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DIRECT AND INDIRECT DISCRIMINATION APPLIED TO ALGORITHMIC SYSTEMS: REFLECTIONS TO BRAZIL

Such as other nations across the globe, Brazil is undergoing an expansion in the use of video monitoring and facial recognition technologies for the purpose of public safety. By compiling news regarding the use of facial recognition by polices in 2019, a Brazilian researcher concluded that, out of 151 of individuals arrested after being witnessed by cameras, 90.5% were black. The list included various mistakes: for example, a woman was imprisoned taken for another one which had already been arrested for four years.[1]

Both nationally and internationally, there have been debates about the potential discriminatory effects from the use of facial recognition technologies, with negative implications specially directed at the black population. Besides general conditions that may lead to error – including low resolution images, dependence on ambient conditions, outdated databases[2] – studies show that these technologies are biased towards black people.[3]

This adds to a scenario of institutional racism in the Brazilian police: for example, research about photo lineup errors concluded that, out of 90 mistaken imprisonments with this mechanism, 81% of them was of black people.[4] The number illustrates the pervasive racism in the context in which these facial recognition technologies are now being adopted.

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[1] Pablo Nunes, 'Exclusivo: Levantamento Revela Que 90,5% Dos Presos Por Monitoramento Facial No Brasil São Negros' (*The Intercept*, 21 November 2019) <https://theintercept.com/2019/11/21/presos-monitoramento-facial-brasil-negros/> accessed 1 December 2021.

[2] Luisa Cruz Lobato, Pedro Augusto P Francisco and Louise Marie Hurel, 'Videomonitoramento Webreport' (*Instituto Igarapé*) <https://igarape.org.br/videomonitoramento-webreport/> accessed 7 December 2021.

[3] Joy Buolamwini and Timnit Gebru, 'Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification', *Proceedings of the 1st Conference on Fairness, Accountability and Transparency* (PMLR 2018) <https://proceedings.mlr.press/v81/buolamwini18a.html> accessed 16 September 2022.

[4] Defensoria Pública do Estado do Rio de Janeiro, 'Relatórios apontam falhas em prisões após reconhecimento fotográfico' (*Defensoria Pública do Estado do Rio de Janeiro*, de fevereiro de 2021)

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The widespread use of algorithms in decisions with a direct impact in people's lives – e.g. recruitment processes, diagnostics, evaluation of eligibility for social programs, bank loans and public safety - invites theoretical reflections about how these technologies may be framed under anti-discrimination law. More importantly, what aspects of algorithmic discriminations may be explained once one sheds light at these problems with anti-discrimination traditional lenses.

In this regard, the aim of this article is to apply the direct and indirect discrimination categories to algorithmic discrimination to then reflect about how the topic is addressed in the Brazilian legal framework. To do so, the article is divided three main sections. The first presents the concepts of direct and indirect discrimination based on specialized literature on the matter (1). Section 2 addresses the topic of algorithmic discrimination, and contains (2.1.) an outlook on how algorithms work and (2.2 and 2.3.) how the categories of direct and indirect discrimination would be applicable to algorithmic discrimination, respectively. Finally, Section 3 discusses how the Brazilian legal framework may tackle algorithm discrimination – with two outlooks, one on (3.1.) anti-discrimination law in Brazil and the other on (3.2.) data protection legislation.

1. Discrimination: direct and indirect typology

Discrimination is a complex social phenomenon, with different dimensions and forms of expression[5] In a very simplified way, discrimination can be defined as the imputation of a disadvantage to an individual due to his belonging to a certain group.[6] The word discrimination

<http://www.defensoria.rj.def.br/noticia/detalhes/11088-Relatorios-apontam-falhas-em-prisoes-apos-reconhecimento-fotografico> accessed 7 December 2021.

[5] Sandra Fredman, *Discrimination Law* (2nd ed, Oxford University Press 2011) 109.

[6] ibid.

is a synonym for differentiation, but not every differentiation is discriminatory.[7] To distinguish both, the notion of disadvantage plays an important role.

The underlying aims of equality can be seen as the driving force behind antidiscrimination law – which is a response to inequalities entrenched in the political and historical context of a society[8]. Generally, anti-discrimination law is organized around outlawing disadvantages to one because of his belonging to a certain group or status – the array of these attributes compound a list (non-exhaustive or not, depending on the legal framework) referred as protected characteristics.[9]

Discrimination is categorized by international scholarship and caselaw around two concepts: direct and indirect discrimination.

The concept of direct discrimination is related to the maxim that likes should be treated alike – that is, direct discrimination happens when one is treated less favourably than another because of a protected characteristic. In this regard, the central feature of direct discrimination is the necessary link between the less favourable treatment and holding a protected characteristic – it is a link that motivates the discriminatory act. In the terminology used in Brazilian literature, Roger Raupp Rios refers to intentionality[10] (RIOS, 2008, p. 89) and, Moreira, to intentionality and arbitrariness[11].

Thus, the occurrence of direct discrimination must be proven from a "hypothetical comparison", that is, it must be demonstrated that individual A treats individual B less favorably than she would treat others, due to the possession of a protected characteristic held

[7] ibid.
[8] ibid 38.
[9] Roger Raupp Rios, *Direito Da Antidiscriminação: Discriminação Direta, Indireta e Ações Afirmativas* (Livraria do Advogado Editora 2008) 19.
[10] ibid 89.
[11] 26/10/2022 10*:33:00*

by B.[12] It is not, therefore, a matter of proving, for example, the impact of that unequal treatment.

To understand the concept of indirect discrimination, it is worth looking back at the story of anti-discrimination law. It emerged in a scenario in which there were direct discrimination norms, with the aim of addressing conducts without any discriminatory intent.[13] In sum, indirect discrimination can be described as an occasion in which the application of a neutral criterion at first sight (be it a rule or an institutional practice), that is, an equal treatment, implies a disproportionate impact on a certain class of individuals with protected characteristics.[14]

The concept is the result of a caselaw construction in the United States of America, from the case Griggs v. Duke Power Co., 1971. Duke Power was a factory that openly restricted the positions available to blacks, hiring them only for the lowest positions and restricting promotions. This policy was amended once the Civil Rights Act of 1964 came into effect, as it prohibited the exclusion of black workers. From then on, the factory demanded that, in order to gain access to higher positions or be promoted, employees would have to have completed high school and pass intelligence tests. In practice, the requirement represented a restriction of access to blacks, who historically had received inferior education. [15]

The United States Supreme Court held that the purpose of the Civil Rights Act was to promote equal opportunity and remove barriers to hiring black people. In this sense, 'practices, procedures, or tests neutral on their face, and even neutral in terms of intent, cannot be

[12] Fredman (n 5) 168.
[13] Adilson José Moreira, *O Que é Discriminação?* (2a reimpressão editada, Letramento 2017) 97.
[14] Fredman (n 5) 178; European Union Agency for Fundamental Rights, European Court of Human Rights and Council of Europe (eds), *Handbook on European Non-Discrimination Law* (2018 edition, Publications Office of the European Union 2018) 53.
[15] *Griggs v Duke Power Co* [1971] United States Supreme Court 401 U.S. 424.

maintained if they operate to "freeze" the status quo of prior discriminatory employment practices.'[16] In order to attest that the act had a discriminatory nature, it was argued that the requirement considered unfair would not be justified from the perspective of the business. In the case, the Supreme Court held that 'neither the high school completion requirement nor the general intelligence test is shown to bear a demonstrable relationship to successful performance of the jobs for which it was used.'[17]

With this background, the caselaw has created the following requirements for the proof of indirect discrimination. First, it must be proved that there was neutral treatment, through a rule, criterion or practice, and that the treatment generated unequal results, placing an individual of a certain special category at a particular disadvantage when compared to others. [18] This comparison, in turn, must refer to the group, so that statistics will play a relevant role, for example, in defining the studied pool and defining what would be a significantly unequal impact. Also, it must be demonstrated that the norm, criterion or practice is not justified by legitimate aims – that is, it is not necessary, adequate or proportionate for a certain position.[19]

The distinction between direct and indirect discriminatory practices has been adopted by legislations around the world.[20] The US caselaw uses other terminology to represent the same idea, respectively: disparate treatment and disparate impact. The main relevance of the distinction stems mainly from the legal exceptions to the discriminatory act. While for direct discrimination (or disparate treatment) no plausible justification for the act is admitted; indirect discrimination (or disparate impact) is considered justifiable.[21] That is, as stated by Griggs v.

[16] ibid.
[17] ibid.
[18] Fredman (n 5) 177–180.
[19] ibid 180–185.
[20] Rios (n 9) 118. Also, please note the approach adopted in Brazil will be detailed in Section 3.1.
[21] Some have questioned the usefulness of the distinction. For example, Fredman reports at length the emergence of justifiable hypotheses of direct discrimination, as well as the emergence of confusion between intent and cause

Duke Power Co., an act will not be considered discriminatory if it is shown that a certain requirement is a proportionate way of achieving a legitimate end.

In any case, the distinction between direct and indirect discrimination and its own historical emergence seems to shed light on how acts can be discriminatory and, as will be presented, demonstrate some of the difficulties associated with the adjudication of acts of algorithmic discrimination.

2. Outlook on algorithmic discrimination

Increasingly, the term algorithm has been incorporated into daily life conversations, and phrases such are "it's the algorithm's fault" are each day more common. In this regard, Tarleton Gillespie states that the general public, social scientists and technology specialists use the term differently (2016, p. 18). With the aim of at least paving the way for the debate, it is worth briefly presenting the concept before moving on to its potential discriminatory effects.

In simple terms, algorithms are usually associated with the technical term "deterministic algorithm", which is formally defined as a finite and generalizable sequence of instructions, rules or linear steps, designed to ensure that the agent executing the sequence will achieve a particular and pre-defined objective[22].That is, algorithms can be defined as a series of logical operations to organize or act on a set of data (also called input) in order to quickly arrive at an

of discrimination. For example, British and Canadian jurisprudence has relaxed a clear distinction between these two types of discrimination, creating hybrid models – for example, through the British category of 'intrinsically discriminatory act, or requiring to prove the reason why an act of indirect discrimination generates negative effects for a protected class. Sandra Fredman, 'The Reason Why: Unravelling Indirect Discrimination' (2016) 45 Industrial Law Journal.

[22] Bethany Nowviskie, 'Algorithm' in Marie-Laure Ryan, Lori Emerson and Benjamin J Robertson (eds), *The Johns Hopkins guide to digital media* (Johns Hopkins University Press 2014).

answer or a desired goal.[23] These instructions range from simple commands that add value to two input variables to complex operations that rank search results based on keywords.[24]

Profiling practices can be described as 'as the construction or inference of patterns by means of data mining and as the application of the ensuing profiles to people whose data match with them'[25]. Essentially, it involves two steps: (i) data about real-life needs to be captured and stored in electronic format, with decisions to perform an aggregation, this is usually referenced as "training data"; (ii) next, there would be a data mining process, which consists of applying algorithms to the data set, in order to discover patterns, such as correlations.[26]

By definition, the data mining process is a means of "statistical discrimination" – that is, its very purpose is to provide a rational basis for distinguishing individuals and reliably confer attributes to individuals as those possessed by statically similar people.[27] Data mining can employ machine learning, for example, when a system is given a task and may use a large amount of data to extract examples of how this task can be achieved or from which to detect patterns - with this training data, the system learns how to achieve the desired input.[28]

The algorithm 'learns' by defining rules that determine how new inputs will be classified. The model can be taught to the algorithm via hand labelled input - that is, with

[23] Tarleton Gillespie, 'Algorithm', *Digital Keywords* (2016) 19 <http://culturedigitally.org/wp-content/uploads/2016/07/Gillespie-2016-Algorithm-Digital-Keywords-Peters-ed.pdf> accessed 10 December 2019.; Solon Barocas and others, 'Data & Civil Rights: Technology Primer' (Social Science Research Network 2014) SSRN Scholarly Paper ID 2536579 3 <https://papers.ssrn.com/abstract=2536579> accessed 12 December 2019.
[24] Barocas and others (n 23) 3.
[25] Mireille Hildebrandt and Bert-Jaap Koops, 'The Challenges of Ambient Law and Legal Protection in the Profiling Era' (Social Science Research Network 2010) SSRN Scholarly Paper ID 1602192 431 <https://papers.ssrn.com/abstract=1602192> accessed 13 December 2019.
[26] ibid.
[27] Solon Barocas and Andrew D Selbst, 'Big Data's Disparate Impact' (Social Science Research Network 2016) SSRN Scholarly Paper ID 2477899 677 <https://papers.ssrn.com/abstract=2477899> accessed 24 November 2019.
[28] F Zuiderveen Borgesius, 'Discrimination, Artificial Intelligence, and Algorithmic Decision-Making' 13 <https://dare.uva.nl/search?identifier=7bdabff5-c1d9-484f-81f2-e469e03e2360> accessed 10 February 2022.

human intervention - in which case it is called supervised learning; unsupervised learning, on the other hand, are cases in which the algorithm itself defines best-fit models to make sense of a set of inputs. [29]

Thus, data mining and profiling practices, central to the running of algorithms that pervade the daily lives of individuals, operate through decisions and generalizations. The question of which of these differentiation practices should be considered discriminatory (and, thus, illegal) is something that we seek to advance here.

2.1. Algorithms and direct discrimination

Direct discrimination practices are, put it simply, unfavourable treatment because of a protected characteristic. In this regard, if algorithms consider protected characteristics in a decision that negatively impacts those individuals, this could be considered an automated decision-making means of direct discrimination. For example, an HR company may use gender as a factor to rank candidates in recruitment processes – if women are unfavorably classified specifically because of that gender, this can be deemed a means of direct discrimination.

According to international anti-discrimination law, as presented, the use of protected characteristics to generalizations with negative impacts would already be considered discriminatory.[30] The caselaw of the United States' provides that the plaintiff has the responsibility to demonstrate the disparate treatment: namely, that a similarly situated individual who does not have the protected characteristic would not have the same treatment.[31]

[29] Brent Daniel Mittelstadt and others, 'The Ethics of Algorithms: Mapping the Debate' (2016) 3 Big Data & Society 2053951716679679, 3.
[30] Barocas and others (n 23) 1.
[31] Barocas and Selbst (n 27) 696.

Also, from the requirements of European anti-discrimination law, the use of a hypothetical comparator would be enough to demonstrate direct discrimination.

For example, in March 2019, the US Department of Housing & Urban Development sued Facebook for a tool that allowed advertisers to exclude ads for "non-American", "non-Christian", "interested in Hispanic culture" or from specific zip codes.[32] According to the agency, the company's actions would enable and allow discrimination in housing markets. In response, the company committed to altering its ad-targeting possibilities for housing: advertisers would not be able to target based on gender, age or zip code.[33] Since the settlement, Facebook developed a Special Ad Categories, which restricted ad targeting options for areas with anti-discrimination rules in the US (namely, housing, employment and credit ads) and required advertisers to certify their new ad does not violate a non-discrimination policy.[34]

Similar accusations against the Facebook service were made regarding employment and credit – after the settlement, there were reports of age discrimination for employment ads on the media.[35] In response, in November 2021, the company announced that it would remove ad targeted options that related to sensitive topics, such as options referencing causes, organizations, or public figures that relate to health, race or ethnicity, political affiliation, religion, or sexual orientation.[36] As stated by the company, advertisers would not be able to target users based on their interactions with topics such as "Catholic Church", "Lung cancer

[32] 'Housing Department Slaps Facebook With Discrimination Charge : NPR' *NPR* (28 March 2019) <https://www.npr.org/2019/03/28/707614254/hud-slaps-facebook-with-housing-discrimination-charge> accessed 14 December 2019.
[33] 'Updates To Housing, Employment and Credit Ads in Ads Manager' (*Meta for Business*, 08 2019) <https://www.facebook.com/business/news/updates-to-housing-employment-and-credit-ads-in-ads-manager> accessed 10 February 2022.
[34] ibid.
[35] Jeremy B Merrill, 'Does Facebook Still Sell Discriminatory Ads? – The Markup' <https://themarkup.org/ask-the-markup/2020/08/25/does-facebook-still-sell-discriminatory-ads> accessed 10 February 2022.
[36] 'Removing Certain Ad Targeting Options and Expanding Our Ad Controls' (*Meta for Business*) <https://www.facebook.com/business/news/removing-certain-ad-targeting-options-and-expanding-our-ad-controls> accessed 10 February 2022.

awareness" and "LGBT culture".[37] The initiative, under roll-out, expands beyond areas with anti-discrimination rules in the US.

Theoretically, it seems intuitive that the choice of advertisers to exclude certain agents based on protected characteristics is discriminatory (in a direct manner) and thus the need of a debate on the accountability of platforms for making this tool available. Traditionally, anti-discrimination law is aimed at the business and policy decisions intentionally discriminatory. This case is different as there is an intermediary which enables these discriminatory choices, but does not conduct them itself, meaning traditional direct discrimination category is not immediately applicable. However, the response to the case indicates that there should be accountability for platform design which allows direct discrimination.

Barocas points to another risk, the possibility of masking - that is, that intentional discriminatory practices can be masked by the use of algorithms.[38] Thus, the author analyzes a scenario where agents are able to infer, from their preferences, that a given individual belongs to a certain protected class and discriminate based on this information.[39]

For example, one can cite an effort by the dating website OKCupid to perform statistical analysis of phrases most used by some social groups, such as white, black, Latino, Arab and Indian men.[40] From the way users communicate, it would be possible to identify the members of these groups and discriminate them based on that. The use of data mining, in this sense, would help agents evade accountability for intentional discriminatory acts in an enhanced manner.[41]

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[37] ibid.
[38] Barocas and others (n 23) 1; Barocas and Selbst (n 27) 629.
[39] Barocas and others (n 23) 1; Barocas and Selbst (n 27) 692–693.
[40] Max Fisher, 'Statistics Show the Real "Stuff White People Like"' (*The Atlantic*, 8 September 2010) <https://www.theatlantic.com/national/archive/2010/09/statistics-show-the-real-stuff-white-people-like/340126/> accessed 14 December 2019.
[41] Barocas and Selbst (n 27) 693.

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Despite the possibility of applying anti-discrimination law to direct discrimination cases related to algorithms, Barocas and Selbst warn that this does not necessarily mean that it would be easy to bring a case against these practices. Authors argue that, such as real-world claims about direct discrimination, there are difficulties of proof that algorithms were moved by a discriminatory intent or that a certain protected class was used as a variable to target individuals.[42] Unless there was circumstantial evidence like an internal record of the specific aim, plaintiffs would need to go as far as to demonstrate indirect discrimination practices.[43]

2.2. Algorithms and Indirect Discrimination

Although algorithms allow direct discrimination and this risk should not be ignored, one can agree with Solon and Selbst when they state: 'when it comes to data mining, unintentional discrimination is the more pressing concern because it is likely to be far more common and easier to overlook'44. Also, Wachter, Mittelstadt and Russell agree that indirect discrimination cases are more pressing when it comes to automated systems: direct discrimination cases would be rarer, whilst risks of indirect discrimination cases would be widespread, yet subtle.45

Data mining has a series of steps, automated or not, in which it is possible that – even before a careful programmer – hidden biases creep and generate discriminatory effects.[46] To use a distinction proposed by Mittelstadt et. Al, biases are a dimension of the decision process

[42] ibid 712–714.
[43] ibid 713.
[44] ibid 693.
[45] Sandra Wachter, Brent Mittelstadt and Chris Russell, 'Why Fairness Cannot Be Automated: Bridging the Gap between EU Non-Discrimination Law and AI' (2021) 41 Computer Law & Security Review 105567, 45.
[46] Kate Crawford, 'The Hidden Biases in Big Data' [2013] *Harvard Business Review* <https://hbr.org/2013/04/the-hidden-biases-in-big-data> accessed 14 December 2019.

itself, while discrimination would represent the effects of the decision – in terms of disproportionate adverse impact resulting from the decision made by the algorithm.[47]

To understand how biases could be incorporated into automated decision processes, it is worth retrieving a seminal article by Helen Nissenbaum and Batya Friedman, in which the authors describe that biases in electronic systems may surface in three different ways: (i) from pre-existing social values, found in institutions, attitudes and social practices; (ii) technological limitations; and (iii) aspects emerging from the context of use.[48]

There are several ways in which biased social values can be incorporated into the algorithmic decision making. As argued before, they can be intentionally added by designers, for example, in the process of defining target variables to be taken into account - that would be the case of direct discrimination by means of profiling, if one considers a protected characteristic for detrimental treatment. For example, an investigation was recently opened against Goldman Sachs for offering lower credit limits for women. It is plausible that gender was established as an analysis variable, as the engineers at Goldman Sachs could have known thought women cannot be trusted with a credit card. The bank, however, denied that decisions were made on the basis of gender – which raises the debate about unintentional discriminatory effects.[49] It could be that a target variable – while not gender in itself – would have a detrimental effect on women.

The incorporation of social biases, for its turn, may be due to a number of factors. Training data may be incomplete, biased, or nonrepresentative. In these cases, if data mining draws inferences from a biased population set, all decisions based on this inference can

[47] Wachter, Mittelstadt and Russell (n 45) 3758.
[48] Batya Friedman and Helen Nissenbaum, 'Bias in Computer Systems' (1996) 14 ACM Trans. Inf. Syst. 330.
[49] 'Viral Tweet About Apple Card Leads to Goldman Sachs Probe' *Bloomberg.com* (11 September 2019) <https://www.bloomberg.com/news/articles/2019-11-09/viral-tweet-about-apple-card-leads-to-probe-into-goldman-sachs> accessed 15 December 2019.

systematically harm those under or overrepresented in the database.[50] Considering that social practices themselves are fraught with discriminatory patterns, it is intuitive to think of ways that training data may be biased.

For example, the under or overrepresentation of groups in training data can derive from an unequal social context. A commonly cited example of underrepresentation is an app that uses smart phone sensors to report potholes in Chicago's streets, Kate Crawford comments that, if these data are used to guide resurfacing public policies in the city, lack of access to cellphones may lead to the misallocation of resources to richer areas.[51]

On the other hand, a common example of overrepresentation is police activity. With indicators that policing practices are biased and focused on some social groups, there is evidence that predictive policing software would reinforce the stigmatization of these same groups, suggesting greater policing precisely in these areas.[52]. According to Cathy O'Neil, this practice would create a pernicious feedback loop, with policing generating new data that would justify greater monitoring of certain groups.[53]

Returning to the classification proposed by Nissenbaum and Friedman, technological limitations and errors can also generate bias. For example, there are the risks of incorrect inferences, given that algorithms produce probable but uncertain results, as they establish correlations and not direct causal relationships.[54] Finally, the context of use may also generate bias – for example, one could think about the adaptation of existing medical triage apps when

[50] Barocas and Selbst (n 27) 681.
[51] Crawford (n 46).
[52] Solon Barocas, 'Data Mining and the Discourse on Discrimination', *Data Ethics Workshop, Conference on Knowledge Discovery and Data Mining* (2014) 3; Sarah Myers West, Meredith Whittaker and Kate Crawford, 'Discriminating Systems: Gender, Race And Power in AI' [2019] AI Now Institute 17.
[53] Cathy O'Neil, *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy* (First edition, Crown 2016) 177.
[54] Mittelstadt and others (n 29) 6.

the COVID-19 pandemic hit, maybe this shift in context and particularities of the disease could render the algorithms biased.

To give an example still related to ad targeting, in 2021, a nonprofit campaign group called Global Witness ran tests hiring ad targeting on Facebook for job openings – including for mechanics and preschool nurses.[55] The NGO did not indicate any criteria, instead it chose the "Traffic/Link Clicks" feature —which, according to Facebook, ensures the ads are delivered to "the people who are most likely to click on them." The results were this: 96% of the people shown the ad for mechanic jobs were men and 95% of those shown the ad for preschool nurse jobs were women.[56] The lack of information about the algorithms employed hinders social control to investigate the causes of the discriminatory effects – for example, it may be that the biased results were due to biased training sets or due to societal context.

As argued, there are multiple ways algorithmic decisions may lead to discriminatory outputs. Except for direct discrimination cases outlined above, the indirect discrimination category fits the cases derived from data mining systems: apparently neutral practice disproportionately posing disadvantages to a protected group in comparison with other people. Once this link is made, one may question what the difficulties are in building an indirect discrimination case to challenge algorithmic discrimination.

The requirements set by indirect discrimination caselaw pose relevant obstacles to the application of the disparate impact doctrine to cases of discrimination through algorithmic decision-making.[57] The first is the difficulty of proof. As argued throughout this section, there are multiple ways automated systems may render biased results – so that it is hard to pinpoint

[57] Barocas and Selbst (n 27) 701–714.
[57] Barocas and Selbst (n 27) 701–714.
[57] Barocas and Selbst (n 27) 701–714.

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at what point of the analysis biases were incorporated and for what reasons.[58] From the perspective of European anti-discrimination law, Wachter, Mittelstadt and Russell indicate a deeply contextual approach: a complex assessment which includes dispute about the contested rule, composition of the disadvantage group and the nature and severity of the harm and disadvantage.[59] In light of these multiple steps, the jurisprudence lacks common standards and metrics, which does not allow for the development of scalable methods to prove discrimination, especially relevant for algorithmic decision making.[60]

Additionally, indirect discrimination accepts justification – that is, one must prove that the practice does not withstand a test of proportionality. For example, in the North American labour caselaw discussed by Barocas and Selbst, this requirement unfolds in proving that the criterion adopted is not justifiable based on the business need and, if so, that there would be alternative hiring practices that would generate less discriminatory results.[61]

In light of the difficulties presented, one may question the effectiveness of taking cases of algorithmic discrimination to the Judiciary through individual anti-discrimination actions. Indeed, in multiple instances, the defendant (for example, an employer) may not be the one who designed the algorithm and the discriminatory effects may result from preexisting social biases..[62] In reviewing the European approach to anti-discrimination law, Wachter, Mittelstadt and Russell pinpoint to the necessity of adopting tools and new standards to understand prevent and fix discrimination in AI.[63]

[58] ibid 729.
[59] Wachter, Mittelstadt and Russell (n 45) 44.
[60] ibid 5–6.
[61] Barocas and Selbst (n 27) 701.
[62] ibid 730.
[63] Wachter, Mittelstadt and Russell (n 45) 69.

In parallel, it seems the opacity of automated decision-making mechanisms is what is most central about the debate about unintentional discriminatory results. AI systems are commonly referred to as "black boxes".[64] As described, algorithmic decision-making processes are complex and there are multiple ways that their use may lead to biased results. Moreover, these processes are often completely opaque for society in general (individuals, regulators, researchers) and, sometimes, the designers themselves (specially with unsupervised machine-learning), who may not know which data was analyzed and how the results were achieved. [65]

Thus, transparency is needed to ensure monitoring, control and eventually correction of algorithms. As many of the systems discussed are privately owned, companies' intellectual property rights and trade secret may be an obstacle for the identification of discriminatory practices. Moreover, access to the code may not be sufficiently, as sometimes complex systems will require examination of how this AI performs in practice, with data from real users.[66]

A great example of the role of transparency is the case of researchers that had the rare opportunity to access a dataset associated with a health predictive system largely employed in the US.[67] They had access to all the "ingredients" of an algorithm, including input, objective function, and output. With this, the researchers were able to quantify racial disparities that arose with the algorithm, as well as identify how they came about. In this specific case, it was found that the algorithm was biased because the target variables would include the health expenses of each patient, but unequal access to care means less money is spent caring for Black patients

[64] Frank Pasquale, *The Black Box Society: The Secret Algorithms That Control Money and Information* (Harvard University Press 2015).
[65] ibid 3.
[66] Zuiderveen Borgesius (n 28).
[67] Ziad Obermeyer and others, 'Dissecting Racial Bias in an Algorithm Used to Manage the Health of Populations' (2019) 366 Science (New York, N.Y.) 447.

than for White patients. With other labels applied to the dataset, focused on illnesses, the health system would increase the percentage of Black patients receiving additional care.

3. Countering algorithmic discrimination in Brazil

As mentioned in the introduction, the use of facial recognition technologies has been a central point of dispute in the debate about algorithmic discrimination in Brazil. Recent experiences with facial recognition cameras employed for public safety have raised flags about their potential mistakes and discriminatory effects. Indeed, this lead academics and civil society organizations in Brazil to develop projects such as "O Panoptico" which maps facial recognition technologies for public security purposes[68] and the research by Instituto Igarapé on different instances of facial recognition technologies adopted by cities across the country[69].[70] All these initiatives invite a debate for the general legal framework on algorithmic discrimination in Brazil.

3.1. Antidiscrimination law

Per the Brazilian constitution, the promotion of the common good without any kind of discrimination is one of the fundamentals objectives of the nation. Indeed, article 5, XLI of the Federal Constitution provides that "law should punish any discrimination violating rights and fundamental freedoms". Furthermore, there are multiple other constitutional provisions which oppose discrimination – for example, stipulating that men and women are equal and that no

[68] 'O Panóptico – Monitor do reconhecimento facial no Brasil' <https://opanoptico.com.br/> accessed 29 June 2022.
[69] Lobato, Francisco and Hurel (n 2).
[70] Also, for a compilation of cases of algorithmic racism from a Brazilian academic, please see: Tarcízio Silva, 'Linha do Tempo do Racismo Algorítmico: casos, dados e reações' (13 May 2019) <https://tarciziosilva.com.br/blog/destaques/posts/racismo-algoritmico-linha-do-tempo/> accessed 29 June 2022.

individual should be deprived of rights because of religious belief or political conviction (article V, items I and VIII, respectively).

Generally, in Brazil, it is a criminal offense to discriminate individuals based on race, color, ethnicity, religion, or origin – such as provided by Law No. 7.716/1989. For labor relations, Law No. 9.029/1995 prohibits discriminatory practices and typifies it as a criminal offense perpetrated by the employer or its legal representative. Also, there are legislations which prevent the discrimination of specific groups in the Brazilian society, such as the Statute of the Elderly (Law No. 10.741/2003), the Statute of the Child and the Adolescent (Law No. 8069/1990) and the Brazilian Law on the Inclusion of Persons with Disabilities (Law no. 13,146/2015).

Across these statutes, the distinction between direct and indirect discrimination has not been explicit adopted. In the caselaw, for its turn, the concepts have been employed. There are multiple cases which recognize direct discrimination practices.[71] As for indirect discrimination, even though the Supreme Federal Court of Brazil (STF) has ruled against indirect discrimination in some opportunities[72], the caselaw is not established – specially for lower courts.

[71] To mention one example, in 1994, STF concluded that a rule restricting woman of participating in an exam to become a public servant would be unconstitutional. *RE 120305/RJ* [1994] Marco Aurélio (STF) 30. For a comprehensive description of the caselaw on the matter, please see Chapter 9 of Adilson José Moreira, *Tratado de Direito Antidiscriminatório* (Editora Contracorrente 2020).

[72] ADI n. 146/DF, STF rendered the limit to social security benefits unconstitutional as it could generate indirect discrimination against women if it were also applied to maternity leave. In ADPF no. 291, which questioned the constitutionality of art. 235 of the Military Penal Code, it was concluded that the crime of sexual activity in place subject to a military administration would constitute indirect discrimination against homosexual people. *ADI 5543* [2020] Edson Facchin (Supremo Tribunal Federal). Another recent case by STF was ADI number 5355, which rendered unconstitutional a rule that restricted licenses for public servants which were married with diplomats when they needed to move out of Brazil. STF concluded that this would disproportionately impact woman who wanted to pursue a diplomatic career, again, citing the disparate treatment and indirect discrimination doctrine. *ADI 5355* [2021] Luiz Fux (Supremo Tribunal Federal).

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Commenting the legal framework in Brazil, Roger Raupp Rios argues constitutional rules about equality and non-discrimination lay the ground for direct discrimination, which is a common approach by Courts as mentioned above, but there is still a long way to counter and recognize indirect discrimination in the Brazilian society.[73] As mentioned above, there is not a consistent tradition of rulings about the indirect discrimination category[74], even though the Constitution generally bans discriminatory practices (which would include indirect discrimination, if they violate the fundamental rights). [75]

While commenting the anti-discrimination law practice in Brazil, scholar Adilson Moreira argues that the explanation for the difficulty in adequately responding to discrimination is the focus on arbitrariness and intention from the jurisprudence to the courts, which is associated with the combat to direct discrimination practices.[76] In order to adequately counter discrimination, Moreira understands one must go beyond the differentiation of direct and indirect discrimination and recognize how this phenomenon is associated with complex social structures, an effort developed by theories such as Kimberlé Crenshaw's intersectionality theory, as well as the idea of unconscious and organizational discrimination.[77]

When it comes to artificial intelligence, Moreira understands it expands the problem of indirect discrimination: its apparently neutral means reproduce unequal social structures, for

[73] Rios (n 9) 130; ibid 151.
[74] Worth noting that, recently, there are some relevant rulings by the Brazilian Federal Supreme Court employing indirect discrimination category, which might reverse this trend.
[75] For an account on how to build an indirect discrimination case based on the Brazilian Constitution, please see: Wallace Corbo, *Discriminação Indireta: Conceito, Fundamentos e Uma Proposta de Enfrentamento à Luz Da Constituição de 1988* (Editora Lumen Juris 2017). If it is clear that indirect discrimination is illegal, one interesting debate is whether indirect discrimination could be considered a criminal offense in Brazil: one could argue the constitutional provision allows for a comprehensive interpretation of it as a criminal offense, however I understand a comprehensive interpretation could be deemed a violation of the principle of legality in criminal law. When commenting Law No. 7.716/1989, Adilson Moreira highlights the types of crimes describes all presuppose the intentionality of preventing access to a vulnerable group because of a protected characteristic, so would not encompass indirect discrimination. Moreira (n 29) 560.
[76] Moreira (n 71) 30–34.
[77] Moreira (n 71).

example, structural racism.[78] That is, even though tackling indirect discrimination goes well beyond the law, as it derives from a complex social problem, the fact is that this legal category helps us understand how algorithmic discrimination may come about.

It is clear that the Brazilian legal framework outlaws algorithmic discrimination as a means to discrimination. When comparing both categories of discrimination with the international landscape, however, some comments can be made as to the challenges of building a case against it. With regards to direct discrimination, as argued in section 2.1., the main obstacle remains to demonstrate the discriminatory intent behind the algorithm.

For indirect discrimination cases, as argued above, the caselaw on both United States and Europe lay a list of requirements which make it difficult to build antidiscrimination cases against algorithmic discrimination. In Brazil, however, STF has employed the indirect discrimination category in some cases, but one can see that it does not rigorously replicate or list requirements for proof. STF mostly mentions the category of indirect discrimination to show how discriminatory effects may derive from apparently neutral rules. One may conclude this is a regional advantage when it comes to proving indirect discrimination in automated systems.

Despite these difference, one outstanding challenge shared with other jurisdictions is that of the opaqueness of algorithms. The lack of access to information about the use of algorithms severely hinders the capacity to demonstrate discriminatory treatment, be it intentional or not. In order to prosecute these discriminatory practices, one needs to identify them first and thus one needs to build consistent evidential standards and assessment procedures against algorithmic discrimination, as argued by Wachter, Mittelstadt and Russell.[79]

[78] ibid 518.
[79] Wachter, Mittelstadt and Russell (n 45) 68.

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3.2. Data protection

Moving away from anti-discrimination law, to understand the Brazilian legal framework applicable to algorithmic discrimination, one must review how the data protection legislation addresses the topic. It is worth noting that this section will focus on the description of the Brazilian General Data Protection Act (Law No. 13.709/2018 or LGPD, in its Portuguese acronym), because it is applicable to data processing activities in Brazil across sectors and for public and private entities.[80]

First and foremost, the LGPD renders non-discrimination a guiding principle. As provided by Article 5, IX, there is a prohibition of data processing activities for illegal and abusive discriminatory purposes. The LGPD, however, does not define those terms: while "illegal discrimination" refers to other legal provisions applicable in the country, such as the antidiscrimination ones previously mentioned, what "abusive discrimination" entails is a topic open for interpretation.

In this regard, much like the European General Data Protection Regulation, the LGPD provides a list of sensitive categories of personal data – which include: data revealing racial or ethnic origin, political opinions, religious or philosophical beliefs, trade union membership, genetic data, biometric data, data concerning health or data concerning a natural person's sex

[80] Besides the LGPD, Brazil has a specific act applicable to credit scoring (Law No. 12.414/2011). Even though prior to the LGPD, it is based on the Fair Information Practice Principles, so incorporates relevant provisions to prevent the use of personal information for discriminatory purposes, including: (i) a restriction of the use of sensitive or excessive information for credit scoring purposes, (ii) the right of information regarding the elements and criteria adopted for the decision and (iii) the right to request review of decisions taken with exclusively automated means. For an assessment regarding algorithmic discrimination for credit scoring, please see: Laura Schertel Mendes and Marcela Mattiuzzo, 'Algorithms and Discrimination: The Case of Credit Scoring in Brazil' in Marion Albers and Ingo Wolfgang Sarlet (eds), *Personality and Data Protection Rights on the Internet: Brazilian and German Approaches* (Springer International Publishing 2022) <https://doi.org/10.1007/978-3-030-90331-2_17> accessed 13 September 2022.

life. The LGPD provides special treatment for sensitive data – including the restrictions of legal basis for processing and the possibility of prohibitions sharing of these data for economic purposes (article 11, § 3º). As highlighted by scholar Bruno Miragem, the creation of this special categories of processing of data itself is justified by the risks that the use of this data cause discrimination.[81]

According to Marcela Mattiuzzo and Laura Schertel Mendes, discrimination based on special categories of data or proxies may be considered abusive means of discrimination, in violation of the principle of non-discrimination.[8283] Both authors argue other cases of abusive algorithmic discrimination could derive from statistical error, unfair generalization, as well as other biased results which restrict the exercise of rights.[84] Additionally, Thiago Junqueira on a book about algorithmic discrimination applied to the insurance sector, argues that pricing insurance based on data unrelated to the subject of coverage would be an abusive type of discrimination.[85] Despite these potential interpretations, it is still early to assess how the data protection practice will unfold, notably, how ANPD (key interpreter of the norm) will interpret the principle of non-discrimination.

So, it is understood that many of the potential discriminatory practices described in Section 2.2. and usually associated with indirect discrimination may be ruled illegal under LGPD's principle of non-discrimination. Indeed, as mentioned above, it is rather clear that the

[81] Bruno Miragem, 'A Lei Geral de Proteção de Dados (Lei 13.709/2018) e o Direito Do Consumidor' (2019) 1009 Revista dos Tribunais 13–14.
[82] Marcela Mattiuzzo and Laura Schertel Mendes, 'Discriminação Algorítmica: Conceito, Fundamento Legal e Tipologia' (2019) 16 Revista Direito Público 52.
[83] Please note that, differently from the GDPR, the LGPD does not restrict the use of automated decision-making with sensitive categories of data. In the GDPR, Article 22 explicitly forbids the processing of sensitive categories of data for decision based solely on automated processing, including processing activities. This prohibition is only lifted when there is explicit and specific consent by the data subject and/or the processing is needed for reasons of substantial public interest.
[84] Mattiuzzo and Mendes (n 82).
[85] Thiago Junqueira, *Tratamento de Dados Pessoais e Discriminação Algorítmica Nos Seguros* (Revista dos Tribunais 2020) 246.

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Brazilian legal framework outlaws algorithmic discrimination, the principle of non-discrimination reinforces this point from the perspective of personal data processing activities. In this scenario, I understand the main question is how to ensure this principle is effective and automated means of discrimination is successfully detected, investigated and, finally, held accountable. As mentioned above, the challenge of unveiling the black box of algorithms is not only applicable to Brazil, on the contrary, this is topic debated by civil society and academics around the world.

The LGPD provides some accountability tools which may be relevant in preventing algorithmic discrimination. First, article 20 regulates data subject rights related to automated-decision making. The head of the article provides for a right of the data subjects to request a review of decisions solely based on automatic data processing which affect their interests. In addition, Article 20, § 1 sets a duty of the data controller to provide, whenever requested, clear and adequate information on criteria and procedures used for such decisions, as long as industrial and commercial secrets are respected.[8687] Article 20 § 2 allows the national data protection authority (in its Portuguese acronym, ANPD) to carry out an audit to verify potentially discriminatory aspects of the data processing activity in case of failure to provide the information referred to in § 1.

Data protection impact assessments are another relevant accountability tool provided by the LGPD.[88] According to its article 38, ANPD may mandate that the data controller

[86] There is a debate whether these provisions regarding the right to information amount to a right of explanation in the LGPD. For this discussion, please see: Renato Leite Monteiro, 'Existe Um Direito à Explicação Na Lei Geral de Proteção de Dados Do Brasil' (2018) 39 Artigo estratégico 1.
[87] Public authorities are subject to a special transparency duty, as provided by Law No. 12.527/2011, so it is possible to build an argument of additional transparency needed for automated-decision making employed for public policy purposes.
[88] Maria Cecilia Oliveira Gomes, 'Beyond a "Legal Obligation": What a Benefit-Risk Methodology Teaches Us about the Role of Data Protection Impact Assessment'

prepares a DPIA regarding its data processing activities, containing the potential risks to fundamental rights and safeguards and risk mitigation measures adopted. For data processing activities related to automated-decision making, the impact of these decisions on individuals' fundamental rights may relate to potential discriminatory effects, the DPIA may play a relevant role in avoiding algorithmic discrimination. However, preparing a DPIA is not legally required per the LGPD, which limits its potential as an accountability tool.[89]

The LGPD also fosters the adoption of good practices and governance mechanisms by data processing agents in its article 50. In order to demonstrate this, for example, data controllers can actively adopt accountability tools against algorithmic discrimination, which are discussed internationally, such as the adoption of certifications (allowing third parties to supervise algorithms) and partnerships with research organizations to inspect algorithms.

While it is early to evaluate (the LGPD only entered effect in 2020), both the duties to provide information about the criteria adopted by algorithms and the possibility of ANPD carrying audits on these systems lay the ground for society to monitor and investigate algorithmic discriminatory practices.[90] As mentioned, data controllers can go beyond by adopting other accountability tools which minimize the risk of discriminatory practices – which I understand should be actively promoted by the ANPD as a means to incorporate the principle of non-discrimination.

<https://www.academia.edu/43970582/Beyond_a_legal_obligation_what_a_benefit_risk_methodology_teaches_us_about_the_role_of_data_protection_impact_assessment> accessed 14 September 2022.

[89] Please note that the LGPD has a provision that the ANPD may edit a regulation about DPIAs for high-risk data processing activities (article 55-J, XIII). Indeed, by the time this article was closed, ANPD had started the regulatory proceeding, but not closed it.

[90] In terms of burden of proof, it is worth noting that LGPD provides in art. 42, § 2 that, in ruling a civil procedure, may shift the burden of proof from the plaintiff to the defendant. Also, if the relation between party and data controller is deemed a consumer one, the Consumer Protection Code is applicable, and the judge may also shift the burden of proof (art. 6, VIII). Given the difficulties presented and illustrated by the "black-box" idea, these might be relevant provisions in building an algorithmic discrimination case.

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4. Conclusion

The direct and indirect discrimination categories are central to anti-discrimination law in some countries – including Europe and the United States. The categories illuminate important aspects of algorithmic discrimination: there are multiple ways in which the apparently neutral criteria of automated-decision making may disproportionately disadvantage protected groups in society. In this regard, indirect discrimination is a central concept to understand and counter this phenomenon, in which intention (associated to direct discrimination) usually does not play a role. The incorporation of unintentional biases may happen for various reasons – such as an unequal biased social reality.

When reflecting about Brazil, the constitutional undertaking against all means of discrimination is general enough to ban both types of discrimination, even though the caselaw has not laid a list of requirements for indirect discrimination such as the international practice. When building an anti-discrimination case, this might be an advantage. Also, the data protection legislation reinforces this constitutional commitment by means of the non-discrimination principle. Moreover, other accountability tools such as article 20 and data protection impact assessment play a relevant role in opposing discriminatory effects of automated-decision making. Looking forward, I understand tackling algorithms discrimination in Brazil, as a complex societal problem that goes well beyond technology, will mostly be related to surpassing the challenge of opaqueness.

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