 256-267. https://doi.org/10.1007/s10943-019-00884-w
- Are, C. (2020). How Instagram's algorithm is censoring women and vulnerable users but helping online abusers. Feminist Media Studies, 20(5), 741-744. https://doi.org/10.1080 /14680777.2020.1783805
- Becker, G., & Nachtigall, R. D. (1994). Born to be a mother: The cultural construction of risk in infertility treatment in the U.S. Social Science and Medicine, 39(4), 507-518. https://doi.org/10.1016/0277-9536(94)90093-0
- Bell, A. V. (2016). The margins of medicalization: Diversity and context through the case of infertility. Social Science & Medicine, 156, 39-46. https://doi.org/10.1016/j. socscimed.2016.03.005
- Bell, A. V., & Hetterly, E. (2014). "There's a higher power, but He gave us free will." Socioeconomic status and the intersection of agency and fatalism in infertility. Social Science & Medicine, 114, 66-72. https://doi.org/10.1016/j.socscimed.2014.05.036
- Blanchette, J. F. (2011). A material history of bits. Journal of the American Association for *Information Science and Technology*, 62(6), 1042–1057.
- Ceballo, R., Graham, E. T., & Hart, J. (2015). Silent and infertile: An intersectional analysis of the experiences of socioeconomically diverse African American women with infertility. Psychology of Women Quarterly, 39(4), 497-511.
- Coleman, M. C. (2021). Leveraging the rhetorical energies of machines: COVID-19, misinformation, and persuasive labor. Human-Machine Communication, 3, 11-26. https:// doi.org/10.30658/hmc.3.2
- Collard, J. (2020). Abnormality as accumulation strategy: Orienting embryos to capital. Annals of the American Association of Geographers, 0(0), 1–16. https://doi.org/10.1080/ 24694452.2020.1752138
- Ergin, R. N., Polat, A., Kars, B., Öztekin, D., Sofuoğlu, K., & Çalışkan, E. (2018). Social stigma and familial attitudes related to infertility. Turkish Journal of Obstetrics and *Gynecology*, 15(1), 46. https://doi.org/10.4274/tjod.04307
- Eubanks, V. (2018). Automating inequality: How high-tech tools profile, police, and punish the poor. St. Martin's Press.
- Fourneret, E., & Yvert, B. (2020). Digital normativity: A challenge for human subjectivation. Frontiers in Artificial Intelligence, 3(27). https://doi.org/10.3389/frai.2020.00027
- Ginsburg, F. (2012). Disability in the digital age. In H. Horst & D. Miller (Eds.), Digital anthropology (pp. 101–126). Oxford.
- Glaser, B. G., & Strauss, A. L. (1967). The discovery of grounded theory: Strategies for qualitative research. Aldine Publishers.
- Greil, A. L. (2002). Infertile bodies: Medicalization, metaphor, and agency. In M. C. Inhorn & F. van Balen (Eds.), Infertility around the globe: New thinking on childlessness, gender, and reproductive technologies: A view from the social sciences (pp. 101–118). University of California Press.

- Greil, A. L., & McQuillan, J. (2010). "Trying" times: Medicalization, intent, and ambiguity in the definition of infertility. Medical Anthropology Quarterly, 24(2), 137-156. https:// doi.org/10.1111/j.1548-1387.2010.01094.x
- Greil, A. L., McQuillan, J., & Slauson-Blevins, K. (2011). The social construction of infertility. Sociology, 5(8), 736-746. https://doi.org/10.1111/j.1751-9020.2011.00397.x
- Guzman, A. L., & Lewis, S. C. (2020). Artificial intelligence and communication: A Human-Machine Communication research agenda. New Media & Society, 22(1), 70-86. https:// doi.org/10.1177/1461444819858691
- Hamad, R. (2019). White tears, brown scars. Melbourne University Press.
- hooks, b. (1981). Ain't I a woman: Black women and feminism. South End.
- Horst, H., & Miller, D. (2012) Normativity and materiality: A view from digital anthropology. Media International Australia, 145, 103-111. https://doi.org/10.1177/132987 8X1214500112
- Inhorn, M. C., Ceballo, R. R., & Nachtigall, R. (2009). Marginalized, invisible, and unwanted: American minority struggles with infertility and assisted conception. In L. Culley, N. Hudson, & F. van Rooji (Eds.), Marginalized reproduction: Ethnicity, infertility, and reproductive technologies (pp. 181–197). Earthscan.
- Jain, T. (2006). Socioeconomic and racial disparities among infertility patients seeking care. Fertility and Sterility, 85(4), 876–881. https://doi.org/10.1016/j.fertnstert.2005.07.1338
- Jarvis, C. M. (2021a). Expanding feminist resilience theorizing: Conceptualizing embodied resilience as a material-discursive process during infertility. Journal of Applied Communication Research. Advance online publication. https://doi.org/10.1080/00909882.20 21.2011373
- Jarvis, C. M. (2021b). Invitational rhetoric in epistemic practice: Invitational knowledge in infertility support groups. Rhetoric of Health & Medicine, 4(1), 1-32. https://doi. org/10.5744/rhm.2021.1002
- Jensen, R. E. (2016). Infertility: Tracing the history of a transformative term. Penn State Press. Johnson, B. L., & Quinlan, M. M. (2016). For her own good: The expert-woman dynamic and the body politics of REI treatment. Women & Language, 39, 127-131.
- Johnson, B. L., Quinlan, M. M., & Pope, N. (2019). #ttc on Instagram: A multimodal discourse analysis of the treatment experience of patients pursuing in vitro fertilization. Qualitative Research in Medicine & Healthcare, 3, 1-14.
- Johnson, B. L., Quinlan, M. M., & Pope, N. (2020). "Sticky baby dust" and emojis: Social support on Instagram during in vitro fertilization. Rhetoric of Health and Medicine, 3(3), 320–349. https://doi.org/10.5744/rhm.2020.1017
- Jones, C. (2013). 'Human weeds, not fit to breed?': African Caribbean women and reproductive disparities in Britain. Critical Public Health, 23(1), 49–61.
- Kirschenbaum, M. G. (2008). Mechanisms: New media and the forensic imagination. The MIT Press.
- Kumar, N., & Singh, A. K. (2015). Trends of male factor infertility, an important cause of infertility: A review of literature. Journal of Human Reproductive Science, 8(4), 191–196.
- Lee, F., & Björklund Larsen, L. (2019). How should we theorize algorithms? Five ideal types in analyzing algorithmic normativities. Big Data & Society, 6(2). https://doi. org/10.1177/2053951719867349

- Lee, M. (2017). Don't give up! A cyber-ethnography and discourse analysis of an online infertility patient forum. Culture, Medicine, and Psychiatry, 41(3), 341-367. https://doi. org/10.1007/s11013-016-9515-6
- MacKenzie, D. (2009). Material markets: How economic agents are constructed. Oxford University Press.
- Malizia, B. A., Hacker, M. R., & Penzias, A. S. (2009, January 15). Cumulative live-birth rates after in vitro fertilization. New England Journal of Medicine, 360, 236-243. https:// doi.org/10.1056/NEJMoa0803072
- McBain, T. D., & Reeves, P. (2019). Women's experience of infertility and disenfranchised grief. The Family Journal, 27(2), 156–166. https://doi.org/10.1177/1066480719833418
- Mishler, E. G., Amarasingham, L., Hauser, S. T., Osherson, S. D., Waxler, N. E. & Liem, Ramsay. (1981). Social contexts of health, illness, and patient care. Cambridge University Press.
- Myers West, S. (2018). Censored, suspended, shadowbanned: User interpretations of content moderation on social media platforms. New Media & Society, 20(11), 4366-4383. https://doi.org/10.1177/1461444818773059
- Noble, S. U. (2018). *Algorithms of oppression*. New York University Press.
- Perone, H. A., Herweck, A. M., Stump, H. M., Levine, H. M., Wong, A. J., & Carugo, J. (2021). The virtual infertility community: A qualitative analysis of patient experiences shared on Instagram. Journal of Assisted Reproduction and Genetics, 38.
- Regalado, A. (2017, November 1). Eugenics 2.0: We're at the dawn of choosing embryos by health, height, and more. MIT Technology Review. https://web.archive.org/ web/20201101160646/https://www.technologyreview.com/2017/11/01/105176/eugenics-20-were-at-the-dawn-of-choosing-embryos-by-health-height-and-more/
- Saldaña, J. (2009). The coding manual for qualitative researchers. Sage.
- Sandvig, C., Hamilton, K., Karahalios, K., & Langbort, C. (2016). Automation, algorithms, and politics when the algorithm itself is a racist: Diagnosing ethical harm in the basic components of software. International Journal of Communication, 10(2016), 4972-4990.
- Schwerdtfeger, K. L., & Shreffler, K. M. (2009). Trauma of pregnancy loss and infertility among mothers and involuntarily childless women in the United States. Journal of Loss and Trauma, 14(3), 211–227. https://doi.org/10.1080/15325020802537468
- Statista. (2018). Daily Instagram usage in the United States as of August 2018, by ethnicity. https://web.archive.org/web/20210915171912/https://www.statista.com/statistics/ 945939/daily-frequency-usage-instagram-usa-ethnicity/
- Tracy, S. J. (2019). Qualitative research methods: Collecting evidence, crafting analysis, communicating impact. John Wiley & Sons.
- Ullah, A., Ashraf, H., Tariq, M., Aziz, S. Z., Zubair, S., Sikandar, K. U. R., Ali, N., Shakoor, A., & Nisar, M. (2021). Battling the invisible infertility agony: A case study of infertile women in Khyber Pakhtunkhwa-Pakistan. Journal of Ethnic and Cultural Studies, 8(2), 89-105.
- Veil, S. R., Sellnow, T. L., & Petrun, E. L. (2012). Hoaxes and the paradoxical challenges of restoring legitimacy: Dominos' response to its YouTube crisis. Management Communication Quarterly, 26(2), 322-345. https://doi.org/10.1177/0893318911426685

- Wardrope, A. (2015). Medicalization and epistemic injustice. Medicine, Health Care and Philosophy, 18(3), 341-352. https://doi.org/10.1007/s11019-014-9608-3
- Whitehead, K. (2016). Motherhood as a gendered entitlement: Intentionality, "othering," and homosociality in the online infertility community. Canadian Review of Sociology/ *Revue canadienne de sociologie*, 53(1), 94–122. https://doi.org/10.1111/cars.12093
- Wieviorka, M. (2012). Du concept de sujet à celui de subjectivation/dé-subjectivation. Working Paper 16. Paris: Fondation Maison des Sciences de l'Homme.
- Wilcox, L. S., & Mosher, W. D. (1993). Use of infertility services in the United States. Obstetrics and Gynecology, 82(1), 122-127. PMID: 8515911.
- World Health Organization. (2018). International classification of diseases, 11th revision (ICD-11). Geneva.

