The right to protection from adverse effects of scientific progress under Article 15(1)(b) ICESCR:

A tool for combating intrusive algorithmic data processing by states?

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1. Introduction

1.1 Background

Article 15(1)(b) of the International Covenant on Economic Social and Cultural Rights (ICESCR) recognizes what is known as the "right to science". The provision stipulates that everyone has the right "to enjoy the benefits of scientific progress and its applications". This right is also recognized in article 27(1) of the Universal Declaration on Human Rights which reads "[e]veryone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits." (UN General Assembly, 1948, art. 27(1)) Further, several regional human rights instruments have included the right to science or specific aspects of it (Saul, Kinley & Mowbray, 2014a, p. 1213).[1]

For a considerable time, article 15(1)(b) was largely neglected by the Committee on Economic, Social and Cultural Rights (CESCR) as well as by the academic community (Saul, Kinley & Mowbray, 2014a, p. 1213-1214). If discussed this was mainly done concerning the realisation of other human rights such as the right to health and right to food for which the applications of science play an integral role (Shaver, 2010; Shaheed, 2012, §23). However, in recent years more attention has been given to the right to science on its own. In 2009, three meetings of experts of the concerned fields cumulated in the drafting of the Venice Statement on the Right to Enjoy Benefits of Scientific Progress and its Applications (the "Venice Statement") which provides guidance on the scope, normative content and obligations of states under the right to science ("Venice Statement", 2009). Additionally, the Special Rapporteur in the field of cultural rights, Farida Shaheed, published a report on article 15(1)(b) in 2012 which further clarifies scope, normative content and obligations of states (Shaheed, 2012). Most recently, the CESCR also initiated a discussion the right to science with the final aim of drafting a general comment on the issue ("General discussion on a draft general comment on article 15 of the International Covenant on Economic, Social and Cultural Rights", 2018). However, this process is still ongoing even though many of the submissions made to the CESCR prove insightful. Case law on the right to science before the CESCR is scarce with only one individual communication referring to article 15(1)(b) (CESCR, 2019).

1.2 The three pillars of article 15(1)(b)

It is generally recognized that the right to science comprises of three main pillars (Saul, Kinley & Mowbray, 2014a; "Venice Statement", 2009; Beiter, 2019, p.238). These are:

1. the freedom of scientific research and communication

[1] See art. 42 of Arab Charter on Human Rights, art. 14 of the San Salvador Protocol to the American Convention on Human Rights, art. 13 of the American Declaration on the Rights and Duties of Man & art. 13 of the Charter of Fundamental Rights of the European Union.

2. enjoyment of the benefits of scientific progress and its applications
3. protection from adverse effects of scientific progress

First of all, the right to science demands respect for and protection of the freedom of scientific research and communication. This is because, as has been extensively argued by Beiter, scientific and especially academic freedom are essential for the creation of scientific progress (Beiter, 2019). Any attempt to control science inevitably inhibits creativity and innovation. Consequently, any interference with the freedom of scientific research ultimately limits individuals' ability to enjoy the benefits of scientific progress and its applications (Beiter, 2019). This is reflected in article 15(3) of the ICESCR which recognizes the need for respecting "the freedom indispensable for scientific research and creative activity" (UN General Assembly, 1966, ICESCR, art. 15(3)).

Secondly and most obviously, article 15(1)(b) includes a right to the enjoyment of the benefits of scientific progress. Under the tripartite typology of human rights[2], this refers to an obligation of states to fulfil the public's demand for benefiting from scientific advances to improve their livelihoods. This is prominently discussed in the light of "access to advances medical technologies [or] use of scientific discoveries to protect the environment" (Saul, Kinley & Mowbray, 2014a, p. 1218). Another important consideration is that scientific discoveries should empower individuals to make informed decisions in deciding whether the benefits of using a technology outweigh its risks (Shaheed, 2012, §22). This firstly implies a need for the diffusion of science so that people can inform themselves about scientific advances in a manner accessible to non-academics (Vitullo & Wyndham, 2013). Article 15(2) of the ICESCR expresses precisely this need for diffusion. Secondly, it calls for the inclusion of the public when discussing what is considered to be 'beneficial' or 'scientific progress' (Shaheed, 2012, §22). This is in line with the Limburg Principle 11 which recognizes that "full participation of all sectors of society is [...] indispensable to achieving progress in realizing economic, social and cultural rights." (UN Commission on Human Rights, 1987)

The last pillar of the right to science is the protection from adverse effects of science (Saul, Kinley & Mowbray, 2014a, p. 1219). Unlike the other two, this right is not explicitly expressed in article 15. However, a strong argument can be made for its existence, the details of which will be discussed later. The right imposes on states both an obligation to respect and protect. On the one hand, states should "take measures, including legislative measures, to prevent and preclude the utilization by third parties of science and technologies to the detriment of human rights and fundamental freedoms" ("Venice Statement", 2009, § 15(a)). However, this also implies that states themselves should not use science and technology to the detriment of human rights and fundamental freedom. With that, the right to protection from adverse effects of science can be considered an excellent instrument for combatting

[2] According to the tripartite typology, states' obligations arising from economic, social and cultural rights can be ordered in three groups. Obligations to respect demand that the state does not actively jeopardise the enjoyment of rights. Obligations to protect require the state to protect individuals from interference with their rights by third party and obligations to fulfil order states to take active measures to realise the enjoyment of rights (Mégret, 2017, pp. 98 - 100)

intrusive uses of algorithmic data processing by governments provided that algorithmic data processing falls within the meaning of the words of article 15(1)(b).

1.3 Research question and structure of the thesis

The research question that will be examined and answered in this thesis is: "Can the right to protection from abuse or adverse effects of scientific progress under Article 15(1)(b) of the ICESCR provide individuals with effective protection if states use algorithmic data processing in ways that interfere with human rights?" The focus of the analysis will be on the right to protection from abuse or adverse effects of scientific progress and not article 15(1)(b) in general because the former imposes a negative obligation on states. The boundaries for infringements of such obligations are clearer cut compared to positive obligations concerned with the progressive realization of goals, as is the case with the right to the enjoyment of the benefits of scientific progress.

The research question can be divided in the following sub questions. Chapter 2.1 will explore the whether the right to protection from abuse or adverse effect of scientific progress exists under international law. Chapter 2.2 answers “what is the scope and normative content of the right and does algorithmic data processing fall under it?” Section 2.3 discusses under which conditions the right can be limited by states. Finally, “what are the available remedies in case of a violation?” will be answered in chapter 2.4. The last part of the thesis will apply the findings of the analysis to a case study, namely the judgement of a Dutch national court on the government's use of the SyRI algorithm. This algorithm is deployed to generate risk profiles for potential social security fraud by linking of data sets and applying a risk model (Braun, 2018). It was criticized for interfering with the privacy of individuals subjected to it and hence serves as an example of how algorithmic data processing can interfere with human rights (Braun, 2018; Vervloesem, 2020).

1.4 Significance of research

The findings of the thesis are significant in several ways. First of all, it will condense the literature on the right not to be subject to abuse or adverse effects of scientific progress by the CESCR, Venice Statement, Special Rapporteur and other academics. Secondly, it contributes to a growing discussion on the use of the right to science and will illustrate how it can be used to combat some of the challenges of modern technologies to human rights.

Furthermore, illustrating how article 15(1)(b) can be used to combat the adverse effects of scientific progress adds to the tools which people can use to defend themselves when technology is used by the state to interfere with their rights. Traditionally, the right to privacy and the right to freedom of information have been the main tools to address such issues. The analysis shows how article 15(1)(b) can add an additional legal claim where states use algorithmic data processing in a manner that interferes with human rights. More importantly, article 15(1)(b) might be able to provide protection when traditionally invoked rights fail to do so, for example due to admissibility or procedural issues. Considering the

current rapid progress in fields like artificial intelligence and big data and the associated risk, especially for the right to privacy, this is very valuable.

1.5 Methodology

In order to answer the research question, I will analyse the relevant law while going into the details of algorithmic data processing whenever it is relevant to the interpretation and application of the law. Consequently, the thesis will follow a multidisciplinary approach drawing on knowledge from law and computer science. The legal analysis will, however, remain the focus.

In the legal analysis, both the doctrinal and human rights-based approach will be applied. For the doctrinal approach, due to lack of case law on article 15(1)(b) I will rely on different sources of expertise on the interpretation of the article, namely the Special Rapporteur in the field of cultural rights, statements by the CESCR, the Venice Statement, commentary on the ICESCR as well as scholarly articles. The human rights-based approach can be found in the thesis' attempt to empower individuals to protect themselves from abuse of algorithmic data processing by states using article 15(1)(b). The case study is chosen because it presents a very recent case and is consequently highly relevant to the current state of fast-changing information technology and use of algorithmic data processing. Further, it provides the opportunity to apply a majority of the findings from the previous analysis. It should be noted that a discussion of algorithmic data processing under the General Data Protection Regulation (GDPR) of the EU from 2018 falls outside the scope of this thesis.

2. The Right to Protection from Abuse or Adverse Effect of Scientific Progress

2.1 Argument for the existence of the right

As mentioned previously, - unlike the freedom of scientific research and communication and the enjoyment of the benefits of scientific progress - the right to protection from abuse or adverse effects of scientific progress is not explicitly mentioned in article 15 of ICESCR or any other international human rights law instrument. Hence it is necessary to first make an argument for its existence before continuing to discuss its scope, normative content, limitations and application to algorithmic data processing.

Despite not being explicitly mentioned, a strong argument can be made that the right not to be subject to abuse or adverse effects of scientific progress does exist under article 15. The first indication can be found in the reworked "Guidelines on Treaty-Specific Documents to be Submitted by States Parties under Articles 16 and 17 of the International Covenant on Economic, Social and Cultural Rights" published by the CESCR in 2009. According to §70(b), states are required to "indicate the measures taken to prevent the use of scientific and technical progress for purposes which are contrary to the enjoyment of human dignity and human rights" when reporting on their efforts to realise the rights protected under article 15. This speaks for the fact that the CESCR, which is authoritative concerning the interpretation of the ICESCR, considers protection from abuse or adverse effects of scientific progress an inherent aspect of the rights granted by article 15.

Secondly, the Venice statement makes explicit reference to the right to protection from the adverse effects of scientific progress in §13(c). It is stated that "the normative content [of Article 15(1)(b)] should be directed towards [...] protection from abuse and adverse effects of science and its applications." When discussing states' obligations arising from Article 15(1)(b) it further mentions that the state's duty to respect includes "to take appropriate measures to prevent the use of science and technology in a manner that could limit or interfere with the enjoyment of the human rights and fundamental freedoms" (Venice Statement, 2009, §14(d). The fact that this is listed as an obligation to respect indicates that states are not only obliged to protect individuals for abuse of science by third parties but that they themselves are also expected not to use science and its applications to the detriment of human rights.

A third argument for the existence of the right to protection from adverse effects of science is that it is frequently referred to by commentators and academics as one of the pillars of the right to science (Saul, Kinley & Mowbray, 2014a, p. 1219; Beiter, 2019, Porsdam Mann et al., 2018; Müller, 2010). It might be said that this does not constitute an additional argument for the existence since these commentators and academics base their inclusion on the previously mentioned factors. Nevertheless, the recognition of the right in the academic

literature should be considered since it indicates a consensus among scholars. There have been no objections against the inclusion of the right as of yet.

Fourthly, protection from the adverse effects of scientific progress has been repeatedly mentioned during the discussions on and in the submissions for the drafting of a general comment on article 15(1)(b). One of the questions that the CESCR raised is "How should a general comment include the question of the harmful use of science and the corresponding protection of people?" (CESCR, 2018). A general comment by the CESCR clarifying the content of article 15(1)(b) would hence likely include this aspect of the obligations of states.

Lastly, the inclusion of the right to protection from abuse or adverse effects of scientific progress under Article 15(1)(b) is justified by more general principles of international law. The principle of effectiveness (*ut res magis valeat quam pereat*) states that the law should be interpreted in a way that makes it effective rather than rendering it useless (Parry, Grant & Barker, 2009). It can be argued that a right to enjoy the benefits of scientific progress and its applications is not effective without protection from the adverse effects of science. This would be comparable to having a right to enjoy medical treatment without a corresponding right that protects from mistreatment. Without protection from the negative consequences the positive right cannot be fully enjoyed. Consequently, the principle of effectiveness speaks for the inclusion of the right to protection from adverse effects of scientific progress as an integral pillar of article 15(1)(b).

Taking into account all of the factors discussed above a strong argument can be made for the existence of a right to protection from abuse or adverse effects of scientific progress under article 15(1)(b).

2.2 Scope and normative content

Having established the existence of a right to protection from adverse effects of scientific progress under article 15(1)(b) this section will now discuss to the scope and normative content of this right. As previously mentioned, article 15(1)(b) has for a long time been largely neglected by the CESCR and the academic community and hence there is little guidance on the interpretation of it. In recent years a discussion on the scope and content of the article has been started. However, this remains an ongoing process with a general comment by the CESCR still in the making. One might attempt to turn to views issued by the CESCR for examples of how the article is applied. However, such efforts prove futile with only one communication in the entire history of the CESCR's views being concerned with article 15(1)(b) - which was ruled inadmissible (CESCR, 2019). This lack of guidance on the interpretation becomes even bigger when turning to the right to protection from abuse or adverse effects of scientific progress as a "sub-right" under article 15(1)(b). Where multiple ways of interpretation are plausible all will be discussed and arguments for and against the adoption of each approach will be presented.

2.2.1 Definitions of the terms

First, it is necessary to establish the meaning of the different terms of the right, namely “scientific progress”, “abuse” and “adverse effect”.

Scientific progress

The term “scientific progress” is explicitly mentioned in article 15(1)(b) and consequently the CESCR has been engaged with defining it in the process of drafting the general comment. Unfortunately, neither the special rapporteur nor the Venice statement have given a concrete definition of "scientific progress". However, both apply a wide view on what is included by the terms "scientific progress and its applications”. It is emphasised that "scientific progress" not only refers to applied natural sciences but all sciences alike (Shaheed, 2012, §24). In its submission to the CESCR, the American Association for the Advancement of Science (AAAS) articulated that "all fields of science – life, physical, computational, social, behavioral and economic – as well as engineering should be recognized as being encompassed by the right to science" (AAAS, 2018, p. 2). This shows that mathematics and computer sciences, the two disciplines on which algorithmic data processing relies, are without a doubt included in the meaning of article 15(1)(b).

In the discussion on the drafting of a general comment, the CESCR has raised the question "should we understand that science (and its applications) include technology and technological development?" (CESCR, 2018, §14). If the CESCR were to follow the understanding of scientific progress expressed in the Venice Statement the answer would be that scientific progress does indeed include technological aspects. The Venice Statement refers to "scientific and technological progress" on multiple occasions indicating that they are assumed to be similar and interrelated. According to the AAAS, "applications of science include products and treatments, the provision of services, and development and deployment of technologies" (AAAS, 2018, p. 2). When governments devise and apply an algorithm for the processing of data this constitutes the "development and deployment" of a technology (AAAS, 2018). All this speaks for an interpretation that includes algorithmic data processing and other recent developments in information technology under the umbrella of "scientific progress and its application". Consequently, algorithmic data processing does fall under the scope of article 15(1)(b).

Abuse

The term “abuse” clearly indicates an intention by the abuser to do wrong. To borrow the language from criminal law for someone to “abuse” scientific progress requires that person to have *mens rea*, i. e. a guilty mind. In such a case, the negative effects on others of using scientific progress are the aim of the act rather than accepted or unintended side effects. In the example of algorithmic data processing, this could be the state using it to identify political dissidents to prosecute them in the absence of a legitimate aim but merely for consolidation of power.

Adverse effect

The term “adverse effect” is not well established in the legal language. It is more frequently used in health sciences where it constitutes the harmful and damaging side effects of drugs or treatments ("Adverse effect", 2020). Something qualifies as an “adverse effect” when the harmful or damaging effect is not the aim of the act itself but a side effect of an act aimed at achieving an otherwise respectable goal. An example to illustrate this would be a state's use of algorithmic data processing to generate profiles of people with an increased risk of radicalisation and joining a terrorist organisation. While this might be in the interest of national security and the protection of the rights of others it would without a doubt interfere with the rights of those subjected to the profiling, such as their right to privacy, the presumption of innocence or the prohibition of discrimination. The difference between “abuse” and “adverse effect” is hence a question of the intention of the state.

2.2.2 The relationship to other human rights

One question that needs consideration is whether the right to protection from abuse or adverse effects of scientific progress can be invoked on its own or whether it is always invoked in conjunction with another human right. This is a question of the role of the right in the ICESCR and its relationship to other rights. Three scenarios are imaginable. The right to protection from abuse or adverse effect of scientific progress could be invoked independent of any other human rights, in conjunction with a violation of another human right or in conjunction with an interference with another human right. It will be discussed what speaks for each of them and their consequences on how the right would be invoked in practice.

The first option is that the right can be invoked independently of any other provision. This would give it the same role as any other substantive provision in the ICESCR. For this style of application speaks for the fact that the right to protection from abuse or adverse effect of scientific progress is a pillar of article 15(1)(b) which in of itself is not dependent on other provisions of the ICESCR. Though the right to enjoy benefits of scientific progress and its applications is linked to other provisions, especially with other paragraphs of article 15, it does not seem like it necessarily needs to be read in conjunction with other provisions. However, the lack of a clear definition of “adverse effect” and the indications that infringements of other human rights would constitute a major aspect of such adverse effects should be considered. Furthermore, so far article 15(1)(b) was mainly discussed in its role in realizing other rights, such as the right to health or food.[3] Taking this into account it seems unlikely that the right to protection from abuse or adverse effects of scientific progress will be applied completely independent of any other provisions, especially in the beginning of its invocation.

[3] See, for example: Donders (2011), “The right to enjoy the benefits of scientific progress: in search of state obligations in relation to health“ & De Schutter (2011), “The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food: From Conflict to Complementarity”.

The second style of application would be that the right to protection from abuse or adverse effects of scientific progress can only be invoked if a violation of another human right has been established. Here “abuse or adverse effect” would be equated with violation of a human right. In this case, using scientific progress to violate human rights could work as an aggravating circumstance. This would reflect the conviction that violations of human rights by states are particularly grave if facilitated through new technologies because states bare special duty to use such technology in a responsible and human rights compliant manner (*NJCM et al. v The State of The Netherlands*, 2020, §6.6). However, it would also mean that as long as states ensure that their applications of scientific progress do not violate any other human rights obligations the right to protection from abuse or adverse effects does not apply. Hence the right would not afford separate protection but only add gravity to an already existing violation. This would constitute a severe limitation to the applicability and can be considered inconsistent with the purpose of the right.

The third scenario in a sense presents a compromise between the first two scenarios. The right to protection from abuse or adverse effects of scientific progress could potentially not extend to all such uses of scientific progress but rather only those that interfere with another human right. This would be the case where invoking the right requires an interference with another human right but not a violation of that right. This distinction is crucial as an act that limits the enjoyment of some right is always an interference but only a violation if the interference was not legitimate. There are several reasons in favour of this interpretation. Firstly, the Venice statement refers to "use of science and technology in a manner that could *limit or interfere* (*emphasis added*) with the enjoyment of the human rights and fundamental freedoms" rather than talking about the use of science and technology in a manner that could violate human rights (Venice Statement, 2009, §14(d)). Considering that the drafters of the Venice statements are leading experts in the field of human rights they are surely aware of the legal difference between "interference" and "violation" and made the choice consciously. The Declaration on the Use of Scientific and Technological Progress in the Interests of Peace and for the Benefit of Mankind also states that measures should be taken "to prevent and preclude the utilization of scientific and technological achievements to the detriment of human rights and fundamental freedoms and the dignity of the human person" (UN General Assembly, 1975, §8). Once again, no mentioning is made to a "violation" of human rights. The meaning of the term "detriment" - which is also found in the Venice statement - seems to be closer to that of "interference" since even in the presence of a legitimate reason an act can come at the detriment of human rights. With this, it is also indirectly defined when scientific progress is abused or used with adverse effect. This is the case where the manner in which it is used gives rise to interferences with other human rights.

In this last scenario, the right would take up a function similar to that of article 14 of the European Convention on Human Rights (ECHR), which concerns the prohibition of discrimination. Article 14 "merely complements the other substantive provisions of the Convention and the Protocols" and hence "does not prohibit discrimination as such, but only discrimination in the enjoyment of the rights and freedoms set forth in the

Convention" (ECtHR, "*Guide on Article 14 of the European Convention on Human Rights*", 2019, p. 6). However, the approach taken by the European Court of Human Rights (ECtHR) shows that article 14 while always being invoked in conjunction with a substantive provision does not necessarily require a violation of a substantive provision. While a certain limitation of a right might be in itself legitimate differences among groups of how the right is limited might still constitute a violation of the prohibition of discrimination (ECtHR, 2019). In other words, a legitimate limitation might still violate article 14 if one group's rights are unjustifiably more limited than those of the rest of the population.

Any approach in which the right is invoked in conjunction with other human rights raises new and equally important questions. In conjunction with which human rights can the right to protection from abuse or adverse effects of scientific progress be invoked? Only those recognized in the ICESCR, all human rights which the concerned state recognizes or perhaps even any human right even if the state did not ratify the corresponding treaty? Can it be invoked in conjunction with rights which are recognized as international customary law? The answer to these questions has profound implications. It might limit the applicability of the right to economic, social and cultural rights or it might extend the protection afforded by it into spheres that were previously unprotected in some states. The principle of state sovereignty speaks clearly against invoking the right in conjunction with human rights that the state does not recognize (Henriksen, 2017, p. 42). According to this principle treaty obligations for a state under international law can only arise with the consent of that state with the exception of *jus cogens* rules and general principles which are binding even without consent (Henriksen, 2017, p. 42). The right could certainly be invoked in conjunction with any ICESCR provision since they are part of the same covenant and state parties to one will also be bound to the rest.[4] Lastly, it is highly plausible that the invocation of the right can be done in conjunction with any human right recognized by the respective state. When a reference to other human rights in a treaty should concern only those rights set forth in the same treaty this is generally explicitly mentioned.[5] Neither the Venice Statement nor The Declaration on the Use of Scientific and Technological Progress in the Interests of Peace and for the Benefit of Mankind or the CESCR have explicitly limited themselves to ICESCR rights when discussing the right to protection from abuse or adverse effects of scientific progress. This indicates that abuses or adverse effects extend to interferences with any human right that the respective state recognizes. This interpretation is also in line with the principle of state sovereignty since the states have given their consent to be bound by these rights.

Taking all of the above into account it seems most likely that practice of applying the right to protection from abuse or adverse effects of scientific progress will gravitate towards it being dependent on interference with but not a violation of any other human right that is recognized by the concerned state.

[4] This is provided that the states have not maybe any reservation when ratifying the ICESCR.
[5] See, for example, art. 14 of the ECHR, art. 3 of the ICCPR & art. 3 of the ICESCR

2.3 Limitations

As with most human rights, article 15(1)(b) and with it the right to protection from abuse or adverse effect of scientific progress is not an absolute right. Under certain conditions, states may legitimately impose limitations on the enjoyment of the right. There are two main sources for states to justify limitations, namely the general limitation clause in article 4 of the ICESCR and the balancing of conflicting rights within article 15. Both of these options will now be explained and analysed to understand under which conditions states might legitimately use scientific progress or technology in a way that interferes with human rights without violating their obligation not to subject individuals to adverse effects of scientific progress.

2.3.1 Limitations under art. 4 ICESCR

Article 4 of the ICESCR provides a general limitation clause. It reads:

> *"The States Parties to the present Covenant recognize that, in the enjoyment of those rights provided by the State in conformity with the present Covenant, the State may subject such rights only to such limitations as are determined by law only in so far as this may be compatible with the nature of these rights and solely for the purpose of promoting the general welfare in a democratic society."*

It becomes clear from the drafting discussions that the introduction of article 4 was aimed at preventing arbitrary interferences by states of the rights in the covenant rather than to allow weakening the protection by permitting numerous limitations (Saul, Kinley & Mowbray, 2014b). Consequently, article 4 should be interpreted conservatively to limit states possibilities of derogating from their obligations to the minimum necessary for the functioning of society. States and the CESCR have paid little attention to justification of limitations under article 4 in the reporting procedure (Müller, 2009). Consequently, commentators (e.g. Saul, Kinley & Mowbray, 2014b) often refer to the writing of other bodies such as the ECtHR and the HCR on limitations. A number of requirements for the legitimacy of a limitation can be found in article 4.

Firstly, any limitation must be "determined by law". The phrase is commonly found in several human rights instruments besides the ICESCR, such as the ECHR and the ICCPR. Hence, a large pool of jurisprudence by courts and views of committees can be relied upon in seeking to clarify its meaning considering that the CESCR is unlikely to deviate much from the established consensus amongst these other bodies (Saul, Kinley & Mowbray, 2014b). This criterion can itself be broken up into sub-requirements that concern "not only on the formal existence of law, but also on its *quality*" (Saul, Kinley & Mowbray, 2014b, p. 9). Accordingly, the law must be existent and in force, at the time the limitation is placed, "not be arbitrary or unreasonable or discriminatory", "be clear and accessible to everyone" and there must exist adequate "safeguards and effective remedy against [...] illegal or

abusive imposition" (Saul, Kinley & Mowbray, 2014b, p. 9). Case law shows that the legal basis for the limitation can be "constitutional, legislative, administrative, common law, or even international law or regional law" (Saul, Kinley & Mowbray, 2014b, p. 9).

The second requirement found in article 4 is that the purpose of the limitation is that of "promoting the general welfare in a democratic society". This phrase in a sense replaces the list of legitimate aims that can be found in other human rights instruments and which usually include 'national security, public order, public health or morals or the rights and freedoms of others'.[6] There is debate about whether "general welfare" is to be understood as a general term which includes all of the above-mentioned aims or whether it has a distinct meaning that potentially defines the legitimate aims more narrowly. It has been said that "on an ordinary interpretation of the 'general welfare', matters of national security, public order, public health or public morals would seem to be species of the general welfare and within its ambit." (Saul, Kinley & Mowbray, 2014b, p. 10) However, Müller (2009, p. 573) advocates for a far stricter interpretation of "general welfare" on the basis that a list of these classical legitimate aims was rejected during the drafting. According to her, the term refers only "to the economic and social well-being of the people and the community" (Müller, 2009, p. 573). In any case, states will most of the time be able to give a reasonable explanation for why a limitation was in the interest of promoting the general welfare. Hence, the ECtHR and the Human Rights Committee (HRC) have frequently emphasised the third criterion: "in a democratic society". Courts are likely to follow this approach when applying rights in ICESCR.

Thirdly, article 4 provides that limitations must be imposed to promote "the general welfare *in a democratic society* (*emphasis added*)". This may seem odd at first considering that by far not all state parties to the ICESCR are democratic societies. However, the Limburg Principles propose that "While there is no single model of a democratic society, a society which recognizes and respects the human rights set forth in the United Nations Charter and the Universal Declaration of Human Rights may be viewed as meeting this definition." (UN Commission on Human Rights, 1987, §55) The burden of proof should be on the state to facilitate why a limitation fulfils the requirements laid out by the phrase "in a democratic society". These are that according to the HRC and the ECtHR "twin requirements of necessity and proportionality" (Saul, Kinley & Mowbray, 2014b, p. 14). Consequently, restrictions "must be appropriate to achieve their protective function; they must be the least intrusive instrument amongst those which might achieve their protective function [and] they must be proportionate to the interest to be protected" (HRC, 2011, §34).

The last criterion found in article 4 is that restriction must be "compatible with the nature of [the right in question]". This is said to "introduce[] and emphasize[] a 'non-derogable' component to ICESCR rights which rules out certain extreme restrictions" (Saul, Kinley & Mowbray, 2014b, p. 14). However, in practice, this standard will most likely not limit the pool of acceptable restrictions further since is hard to imagine how such extreme

[6] See, for example, ICCPR, articles 12, 14(1), 18(3), 19(3), 21 and 22(2).

restrictions will fulfil the requirement for proportionality as discussed earlier (Saul, Kinley & Mowbray, 2014b).

2.3.2 Limitations due to the balancing of rights within Art 15

A further aspect that might allow states to place limitations on the right to protection from abuse or adverse effect of scientific progress are tensions between other rights outlined in article 15. Should there be a conflict in the realisation of different rights the state might be justified in striking a balance which might mean that rights cannot be fully fulfilled as that would come at the detriment of other rights provided in article 15.

An example of this is the tension between academic freedom and protection from adverse effects of scientific progress. While academic freedom prevents the state from interfering excessively with the work of researchers and academics there may be cases where their work poses a risk to the other people's right not to be subject to adverse effects of science (Beiter, 2019). This analysis concerns algorithmic data processing by the state in a manner that interferes with the rights of those subjected to it. Consequently, academic freedom is not relevant to the case since the focus is on the state regulating its conduct with science and technology. This does not require the state to limit research in the field of computer science but only not to abuse or use such research with adverse effect.

Another right set forth in the article 15 that might be relevant is the right "to benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author" (ICESCR, art. 15(2)). This might create tensions between the interest of the programmer of the algorithm that the state and people's interest to be able to assess how the state's algorithmic data processing affects them by looking at the code of these algorithms (Saul, Kinley & Mowbray, 2014, p. 1224). However, once again this seems a weak argument for justifying algorithmic data processing by the state in a manner that interferes with the rights of those subjected to it. This tension would not arise in the first place if the state would not use the algorithm and hence the interest of the subjects could be respected without even giving rise to those of the programmer by simply not using his algorithm. Further, it is questionable whether the interests of the programmer would outweigh those of everyone subjected to the algorithm.

Taking the above into account it is seems unlikely that the weighing of different interest arising from article 15 might warrant a state to use algorithmic data processing in a manner that interferes with the rights of the subjects. The only such scenario would be using algorithmic data processing to explicitly secure one of the rights in article 15. However, in such a case, this might constitute a legitimate aim under Article 4 as discussed before and hence would be justified anyways.

2.4 Available remedies in case of violation

One crucial question in assessing whether the right to protection from abuse or adverse effects of scientific progress can grant provide individuals with effective protection from states using algorithmic data processing is what remedies exist in case of a violation and whether they are effective. When it comes to human rights, there are two options to have a violation recognized: in front of a national court or by an international court or committee.

Whether a human right can be invoked before a national court depends on the legal system of the state concerned (Shaw, 2003). Different theories exist about the relationship between international and domestic law. The monist approach advocates the unity of international and domestic law while the dualist view proposes a strict separation of the two (Shaw, 2003). Several issues surround the applicability of international treaties before national courts. Can rights stemming from international treaties be invoked before national courts? Does international supersede national legislation in case of conflict? Do international treaties take immediate effect or do they need to be incorporated into national legislation first? Since the role of international treaties, such as the ICESCR, in national law differs between states it is not possible to say anything general.

Besides national courts, violations of human rights can also potentially be invoked before international bodies. In the case of the ICESCR, the body responsible for monitoring the implementation of the treaty is the CESCR. The ICESCR itself does not allow for individual complaints to be brought before the CESCR. However, there has been an optional protocol to the ICESCR adopted which allows includes an individual communications procedure according to article 2 of this protocol. Unfortunately, as of now only 24 states have ratified the optional protocol and another 25 states have signed the protocol. The majority of countries (149) does not recognize the CESCR's competency to receive individual communications against states ("Status of Ratification: Interactive Dashboard", 2020). Hence the protection afforded by the procedure is very limited. For individuals from states that have ratified the protocol, requirements for admissibility can be found in articles 3 and 4. Once an application is received, the CESCR can approach the state to take interim measures to avoid irreversible harm to the applicant (art. 5). In the case of algorithmic data processing, this could include temporarily suspending the application of the algorithm in question. Once the state has been informed of the communication has six months to issue a response (art. 6). In general, the CESCR will attempt to mediate between the two parties to reach a friendly settlement (art. 7). If this fails, however, the CESCR is in a position to "transmit its views on the communication, together with its recommendations, if any, to the parties concerned." (art. 9(1)) It needs to be stressed that the CESCR's decisions and recommendations are not legally binding. To receive effective remedy the applicant hence relies on the state's willingness to follow the decision.

3. Case Study: The SyRI Judgement

Having discussed extensively the theoretical framework of the right to protection from abuse or adverse effect of scientific progress, the acquired insights will now be applied to an exemplary case of *NJCM et al. v the State of the Netherlands*. It concerns the Dutch government's use of the so-called SyRI (short for Systeem Risicoindicatie) algorithm to identify potential social welfare fraud (*NJCM et al. v The State of The Netherlands*, 2020). The proceedings were discussed by news outlets from several countries and a judgement was issued on the February the 5th, 2020 (Henley & Booth, 2020; Laux, 2020; "Government's fraud algorithm SyRI breaks human rights, privacy law", 2020). On the 5th of March, the official English translation became available.[7] The case even attracted the attention of the United Nations Special Rapporteur on extreme poverty and human rights who contributed a brief to the court voicing his concerns surrounding the use of the SyRI algorithm (United Nations Special Rapporteur on extreme poverty and human rights, 2019). In its decision, the court ruled that the legislation regulating the use of the SyRI algorithm (hereinafter, "SyRI legislation") violated the right to privacy under the ECHR as it lacked transparency and sufficient safeguards and thus did not strike a fair balance between the aim and interferences with people's privacy (*NJCM et al. v The State of The Netherlands*, 2020, §6.110-6.112). The deadline of three months for the government to appeal against the decision has by now expired (citation) and no report could be found indicating that government has appealed within this period. The following sections will examine whether the SyRI legislation also violates the right to protection from abuse or adverse effect of scientific progress. This illustrates how the right could be applied by courts in practice. Further it is relevant as it shows that even where a court found a violation of the right to privacy, the right to protection from abuse or adverse effects of scientific progress can provide an additional legal claim to add another dimension to the wrongfulness of the state's conduct.

3.1 The facts of the case

The Dutch government makes use of SyRI "to prevent and combat fraud in the area of social security and income-dependent schemes, taxes and social security, and labour laws." (*NJCM et al. v The State of The Netherlands*, 2020, §3.1) SyRI is a combination of technical infrastructure and associated procedures that govern the use of the infrastructure. Government bodies such as municipalities can make use of SyRI to generate risk reports of individuals living in a certain neighbourhood with an increased risk of committing social welfare fraud (Braun, 2018). SyRI generates these reports by linking data sets held by different government agencies (Braun, 2018). There is an extensive list of what personal data can be used processed by SyRI (Article 5a.1 paragraph 3 SUWI Decree). In fact, the list is of such dimensions that the State Council has criticised that there is "hardly any personal data that cannot be processed" (United Nations Special Rapporteur on extreme poverty and

[7] See https://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:RBDHA:2020:1878 for English version of the judgement

human rights, 2019). Taking these linked data sets and a risk model the SyRI algorithm detects "increased risk of irregularities" and generates risk profiles of cases that raised suspicion (Braun, 2018). There is little transparency about the risk model used and the sources of data. The state refuses to make such information public out of fear that it would enable possible perpetrators to adjust their behaviour so as not to raise suspicion (*NJCM et al. v The State of The Netherlands*, 2020). The risk profiles get decrypted, examined by an employee of the Ministry of Social Affairs and Employment and checked for false positives (Vervloesem, 2020). After obvious false positives have been removed, risk reports for the remaining cases are created and forwarded to the government body that requested the SyRI analysis. This can then lead to further investigation by the relevant authorities of the individuals that are subject to a risk report. Individuals are not informed that a risk report has been created about them and are not able to gain insights into the data that led to the decision (*NJCM et al. v The State of The Netherlands*, 2020).

3.2 Applicability of the right to protection from adverse effects of scientific progress

The Netherlands is party to the ICESCR and is thus bound by its provisions, including Article 15(1)(b). The first step of analysing whether the use of SyRI constitutes a violation against the right to protection from adverse effects of scientific progress is to check which bodies the complaint could be brought before. The Netherlands is not a state party to the optional state protocol and thus no individual communication could be brought before the CESCR. However, it might be possible to invoke the right before Dutch national courts.

In the Dutch legal system, the monist approach is deeply ingrained and it is said to have "one of the most [international law friendly] constitutions in the world" (Fleuren, 2010, p. 246). The Dutch constitution regulates the relationship between domestic and international law. Article 94 states that "statutory regulations in force within the Kingdom shall not be applicable if such application is in conflict with provisions of treaties that are binding on all persons or of resolutions by international institutions". International treaties consequently supersede statutory regulations. Even treaties conflicting with the constitution may be adopted with a two-thirds majority of the Houses of Parliament (Constitution of the Kingdom of the Netherlands, 91§3). However, only so-called self-executing provisions have direct applicability before courts (Fleuren, 2010, p. 248). These are provisions that do not require further legislation to be implemented. The protection of individuals from third parties using scientific progress contrary to human rights requires additional legislation to be adopted by the state. However, the state's own responsibility to respect the right by not using scientific progress in this manner can be said to be self-executing and could thus be invoked against the state before Dutch courts.

Secondly, it must be examined whether the use of SyRI by the Dutch government falls within the scope of the right to protection from adverse effects of scientific progress. As the court stated in its judgement "the development of new technologies gives the government,

among other things, opportunities to link files and analyse data with the aid of algorithms in order to exercise supervision more effectively" (*NJCM et al. v The State of The Netherlands*, 2020, §6.85). Thus, the SyRI algorithm can be said to make use of scientific progress as without recent developments in computer science the linking and processing of data files on such a scale would not be possible.

As was argued for under 2.2.2, there further needs to be an interference with another human right recognized by the state through the state's use of scientific progress. The Netherlands is state party to the ICCPR and the ECHR, both of which recognize the right to privacy (citation). According to the court's judgement, how SyRI is used certainly interferes with the right to privacy of those subjected to it (*NJCM et al. v The State of The Netherlands*, 2020, §6.42) and thus the right to protection from the adverse effect of scientific progress could be invoked in conjunction with the right to privacy. The requirement of interference with a human right recognized by the Netherlands is thereby fulfilled. Considering that SyRI is used for the legitimate aim of combating social welfare fraud its application constitutes the infringement with individuals' privacy constitutes adverse effect rather than abuse. Therefore, the use of SyRI interferes with the right not to be subjected to adverse effects of scientific progress of those that have their data processed by SyRI and potentially become subject of a risk report.

3.3 Potentially legitimate limitation invoked by the state

As discussed in section 2.3.1 a limitation of the right can be justified if it is determined by law, promotes the general welfare in a democratic society and does not go against the nature of the right according to article 4, ICESCR. The use of SyRI is regulated by the SyRI legislation and thus has a basis in the law. However, as the court remarked it is questionable whether the legislation is accessible and transparent enough (*NJCM et al. v The State of The Netherlands*, 2020). The court did not discuss this further because it instead focused on assessing the lack of the proportionality of the interference.

The state can reasonably argue that combating social welfare fraud falls within the purpose of promoting the general welfare in a democratic society. Without such measures it may become impossible to provide those in need with the adequate funds which would undermine the functioning of a social welfare state (*NJCM et al. v The State of The Netherlands*, 2020, §6.4).

In order to judge whether the limitation strikes a fair balance between the legitimate aim pursued and the severity of interference one must assess how harmful the use of the algorithm is to the rights of those subjected to it. However, this is not possible without insights into the functioning of the SyRI algorithm and the nature of data it processes. In the case, the government refused to reveal details such as the risk indicators used (*NJCM et al. v The State of The Netherlands*, 2020). This illustrates a problem that is likely to recur in other cases where the impact of algorithms employed by the government needs to be

assessed. State will be hesitant to publish details about the algorithms out of fear that this might compromise their usefulness. How should courts judge the harmfulness in such scenarios? The approach applied by the court in this case was to put the burden of proof on the government. The state was expected to provide proof of why the algorithm's negative impact is outweighed by the legitimate aim and the safeguards for abuse. As the defence failed to disclose such information, the court assumed severe adverse effects on subjects' right to privacy. An alternative approach would have been to present details on SyRI's functioning in a closed hearing to the court. This is frequently done with other confidential information that is relevant to a legal dispute.[8] It would have allowed the court to be informed about the details of the algorithm and be assisted by experts in the field to assess its impact adequately without impairing the effectiveness of SyRI.

Considering the lacking information on the actual functioning and impact of the algorithm, the SyRI system does not meet the requirements of necessity and proportionality as ingrained in "in a democratic society". The system has thus far primarily been used in low-income neighbourhoods and can thus be considered discriminatory in its application as it further stigmatises people living in these neighbourhoods and puts them under general suspicion (*NJCM et al. v The State of The Netherlands*, 2020, §6.92; Vervloesem, 2020). In addition to this, the legislation does not provide sufficient "safeguards and effective remedy against [...] illegal or abusive imposition" (Limburg Principles, §51), as individuals are not informed that they are subjected to an investigation by SyRI. The legitimate aim pursued is thus not proportionate to the harm done by SyRI to subjects' privacy.

It has also been remarked that the intrusive use of SyRI would simply not be necessary if adequate checks were performed before awarding individuals with social welfare benefits (Vervloesem, 2020). Here algorithmic data processing could be used only one those that apply for social welfare benefits to give a preliminary recommendation whether they qualify. If the recommendation is positive the benefits could be granted immediately while a negative recommendation could lead to further evaluation by a human employee. This illustrates that many less intrusive ways of combating social welfare fraud are at the disposal of the government. The interference was consequently not necessary.

This leads to the conclusion that the limitation of the right to protection from adverse effects of scientific progress is not justified under article 4 and is consequently unlawful. If article 15(1)(b) and specifically the right to protection from adverse effects of scientific progress had been invoked before the court this could have given another dimension to the illegality of SyRI, namely the inappropriate use of technology.

[8] See, for example, *Big Brother Watch and Others v. the United Kingdom.* Here the court was given information on the surveillance system of the United Kingdom in a closed hearing to ensure the system would remain effective.

4. Conclusion

It can be concluded, that of the three pillars of article 15(1)(b) the right to protection from abuse or adverse effects of scientific progress is most suitable for addressing issues arising from states using algorithmic data processing in a manner that interferes with human rights. Despite it not being mentioned explicitly in article 15(1)(b), a strong argument can be made for the existence. Much uncertainty still surrounds the scope and content of the right. The most likely approach to applying the right will be that for abuse or adverse effect to exist there needs to be an interference with but not necessarily a violation of another human right recognized by the concerned state. States can nevertheless lawfully make use of algorithmic data processing in ways that interfere with human rights provided that the limitation fulfils the requirements laid out in article 4. Whether there exist means of getting effective remedies in case of a violation depends on which country violated the right. In case the state recognizes the optional protocol to the ICESCR an individual communication can be brought before the CESCR. Otherwise, individuals have to rely on national courts as far as the respective national legal system allows the direct invocation of provisions of international treaties before domestic courts. Where a way of reaching effective remedies exists the right to protection from abuse or adverse effect of scientific progress provides a useful tool for combatting interferences with human rights such as the right to privacy through algorithmic data processing by states. Lastly, the case study demonstrates that right to protection from abuse or adverse effect of scientific progress is likely to apply in many instances where states utilise technological advances in a manner that interferes with human rights. That the right has so far not been invoked in such cases is likely due to the lacking awareness for the relevance of the right rather than a conscious choice. More attention should be given to it, especially considering its potential in addressing threats to human rights by states' use of emerging technologies such as artificial intelligence and big data.

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