

Computing Cupid: Online Dating and the Faith of Romantic Algorithms

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¹SHORT BIO

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ABSTRACT

The religious identity and preferences of daters increasingly constitute key data in algorithmic matchmaking processes, including religious dating sites. This article explores the implication of online dating algorithms for religious people looking for romantic relationships. The article demonstrates that, while religious dating sites reinforce heteronormativity, using narrow theologies and algorithms, the work they do on these sites further entrench these attitudes at much deeper, invisible, and ubiquitous levels. Using data from a study of more than 20 Christian dating websites and several sources of public discourses on online dating algorithms, this article shows that online dating sites centre their offerings around a particular interpretation of God's plans for romantic relationships. These sites also position their services and algorithms as mediators or facilitators of such plans. I argue that in mining user data, these dating sites mine culture with some of its biases and norms. Thus, users, algorithms, dating technologies, account settings, and the system designers co-create user experiences and the cultural outcome of user interactions with online dating technologies, including how these shape their core values and attitudes surrounding gender and sexuality.

KEYWORDS

religion; online dating; algorithms; romantic relationships; data; culture

Introduction

I: Listen, Google, both John and Paul are courting me. I like both of them, but in a different way, and it's so hard to make up my mind.

Given everything you know, what do you advise me to do?

Google: Well, I know you from the day you were born. I have read all your e-mails, recorded all your phone calls, and know your favourite films, your DNA and the entire history of your heart. I have exact data about each date you went on, and if you want, I can show you second-by-second graphs of your heart rate, blood pressure and sugar levels whenever you went on a date with John or Paul. If necessary, I can even provide you with accurate mathematical ranking of every sexual encounter you had with either of them. And naturally enough, I know them as well as I know you. Based on all this information, on my superb algorithms, and on decades' worth of statistics about millions of relationships – I advise you to go with John, with an 87 percent probability of being more satisfied with him in the long run.

Indeed, I know you so well that I also know you don't like this answer. Paul is much more handsome than John, and because you give external appearances too much weight, you secretly wanted me to say, "Paul." Looks matter of course, but not as much as you think. Your biochemical algorithms – which evolved tens of thousands of years ago in the African savannah – give looks a weight of 35 percent in their overall rating of potential mates. My algorithms – which are based on the most up-to-date studies and statistics – say that looks have only a 14 percent impact on the long-term success of romantic relationships. So, even though I took Paul's looks into account, I still tell you that you would be better off with John.¹

Yuval Harari, in this excerpt, aimed to illustrate the nature of the human-technology interaction in what he terms a "Dataist society," where algorithms are the new gods and data the new reality. The quote illustrates the abilities and all-knowing "power" of algorithms in a not-so-distant future that has already begun. While showing us what Google could do if we grant it the necessary access to data about our lives, for Harari, this also reflects the historical shift in authority and dependence from religion and God to humanism and its emphasis on individual preferences, feelings and desires, and to the growing reliance on algorithms to make key decisions about our lives, including our intimate and sexual relationships. Thus, algorithms could be trusted to provide more accurate and trustworthy suggestions about who to date or marry than a priest or our own personal values or feelings could ever provide. This is, arguably, an aspiration of the competitors in the online dating industry – to develop systems that know daters so well that they perfectly match them to their desired or right dates and possible long-term partners.

Online dating platforms and technologies have evolved significantly from personal advertising boards for singles to data-driven algorithmic systems that match and connect daters (romantic algorithms), as well as the human dating of chatbots and simulated realities. Online dating services are increasingly normalised as mediators in the process of finding romantic and marital relationships. The spiritual and religious identity and preferences of daters also constitute key data in some algorithmic matchmaking processes, alongside the growth in religious

¹ Yuval N. Harari, *Homo Deus: A Brief History of Tomorrow* (New York: HarperCollins, 2016), 337-8.

niche dating and those of groups that feel excluded by the algorithms of popular dating platforms.

This article explores online dating algorithms and religious niche dating platforms and their implications for religious ideas about romantic relationships. I will demonstrate that the websites that I have examined, reinforce and sustain heteronormative theologies about romance and marriage. This can be assessed from the content, appearance, and some of the settings of the websites which are visible and accessible. However, I aim to show that algorithms and the work they do on these sites make these reinforcements possible at a much deeper, invisible, and ubiquitous level. In the first part of the article I explain algorithms. I then discuss online dating algorithms and the ways in which they rely on different types of user data and collaborative filtering to influence romantic relationships, thereby reinforcing cultural norms about romantic relationships. The second part of the article focuses on the pitch of Christian dating websites in South Africa. In this part, I demonstrate how this is centred around certain interpretations of God's plans for romantic relationships as well as the positioning of online dating services and their sophisticated algorithms as mediators or facilitators of such plans. I argue that, in mining user data, these dating sites also mine culture with some of its biases and norms. Thus, users, algorithms, dating technologies, account settings, and the system designers co-create user experiences and the cultural outcome of user interactions with online dating technologies, including how these shape their core values and attitude around gender and sexuality.

Algorithms and the Work they Do

Online dating is only one aspect of contemporary life in which algorithms exert enormous influence. Algorithms are the quiet and opaque objects employed to process and turn into capital the massive data that are continually being generated from our digital life and practices.² Algorithms are a major force behind the fourth industrial revolution. Google search and ranking are among the most commonly known and used, but algorithms shape many of our online activities and determine what we interact with online. These include what search results we see on Google, what we see and interact with on social media news feeds,

² Luke Dormehl, *The Formula: How Algorithms Solve All Our Problems – and Create More* (New York: TarcherPerigee, 2015).

movie recommendations on Netflix, or products on Amazon or Takealot, Gmail's smart compose which uses machine learning to complete our sentences when we write e-mails or suggest replies, as well as Facebook's proximity algorithm's suggestions of whom we may want to be friends with, and what is generally visible online. Predictive algorithms are also increasingly used in different forms of governmentality, crime management, and major economic decisions in ways that engender several ethical and social questions.³ As Rob Kitchin argues, algorithms appear to produce outcomes that disrupt and transform the organisation, operation, and labour of any domain on which they are deployed.⁴ The impact of algorithms in the world is felt and experienced increasingly, but without adequate knowledge of what they are and how they work. Moreover, they are usually presented as "black-boxes" whose inner workings are incomprehensible.⁵

Technically, algorithms exist to solve problems through a series of instructions or steps, and in the most effective way.⁶ A commonly used and helpful, but not entirely accurate, example of an algorithm is a recipe. When one follows the instructions in a recipe to prepare a particular meal, they are executing an algorithm which transforms raw ingredients into a specific product.⁷ Thus, an algorithm (recipe) has been applied to solve a problem (how to efficiently produce a specific meal). According to Jeff Erickson, an algorithm is an "explicit, precise, unambiguous, and mechanically-executable sequence of elementary instructions, usually intended to accomplish a specific purpose."⁸ Thus, algorithms are abstract mathematical procedures implemented or materialised in programming languages and software. Software and digital technologies are primarily a composition of algorithms.⁹ This results in machines being capable of executing very complex tasks in less time than humans, reduce labour, minimise errors and costs, and create new products and services in ways that would otherwise be impossible.¹⁰

³ Daniel Neyland, *The Everyday Life of an Algorithm* (Cham: Springer, 2019).

⁴ Rob Kitchin, "Thinking Critically about and Researching Algorithms," *Information, Communication & Society* 20, no.1 (2017): 14-29.

⁵ Neyland, *The Everyday Life of an Algorithm*.

⁶ Dormehl, *The Formula*.

⁷ Martin Erwig, *Once Upon an Algorithm: How Stories Explain Computing* (Cambridge: MIT Press, 2017).

⁸ Jeff Erickson, *Algorithms* (Independently published, 2019), 1.

⁹ Kitchin, "Thinking Critically about and Researching Algorithms."

¹⁰ Kitchin, "Thinking Critically about and Researching Algorithms."

Yet, critical scholars increasingly seek to show that algorithms are not simply the formal, objective, reliable, abstract, and technical objects and procedures that technology companies and computer scientists claim them to be.¹¹ Even when programmers make deliberate efforts to be impartial, they cannot escape the influence of their local context, culture, and knowledge in the processes within which they are located and operate.¹² The choices and judgements they make, shape such algorithms. As Kitchin argues, algorithms are hardly created for any neutral purposes. They usually serve to create value and capital, to influence behaviour and preferences, and to identify, sort, and classify people.¹³

Algorithmic processes and production are located within several social, material, historical, and cultural processes. Thus, among the key issues that have concerned scholars about algorithms, include autonomy, agency, governmentality, the ability to acquire bias, sort, order, and classify people and content, make predictions that victimise groups, determine how people are judged and treated, and their apparent (social) power.¹⁴ This power is both in the sense of a capacity to influence, shape, or produce certain effects (holding power), and in the Foucauldian sense of being part of social relations through which power is achieved and performed.¹⁵ Despite these bugging questions, investigating algorithms to understand how they produce effects can be a very challenging task due to corporate and state secrecy, their opacity, their complex and cumbersome nature, and because of the communities and processes involved.¹⁶

Methodology

I employ a scavenging strategy which draws on different types of resources and clues to understand algorithms and circumvent some of

¹¹ Ernest Davis, "Algorithms and Everyday Life," *Artificial Intelligence* 239 (2016): 1-6; David Beer, "The Social Power of Algorithms," *Information, Communication & Society* 20, no.1 (2017): 1-13; Neyland, *The Everyday Life of an Algorithm*; Dormehl, *The Formula*; Louise Amoore, *Algorithmic Life: Calculative Devices in the Age of Big Data* (Abingdon, Oxon; New York, NY: Routledge, 2015).

¹² Kitchin, "Thinking Critically about and Researching Algorithms."

¹³ Kitchin, "Thinking Critically about and Researching Algorithms."

¹⁴ Neyland, *The Everyday Life of an Algorithm*; Kitchin, "Thinking Critically about and Researching Algorithms;" Beer, "The Social Power of Algorithms;" Nick Seaver, "Algorithms as Culture: Some Tactics for the Ethnography of Algorithmic Systems," *Big Data & Society* 4, no.2 (2017).

¹⁵ Beer, "The Social Power of Algorithms;" Neyland, *The Everyday Life of an Algorithm*.

¹⁶ Kitchin, "Thinking Critically about and Researching Algorithms."

the challenges in analysing an algorithm humanities scholar rather than a computer scientist. Nick Seaver's proposal of this strategy draws on the anthropological approach to culture as practice.¹⁷ Partly as an attempt to address the representation of algorithms as inaccessible and therefore unknowable black boxes, Seaver suggests that we approach algorithms as "sociomaterial tangles" that are also engaged by users, including researchers. This suggestion is based on his argument that algorithms are more accessible if understood and approached as culture, rather than as aspects of, or objects *in* culture, because they function as and display characteristics of culture.¹⁸ Thus, multiple approaches can be used to study them and how they function.

I analysed data from a previous study of more than 20 Christian dating sites in South Africa. While the study was intended to be on Pentecostalism, the websites did not self-describe as Pentecostal, as some were explicit about servicing born-again Christians of all denominations. This necessitated the use of the term "born-again" rather than "Pentecostal" as an inclusion criterion, since it was clear from these platforms that "born-again" was not narrowly defined as referring to Pentecostal Christians only, but to include other Christians. Moreover, while Pentecostal Christians would generally identify as born-again, not all who identify as born-again are Pentecostals. In Africa, evangelicals, some protestants, members of the Catholic Charismatic Renewal, and interdenominational groups may also identify as born-again.¹⁹ Thus, dating websites that targeted Christians that could generally be described as born-again (indicating a conversion or personal commitment to Christ as used among Pentecostal, evangelical, and other Christians) were prioritised. This further helped me to minimise a bias in website selection due to search engine ranking algorithms, based on unknown criteria and search engine optimisation, which often influence how search results are ranked and seen. Content analysis on the sites focused on selected pages, such as the home/landing page, about page, displayed profiles of users, and FAQ pages. These were archived to freeze them within a specific period, since website content can change. The content was manually and inductively coded and thematised with

¹⁷ Seaver, "Algorithms as Culture."

¹⁸ Seaver, "Algorithms as Culture."

¹⁹ Kenneth R. Ross, J. Kwabena Asamoah-Gyadu and Todd M. Johnson (eds.), *Christianity in Sub-Saharan Africa* (Edinburgh: Edinburgh University Press, 2017).

the broad aim of finding what such sites promise/offer their clients and how they offer it.

To understand online dating algorithms, I relied primarily on a close reading of blogs published by insiders of dating companies, experts, interviews with online dating companies, relevant discussion threads, reviews of dating sites, their settings, FAQ pages, reports, instructions, and publicly accessible profiles. While the inner workings of key algorithms are closely guarded secrets, the gathered data offer some insights on how they work and shape the romantic relationships of users. Most of the content on these blogs are about algorithms and systems of dating sites and applications located in the United States and a few from Europe. Because they are the big competitors in the industry, they have received more media and critical attention, and thus have more publicly available information. Therefore, I used sites such as eHarmony, Tinder, and OkCupid as key examples. However, several of these sites operate internationally – Africa included – and their algorithms operate similarly across dating sites.

Romantic Algorithms

Online dating sites and apps offer three major services,²⁰ which are *access* (exposure to a large pool of potential partners, far more than is otherwise possible, and an opportunity to assess them against one's dating objectives), *communication* (different methods of computer-mediated communication to interact with potential partners before any face-to-face encounters), and *matching* (the utilisation of mathematical algorithms to find one's match and support the process of selecting a potential partner).²¹ These services have fundamentally disrupted the traditional dating scene. Much of the earlier anxieties about online dating – privacy,²² impression management, and deception²³ – do not limit the

²⁰ Eli J. Finkel, Paul W. Eastwick, Benjamin R. Karney, Harry T. Reis and Susan Sprecher, "Online Dating: A Critical Analysis from the Perspective of Psychological Science," *Psychological Science in the Public Interest* 13, no.1 (2012): 3-66.

²¹ Finkel *et al.*, "Online Dating."

²² Camille Cobb and Tadayoshi Kohno, "How Public is My Private Life? Privacy in Online Dating," *WWW* (2017): 1231-40.

²³ Jeffrey T. Hancock, Catalina L. Toma and Nicole Ellison, "The Truth about Lying in Online Dating Profiles," in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (San José: ACM, 2007), 449-52; Catalina L. Toma, Jeffrey T. Hancock and Nicole B. Ellison, "Separating Fact from Fiction: An Examination of Deceptive Self-Presentation in Online Dating Profiles," *Personality and Social Psychology Bulletin* 34, no.8 (2008): 1023-36; Jeffrey A. Hall, Namkee Park, Hayeon

mainstreaming of online dating. An online dater has access to a range of information about a potential partner within a few minutes, a process that could be much slower in offline connections.²⁴ Rather than slowly learning about the personality and character of a partner or rely on families and friends to assess compatibility over time, online dating algorithms can match daters within minutes.²⁵ Currently one can only speculate about the accuracy of such matching and the role that advances in artificial intelligence and machine learning. Arguments also exist about how, despite regular improvements to online dating experiences and technologies, it fails to match the experiential dimensions of offline dating.²⁶ As demonstrated in the quote at the beginning of this article, and as we increasingly experience the realms of governance and business in the fourth industrial revolution, increasingly smart algorithms are able to convert data into very revealing, insightful and predictive information about us, with increasing levels of accuracy. As with recommenders on Netflix, Facebook, or Amazon, dating technologies are getting better at knowing what users like and tailoring user experience along those lines. The central interest of this article is that daters rely on these matches and have made important romantic decisions based on them, with many “happy-endings” and “happily-ever-after” testimonies as found on the religious websites and on other platforms being studied. More importantly, through data mining strategies and collaborative filtering, these sites arguably contribute to sustaining and reproducing cultural norms about gender, romantic relationships, and related religious values.

“Data is King”

This is a very common expression in the current obsession with (Big) Data where power, capital, and imaginations of better futures are strongly tied to data and the capacity to manipulate data. Irrespective of the categorisation and strategies of online dating companies, their operations and services depend primarily on user data, whether self-reported or tracked behavioural data. I will discuss briefly how these data are mined and manipulated in order to demonstrate that, to a significant degree, algorithmic mechanisms and the objectives of the decision-

Song and Michael J. Cody, “Strategic Misrepresentation in Online Dating: The Effects of Gender, Self-Monitoring, and Personality Traits,” *Journal of Social and Personal Relationships* 27, no.1 (2010): 117-35.

²⁴ Finkel *et al.*, “Online Dating.”

²⁵ Finkel *et al.*, “Online Dating.”

²⁶ Finkel *et al.*, “Online Dating.”

makers behind them shape and sustain gender and relationship norms and practices.

Online dating sites generally fall into two categories in terms of how they collate and use information about users.²⁷ The first category includes survey-using sites such as Match.com, OkCupid, and eHarmony which make use of personality questionnaires and essay fields to develop rich data and profiles about registered users. Such data are used to calculate compatibility and pair users. Several other types of information are collected by some services. For example, Horozo additionally uses tarot readings, Pythagoras Squire Psychomatrix, fortune cookies, Natal Chart, lucky numbers, and other astrological elements to match singles.²⁸ In the case of the dating app, Once, human matchmakers work on user profiles and behavioural information to recommend the next date from the Once database.²⁹ The second category of dating platforms asks users during registration to link their dating accounts to their social media accounts. Examples include Tinder, Hinge, and Bumble. Daters' social media profiles and information – Facebook friends and likes, Instagram photos, and artists on Spotify – are used to suggest potential partners. In 2016, Once announced that users could sync their Fitbit and Android Wear devices to their dating profile, allowing them to track heartrates.³⁰ When a user comes across someone they find attractive or see the day's match, they could see their own reaction in real-time heartrates, and in future updates, be able to share heartrate information with the match.

This dynamic data embody and represent who we are, as well as our values and culture, because we arguably supply aspects of ourselves including our religion and culture to such sites – whether we do so deliberately, passively, or actively. This then raises the question of what happens to the selves users supply, to what extent they are altered, and how they return to inform who we are and what our cultures are. It is also important that the cultural context of the technologies and their designers as well as their preferences and interpretation of the needs of users

²⁷ Dale Markowitz, "The Future of Online Dating Is Unsexy and Brutally Effective," *Gizmodo*, 2017, <https://gizmodo.com/the-future-of-online-dating-is-unsexy-and-brutally-effective-1819781116>.

²⁸ Horozo. "Create Serious Relationship," *Horozo.com*, 2019, <https://www.horozo.com/>.

²⁹ Jordan Crook, "Dating App Once Uses Your Heart Rate To Help You Find Love," *TechCrunch*, 2016, <http://social.techcrunch.com/2016/01/14/dating-app-once-uses-your-heart-rate-to-help-you-find-love/>.

³⁰ Crook, "Dating App."

shape the outcome. For example, eHarmony does not only collect personality, age, location, sexual, religious, and spiritual information, it sets its systems to ignore users' choices, unless such users choose extreme points on the scales that are used to measure their preferences around race, religion, and other variables.³¹

While Tinder claims not to believe in stereotypes and therefore does not take race, income, or religion into consideration,³² it is difficult to see how its algorithms can avoid reproducing prejudices. Moreover, as data from sites such as OkCupid have shown, dating sites consider behavioural data to be more insightful and reliable than self-reported information, partly because singles get invested in presenting favourable images of themselves. For example, OkCupid data, in a 2010 post, showed that male users spend a significant amount of time and energy going after the youngest women in their preference pool – women younger than the minimum age that they state in their profiles – while neglecting women only a few years older than them.³³ Women, on the other hand, are more open to dating both reasonably younger and older men. Added to this, users often say that race does not matter, however, their actions show racial preferences.³⁴ In 2014, OkCupid reported that, while Black men showed little preferences based on race, non-Black men were less likely to converse with Black women. Additionally, all women preferred men belonging to their own race, but otherwise were less likely to initiate conversations with Black or Asian men.³⁵ Thus, by focusing on behaviour, algorithms can learn and identify nuanced preferences and values to improve their systems. However, there is hardly any indication that challenging the gender and cultural prejudices manifested in some of these observed behaviours, is a consideration when dating services use such data to improve their systems. It seems to be more about

³¹ Sarah Knapton, "Secret of eHarmony Algorithm Is Revealed....," *The Telegraph*, 2017, <https://www.telegraph.co.uk/science/2017/05/14/secret-eharmony-algorithm-ignoring-wishes-picky-daters/>.

³² Tinder, "Powering Tinder® – The Method Behind Our Matching," *Blog Gotinder*, 2019, <https://blog.gotinder.com/powering-tinder-r-the-method-behind-our-matching/>.

³³ OkCupid, "The Case For An Older Woman," *The Blog, OkCupid*, 2019, <https://theblog.okcupid.com/the-case-for-an-older-woman-99d8cabacdf5>.

³⁴ OkCupid, "The Big Lies People Tell In Online Dating," *The Blog, OkCupid*, 2010, <https://theblog.okcupid.com/the-big-lies-people-tell-in-online-dating-a9e3990d6ae2>;

Markowitz, "The Future of Online Dating;" OkCupid, "The Case For An Older Woman."
³⁵ OkCupid, "Race and Attraction, 2009-2014: What's changed in five years?," *The Blog, OkCupid*, 2014, <https://theblog.okcupid.com/race-and-attraction-2009-2014-107dcb4f060>.

efficiency in giving singles tailor-made solutions to what they are believed to desire. Thus, if the cultures, preferences, and values absorbed by these systems are patriarchal – which often appears to be the case – the outcome becomes a more efficient patriarchy, and data remain “King.”

Collaborative Filtering and Digital Cages

This is worsened by the fact that recommenders tend to close in and narrowly confine user interaction to a small group defined according to racial, physical, religious, and other user information, preferences, and behaviour – which is not always the result of careful thought or decision on the part of the user. To some degree, recommenders merely accentuate what might be common offline behaviour in terms of how people are likely to seek or find romantic relationships. This may involve looking within one’s geographical locations, family, and friend networks, that communities and other groupings within which they already belong, have reasonable proximity or encounters, and/or enjoy cultural approval. However, a critical question that dating algorithms evoke, is the extent to which they reinforce prejudice and bias, shape perception and social interaction within and beyond the immediate dating context, and govern user exposure to alternatives. Ben Berman attempted to demonstrate such bias by building a dating game called Monster Match funded by the tech company, Mozilla.³⁶ In Monster Match, a user creates a profile by choosing from a cast of monsters and swipes to match and set dates with other monsters.³⁷ The game shows how one’s “field of choice” becomes narrower as they swipe left or right to indicate dislike or like. The chance of being seen is reduced for every profile swiped left and one ends up seeing the same set of monsters repeatedly. Thus, Berman argues that these algorithms trap users in a cage created by their own preferences.³⁸

Berman also demonstrates how collaborative filtering works to exclude individuals and groups in online dating. Used by several dating platforms, collaborative filtering is a way of making recommendations based partly on a user’s preferences and partly on popularity among other users. To illustrate with an example from Wired’s report on Ber-

³⁶ Ariel Pardes, “This Dating App Exposes the Monstrous Bias of Algorithms,” *Wired*, 2019, <https://www.wired.com/story/monster-match-dating-app/>.

³⁷ Pardes, “This Dating App Exposes the Monstrous Bias of Algorithms.”

³⁸ Pardes, “This Dating App Exposes the Monstrous Bias of Algorithms.”

man's experiment, "if you swipe right on a zombie and left on a vampire, then a new user who also swipes yes on a zombie won't see the vampire in their queue."³⁹ Thus, certain profiles get excluded based on popular practice. Berman notes that the failure of collective filtering is evident in the rapid growth of niche dating, as many minorities feel excluded in the popular online dating scene. Niche dating sites range from those based on occupation, body type, sexual orientation, and community, to those based on ideology, religious affiliation, spirituality, and ethnicity.⁴⁰ These dating sites also rely on user data, use the same or similar technologies, and make the same promises as the major platforms, only within the limits of their niches and to cater for more clearly defined groups. Religious dating sites particularly draw on religious ideas, sentiments, and belonging to attract singles. Thus, they also arguably reinforce certain ideas about romantic relationships and confine users within preferences partly defined by the offerings of the platforms and user data. I will now discuss Christian dating sites more specifically in terms of what they pitch to users, how they position themselves in relation to the theologies behind their offering, and what the implication might be in light of the preceding discussion of algorithms.

Matches Made in Heaven

Many religions strive to direct and regulate the sexuality of their members.⁴¹ Sylvia Tamale argued that intersecting with law and reinterpretations of traditional customs and religions, instrumentalise, regulate, and control sexualities, especially women's.⁴² Religions provide several algorithms – rules, doctrines, and processes – to ensure that romantic relationships are practiced within an acceptable religious framework. These teachings are based on what is constructed or believed to be God's intention, commands, or desire. In one of the earlier works that explored the relationship between religion and digital media, Brenda Brasher argues that the Internet and communication technologies are shaping the ways in which religious people and communities interact and

³⁹ Pardes, "This Dating App Exposes the Monstrous Bias of Algorithms."

⁴⁰ Niche Dating Sites Reviews, "Dating Sites that fit your needs," *DatingScout*, 2019, [//www.datingscout.com/niche-dating](http://www.datingscout.com/niche-dating).

⁴¹ Stephen Ellingson and M. Christian Green, *Religion and Sexuality in Cross-Cultural Perspective* (London, New York: Routledge, 2014).

⁴² Sylvia Tamale, "Exploring the Contours of African Sexualities: Religion, Law and Power," *African Human Rights Law Journal* 14, no.1 (2014): 150-77.

select spouses.⁴³ Religious dating sites are a manifestation of this change. Research on the motives behind online dating among religious people is scarce. However, a study among Muslim American women suggests that religious people use online dating technologies to navigate the mate selection landscape for several other reasons than the usual online daters.⁴⁴ Muslim American women, for example, use such services because they have a limited access to traditional religious communities and networks where they can meet other singles. Online dating also gives them some control over their self-presentation, interaction, and dating practice, as well as some privacy and confidentiality.⁴⁵ The study shows that in their use of online dating services, Muslim women also strive to find a balance between the affordances of these sites and their desire to maintain their religious and cultural values and practices around courtship and romantic relationships.⁴⁶ This is an indication that religious daters, like others, approach online dating with some clarity about what they want and this is likely to be shaped by their religious and cultural values and preferences.

Many online daters consider it important to include information about their religious or non-religious status in their dating profiles in the hope of finding compatible partners.⁴⁷ Some dating sites show a considerable sensitivity to the religious preferences of their users and attempt to cater for them. eHarmony, for example, in its guidelines for the religion settings on user accounts, expresses an awareness that religion can be deeply personal and diverse, and acknowledges that their settings system is unable to simply categorise or include “every nuanced shade in the spectrum.”⁴⁸ While the settings allow users to “define” themselves religiously, and the matches they hope for, eHarmony advises users –

⁴³ Brenda E. Brasher, *Give Me That Online Religion* (San Francisco: Jossey-Bass, Inc., 2001).

⁴⁴ Annisa M.P. Rochadiat, Stephanie T. Tong and Julie M. Novak, “Online Dating and Courtship among Muslim American Women: Negotiating Technology, Religious Identity, and Culture,” *New Media & Society* 20, no.4 (2018): 1618-39.

⁴⁵ Rochadiat *et al.*, “Online Dating and Courtship.”

⁴⁶ Rochadiat *et al.*, “Online Dating and Courtship.”

⁴⁷ Religion, “Online Dating Gets Religion: Spiritual Profile Crucial To Many Seeking Romance,” HuffPost, 2012, https://www.huffpost.com/entry/religious-romance-require_n_1270558.

⁴⁸ eHarmony Staff, “eHarmony Religion Settings: The How-To Manual,” *Love & Harmony*, 2019, <https://www.eharmony.com/dating-advice/using-eharmony/eharmony-religion-settings-the-how-to-manual/>.

for the sake of optimising their experience – to ignore personal definitions of religions and use the categories provided.⁴⁹

It is clear from these sites that, while they attempt to accommodate religious preferences, they also get deeply involved in determining how these preferences are portrayed and represented online. A dater's religious data and the religious profile of their desired partner becomes a product co-created by the user, the settings, and the designers of the dating system. This is also the case with religious niche dating sites. However, some of them make a specific faith or denomination the primary focus and community of their dating pool, which could reduce the extent to which daters' religion are co-designed online, since the level of ambiguity may have been reduced.

“God-intended” Romance and its Facilitators

The dating sites analysed in my research generally targeted born-again Christians and employed different strategies to portray themselves as safe nests for Christians, where Christian values are protected in an online dating world that is rife with vice. This is probably an appeal to the belief among some Christians that the Internet is infested with demonic principalities and powers and a spiritual danger to the undiscerning Christian user.⁵⁰ Users also tend to respond in their profile essays by stating their born-again or similar Christian status. For example, Thando,⁵¹ on one of these profiles, writes:

I am a born again Christian enjoying a fulfilling journey with Jesus and have done so since...Jesus at the center of my life, is how I choose to live and as such I am in fellowship regularly as this feeds my soul and transforms me in the likeness of Jesus. I would like to...share God-adventures with a man who loves Jesus.

The sites present themselves as imbued with Christian values and as environments that are agreeable to Christians. The ultimate pitch of

⁴⁹ eHarmony Staff, “eHarmony Religion Settings.”

⁵⁰ Jana M. Bennett, *Aquinas on the Web? Doing Theology in an Internet Age* (New York: T & T Clark, 2012).

⁵¹ When citing examples from personal profiles, I use pseudonyms and anonymise the website. Online content is dynamic and constantly changes, including the structures and designs of websites and user-provided data. Thus, the Christian dating sites data used here were archived between January and June 2018.

born-again dating services is best captured in the following lines selected from the landing page of Christian Match:⁵²

Let us help you find a Match made in Heaven! We provide a secure environment where you will be able to meet like-minded Christian Singles in your area, who share your love of God and are committed to Jesus Christ and the Word of God. You could meet your soul mate, and have a lasting relationship that is truly blessed in the eyes of the Lord. True love that is blessed is possible.

Besides giving hope to Christian singles that their desired partners are within reach, these sites also reflect the commonly held belief that each Christian single has a partner prepared for them by God (“made in heaven”) and only needs to find or have that person revealed to them. These services often emphasise that their “sophisticated” algorithms are able to assist with this process. The use of algorithms and other tools to generate matches does not seem to contradict or exclude the idea of a match made in heaven. For these services, dating technologies may be interpreted as tools that enable them to facilitate God’s plan for singles in terms of dating. These Christian dating services also appear to understand the importance for many Christians of an identity forged around the personality of and belief in Christ and what that demands. Thus, some of them encourage users to make Jesus the centre of their lives and their relationships and find partners who do the same.

Another site describes “the sort of love God intended,”⁵³ and which can be found through their services, as one based on faith and commitment, and with singles who share the same core Christian values. Besides implying that they understand and know the types of union intended by God and are mediators or missionaries, in a way of such love, these services contribute in defining for their users what God’s intended relationship means. Such interpretations can sometimes be narrow and exclusive. For example, the above definition excludes interfaith marriages and may further exclude interdenominational marriages depending on how much they differ on their understanding of God’s intention. Like other ideas on the platforms, such exclusions are supported with certain interpretations of scripture, like the following

⁵² Christian Match, “Why Choose Christian Match for Christian Dating,” 2018, www.christianmatch.co.za.

⁵³ Christian Dating, “Have Faith in Love,” *EliteSingles*, 2019, www.elitesingles.co.za/christian-dating.

example of a passage from the Bible: “Believers, do not be teamed or yoked with unbelievers, for what do the people of God have in common with unbelievers...How can light live with darkness?...How can a believer live in harmony with a non-believer...How can a Christian be a partner with one who does not believe?” (2 Cor 6:14-15; Living Bible).

The choice of Bible version and the heavily religious nature of a website may suggest that interreligious marriages are not considered to be approved by God. Thus, these sites can be viewed as playing a critical role in fashioning and sustaining certain interpretations as the ideal for Christian relationships.

Another key aspect of the vision of relationship intended by God is its resulting in marriage. While some of these sites do not explicitly mention marriage as a goal, they sometimes imply it in their use of “lasting commitment” and similar terms. There is also no indication on any site that God could intend a romantic relationship that does not end in a lifelong commitment, although friendship is among the outcomes promised on some of the sites. Nonetheless, some of them explicitly name marriage as their ultimate goal and use the term “marriage-minded” Christians to further define their targeted singles. This also suggests an implicit acknowledgement that some singles are not seeking marriage, but emphasise, as CWed did, that marriage is part of God’s plan for Christians.⁵⁴

It was insightful to observe the “loud” silences on these sites about same-sex marriages or relationships, both in textual content and visual representations, making their theologies to emerge as heteronormative. First, most of them only offer two options – male or female – as the gender of the potential partner sought by a user. For example, the first field to be completed by a potential user on Christian Match begins with “I am a” and requires the potential user to complete the statement by selecting either “man looking for a woman” or “woman looking for a man.”⁵⁵ No other option is provided in the drop-down list and no blank field is provided for potential users to type in other preferences during registration. Same-sex singles cannot use this service to find partners irrespective of their born-again Christian status. It either assumes that

⁵⁴ CWed, “Where Christian Singles Meet,” *South Africa’s Marriage Minded Christian Dating Service*, 2018, www.cwed.co.za.

⁵⁵ Christian Match, “Why Choose Christian Match for Christian Dating.”

same-sex singles are not truly born-again, or deliberately aims to keep them out. Sites that cater for a broader population of singles, but have sections for Christians, such as Elite Singles,⁵⁶ are likely to allow users to select singles of their own gender during registration. For example, I was able to select the male symbol as my gender identity and the same symbol for the partner I am looking for during the initial stage of experimental registration at Elite Singles. Nonetheless, other types of visible information on the Christian section make this flexibility disappear.

Second, the testimonies and success stories on the sites being examined, whether in video or text-image formats, only show happy and intimate-looking heterosexual, often white couples, smiling, looking each other in the eyes, noses touching, men carrying women on their back by the sea, and so on. In light of the religious nature of the offers of these websites, such imagery and stories could signal to potential users that a marriage between a man and woman is the only type intended by God. The potential impact of this suggestion can be further appreciated when the special place that testimonies occupy in the spiritual life of many Christian communities is considered. For Christians, testimonies reaffirm faith and spirituality, they provide evidence of what is believed and of God's work in the believer's life; it shows the world the character and abilities of the Christian's God.⁵⁷ Thus, testimonies of successful online born-again dating are capable of having a deep significance for Christian singles, keeping them hopeful and increasing their confidence in online born-again dating services. However, their dominant narratives in the testimonies may wrongly suggest that only certain types of couples are approved by God, and their experiences ought to resemble such narratives to be a sign of God's blessing.

Reproduction of Culture

At this point, it serves to reiterate that the earlier discussion about algorithms, the work that they are doing, and the specific working of online dating algorithms and systems to reinforce culture, govern exposure, and shape preferences and values, also apply to the Christian dating sites I have discussed. These sites rely on the same or similar

⁵⁶ Christian Dating, "Have Faith in Love."

⁵⁷ Scott A. Ellington, "History, Story, and Testimony: Locating Truth in a Pentecostal Hermeneutic," *Pneuma* 23, no.1 (2001): 245-63; Meredith B. McGuire, "Testimony as a Commitment Mechanism in Catholic Pentecostal Prayer Groups," *Journal for the Scientific Study of Religion* 16, no.2 (1977): 165-8.

systems and logics to target a more streamlined clientele. Thus, they are not free of the concerns generally raised about algorithms and their designers. They are also products of specific cultures, priorities, and modes of interpreting the world. Therefore, the theologies and heteronormative ideas advanced through the content and imagery of religious dating sites may be further entrenched through algorithmic processes in digital culture, while filtering ensures that users' exposure to alternatives is consistently narrowed.

This is magnified by the fact that cookies and other online behavioural tracking and data mining tools make it possible for data from one's activity on a single website to inform what is made visible to them on another site. Searching for some relationship advice on Google, only to be flooded with tailored adverts of relationship products on one's Facebook account, on online store, or through phone calls and e-mails from advertisers, is an experience familiar to many. Thus, the control of a user's field of choice and the type of cultural messages one is exposed and limited to on online dating platforms, likely follow them to other platforms.

It is not my intention in the present study to undermine the massive potential for improving life conditions and wellbeing in digital technologies and platforms. Advances in artificial intelligence and data science often signal progress, even on epistemological level. However, their ability to reinforce worldviews that contribute to the exclusion of people based on religion, gender, or sexual orientation, is an indication of how they cannot be separated from the values and practices of the cultures and people from which they emerge. Thus, if such cultures have harmful norms around gender and sexualities, these technologies are very likely to reproduce them. If online dating sites mine the culture of users through data, primarily to better service themselves and make profit, then they are likely to only reproduce more efficient versions of such culture. Moreover, as I have suggested, there is a co-creation of religion and values in the process of user interaction with online dating platforms. This happens from the moment of registration when users apply some predefined values to define their religious belonging, values, and preferences, as well as those of their desired partners. It also continues in the different encounters, redefinitions, and exposures that users experience while participating in the dating process which sometimes extend outside the dating platforms with several dates and interactions with different people. How these experiences shape the

dater is no longer a matter of their own choice alone or their self-reported data. The religious and cultural values that they acquire in the process, and the effect that it produces on their gender preferences and practices, are ultimately a product of their interaction with technologies.

Conclusion

Online dating platforms are obviously very useful developments for many people. However, the technical systems and processes on which they depend, invite critical inquiry. There is a growing awareness that these technologies have more consequences for social interaction and the economy than their appearance as simple technical objects that make life better would convey. Advancements in machine learning increase the chances of accuracy in predictions, while the linking of one's dating profile to social media sites such as Facebook, Twitter, and Instagram, provides broader data for such accurate predictions. However, the question of algorithmic bias and influence remains a crucial one as far as the role of religion in social interaction is concerned, including the realm of romantic love and relationships.

The sites discussed in this article are not necessarily representative of the hundreds of religious niche dating platforms available, some of which have shorter lifespans than others. However, they offer relevant insight on the dynamics of technology, religion, culture, and some of the ways that these intersect to reproduce and sustain patriarchy and heteronormativity. Thus, algorithms and interface systems that aim to make their operations and influence on users and society invisible,⁵⁸ need some close investigation to understand the ways in which oppressive and dehumanising norms are sustained in less obvious ways. This will contribute towards critical research on algorithms and the efforts to influence the design of more humane and ethical artificial intelligence.

References

Amoore, Louise. *Algorithmic Life: Calculative Devices in the Age of Big Data*. Abingdon, Oxon; New York, NY: Routledge, 2015.
<https://doi.org/10.4324/9781315723242>.

⁵⁸ Grant D. Bollmer, *Theorizing Digital Cultures* (Los Angeles: SAGE, 2018).

- Beer, David. "The Social Power of Algorithms." *Information, Communication & Society* 20, no.1 (2017): 1-13. <https://doi.org/10.1080/1369118X.2016.1216147>.
- Bennett, Jana M. *Aquinas on the Web? Doing Theology in an Internet Age*. New York: T & T Clark, 2012.
- Bollmer, Grant D. *Theorizing Digital Cultures*. Los Angeles: SAGE, 2018.
- Brasher, Brenda E. *Give Me That Online Religion*. San Francisco: Jossey-Bass, Inc., 2001.
- Christian Dating. "Have Faith in Love." *EliteSingles*, 2019. www.elitesingles.co.za/christian-dating (Accessed on 30 September 2019).
- Christian Match. "Why Choose Christian Match for Christian Dating." 2018. www.christianmatch.co.za (Accessed on 30 September 2019).
- CWed. "Where Christian Singles Meet." *South Africa's Marriage Minded Christian Dating Service*, 2018. www.cwed.co.za (Accessed on 30 September 2019).
- Cobb, Camille and Tadayoshi Kohno, "How Public is My Private Life? Privacy in Online Dating." *Proceedings of the 26th International Conference on World Wide Web* (2017): 1231-40.
- Crook, Jordan, "Dating App Once Uses Your Heart Rate To Help You Find Love." *TechCrunch*, 2016. <http://social.techcrunch.com/2016/01/14/dating-app-once-uses-your-heart-rate-to-help-you-find-love/> (Accessed on 24 September 2019).
- Davis, Ernest. "Algorithms and Everyday Life." *Artificial Intelligence* 239 (2016): 1-6. <https://doi.org/10.1016/j.artint.2016.06.006>.
- Dormehl, Luke. *The Formula: How Algorithms Solve All Our Problems – and Create More*. New York: TarcherPerigee, 2015.
- eHarmony Staff. "eHarmony Religion Settings: The How-To Manual." *Love & Harmony*, 2019. <https://www.eharmony.com/dating->

advice/using-eharmony/eharmony-religion-settings-the-how-to-manual/ (Accessed on 30 September 2019).

Ellingson, Stephen and M. Christian Green. *Religion and Sexuality in Cross-Cultural Perspective*. London, New York: Routledge, 2014.

Ellington, Scott A. "History, Story, and Testimony: Locating Truth in a Pentecostal Hermeneutic." *Pneuma* 23, no.1 (2001): 245-63.

Erickson, Jeff. *Algorithms*. Independently published, 2019.
<http://jeffe.cs.illinois.edu/teaching/algorithms/>.

Erwig, Martin. *Once Upon an Algorithm: How Stories Explain Computing*. Cambridge: MIT Press, 2017.

Finkel, Eli J., Paul W. Eastwick, Benjamin R. Karney, Harry T. Reis and Susan Sprecher. "Online Dating: A Critical Analysis from the Perspective of Psychological Science." *Psychological Science in the Public Interest* 13, no.1 (2012): 3-66.

Hall, Jeffrey A., Namkee Park, Hayeon Song and Michael J. Cody. "Strategic Misrepresentation in Online Dating: The Effects of Gender, Self-Monitoring, and Personality Traits." *Journal of Social and Personal Relationships* 27, no.1 (2010): 117-35.

Hancock, Jeffrey T., Catalina L. Toma and Nicole Ellison. "The Truth about Lying in Online Dating Profiles." In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 449-52. San José: ACM, 2007.

Harari, Yuval N. *Homo Deus: A Brief History of Tomorrow*. New York: HarperCollins, 2016.

Horoza. "Create Serious Relationship." *Horoza.com*, 2019.
<https://www.horoza.com/> (Accessed on 2 September 2019).

Kitchin, Rob. "Thinking Critically about and Researching Algorithms." *Information, Communication & Society* 20, no.1 (2017): 14-29.
<https://doi.org/10.1080/1369118X.2016.1154087>.

- Knapton, Sarah. "Secret of eHarmony Algorithm Is Revealed...." *The Telegraph*, 2017. <https://www.telegraph.co.uk/science/2017/05/14/secret-eharmony-algorithm-ignoring-wishes-picky-daters/> (Accessed on 2 September 2019).
- Markowitz, Dale. "The Future of Online Dating Is Unsexy and Brutally Effective." *Gizmodo*, 2017. <https://gizmodo.com/the-future-of-online-dating-is-unsexy-and-brutally-effe-1819781116> (Accessed on 19 September 2019).
- McGuire, Meredith B. "Testimony as a Commitment Mechanism in Catholic Pentecostal Prayer Groups." *Journal for the Scientific Study of Religion* 16, no.2 (1977): 165-8.
- Neyland, Daniel. *The Everyday Life of an Algorithm*. Cham: Springer, 2019.
- Niche Dating Sites Reviews. "Dating sites that fit your needs." *DatingScout.com*, 2019. www.datingcout.com/niche-dating (Accessed on 30 September 2019).
- OkCupid. "The Big Lies People Tell in Online Dating." *The Blog, OkCupid*, 2010. <https://theblog.okcupid.com/the-big-lies-people-tell-in-online-dating-a9e3990d6ae2> (Accessed on 12 November 2018).
- OkCupid. "Race and Attraction, 2009-2014." *The Blog, OkCupid*, 2014. <https://theblog.okcupid.com/race-and-attraction-2009-2014-107dcbb4f060> (Accessed on 12 November 2018).
- OkCupid. "The Case For An Older Woman." *The Blog, OkCupid*, 2019. <https://theblog.okcupid.com/the-case-for-an-older-woman-99d8cabacdf5> (Accessed on 12 November 2018).
- Pardes, Ariel, "This Dating App Exposes the Monstrous Bias of Algorithms." *Wired*, 2019. <https://www.wired.com/story/monster-match-dating-app/> (Accessed on 24 September 2019).
- Religion. "Online Dating Gets Religion: Spiritual Profile Crucial To Many Seeking Romance." *HuffPost*, 2012.

https://www.huffpost.com/entry/religious-romance-require_n_1270558 (Accessed on 30 September 2019).

Rochadiat, Annisa M.P., Stephanie T. Tong and Julie M. Novak. "Online Dating and Courtship among Muslim American Women: Negotiating Technology, Religious Identity, and Culture." *New Media & Society* 20, no.4 (2018): 1618-39.

Ross, Kenneth R., J. Kwabena Asamoah-Gyadu and Todd M. Johnson (eds.), *Christianity in Sub-Saharan Africa* (Edinburgh: Edinburgh University Press, 2017).

Seaver, Nick. "Algorithms as Culture: Some Tactics for the Ethnography of Algorithmic Systems." *Big Data & Society* 4, no.2 (2017): n.p. <https://doi.org/10.1177/2053951717738104>.

Tamale, Sylvia. "Exploring the Contours of African Sexualities: Religion, Law and Power." *African Human Rights Law Journal* 14, no.1 (2014): 150-77.

Tinder. "Powering Tinder® – The Method Behind Our Matching." *Gotinder*, 2019. <https://blog.gotinder.com/powering-tinder-r-the-method-behind-our-matching/> (Accessed on 30 September 2019).

Toma, Catalina L., Jeffrey T. Hancock and Nicole B. Ellison. "Separating Fact from Fiction: An Examination of Deceptive Self-Presentation in Online Dating Profiles." *Personality and Social Psychology Bulletin* 34, no.8 (2008): 1023-36.