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Pluralism or Systemic Coherence

Nordberg, Ana

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Legal method and legal interpretation in international IP law: Pluralism or systemic coherence

By:
Ana Nordberg, Ph.D.,[1]

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1. Introduction

While pluralism and minimum harmonisation may have advantages concerning substantive requirements for intellectual property (IP)[2] protection, there is an argument to be made in favour of establishing further harmonisation of rules and principles for the legal interpretation of international or regional IP treaties, conventions and other legal instruments.

The increasing autonomy of IP law as a legal discipline and the development of specialisation within different IP areas have resulted in different sources of law, comprising specific scopes of territorial and subjective application, conceptual frameworks and enforceability mechanisms. A similar picture emerges in terms of adjudication: specialised international, regional and national institutions are creating a body of *case-law* following internal interpretative logics, rules, principles or praxis.

This paper focuses on matters of legal interpretation, leaving for a separate discussion other important issues such as the dynamics of governance and institutional collaboration, and the processes of legislative production. It reflects on policy options between pluralism and harmonisation in two separate levels: (1) the desirability of establishing, or not, further harmonisation of interpretative rules, criteria and praxis in IP law; (2) whether internal harmonisation or systemic coherence between different areas of law and regulation that affect the same object or legal fact is a desirable interpretative objective in IP. The point of departure for this analysis is emerging technologies, such as for example synthetic biology applications, 3D printing, and gene editing. These are technologies that present a multitude of horizontal challenges as they cut across different legal disciplines and areas of IP law. These are also technologies raising important social and ethical questions. This confluence of circumstances and characteristics strengthen the possibility of actual emergence of a pluralism of legal responses, while making it crucial to debate arguments for using either 'functional pluralism' or 'systemic coherence' as a policy approach.

2. Intellectual Property substantive and formal overlaps

IP law is a field where considerable international and regional harmonisation has occurred. There are multitudes of coexisting sources of law, creating overlaps of substantive rules that are both internal and external to IP law. IP rights are granted by different national and supranational entities, and likewise its enforcement and validity is subject to diverse adjudicating authorities: courts, tribunals and administrative boards. Hierarchies and relationships between rules and rulings are increasingly unclear and difficult to navigate. The nature and complexity of the institutional factors in the global framework(s)

[1] Associate Senior Lecturer, Faculty of Law, Lund University, Sweden. Contact: Ana.nordberg@jur.lu.se
[2] IP and IP rights are used in this article as umbrella terms for rights over immaterial goods.

for IP law facilitates pluralism. While simultaneously, these features provide strong arguments for coherence as a goal in legal interpretation.

2.1 Multi layered legal framework

International IP Law can be described as a multi-layered legal framework, both regarding the formal sources of law and its substantive content. The multi-layered framework can be observed in both a vertical and a horizontal dimension, but also by considering network effects. In a vertical dimension it is characterised by layers of legislation with a hierarchic relationship - an *onion-shaped* structure-. In its horizontal dimension, we observe diverse legal sources where formal hierarchy is absent or difficult to determine - a *flower-shaped* structure. From a different, and perhaps better, visual analogy is a *network-shaped* structure were legal rules intersect around different focal points.

In formalistic terms, it can be said that IP law contains various sources of law interacting at different levels (international, regional or national) with or without a (completely clear) hierarchic relationship, accompanied by a pluralism of legal sources. Traditional international instruments negotiated among countries, are side-by-side with internal resolutions, directives or regulations, and the jurisprudence of courts, tribunals or administrative boards of various international organisations.

IP related international treaties, include those that provide for substantive IP norms, such as TRIPS Agreement[3], Berne Convention[4] and the Paris Convention[5]; but also procedural instruments creating systems for application, examination or grant of IP rights, such as the PCT[6], the Madrid Agreement/Protocol[7], or the Hague Agreement[8]; instruments creating international classification systems such as the Locarno Agreement,[9] Nice Agreement[10] or the Strasbourg Agreement;[11] or Free Trade Agreements (FTAs) and Bilateral Investment Treaties (BITs) with IP clauses.

According to their geographical scope legal sources can be described as Bilateral, regional or pan-regional treaties,[12] multilateral international treaties,[13] secondary legal sources produced by regional economic integration treaties/organisations[14] and other supranational agencies or organizations, and finally national laws and regulations.

[3]The Agreement on Trade-Related Aspects of Intellectual Property Rights is Annex 1C to the Marrakesh Agreement, and under Article II (2) an integral part of the Marrakesh Agreement, binding on all signatory parties.

[4] Berne Convention for the Protection of Literary and Artistic Works, adopted in 1886 (as amended on September 28, 1979).

[5] Paris Convention for the Protection of Industrial Property, adopted in 1883 (as amended on September 28, 1979).

[6] Patent Cooperation Treaty, done in Washington on June 19, 1970, amended on September 28, 1979, modified on February 3, 1984, and on October 3, 2001.

[7] Madrid Agreement Concerning the International Registration of Marks, concluded 1891 (as amended on September 28, 1979) and Protocol Relating to the Madrid Agreement Concerning the International Registration of Marks concluded 1989.

[8] Hague Agreement Concerning the International Registration of Industrial Designs concluded 1925, modified by the 1960 Act, and the 1999 Act).

[9] Locarno Agreement Establishing an International Classification for Industrial Designs (as amended on September 28, 1979).

[10] Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks (as amended on September 28, 1979).

[11] Strasbourg Agreement Concerning the International Patent Classification (as amended on September 28, 1979).

[12] Convention on the Grant of European Patents (European Patent Convention or EPC) of 5 October 1973, as revised by the Act revising Article 63 EPC of 17 December 1991 and the Act revising the EPC of 29 November 2000.

[13] See WIPO administered Treaties.

[14] For example, EU Directives and regulations approximating and harmonizing national law regarding IPR's but also connected regulatory instruments. The number of these is too vast to list.

These treaties are administered by different agencies and organisations.[15] Among them the most relevant to IP are the World Trade Organization (WTO)[16], which administers and enforces compliance with the TRIPS Agreement and the WIPO[17] which administers 26 IP related international treaties.[18] The WIPO database reveals 178 IP related legal texts in the EU legal order.[19] A similar search concerning members states of the EU shows very different numbers for each national jurisdiction for example from Latvia (27); Czech Republic and Romania (47) to France (296), UK (286) and Greece (236).[20] The bottom line is that IP related legal texts and provisions are abundant and the number of IP related provisions and legal sources vary considerably, as does the structure and level of codification of each system. From a perspective of traditional hierarchy of legal sources, it can be said that IP norms exist at every level of legislative sources: constitutional norms, laws, regulations, administrative acts and decisions and judicial adjudication/jurisprudence.

Arguably, IP has human rights status, through its inclusion in the UN catalogue of economic and social rights. Article 15 (1) (c) ICESCR reads: 'The States Parties to the present Covenant recognize the right of everyone: […] 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.'[21] In Europe, the major Human Rights legal instrument – the Council of Europe Human Rights Convention[22] - does not refer to IP, but protocol n.1 mentions the protection of property in broad terms,[23] and the European Court of Human Rights has held that IP rights constitute property[24]. At EU level, the EU Charter[25] explicitly mentions IP, and Article 17(2) states that 'intellectual property shall be protected'. This has been considered a puzzling

[15] UN agencies (World Health organization; United Nations Educational, Scientific and Cultural Organization; World intellectual property organization; Food and Agriculture Organization, etc.), World Trade Organization; International Union for the Protection of New Varieties of Plants (UPOV); Council of Europe; European Patent organization, etc.

[16] WTO is an international organization established by the Marrakesh Agreement Establishing the World Trade Organization, signed in Marrakesh, Morocco on 15 April 1994

[17] The constituent instrument of the WIPO was the WIPO Convention, signed at Stockholm on July 14, 1967, entered into force in 1970 and amended in 1979. WIPO is an intergovernmental organization which in 1974 became a specialized agency of the United Nations system. However, the origins of WIPO can be traced to 1883 and 1886 when the Paris Convention for the Protection of Industrial Property and the Berne Convention for the Protection of Literary and Artistic Works provided for the establishment of an "International Bureau". The two bureaus were united since 1893, until being replaced by the World Intellectual Property Organization in 1970.

[18] <http://www.wipo.int/wipolex/en/profile.jsp?code=WIPO, accessed 20 October, 2016.

[19] Including Laws (79 texts), Implementing Rules/Regulations (55 texts), Geographical Indications (38 texts), Treaty Approvals (6 texts, IP Legal Literature (1 texts), IP Jurisprudence (1 texts), Administered IP-related Treaties (2 texts), Treaty Membership (25 texts). The real number could be higher if we consider the number of IP related decisions by the CJEU. Source: WIPO, <http://www.wipo.int/wipolex/en/profile.jsp?code=EU#a5>, accessed 20 October, 2016.

[20] Source: WIPO <http://www.wipo.int/wipolex/en/profile.jsp?code=EU#a5>, accessed 20 October, 2016.

[21] Article 15 (1) (c) UN International Covenant on Economic, Social and Cultural Rights, Adopted and opened for signature, ratification and accession by General Assembly resolution 2200A (XXI) of 16 December 1966, entry into force 3 January 1976, in accordance with article 27.'.

[22] Council of Europe Convention for the Protection of Human Rights and Fundamental Freedoms, as amended by Protocols No. 11 and No. 14, Rome, 4.XI.1950 (ECHR)

[23] Article 1, Protocol to the Convention for the Protection of Human Rights and Fundamental Freedoms, as amended by Protocol No. 11, Paris, 20.III.1952 (Protocol No.1)

[24] Anheuser-Busch Inc v Portugal, Merits, App no 73049/01, (2007) 44 EHRR 42, IHRL 3436 (ECHR 2007), 11th January 2007, European Court of Human Rights [ECtHR, Grand Chamber].

[25] Charter of Fundamental Rights of the European Union of 7 December 2000, as adapted at Strasbourg, on 12 December 2007 (EU Charter).

provision.[26]. Different EU jurisdictions may lean towards different theoretical understandings of the nature of IP rights. These can be seen as property rights, sui-generis rights or as administrative concessions, and there is not much on the text of the EU Charter to indicate adherence to any of these three different views.[27] It appears equally realistic to argue that the *ratio legis* of Article 17(2) of the EU Charter is based on a need to fall in line with Article 15 (1) (c) of the ICESCR.

If we look at the international panorama, in many countries protection of IP is directly or indirectly protected by the constitution.[28] In some cases such constitutional provisions predate the debate and inclusion of IP in the catalogue of human rights, attesting the long standing relevance attributed to protection of intellectual goods. The actual formulation varies considerably. Indirectly many countries recognise IP as property in the traditional sense, and thus protection is afforded by the constitutional right to private property. A number of jurisdictions contains specific constitutional provisions creating a constitutional right to (some) IP rights by establishing legislative competence to enact laws protecting IP.[29] While some have constitutional provisions mandating legislative measures to provide an incentive for the protection of scientific research and cultural creation.[30]

As the above shows, the landscape of IP law is constituted by a network of sources of law interacting over the same subject-matter and/or factual situations. From the perspective of enforcement and adjudication, in any jurisdiction and by adjudicating entity (national or transnational), a decision will require analysis of a number of IP laws, private contractual arrangements and other areas of law closely related to the exercise and enforcement of or IP rights. This could include competition rules, medical law, private international law rules on jurisdiction and forum, criminal law and tort law, market approval procedures and boarder control and customs measures. This practical or *law in motion*

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[26] Ansgar Ohly 'European Fundamental Rights and Intellectual Property' in Justine Pila and Ansgar Ohly (eds.), *The Europeanization of Intellectual Property Law: Towards a European Legal Methodology* (OUP 2013), 151.

[27] Ibid

[28] See Lior Zemer, TITLE, Above/below in Chapter ?

[29] A few examples are: The USA Constitution gives Congress the power to enact laws relating to patents and copyrights (Article I, Section 8, Clause 8). Furthermore, gives authority to the Congress to provide for the registration of Trademarks (Article I, Section 8, Clause 3); The Constitution of the Federal Republic of Brazil (2012, 35th ed.), protects directly intellectual property rights (Article 5 XXVII and XXIX). In India, the constitution contains provisions giving the Parliament the power to enact laws relating to patents, inventions and designs; copyrights; trademarks and merchandise marks (Part XI, Chapter I, Article 246, as interpreted under Seventh Schedule, List I.-Union List, Section 49); The Basic Law for the Federal Republic of Germany contains provisions establishing legislative competency on protection of copyright and industrial property rights in Article 73(1) & (9); The Swedish Instrument of Government protects the copyright of authors, artists and photographers in their works (Chapter 2, Article 16); The Portuguese Constitution (1976, VII revision 2005) in Article 42 guarantees the freedom of intellectual, artistic and scientific creation. Article 73, paragraph 4 states that: The state shall stimulate and support scientific research and creation and technological innovation , and Article 78, paragraph 2c provides for the protection of cultural heritage; Likewise, the Spanish constitution (1978, last modified in 27 September 2011) recognizes and protects the rights to literary, artistic, scientific and technical production and creation, as well as scientific freedom (Article 20(b) and (c)), and prescribes that the public powers shall promote and ensure general access to culture, and promote science and scientific and technical research for the general benefit (Article 44 (1) and (2)). Available in translation at: http://www.wipo.int/wipolex/en/ (accessed 10 September 2018).

[30] For example: The Italian constitution, in its Article 9 provides for the duty of the State to promote scientific and technical research, and safeguard the historical and artistic heritage of the nation. Another example, is the Constitution law of the People's Republic of China which in its Article 20 [Science] prescribes that the state promotes the development of the natural and social sciences, disseminates scientific and technical knowledge, and commends and rewards achievements in scientific research as well as technological discoveries and inventions. While, Article 22 [Culture] (1) mentions that the state promotes the development of literature and art.. Available in translation at: http://www.wipo.int/wipolex/en/ /c (accessed 10 September 2018).

dimension is very relevant to the understanding of how the law is shaped by private actors, procedural parties and institutions. It has been long contended that the law in the books and the law in practice are two different and interdependent realities. This perspective may seem more relevant to practitioners, but in IP legal scholarly has much to benefit from considering this dimension.

2.2 Legal and regulatory overlaps

The existence of a multi-layered framework of laws and regulations is simultaneously cause and consequence of a complex network of overlaps. The existence of substantive overlaps will become more apparent, once we take intellectual creations as the point of departure, instead of focusing on the normative framework. These overlaps include: (1) jurisdictional overlaps; (2) overlaps between different IPRs;[31] (3) overlaps between IPRs and other rights pertaining to different fields of law; (4) regulatory overlaps.

Jurisdictional overlaps are a direct consequence of a multi layered international legal framework. There is considerable substantive and procedural harmonisation in IP law, which is surrounded by broad areas of national pluralism. Each legal instrument has a specific substantive but also geographical jurisdictional limitation, as treaties only create obligations concerning their subject-matter[32] and among signatory parties.[33] The same applies to secondary sources of law, e.g. resolutions, decisions or rulings of international organisations. This leads often to simultaneous protection in different jurisdictions with different scope and validity, such as in European patent law where an inventor may choose a unified right (EU patent with unitary effect)[34]; a semi-harmonised independent right (European patent or bundle of national patents)[35]; a harmonised procedure to obtain national patents world-wide via PCT,[36] or completely independent national rights (national patents).

Overlaps between IPRs occur both intentionally or unintentionally. In certain areas the legislator(s) have realised the usefulness of allowing simultaneous protection of different aspects of the same intellectual creation or immaterial goods though different legal regimes. This will necessary entail overlaps as creators try to obtain the most extensive legal protection for their rights. A typical example would be a trade mark right granted over a sign which is copyright protected. A second scenario occurs as a result of emerging technologies which often escape the logic of previously established legal boundaries. For example, attempts to use copyright instead of patent to privatise innovations in synthetic biology.[37]

There are also considerable overlaps between IP law and other areas of law, such as the EU right to freedom of movement, competition law rules, and generally IP and human rights.

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[31] For an overview on overlaps in IP law see: Estelle Derclaye, Matthias Leistner *Intellectual Property Overlaps: A European Perspective* (Hart Publishing, 2011).

[32] Article 26 and 33 *a contrario,* Vienna Convention on the Law of Treaties, Concluded at Vienna on 23 May 1969, Registered ex officio on 27 January 1980.(No. 18232) [VCLT]

[33] Article 29 VCLT.]; Cf. with articles 34-36 VCLT.

[34] REGULATION (EU) No 1257/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 December 2012 implementing enhanced cooperation in the area of the creation of unitary patent protection, and COUNCIL REGULATION (EU) No 1260/2012 of 17 December 2012 implementing enhanced cooperation in the area of the creation of unitary patent protection with regard to the applicable translation arrangements. The regulations entered into force on 20 January 2013. However, they will only apply from the date of entry into force of the Agreement on a Unified Patent Court.

[35] Article 2 European patent convention.

[36] The PCT constitutes a Union for cooperation in the filing, searching, and examination, of applications for the protection of inventions, and for rendering special technical services - Article 1 Patent cooperation treaty.

[37] Andrew Torrance, 'DNA Copyright' (2011) 46 Val. U. L. Rev. 1; Ledford (2013) reports DNA 2.0 efforts to obtain copyright protection on an engineered DNA sequence for a fluorescent green protein.

Overlaps also occur motivated by the use of IP law as policy tools directed at goals that escape the general utilitarian justification in which IP protection over immaterial creations is anchored. This is for example easily observable in exceptions and exclusions to IPRs. The Biotechnology Directive[38] is a good example of both a jurisdictional overlap and a substantive overlap. This is an EU law internal source of law, which applies to bundles of national patents granted by the EPO, to the (future) EU patents with unitarian effect and to national patents. These norms have been converted into Pan-European via the EPO implementing regulations.[39] This solution is pragmatic considering that the EPO is not an EU institution, but an international organisation with contracting parties that are not part of the EU. The legitimacy of the Biotechnology Directive, however, is the protection of the EU internal market.[40] The object of the Biotechnology Directive is to harmonise and clarify the content of subject-matter patentability exclusions and exceptions to patentability in the national legislation of the EU countries.[41] While the substantive provisions are based on a variety of morality based legal policy considerations, basic human rights and legal values such as human dignity.[42]

2.3 Adjudication and enforcement

The IP landscape also entails multiple actors, with different powers of adjudication and enforcement (registability, scope and validity) all of which simultaneously consider the same intellectual goods. Often an innovation will be protected by both national and supra national rights that apply to different features corresponding to separate elements of the underlying embedded complex intellectual creation. These innovations will result in complex products protected by different IPRs and enforcement of rights through infringement procedures will entail several (possible) causes for action. Rules on substantive and territorial fora competence will apply, however, opportunities for forum shopping will subsist, both at the level of choice of legal regime and concerning forum shopping *stricto sensu* – choice of the adjudicating authority.

Right holders tend to pay attention to strategic considerations concerning the most efficient and effective manner of ensuring the protection of their interests, being theses either purely personal, reputational or a mixture of complex business considerations. This entails decisions on whether to rely on IP law rules or resort to other fields of law, as mentioned above.. It also implies that perceived or objective lines of jurisprudence may be an important factor dictating strategies concerning registration of rights and options between unified rights or national rights, e.g. European patent v. European patent with unitary effect.[43]

Because adjudicating authorities are bound to both subject-matter specialisation and territorial competence, these strategic decisions have jurisdictional consequences. There are many international and national law adjudicating authorities and institutional actors deciding on IP Law or matters with IP law relevance, with different types of powers and institutional configuration. International/regional

[38] Directive 98/44/EC of the European Parliament and of the Council of 6 July 1998 on the legal protection of biotechnological inventions, OJ 1998 L213 (Biotechnology Directive)
[39] The EPC Implementing Regulations, as in force since 1 May 2016.
[40] Recitals 3, 5 and 7 Biotechnology Directive.
[41] Recitals 4 and 9 Biotechnology Directive.
[42] Recitals 16, 39, 43 Biotechnology Directive.
[43] For a discussion see generally: Clement Petersen, Thomas Riis and Jens Schovsbo 'The Unified Patent Court (UPC) in Action - How Will the Design of the UPC Affect Patent Law?' in Rosa Maria Ballardini, Marcus Norrgård, Niklas Bruun (eds) *Transitions in European Patent Law. Influences of the Unitary Patent Package* (Kluwer, 2015).

organizations tribunals (EPO boards, WTO panels); Regional courts (UPC[44]; ECHR[45]); EU administrative institutions (EUIPO ex-OHIM)[46]; EU courts; national courts acting as specialised EU IP courts (TM and design regulations);[47] National courts (with specialised competence or generalists); national administrative entities (patent and TM offices, domain names boards, competition authorities, copyright collective management societies). Furthermore, there is also a tendency for large commercial actors to resort to private arbitration and private settlements. Generally, adjudicating entities tend to be highly specialised, which both has advantages and poses the risk of a *tunnel vision* effect on jurisprudence.

3. Pluralism and coherence in International IP law

Not only is current international IP law characterised by fragmentation and a multi-layered network of rules and institutions, but also by being a highly specialised field of law, where the interface between law and technology plays an important role. The fast pace of scientific progress and technological innovation creates challenges both to legal interpretation and further legislative activity. The option between pluralism or coherence should be considered both within IP law and between IP law and other closely related fields. When technology erodes boundaries between what can be protected by different rights there is the need to consider whether internal IP law harmonisation of interpretative rules and practice between the different IPRs is reasonable, useful and desirable. Technology, art and communication are pervasive and relate to economic development, human flourishing, or, in another formulation, civilizational progress. It is worth considering the coherence between other areas of law and the normative framework was devised to promote, protect and regulate the creation and enjoyment of intellectual goods by society.

Each legal field or subfield of law have their own internal structure, based on specific policy justifications and legal theory, and often has developed discursive patterns in jurisprudence and legal sources. Different institutional aspects also help shape international IP law. A paradigmatic example can be found in the stem cell *Brüstle*[48] and *ISCO*[49] patent cases and the different lines of reasoning which can be found in the respective decisions of the EPO, ECJ and national courts.[50] Pluralism of views over legal

[44] Agreement on a Unified Patent Court and Statute,document 16351/12, of 11.01.2011.

[45] Council of Europe Court of Human Right, established by Article 19 of the Convention for the Protection of Human Rights and Fundamental Freedoms (ETS No.005), Rome, 04/11/1950.

[46] The European Union Intellectual Property Office (EUIPO), which was known as OHIM until 23 March 2016, was created as a decentralised agency of the European Union it manages the registration of the EU trade mark and the registered Community design.

[47] Regulation (EU) 2015/2424 of the European Parliament and of the Council of 16 December 2015 amending Council Regulation (EC) No 207/2009 on the Community trade mark and Commission Regulation (EC) No 2868/95 implementing Council Regulation (EC) No 40/94 on the Community trade mark, and repealing Commission Regulation (EC) No 2869/95 on the fees payable to the Office for Harmonization in the Internal Market (Trade Marks and Designs). Official Journal of the European Union, 24.12.2015 L 341/21; and Council Regulation (EC) No 6/2002 of 12 December 2001 on Community designs (OJ EC No L 3 of 5.1.2002, p. 1) amended by Council Regulation No 1891/2006 of 18 December 2006 amending Regulations (EC) No 6/2002 and (EC) No 40/94 to give effect to the accession of the European Community to the Geneva Act of the Hague Agreement concerning the international registration of industrial designs (OJ EC No L 386 of 29.12.2006, p. 14).

[48] Case C-34/10 Oliver Brüstle v Greenpeace e.V, ECR I-09821 (ECLI:EU:C:2011:669).

[49] Case C-364/13, International Stem Cell Corporation v Comptroller General of Patents, Designs and Trademarks, (ECLI:EU:C:2014:2451).

[50] Ana Nordberg, Timo Minssen, 'A "ray of hope" for European stem cell patents or "out of the smog into the fog"?: The CJEU decision in C 364/13 and how it compares to recent US developments' IIC - International Review of Intellectual Property and Competition Law (2016) 47 (2), pp. 138-177.

interpretation and the influence of different legal traditions concerning the relative value of sources of law is not only useful, but necessary to the general development of IP law. Simultaneously, pluralism is also direct consequence of procedural norms. In applying general and abstract norms to the individual complex factual situation, adjudication is delimited by the subject matter and the adjudicating authority limits of appreciation. This is especially strict under civil law traditions and for international organisations jurisdictional organs, which are bound by the founding treaty competence attribution and specific procedure rules. Even within the national court systems procedure norms may impose limitations as to obligations of the parties during the discovery phase in civil proceedings, powers of discovery of the court, limited case law effect (no stare decisis). Adjudication is bound by the cause of action, and generally courts will only rule over facts and rights invoked by the parties. For example, if asked to adjudicate on copyright infringement in a civil proceeding, the court may not have the power to rule on a design or trademark infringement, nor a breach of privacy. This means that there is little margin or need for courts to consider law and jurisprudence in other areas unless such is argued as a defence against the assertion of an IPR.[51]. There are clear advantages of keeping separate lines of legal interpretation and adjudication, because by applying the specific ratio of these norms to factual situations arguably it will be possible to be closer to legislative intent. It also may strengthen legal certainty as parties to a procedure are able to determine to a higher degree of certainty a potential outcome and help parties devise IP portfolio construction and enforcement strategies. However, on the reverse of the coin there is potential for the development of considerable distinct interpretation of provisions sharing similar legal historic roots, purposes and public policy functions – for example exceptions and limitations to the different IPRs.

3.1. Coherence: taxonomic types and approaches

Legal coherence can be debated and advocated at different levels, and for this purpose subdivided according to specific taxonomic criteria. Because coherence entails necessarily a comparative element, it can be approached in different ways. From a geographic perspective, coherence can be jurisdictional, internal to a given national or trans-national legal system; or understood in a trans-jurisdictional sense as a harmonisation or approximation of laws between different national or trans-national legal systems or regimes. . In this sense, coherence can be either global or local. Global coherence considers the complete legal system and the objective of achieving coherence between legal interpretation at a systemic level.[52] Local coherence considers only internal coherence within a specific legal field or subsystem.[53]

In a different perspective, legal coherence can be viewed as either substantive or normative. Meaning that coherence may be approached both at the level of the substantive norms and at the level of normative choices. In this sense, coherence can be an instrument for developing legal reasoning, both in judicial adjudication and in legal scholarly work, or as a guiding principle for legislative production. , .

It is also possible to approach coherence from an institutional perspective and to make distinctions among the actors involved. It is possible to talk about horizontal, vertical and transversal coherence. Horizontal coherence refers to coherence of legal praxis between the same level or type of actors and it can be national (e.g. comparison between different national first instance courts) or international (e.g.

[51] An example can be found in the case Plesner v Louis Vuitton, Court of the Hague of 4 May 2011, 389526/KG ZA 11-294, initiated and decided on grounds of design v freedom of expression and where different venues of argumentation could have been chosen.

[52] Ronald Dworkin, *Law's Empire* (Fontana Press, 1986).

[53] B.B. Levenbook 'The Role of Coherence in Legal Reasoning', (1984) *Law And Philosophy*, 3: 355-377; J. Raz 'The Relevance of Coherence' in J Raz (ed) *Ethics in the Public Domian* (Clarendon Press, 1994).

comparison between different national patent offices). Vertical coherence compares legal reasoning between actors in hierarchic regimes(e.g. lower courts – upper courts).[54] Finally, transversal coherence addresses different levels and types of actors (e.g. a comparison between the jurisprudence of the EPO and CJEU).[55]

, A corresponding number of options to the different types of coherence are available as ways to achieve coherence between any *systems* or *parameters* considered for comparison Approaches to achieve legal coherence include (1) normative production; (2) structural organisation; (3) institutional collaboration; (4) Indirect coherence effect of pluralism; and (5) legal interpretation.

Legal coherence may be achieved through legislative activity, i.e. production of coherent norms through the introduction of legislative changes or of new legislation. This includes international negotiation of treaties and conventions, and secondary legislation of international organisations or supra-national entities. Whenever, norms are designed as tools for approximation or harmonization of national legislations, legal coherence is part of the production process and one of its main objectives. Because legal coherence is an objective it becomes also an intrinsic element for legal interpretation. Examples can be found in international IP related treaty negotiation under the *aegis* of the WIPO or WTO, and in in secondary legislation of UN agencies, the EU and other regional integration entities or federations of states.

Structural organisation of the legal system and institutional design can also become an important tool for achieving legal coherence or ensuring pluralism. Centralisation and specialisation of adjudicating actors may enhance internal IP vertical coherence; for example the future UPC and TM/Design courts systems in the EU.

Institutional collaborations can also be a tool to achieve coherence in many forms: meetings, courses and conferences, and be conducted *ad hoc* and/or within the framework of international organisations. Examples include the establishment of various intergovernmental working groups at the WIPO,[56] or the institutional collaboration between EPO and USPTO, JPO,[57] SIPO and KIPO[58].

Paradoxically, there is also an indirect coherence effect of pluralism. It occurs because pluralism of sources of law and pluralism of legal interpretation once confronted with material facts and legal disputes tends to bring to light contradictions and often serves as a driver to higher courts adjudication and further legislative intervention. Pluralism of private law actors and private law or informal mechanisms of adjudication, also can result in spontaneous coherence as a result of pragmatism.

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[54] Frederica Baldon, Esther Van Zimmeren 'The Future of the Unified Patent Court in safeguarding Coherence in the European Patent System' (2015) Common Market Law review, 52: 1529-1578.

[55] Ana Nordberg, Timo Minssen, 'A "ray of hope" for European stem cell patents or "out of the smog into the fog"?: The CJEU decision in C 364/13 and how it compares to recent US developments' IIC - International Review of Intellectual Property and Competition Law (2016) 47 (2), pp. 138-177.

[56] The WIPO Convention establishes different negotiation and decision making bodies and allows the formation of permanent committees, ad hoc or standing committees and working groups and call for diplomatic conferences. See: http://www.wipo.int/policy/en/.

[57] In 1983, the Trilateral Cooperation was set up by the three largest patent offices at the time - EPO, JPO and USPTO - to search for solutions for common automation problems. The heads of the Trilateral Offices meet annually and currently, co-operation activities include areas such as documentation, data standards and patent information. Source: http://www.epo.org/about-us/office/international-european-cooperation/international-multilateral.html

[58] In 2007, the combination of the emergence of two new major patent offices - China and Korea - with the continuing rise in patent applications and the ensuing effect on backlogs led to the formation of the "IP5": the three Trilateral Offices plus the patent offices of the People's Republic of China (SIPO) and South Korea (KIPO). Source: http://www.epo.org/about-us/office/international-european-cooperation/international-multilateral.html.

Examples emerge from phenomena such as user generated law, contractual arrangements, legal scholarship, mediation and arbitration. Finally, coherence (or pluralism) can also be achieved through legal interpretation.

3.2 Coherence as a legal interpretation objective and guiding principle

When legal philosophy discusses pluralism and legal coherence, usually it does so in the context of legal reasoning. Legal reasoning can be understood in a narrow sense to encompass only the decision making process of adjudicating authorities or in a broad sense covering legal argumentation of a multitude of legal actors in different institutional roles (legal practitioners, scholars, politicians and legislators, and even stakeholders). In its narrow sense, legal reasoning can also mean three different things: (a) reasoning establishing the content of positive law on a given issue; (b) reasoning establishing how a case should be adjudicated based on the law (c) reasoning establishing how a case should be adjudicated based on positive law and also including *de lege ferenda* considerations. It should be noted that not all theorists separate such issues. Notably Dworkin, according to whom the interpretation and application of law includes more than applying positive law, meaning that when judges reason about the law all considerations (positive or not) they are allowed to include are part of the law.[59] In a sense Law and other normative systems such as ethical principles and morality or social behaviour norms have fluid boundaries. Once we consider that Law is more than positive norms and also encompasses a complex and diffuse network of 'norms' e.g. contractual arrangements, trade and professional use and customary norms, , industry volunteer codes of conduct, user generated rules, recommendations of institutional actors and opinions of legal scholars.

Most legal theorists would agree with the notion that interpretation is a Janus-faced concept.[60]On one side interpretation relates to an *original* something (object – e.g. the text), and on the other *interpretation* creates something (a vision or interpretation – jurisprudence).[61] In a way, the object and product of interpretation are two distinct faces of the law. Because of the dual face nature of interpretation (past the literal type) it plays a role in legal reasoning. According to Raz, interpretation blurs the lines between law-finding and law-creating roles of the judges according to legal positivists. Dworkin contends that interpretation occurs at an early stage of legal reasoning, explaining why there are no gaps in the law (to be filled by judges), because everything a judge is entitled to rely on when deciding a case is already part of the law.[62] However, one should always be aware that legal interpretation is perceived differently depending on the legal system taken as point of departure. The specific jurisdiction may work with black-letter, well established specific legal norms and principles of legal interpretation emanating from the legislative power. Or on the contrary, allow considerable latitude to the adjudicators in determining such rules and principles and thus entrusting the judicial power with a quasi-legislative function. This point is of major relevance when considering international law and international

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[59] Dworkin (1986) above n. 52, chp 3, 101-108 discussing duty of the judge of not applying immoral law (immoral/illegitimate law as non-law). It also has the reverse effect of precluding the lines of defence based on arguments of obedience to hierarchic orders or the 'I was only following orders' defence.

[60] Janus, represented with two opposing faces, is in Roman mythology the good of beginnings and transitions.

[61] Owen M. Fiss 'Objectivity and Interpretation' (1982) *Stanford Law Review*, 34: 739-736; Dworkin (1986) above n. 50; Andrei Marmor, *Interpretation and Legal Theory* (Claredon press, 1992) and Andrei Marmor, *Interpretation and legal Theory* , revised 2nd Ed. (Hart Publishing, 2005); Timothy Endicott 'Putting Interpretation in Its Place' (1994) Law And Philosophy, 13:451-479; Joseph Raz ' Why Interpret?' (1996) *Ratio Juris*, 9:349-363; Joseph Raz ' Intention in Interpretation', in R.P. George(ed.) *The Autonomy of Law* (1996, Clarendon).

[62] Dworkin (1986) above n. 50. Cf. Hart and Raz.

adjudication, and their relationship with national norms. Once international norms and case-law are implemented in a national system, coherence may be consolidated or scattered through legal reasoning depending on the interpretative principles or traditions applied. For example, this is visible in divergent interpretation of national norms transposing the same EU Directive, even when implementation was done literally.

For purposes of scope delimitation, in this paper the concepts of Law, legal reasoning and legal coherence are approached from a theoretical perspective of their usefulness as approaches to legal interpretation. Legal interpretation being understood in a broad sense as any activity of understanding and applying the law to materials facts and situations, pursued by different actors and including both pre and post judicial conflicts.

3.3 Legal method and legal interpretation: the role of coherence

It is important to begin by stressing that while the concept of coherence is an elusive one, coherence and consistency are two different things.[63] Moreover, coherence alone cannot be presumed as a normative value without debating whether it is in fact useful to the legal development of Law as a normative system. Furthermore, as it has been argued legal coherence is not necessarily positive from a material justice point of view and, in this sense, it is possible to talk about 'bad coherence'.[64] Legal coherence as justification in legal reasoning fosters formalism and may be used to perpetuate unsuitable or outdated lines of jurisprudence. This is a particularly acute challenge when emerging technologies and associated innovative business models are concerned. These entail often technical possibilities and enable social phenomena which legislators did not predict directly. At the same time, scientific progress is rarely composed of leaping steps but instead is incremental and new technologies are often the development of older realities. and. Legal norms are often based on assumptions about reality at the time they are established and scientific and technological developments cannot be fully predicted. Broad interpretation, extensive interpretation and analogy may lead to unnecessary and unreasonable constraints on innovation.[65] Under these circumstances there is an argument to be made in favour of pluralism as essential in order to foster: flexibility in legal solutions; adaptability to new factual situations; pragmatism and material justice over formalism; respect for diversity of legal traditions and cultural specificities; innovation and further development of legal reasoning and legal argumentation; inclusiveness[66] and acceptance of a wider range of perspectives and different actors point of view. Finally, another perspective to be considered is Raz argument that pluralism is a feature intrinsic to legal interpretation.[67]

Legal interpretation, *lato sensu*, concerns itself both with selection of sources of law, and interpretation *stricto sensu* and application of law to material facts. The rules of interpretation of international law are prescribed in the Vienna Convention.[68] Legal interpretation as a procedural process is in itself a propitious ground to debate coherence. Legal coherence could be fostered by clear and

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[63] Amalia Amaya *The tapestry of Reason: An Inquiry into the nature of Coherence and its role in Legal Argument* (Bloomsbury Publishing, 2015), p. 472.
[64] Andrei Marmor, *Law in the Age of Pluralism* (Oxford University Press, 2007), p.183-197.
[65] Consider for example the Stem cell debate. Ana Nordberg, Timo Minssen, 'A "ray of hope" for European stem cell patents or "out of the smog into the fog"?: The CJEU decision in C 364/13 and how it compares to recent US developments' IIC - International Review of Intellectual Property and Competition Law (2016) 47 (2), pp. 138-177.
[66] Boaventura Sousa Santos, 2005.
[67] Joseph Raz, *Between Authority and Interpretation* (Oxford University Press, 2009).
[68] VCLT, above at n. 32.

harmonised rules on the selection of sources of law and their relative relevance in adjudication, and choice of interpretative method of legal texts. However, not all interpretative rules are harmonised and clear. International law will be interpreted according to the Vienna Convention rules for purposes of determining the scope of international obligations of the signatory parties. But once the normative content is transposed and transformed into national law according to local rules on the reception of international law, international norms, thus transformed into national law will be interpreted within the larger context of the national jurisdiction. Accordingly native rules of interpretation will, in practice, take precedent whenever the law is applied to material facts. This national law will comply with the international IP obligation of harmonisation (interpreted according to the rules of interpretation applicable to international law), but because international law is an incomplete and fragmented system, the national law will contain also provisions not harmonised or semi-harmonised: examples include the use of TRIPS flexibilities concerning exceptions, exclusions and limitations to IP rights[69] and at EU level the possibility of choice by the national legislators between a list of exceptions in the *InfoSoc Directive*.[70]

In some cases, the interpretation of international norms will obey and /or be influenced by specific procedure rules, as determined by the international treaty establishing an international organisation. It is possible that a treaty may contain specific rules of interpretation or that its enforcement or adjudication body will develop lines of interpretative jurisprudence, such is the case with the panels at the WTO, the examiners and boards of appeal at the EPO and EUIPO, the EU courts, and the ECHR. The specific case of the EU is interesting to mention as a process of Europeanisation of IP law has been developing.[71] Contributing factors are not only the number of directives and regulations on IP or IP related matter, but also that the ECJ has developed the doctrine of consistent interpretation or indirect effect, which requires EU member states domestic courts to interpret domestic law in a manner which is consistent with EU law.[72] It is interesting that such principle would apply both to domestic law which results from implementation of EU legislation and also to norms of domestic law (where EU law is silent or specifically allows for national autonomy), resulting overtime in additional harmonisation via jurisprudence.[73]

4. Emerging technologies: a justifier for coherence in IP legal interpretation?

The discussion concerning policy options between pluralism and harmonisation is vast and ubiquitous. It emerges concerning every negotiation of an instrument of international law. Internally it is often present and debated in connection with discussions surrounding the limits and boundaries of federal legislative powers, or centralisation versus regionalisation. It is also particularly visible in political debates concerning economic integration projects such as the EU. In a sense the planned exit of the UK from the EU and the internal and pan-European debate it has sparked, relaunched academic legal debates in various areas of law and at different levels about pluralism versus coherence. Against this background,

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[69] Articles 13, 17, 26 (2), 27 (2) and (3), 30, 31TRIPS Agreement

[70] Article 5 (2) Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society Official Journal L 167 , 22/06/2001 P. 0010 – 0019.

[71] Generally see: Ansgar Ohly and Justine Pila (eds) The Europeanization of intellectual property Law: towards a legal methodology (Oxford University Press, 2013).

[72] Sabine von Colson and Elisabeth Kamann v Land Nordrhein-Westfalen, Case 14/83 [1984] ECR1891 (ECLI:EU:C:1984:153) and Marleasing SA v La Comercial Internacional de Alimentacion SA, Case C-106/89 [1990], ECR-*I-04135* (ECLI:EU:C:1990:395).

[73] Graeme Dinwoodie 'The Europeanization of Trade Mark Law' in Ansgar Ohly and Justine Pila (eds) *The Europeanization of intellectual property Law: towards a legal methodology* (Oxford University Press, 2013).

this chapter considers the hypotheses of whether emerging technologies and technological driven phenomena would: (1) justify developing further coherence among interpretative rules, criteria and praxis in International IP law; (2) justify establishing systemic coherence between different areas of law and regulation affecting the same object or legal fact as a desirable interpretative objective in international IP law.

Emerging technologies such as nanotechnology, synthetic biology, gene editing, 3D printing and technologies of the 'second' digital age: artificial intelligence, internet of things, deep machine learning, data mining, and technological driven phenomena such as big data, human enhancement, and human machine neural interaction and interface are all enabling technologies and create complex network effects. These present a multitude of horizontal challenges across a variety of legal disciplines and naturally have particular widespread impact in IP law. These are also technologies and phenomena which raise deep social and ethical questions and as such entail possibilities for further legal and regulatory overlaps.

Generally, such technologies pose interpretative (and also legislative) challenges because it is not always clear how to fit these new realities into legal categories, and operative concepts of applicable norms. New technologies and technologically driven phenomena challenge assumptions and developed interpretative criteria of the law. As an example, consider that the distinction between methods and products relevant for patent law purposes of determining patentability of medical methods, is difficult to establish in scientific terms in nanomedicine; [74] or the distinction between natural phenomena and technological interventions in gene editing and plant synthetic biology for patent eligibility and regulatory purposes.[75]

Another characteristic is the fast pace of development of new technology and technological enabled business models and social phenomena. Law is often produced as an after the fact solution addressing different interests. However, in contemporaneous societies the pace of innovation is much faster than the time that takes for 'new' law to be created (the democratic legislative process is lengthy) and jurisprudence to be clarified (it may take considerable time before a case is taken and decided by e.g a national supreme court, CJEU or EPO enlarged board of appeal). The slow reaction of legal institutions often defeats their direct usefulness. Technology evolves so fast, that the closest legal text is always outdated and extensive interpretation and legal analogy becomes almost the *de factum* standard for interpretation. An example can be found in the Biotechnology Directive, where a lengthy and complex legislative process that heavy relied on the state of the art of scientific knowledge and technological development to negotiate the legislative text led to unsatisfactory results. The text was outdated by scientific and technologic progress by the time of its enactment. This situation has emerged in controversial patent cases such as the *Brüstle*[76], *ISCO*[77] relating to human embryonic stem cells

[74] Ana Nordberg *Patenting Nanomedicine in Europe: Applying the 'medical methods exception' to emerging technologies* (DGØF Publishing, 2017).

[75]Timo Minssen, Ana Nordberg (2015) 'The Impact of Broccoli II & Tomato II on European patents in conventional breeding, GMO's and Synthetic Biology: The grand finale of a juicy patents tale?' 34 (3) *Biotechnology Law Report*, pp. 81-98.; See also the discussion concerning the distinction between health and enhancement, in Ana Nordberg (2015) 'Patentability of methods of human enhancement', 10 (1) *Journal of Intellectual Property Law & Practice*, p. 19-29 and between natural and technological in Ana Nordberg (2017) 'Defining Human Enhancement: towards a foundational conceptual tool for Enhancement Law' 25 (3) *Journal of Law Information & Science*, with further references.

[76] Case C-34/10 Oliver Brüstle v Greenpeace e.V, EU:C:2011:669

[77] Case C-364/13, International Stem Cell Corporation v Comptroller General of Patents, EU:C:2014:2451.

adjudicated by the CJEU.[78] The stem cell patent cases are good examples of lack of coherence between decisions regarding patent law morality clause in the Biotechnology Directive, which is said to be based on a *ratio* of protecting of human dignity,[79] the jurisprudence of the European Court of Human Rights (ECtHR)[80] and the corresponding EU regulatory framework.[81] The EU has not acceded to the ECHR,[82] therefore unlike all of its member states, the EU and its adjudicating institutions cannot be considered to fall under the scrutiny of the ECtHR. However, as nothing prevents the CJEU from finding the arguments of the ECtHR persuasive doing so would be a logical step from a coherence in international law perspective since all EU members are signatory parties of the ECHR and have incorporated into their national legal order such human rights norms. The decision in *Brüstle* has been also criticised for inducing a lack of formal and substantive coherence in EU Law between a more permissible regulatory framework and research funding and the strict interpretation of the patentability exception.[83]

The decisions of the EPO Enlarged Board of Appeal in the plant innovation saga: *Tomato I* and *Broccoli I*[84] and *Tomato II* and *Broccoli II*,[85] regarding patentability of plant varieties show how legal and biologic concepts can collide concerning the concept of 'essentially biological process'.[86]

Another characteristic of emerging technologies is that these can have a horizontal impact on different areas of law and create interpretative difficulties simultaneously under different IPRs frameworks. A paradigmatic example is additive manufacturing or 3D printing, a technology with potential to widely impact industrial production, and which also affords ample possibilities for disseminated creation of immaterial goods and replication of proprietary intellectual creations embodied in physical objects in a manner not predicted in current IP legislations, but also may impact personality rights. The technology erases boundaries between immaterial and physical world, allowing to reproduce three-dimensional objects, but also to transpose objects from two-dimensional forms (e.g- a picture or painting) into a three-dimensional object. It also includes the possibility to 'print' biological material.

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[78] See the discussion in Ana Nordberg, Timo Minssen, 'A "ray of hope" for European stem cell patents or "out of the smog into the fog"?: The CJEU decision in C 364/13 and how it compares to recent US developments' IIC - International Review of Intellectual Property and Competition Law (2016) 47 (2), pp. 138-177.

[79] Recitals 16, 38-46 Biotechnology Directive.

[80]Unlike the ECJ, the ECtHR has reiterated (for the purposes of evaluating the scope of protection conferred under the right to life – Art. 2 Council of Europe Convention for the protection of Human Rights and Fundamental freedoms) that determining the concept of human being lies under the margin of appreciation enjoyed by each state. See Vo v. France [CG], no. 53924/00 para. 82; Evan v. UK, no. 6339/05 para. 46; A.B.&C. v Ireland [2010] ECHR 2032. Cf. Case C-34/10 Oliver Brüstle v Greenpeace e.V, EU:C:2011:669.

[81] Cf. Directive 2004/23/EC of the European Parliament and of the Council of 31 March 2004 on setting standards of quality and safety for the donation, procurement, testing, processing, preservation, storage and distribution of human tissues and cells, OJ EU L 102/48, 7.4.2004 and Regulation (EC) No 1394/2007 of the European Parliament and of the Council of 13 November 2007 on advanced therapy medicinal products and amending Directive 2001/83/EC and Regulation (EC) No. 726/2004OJ EU L 324/121, 10.12.2007.

[82] Article 6 of the Treaty of Lisbon created the legal basis for the EU accession to the EcHR. However, the CJEU declared that accession is not possible unless further conditions are met; cf. Opinion 2/13 of the Court (Full Court), 18 December 2014, at para. 153.

[83] See inter alia, R. Brownsword (2014) Regulatory coherence – a European Challenge. In: Purnhagen K, Rott P (eds) Varieties of European economic law and regulation: liber amicorum for Hans Micklitz. Springer, pp 235-258, 238; 59; Aurora Plomer (2009) Towards systemic legal conflict: article 6 (2) (c) of the EU Directive on Biotechnological inventions. In: Plomer A, Anderman S (eds) Embryonic Stem Cell Patents: European Law and Ethics. OUP, Oxford, pp 173-203, 180-184.

[84] Consolidated cases G 2/07 *Broccoli I/Plant Bioscience* and G 1/08 *Tomatoes I/State of Israel*, OJ EPO 2012, 130.

[85] Consolidated cases G 2/12 *Tomatoes II* OJ EPO 2016, A27 and G 2/13 *Broccoli II,* OJ EPO 2016, A28.

[86] See: Timo Minssen, Ana Nordberg (2015) 'The Impact of Broccoli II & Tomato II on European patents in conventional breeding, GMO's and Synthetic Biology: The grand finale of a juicy patents tale?' 34 (3) Biotechnology Law Report.

Associated business models and private user behaviours creates a new 'e-ecosystem' of actors impacting and creating enforceability issues across the different IPRs when applied to different IPR protected creations. All convening to conjugate the challenges of protecting and enforcing intellectual creations against traditional imitation, with the difficulties of containing online infringement, and legal interpretative uncertainty in determining which IPRs regimes to apply and how. On the other side, the technology, if developed and made widely accessible, is bound to democratise the design creative process, open new venues for artistic expression and citizen science. It will allow individuals to express artistic creativity, create their own designs, customise and adapt existing appearances of products, and share these creations. It will also create new markets and address market failures by introducing products for which there is demand but currently no offer: personalisation of products, reproduction of products no longer available on the market, and creation of unavailable spare parts or parts necessary for restoration of *vintage* complex products.[87] Due to its characteristics this is another example of technology creating challenges across conceptual boundaries, creating either overlaps, intersections or similar challenges to IPRs,[88] which provides an argument for coherence across the corresponding interpretation.

Some emerging technologies and technology enabled social phenomena contain the additional characteristic of impacting various social domains and normative systems. A currently much debated example can be found in gene editing and other technologies enabling extraordinary interventions on the human body – human enhancement.[89] Gene-editing technologies, such as CRIPSR-Cas9[90] allow e precise modification of genetic structures of any living organisms. The technology raises many ethical concerns which are relevant to several legal fields including IP law.[91] Particularly controversial issues are (a) the potential use of gene editing technologies to make genetic changes on somatic cells (passed down to future generations); (b) the possibility to modify wild insect and other animal populations; (c) untraceable genetically modified plants and related implications for the broader debate about genetically modified organisms.[92] The prospect of human enhancement also raises interesting interpretative issues and legal philosophical debates, including the legitimacy to legislate and adjudicate over matters concerning consented or self-induced interventions on a person's own body – implications of balancing autonomy with human dignity in interpretation and creation of law and regulation.[93]

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[87] See Ana Nordberg, Jens Schovsbo 'Design Law and 3D printing', In Rosa Maria Ballardini, Marcus Norrgård, Jouni Partanen (eds) *3D Printing, Intellectual Property and Innovation – Insights from Law and Technology* (Wolters Kluwer, 2017).

[88] Generally see the different contributions in Rosa Maria Ballardini, Marcus Norrgård, Jouni Partanen (eds) *3D Printing, Intellectual Property and Innovation – Insights from Law and Technology* (Wolters Kluwer, 2017).

[89] For a debate on the contested definition of human enhancement for legal purposes see: Ana Nordberg (2017) 'Defining Human Enhancement: towards a foundational conceptual tool for Enhancement Law' 25 (3) Journal of Law Information & Science.

[90] CRISPR stands for Clustered Regularly Interspaced Short Palindromic Repeats. Cas9 stands for CRISPR associated protein 9.

[91] Gene editing and the underlining social and ethical debates can be approached and influence different legal fields, such as IP law, medical and health law, competition law, labour law, tort and liability regimes, environmental law, human rights and constitutional law.

[92] These and other legal issues are addressed from an interdisciplinary perspective and with further references in Ana Nordberg, Timo Minssen, Sune Holm, Maja Horst, Kell Mortensen and Birger Lindberg Møller, (2018) 'Taking the gene-editing revolution to the next level: An interdisciplinary view on challenges, threats and opportunities of CRISPR-Cas9 and related technologies' 5 (1) *Journal of Law and the Biosciences*, pp. 35–83.

[93] See with further references the debate in Ana Nordberg 'Human enhancement from ethical interrogations to legal (un)certainty', in Tana Pistorius (ed) Intellectual property perspectives on the regulation of new technologies (Edgar Elgar, forthcoming).

These examples illustrate a confluence of circumstances and characteristics which strengthen the possibility of a pluralism of legal responses, but also may induce negative coherence. Excessive pluralism, both in legislative production *stricto sensu*, adjudication and via contractual arrangements is likely to occur. In the absence of international norms, specific national norms are likely to be enacted, jurisprudence will likely vary, and private actors will tend to create defensive legal strategies and/or user generated informal norms and codes of conduct. Simultaneously, these create negative coherence because of a lack of sufficient tried legal solutions and interpretative argumentation. The tendency will be to apply by analogy or extensive interpretation existing rules and lines of jurisprudence, sometimes misunderstanding or ignoring specificities of the new technical and social realities.

This scenario, however, is not in itself new. All truly innovative technologies, associated business models and enabled social phenomena will, to a higher or lesser degree, challenge the legal framework and require legal responses. In the absence of contrary empirical evidence, emerging technologies do not, *per se*, justify either pluralism or coherence,[94] but rather bring visibility to the need to strengthen independence and legitimacy of adjudicators to include new elements in legal interpretation; and to consider when appropriate global multi-level coherence as an interpretative element in adjudication. Likewise, emerging technologies also inspire active consideration during the legislative process of using (or rejecting) coherence as a justification principle and policy objective.

Multi-level coherence operates internally and externally, both at local and trans-jurisdictional geographic level. The degree of coherence justified will be higher when considering local and vertical coherence because these will encompass intersections between different IPRs concerning the same innovation, and situations where IPR's interface with general principles of law or basic constitutional/human rights. As for scope, in order to avoid 'bad coherence', efforts should focus primarily on the legal method interpretative phases of establishing standards and criteria on application of legal principles, and exclusions, exceptions and limitations. This is because *bad coherence* and/or what could be called *false coherence* would mostly arise from the use of coherence as objective criteria for direct adjudicating over material facts. Coherence by itself is not a sufficient argument to extend a legal solution to different facts, nor to apply by analogy a legal norm to an emerging technology.

There are however, clear advantages of using global multi-level coherence as interpretative element for emerging technologies, namely concerning: (1) the application of general legal principles and development of standards for analogue or similar concepts, especially regarding subject matter exclusions and exceptions or limits to enforcement; (2) facilitate the interface between IP Law and IP related law(s) and avoid conflicting norms or lines of jurisprudence; (3) develop standards for application of rules pertaining to different fields of law over same factual subject matter; (4) Between law and regulations affecting same technology/innovation; (5) Coherence of practical effects in decisions, i.e. avoiding the 'give-take' effect.

5. A way forward: Legal method and legal interpretation in International IP Law

If active consideration is to be given to legal coherence in both legislative, adjudication and legal scholarly practice, then coherence also needs to be approached as a matter of legal interpretation and legal methology(ies). This section argues, from a *de lege ferenda* perspective, that the use of contextual systemic elements in legal interpretation could offers solutions to both avoid 'bad coherence' and foster

[94] See Ana Nordberg, 'Medical methods and Patentability of Nanomedicine in Europe: small matter, large interrogations'. In Tana Pistorius (ed) *ATRIP Congress 2015 proceedings/Title to be announced* (Edgar Elgar, forthcoming)

the resort to global multi-level coherence when appropriate.[95] In particular, regarding emerging technologies, which for the reasons exposed are more likely to require and benefit from such approach.

5.1 Coherence by extensive application of the Vienna Convention on the Law of Treaties

As mentioned in section 3, the rules of the Vienna Convention on the Law of Treaties (VCLT) guide the application and interpretation of international obligation of states in international relations. The VCLT applies to international treaties in all fields of law, including IP. However, in practice considerable debate has arisen, as to the VCLT scope of applicability to concrete international treaties and supra-national adjudicating authorities.

Firstly, it has been invoked the VCLT general rule excluding retroactive application to international legal instruments ratified before it has come into force in 20 of January, 1980.[96] However, often international instruments concluded prior to this date are not considered covered by the non-retroactivity principle. The subject has been debated extensively in IP law. For example regarding the interpretation of the EPC, the EPO Enlarged Board of Appeal (EBA) observed that although the VCLT does not formally applies to the EPC, there are convincing precedents for applying the rules for interpretation of treaties incorporated in the VCLT.[97] The EBA argues that the rules codified by the VCLT can be said to be in their essence customary norms, and the International Court of Justice (ICJ), European Court of Human Rights, and national constitutional or supreme courts have for long applied the principles expressed in the Vienna Convention to situations to which the VCLT did not apply *ex lege*.[98] A similar debate and reasoning can be found *mutatis mutandi* concerning other formal limitations of the VCLT scope of applicability, namely concerning the type of international legal instruments[99] and the coincidence of ratifying entities.[100] Generally, under Article 34 VCLT a treaty does not create either obligations or rights to third-parties without consent. The interpretation and application of this provision can be quiet complex, considering for example the framework of international organizations or expansion of treaty obligations via the case-law of international adjudicating authorities. Furthermore, an additional controversial issue is the question of the convention's substantive limitations. This is a fairly broad and open framework and in itself its interpretation and application is object to variation and debate.[101]

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[95] Coherence has both shortcomings and limits and this are to be explored. For example, see: Graham Dutfield, 'The limits of substantive Patent Law Harmonization' in Ruth L. Okediji and Margo A. Bagley (eds) *Patent Law in Global perspective* (Oxford University press, 2014).

[96] Article 28 VCLT.

[97] G 5/83 *Second Medical indication* OJ 1985, 64; see also Consolidated cases G 2/12 *Tomatoes II* OJ EPO 2016, A27 and G 2/13 *Broccoli II*, OJ EPO 2016, A28.

[98] Idem. See also Case Law of the Boards of Appeal, III- H 1. Available at: <https://www.epo.org/law-practice/legal-texts/html/caselaw/2016/e/clr_iii_h_1.htm> (accessed 3 September, 2018).

[99] For example its application to Bilateral Investment Treaties with IP provisions. See with further references: Suzy Frankel (2016) 'Interpreting the Overlap of international Investment and Intellectual Property Law' 19 (1) *Journal of International Economic Law*, pp. 121–143 at p. 137.

[100] Concerning article 34 VCLT scope of the term obligations see with further references: Dörr and Schmalenbach (2018) below n.101), p. 655-659.

[101] There is a vast body of academic literature addressing the VCLT, for example: Ulf Linderfalk, *On The Interpretation of Treaties: The Modern International Law as Expressed in the 1969 Vienna Convention on the Law of Treaties* (Springer, 2007); Oliver Corten and Pierre Klein (eds), *The Vienna Conventions on the Law of Treaties: A commentary* (Oxford University Press, 2011); Christian J. Tams, Antonios Tzanakopoulos, and Andreas Zimmermann, with Athene E. Richford (eds), *Research Handbook on the Law of Treaties* (Edward Elgar, 2014); Robert Kolb, *The Law of Treaties: An Introduction* (Edward Elgar, 2016); Oliver Dörr and Kirsten Schmalenbach (Eds) *Vienna Convention on the Law of Treaties* (Springer, 2018). See also: *International Law Commission, Fragmentation of International Law: Difficulties Arising from the*

5.2 Coherence by contextual interpretation and systemic integration

Article 31 establishes general rules of interpretation, providing that: 'A treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose.'[102] The reference to ordinary meaning points out to the literal or dictionary sense of the word as point of departure, but the conjugation with an obligation of good faith interpretation and consideration of contextual elements allows, arguably for a teleological interpretation.[103] The VCLT, is conservative insofar as defining contextual elements, as these are limited to the treaty text, including its preamble and annexes, and subsequent agreements relating to the treaty made by or accepted by all the parties.[104] Authentic interpretation in the form of agreements, practices or rules of international law is also mentioned.[105] Preparatory works of the treaty and the circumstances of its creation are mentioned as included under this notion. However, the norm is not a closed exhaustive enumeration. It follows from Article 31 (3) (c) that it is acceptable to include systematic elements such as pre-existing or subsequent norms of international law and other obligations of the parties which relate, even if indirectly, to the object of the treaty.[106] Koskenniemi goes as far as describing this norm as expressing a 'principle of systemic integration'[107] which '[…] *looks beyond the individual case. By making sure that the outcome is linked to the legal environment, and that adjoining rules are considered – perhaps applied, perhaps invalidated, perhaps momentarily set aside – any decision also articulates the legal-institutional environment in view of substantive preferences, distributionary choices and political objectives.*' I would add, that both from a *de lege ferenda* and a *de jure condendo* perspective, both the law to be made and Law to be constructed by adjudication would largely benefit from including as contextual interpretative elements interdisciplinary contributions, in accordance and under the framework of Article 32 VCLT.[108]

5.3. Coherence by supplementary means of interpretation

Law does not exist in a social vacuum and this means that scientific facts and ethical reflexion are most relevant were IP rules and regulatory norms interface. In this sense, an excessively formalistic interpretation that does not account for reality risks leading to a manifestly absurd or unreasonable results. Article 32 VCLT allows for additional contextual elements not listed under Article 31 VCLT.[109]

Diversification and Expansion of International Law, Finalized by Martti Koskenniemi. Fifty-eighth session. 13 April 2006. Part C. available at <http://legal.un.org/ilc/documentation/english/a_cn4_l682.pdf> (accessed 20 September, 2018).

[102] Article 31 (1) VCLT.

[103] Cf. Jean-Marc Sorel and Valérie Boré Eveno, 'Volume I, Part II observance, Application and Interpretation of treaties, S. Interpretation of Treaties, Art. 31 1969 Vienna Convention' in Corten & Klein (2011), above n. 111, arguing that 'the text of Article 31 is a true example of a compromise: a compromise between the defenders of textual interpretation, of subjective interpretation, […and] teleological interpretation', page 808. See also Nguyen Quoc Dinh, P. Daillier and A. pellet, *Droit international public* (7th edn, Paris: LGDJ, 2002), p.266.

[104] Article 31 (2) VCLT. Concerning objective and purpose of international IP Agreements see: Frankel (2016), above n. 99, at p. 133.

[105] Article 31 (3) and (4) VCLT.

[106] Linderfalk (2007), above at n. 101, pp. 259-265; see also Susy Frankel (2014) 'The WTO's Application of "The Customary Rules of Interpretation of Public International Law" to Intellectual property', 4 (1) Victoria university of Wellington Legal Research Papers, 44 pages.

[107] Koskenniemi (2006) above n. 101, p. 243 para.479.

[108] Concerning the non-exclusive nature of Article 32 VCLT and the concept of supplementary interpretative elements See R K Gardiner Treaty Interpretation (2nd Edn. Oxford university Press, 2015), page 348, pp 357-358.

[109] Linderfalk (2007) above at n. 101, pp. 259.

Supplementary means of interpretation are mentioned as means to prevent interpretation witch leaves the meaning ambiguous or obscure or leads to a manifestly absurd or unreasonable result.[110]

The VCLT does not contain further indication concerning selection and relative weight to give to different sources of law used as interpretative tools. Such can in part be inferred from customary international law, but it is always a matter for specific institutional preferences. Article 38 (1) of the Statute of the International Court of Justice:[111], is generally considered to be the most authoritative enumeration of the sources of International Law. It describes the law to be applied by the ICJ when deciding cases within its jurisdiction. It is pointed usually as an example of codification into international law of long standing tradition in International relations.[112]

The use as secondary sources of law of other international treaties and conventions can be a tool for the type of coherence which strengthens international law as a normative system and a dialectic cross-fertilization process capable of a positive contribute for its development.[113] However, reality shows that this approach is not without flaws. Influence from Free Trade Agreements (FTAs) and Bilateral Investment Treaties (BITs) with IP clauses, is contributing to a reconceptualization of international IP, transforming IPRs from a mechanism of incentive to produce innovation, to tradable commercial assets in themselves.[114]

Resort to international custom, from a *de lege ferenda* perspective, can also be understood as including more than just public international law praxis. International corporations and other private actors are often faster that legislators and states in creating legal interpretation through a variety of *inter partes* norms. In such broad sense, private law instruments such as standard or massive contracts, terms of service and licensing agreements can be understood as *de facto* customary norms of international commerce, and as such sources of IP law in a broad sense. Also here, a critical systemic stance is essential when considering such elements. In particular, were these form or point in the direction of *contra legem* practices. However, in an era where we observe the first steps in international law instruments to create obligations on private actors,[115] these elements cannot be ignored.[116]

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[110] Article 32 VCLT.

[111] The Statute of the International Court of Justice is annexed to the Charter of the United Nations signed at San Francisco on 26 June 1945, of which it forms an integral part.

[112]Article 38 (1) STCJ reads as follows:

1. The Court, whose function is to decide in accordance with international law such disputes as are submitted to it, shall apply:

a. international conventions, whether general or particular, establishing rules expressly recognized by the contesting states;

b. international custom, as evidence of a general practice accepted as law;

c. the general principles of law recognized by civilized nations;

d. subject to the provisions of Article 59, judicial decisions and the teachings of the most highly qualified publicists of the various nations, as subsidiary means for the determination of rules of law.

[113] For example see generally the framework proposed by Laurence R. Helfer and Graeme W. Austin *Human Rights and Intellectual Property: Mapping the Global Interface* (Cambridge, 2011).

[114] For concrete examples see: Rochelle Dreyfuss and Susy Frankel (2015) 'From incentive to Commodity to Asset: How International Law is Reconceptualizing Intellectual Property'36 (4) Michigan Journal of International Law, pp. 557-602.

[115] For example, the Universal Declaration on Bioethics and Human Rights, adopted by the UNESCO General Conference on 19 October 2005, declares Non-discrimination, justice, social responsibility and benefit-sharing as collective goals of humanity, to be pursued both by states and other actors.

[116] See in the context of the interface between patent law and regulation: Ana Nordberg, Timo Minssen, Oliver Feeney, Iñigo de Miguel Beriain, Lucia Galvagni and Kirmo Wartiovaara 'Editing Humanity?: An Interdisciplinary commentary on Genome Editing in Assisted Reproductive Technology (forthcoming, 2018) and Ana Nordberg, Timo Minssen, Iñigo de Miguel Beiren, Lucia Galvani, kirmo Wartiovaara, Oliver Feeney (2018) 'Response to Nuffield Council on Bioethics' Genome

General principles of law are another essential element to take into consideration as a potential guide to positive legal coherence, in particular were these are codified as international human rights and/or constitutional principles in a variety of nations. An example could be found in applying reasoning's of human dignity to emerging technologies, such as for example gene editing, within the application of exclusions to patentability. The concept of human dignity and human being can vary depending on the adjudicating entity and sources of law considered. Humanity and human being has to be understood and constructed as a *jus cogens* concept. The matter is an urgent point of legal interpretation, at a moment when our societies are confronted with artificial intelligence, autonomous weapons, self-driven vehicles and human enhancement through human-machine hybridization. Simultaneously, while different legal traditions may entail variations on what is meant by 'dignity', within the same geographical jurisdiction there is no theoretical argument to create a divergent autonomous concept for IP law purposes (or for example for EU biotechnology patents as in *Brüstle*). In particular, where pluralistic normativism is used as justifying interpretation of international obligations in a manner that results in clear misalignment between general international treaties and principles and more specific laws and adjudication practices.[117]

The mentioned growing tendency for judicial *Europeanization* of IP law is an example were CJEU methodologies (or cultures) of legal interpretation collide at times with traditions of legal interpretation of national or international judicial actors, but also an example of a gravitational effect on legal methodological issues and choices of interpretative elements.[118]

Contextualization and systematic interpretation by reference to the norms original and secondary functions should play a role in deciding whether a concept should be given an autonomous meaning through legal interpretation is to be decided. Meaning that, where there is not a strong theoretical justification for pluralism of conceptual understandings, legal coherence should be an interpretative element to take into consideration.[119]

Finally, it is important to stress that although pluralism of legal traditions and legal cultures has value in itself, the critical consideration of arguments raised in judicial decisions, legal scholarly works and amicus curia briefs is a dynamic element that could proof extremely valuable, across formal jurisdictional boundaries.[120] Against this argument is possible to contend that expanding the use of secondary elements and sources of law could have the opposite effect of fostering pluralism and introduce uncertainty. However, I would submit that on the contrary, in contemporaneous societies where access to information about foreign law and legal scholarly works is no longer a privilege of few or a time consuming and costly endeavour, there are endless opportunities for trans-border legal debates and exchange of legal arguments. This entails that critical reference in legal reasoning to a pluralism of sources is a necessary step to develop international law and an international legal culture.

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editing and human reproduction: open call for evidence', Available at: <http://portal.research.lu.se/portal/sv/persons/ana-nordberg(67e49f96-0d7a-4344-9292-db57323dd10a).html.> (accessed 10 September, 2018).

[117] See our reflections on Nordberg et al (2018) above n. 92 and Nordberg et al (forthcoming) above n. 116.

[118] Johan Axhamn 'Striving for Coherence in EU Intellectual Property Law: A Question of Methodology', in Gunnar Karnell, Annette Kur, Per Jonas Nordell, Daniel Westman, Johan Axhamn, Stephan Carlsson (Eds.) *Liber Amicorum Jan Rosén* (eddy.se, 2016), 56-60 (with further references).

[119] Graeme B. Dinwoodie and Rochelle C. Dreyfuss (2009) 'Designing a Global intellectual property System Responsive to Change: The WTO, WIPO, and Beyond' 46 (4) *Houston Law Review*. 1187-1234.

[120] In a timid manner, this is already a reality, either by effect of the submissions of the parties, or in national jurisdictions that have a tradition of allowing comparative law elements as secondary legal sources, in similarity to Article 38 (1) (d) Statute of the International Court of Justice.

Expanding the use of the interpretative framework created by the VCLT, as described above, would promote coherence at the level of legal interpretation and enhance legal certainty. On its turn, evolutionary interpretation of the VCLT,[121] in particular concerning the use of a broad critical systemic approach to the selection of sources of law will benefit coherence, both within IP law and between IP law and other intersecting legal fields.

6. Closing remarks

This chapter debated coherence in legal interpretation of international IP law. The challenges of emerging technologies to both general legal and regulatory frameworks, and specific IP law regimes were considered as part of the equation. It cannot be argued with certainty that emerging technologies, per se, justify legal coherence. However, in face of the constant and time urgency provoked by potentially disruptive technologies, and technological induced phenomena and business models it is apparent that coherence may have a role to play in the development of international and trans-national IP law. It is therefore essential to engage in a debate and contribute to the development of legal methodological tools capable of ensuring coherence in legal interpretation. Such tools should be based on a critic stance towards the law capable of avoiding formalism, as formalism does not serve the fast pace of the market and risks hindering progress. It also should include dynamic elements. While legal interpretation may resort to a historical element contextualisation of a norm should not only be determined by the context at the time of the legal instrument negotiation and ratification, but rather have a component of actualisation. Interdisciplinary is also important, in contemporaneous societies, there is nothing to be gained from understanding different fields of knowledge separately in a rigid and formalistic manner. This includes the Law, were b developments in legal scholarly work, scientific state of the art and the social and technological trends and phenomena should be taken into consideration by legal interpreters. Finally, any development in legal interpretation leading to coherence, should simultaneously develop a better understanding of pluralistic extra-judicial and sometimes extra-legal normative sources and structures (emerging contractual arrangements, self-regulation, governance, communities of innovators functioning outside the paradigms of traditional IP). While it will be most important to maintain legal certainty by coherence in legal interpretation, a certain level of flexibility and pluralism of legal traditions ought to be preserved. Regulators and adjudicators would also be wise to pay close attention to different layers of informal or private normative solutions, structures and systems. Including them as much as possible into the legal system as to improve transparency, accountability, certainty and respect for a democratic based balance of rights.

[121] See with further references: Christian Djeffal, *Static and Evolutive Treaty Interpretation: A Functional Reconstruction* (Cambridge University Press 2015).