Intellectual property (IP) law is an umbrella term that encompasses a range of protections for the intangible property emanating from human creativity and innovation. Early approaches saw a distinction between principles relating to literary and artistic works, such as copyright, and approaches to what was termed “industrial property”, including patents and trademarks.\(^1\) This distinction has been diluted and the law has evolved to the point at which a product such as mobile phone can be covered by numerous patents, trademarks and copyright protections. This complexity is exacerbated by this area’s international reach, originating in early bilateral instruments and continued through to the Paris and Berne Conventions and to the TRIPS Agreement.

The ownership of intangible property is of global economic importance; pharmaceutical, manufacturing and chemical industries’ business plans, for example, rely strongly on the ability to protect their intangible assets. The film and music industries centre on the protection of artistic works, although the ability to enforce this has been severely diminished by the impact of the Internet. State-based regulatory policy often emphasises the use of the intellectual property law to encourage innovation and creativity and, in turn, increase Gross Domestic Product. Wider enforcement and protection mechanisms can, however, perpetuate power imbalances, because, for example, of registration fees and the need to pay legal professionals to police IP protections. Furthermore, many key rights are transferable and can become centralised in powerful institutions such as music companies, far removed from the initial creative impulse. Overly strong legal protections can impede new inventors’ ability to develop new products or hinder artists’ potential to create new artistic works. While IP laws may be written in a formally neutral way, their substantive application can exacerbate economic and societal divisions. Such imbalances can have wider impacts on how society develops and the monetary and social value placed on certain types of creativity and innovation. With its intrinsic link to new technologies and creative expression, IP law is fundamentally linked to the future, human development and progress.

Traditionally, IP law is not an area in which gender-focused research and scholarship has been active. As Halbert notes:

> Feminist scholars rarely, if ever, mention the words copyright, patent, or intellectual property; intellectual property scholars rarely, if ever, appeal to feminist interpretations to better understand the law.\(^2\)

However, a growing body of scholarship and policy initiatives has developed to highlight and critique the interaction of IP law and gender, shedding light on stark disparities on the position of women when assigning protection to creativity and innovation. A key theme is that the wider framework surrounding the substantively neutral law has developed to exacerbate existing socio-economic divisions and to increase marginalisation of certain groups. To examine this within the framework of gender, two key issues have been chosen: the need for more flexibility in patenting, and the extent to which copyright law protects women’s creativity.

**Debate 1: Do we need more flexible patents?**

\(^{1}\) Iselin, J. The Protection of Industrial Property, 46 Journal of the Society of the Arts, 1898, 46, 293

Patents provide the highest form of IP protection, giving their owner a monopoly over the relevant invention. This needs to be inventive, not obvious and capable of being put to industrial, practical use. Harmonised by Article 33 of the TRIPS agreement, their term of protection is usually fixed at 20 years. These strong rights are awarded as incentives to innovate and come with strict registration and disclosure requirements.

The global economy is becoming increasingly focused on invention and innovation, with 2.9 million patents filed in 2015, a 7.8% increase on 2014. The number of patent registrations in a country is considered to be an indicator of development and economic progress and provides quantifiable indications of participation in science and technology research and development. The holding of a patent not only provides economic opportunities in its development and licensing but is also an important tool in gaining future investment and funding. Furthermore, for the individual rightsholder, patents held can increase stature and promotions within commercial environments, a factor that also applies to the increasingly commercialised academic sector. Strikingly, however, the number of female patent holders is woefully low with, in 2010 in the USA, around 7.7% of primary inventors being female and in 2008 8.3% of the patents awarded by the European Patent Office being made to women as a primary applicant. Social and economic trends relating to female participation and innovation are intrinsically linked to this clear-cut gendered distinction in access to this legal protection.

A simple answer to this issue could be women’s historic lack of access to money, resources and, more specifically, participation in scientific development. However, more nuanced conclusions can be drawn through an examination of both historic and contemporary data. Due to the strict registration requirement, records can be accessed to determine trends in female patenting. However, problems are created in analysing this area due to most patent registration procedures not requiring an express indication of the gender of the applicant. Researchers often employ name-matching techniques, with the development of in-depth methodologies for determination of gender.

The first British patent granted to a woman was recorded as early as 1637, 76 years after the first ever British patent. It was granted to Amye Everard Ball for a tincture of saffron and roses. In America, the first registered patent for a resident of the British Colonies was granted in 1715 to the husband of a woman who had invented a corn cleaning machine. It then took until 1809 for the recorded patent issued to a US woman to be awarded to Mary Kies for an invention relating to straw weaving with silk or thread. Charlotte Smith, President of the Woman’s National Industrial League of America, provided an impassioned foreword to the 1890 pamphlet ‘The Woman Inventor’ in which she criticised the contemporary legal situation whereby a husband could patent and exploit a wife’s invention with no legal remedy. This situation persisted across many of the States despite an 1845 New York State provision that: ‘secured to every married woman who shall receive a patent for

4 Merges, R. The Law and Economics of Employee Inventions, Harvard Journal of Law and Technology 1999 13 (1)
5 Mili, J., Gault, B, Williams-Baron, E., Xia, J. and Berlan, M. The Gender Patenting Gap, [Institute for Women’s Policy Research, 2016] [Accessed 16/01/17]
8 PATGB104
9 Amran, F. The innovative woman New Scientist, 1984 24 May
her own invention, the right to hold and enjoy the same, and all the proceeds, benefits and profits as her separate property...as if unmarried.\(^\text{10}\)

The stated aims of ‘The Woman Inventor’ included fostering women’s innovation and to press for fairer laws to enable women to gain their just rewards and protection. In its first volume, published in 1890, Smith looked to the future with the call:

> Let us hope with the dawn of a new century, that unjust wrongs will be righted, and that man will broaden the boundaries that have heretofore separated the barriers of women’s inventive genius from man’s.\(^\text{11}\)

This needs to be placed within the context of research spearheaded by Smith\(^\text{12}\) herself that estimated that from 1790 to 1895 one in every 100 patents granted were to women. Sarada et al’s work\(^\text{13}\) in the US analyses the Annual Report of the Commissioner of Patents from 1870 to 1940 as against the corresponding ten year US population data. Over this 70-year timeframe the percentage of female patent holders, which starts at 2% of 50% of the population, grows slowly over the first 50 years until a slightly greater rise in 1920. This, holds the authors, corresponds with the impact of the women’s rights movement in the USA but predates the increased female workforce participation brought about by the Second World War. More recently, in the USA the share of patents with any women inventors has risen more than fivefold from 3.4% in 1977 to 18.8% in 2010.\(^\text{14}\) Research carried out by the UK Intellectual Property Office shows an increase in female patenting globally of 60% in the last 15 years from 7.1% in 2001 to 11.5% in 2015.\(^\text{15}\) While this indicates some improvements it is far from Smith’s predicted revolutionary dawn at the start of the 20\(^{\text{th}}\) century.

In the context of the low levels of female patenting, the actual activities can be examined to determine the nature of those engaging with this form of legal protection. Classes need to be assigned when registering utility patents for new inventions. In the late 1800s in the USA the categories with most female patent holders were ‘Culinary Utensils’ and ‘Wearing Apparel’, followed by ‘Furniture and Furnishings’ and ‘Washing and Cleaning’.\(^\text{16}\) While this may demonstrate that women’s activities are confined the realm of the home, women’s clothing and fashion, Khan’s nineteenth century-focused work highlights that while female patenting may mainly relate to the sphere in which they had most influence and experience, many of these inventions were made commercially available and were profitable. They improved the lives of men and women alike and had influence outside the domestic sphere, leading to industrial progress. In an on-going reflection of the early categorisations, a 2016 UK Intellectual Property Office survey\(^\text{17}\) found the highest number of female patent holders for inventions relating to “brassieres, clothing, footwear,

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\(^{11}\) Smith, C (ed) The Woman inventor. Washington, DC. April and 1890, June Vol 1 (1) p2

\(^{12}\) Government Printing Office Women Inventors To Whom Patents Have Been Granted By the United States Government, 1790 To July 1,1888, Vol 1 Washington, D.C


\(^{14}\) Above, n:5

\(^{15}\) UK Intellectual Property Office Gender Profiles in Worldwide Patenting: An analysis of female inventorship, 2016


\(^{17}\) UK Intellectual Property Office Gender Profiles in UK Patenting An analysis of female inventorship, 2016
cosmetics, furniture and food”. Conversely the lowest numbers related to patents for “combustion engines, tools and weapons”.

Given the high level of patents that emanate from the science and engineering sectors, the lack of female patent holders could be seen as a direct result of historically low participation in these sectors. However, research carried out by Hunt et al. found that women with degrees in these areas patent only at a slightly higher level than other women. On further, detailed, analysis they did find a correlation between the specific underrepresentation of women in the patent-intensive fields of mechanical and electrical engineering. Furthermore, within this, the actual position occupied by women had an impact, with underrepresentation in design and development leading to a low relative level of patenting. This raises wider societal questions relating to the impact of female input in the process of innovation. Kahler highlights the dangers of a lack of ‘cognitive diversity’, in which strategies and views are overlooked due to women’s different perspective on problem-solving. This can be placed within research that has found that the more diverse a team is, the more successful it will be.

Examining the issue in more specific fields, Ding et al’s work presents longitudinal study of gender and patenting in academic life sciences. While adjusting their parameters for “productivity, social network, scientific field, and employer characteristics” it was found that women patent at 0.40 times the rate of their male counterparts. The authors examined whether women were carrying out research of differing quality to men and chose to test this by examining number of citations and journal impact factor. They found that in their sample the women actually achieved higher in relation to the impact factor and concluded that in general women do not do work that is less significant by these measures. Interviews probed these issues further and suggested that the differing levels of patenting could be linked to women having a lower number of vital commercial connections, and women finding it difficult to balance commercial pursuits with academic and educational work. The research outlined here shows that there is a need for further examination of why, when women are increasing their education and participation in the fields of science and engineering, the levels of female patenting remains so low. Kahler indicates the lack of ‘comprehensive and longitudinal empirical studies of woman-inventor patenting across technologies, organizations, and geography’. Hunt et al see the need for mentoring schemes to match those working in development and design roles with young female engineers.

The statistics on female patenting are stark and they link strongly to the role of and attitudes towards women in society. Intellectual property law protects the development of knowledge, which in itself is constructed by society. Firestone’s *The Dialectic of Sex* (1970) argues that culture is developed and experienced indirectly by women, with men dictating both its value and its nature, stating: ‘cultural dicta are set by men, presenting only the male view’.

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21 Ding, W., Murray, F. and Stuart, T. Gender Differences in Patenting in the Academic Life Sciences, 2006 [Accessed 17/01/16]
22 Kahler p777
A distinction has been highlighted that identifies the cultural with the masculine and the natural with the feminine.\(^{24}\) This sees men as those moving human knowledge and production forward with the role of women being to nurture and support. Women’s labour in this way could be seen to have been separated from the ‘industrialised’, male forms of productivity. The locations and networks of this industrial production and creativity have, through history, denied women equal access.\(^{25}\) The terms of creativity are, in this way, constructed from a non-neutral, masculine perspective. This, in its turn, pervades intellectual property law, the outward substance of which may be expressed neutrally, but whose premise can be seen to be based on the male creation of knowledge. Specifically, in relation to patent law and the monopoly it creates, it by its very nature gives preference to one social form of activity over another. While it may not be overtly recognisable, Halbert\(^ {26}\) holds that the masculine forms of production, labour and knowledge enjoy a position of privilege within the protective legal framework. As Barwa and Rai state:

> One can hardly be surprised that there are so few women inventors patenting their inventions. It is still more surprising that inventions made by women exist at all and that they are not only patented but also commercially developed.\(^ {27}\)

They\(^ {28}\) tell the stories of the female inventors whose contributions were exploited and often overlooked; they see this as a continuing product of societal and institutional prejudices that impede women’s participation in public life. Used as an example is herbal medicines, which were often developed, honed and used in the home by women but, when their commercial potential was realised, moved into the realm of predominantly male patent holders. This is then drawn back into the TRIPS agreement which, with its market-based focus on centralised, exclusive protections gives legal validity to those who can prove a claim based on a patriarchal definition of knowledge. This, in turn, increasingly marginalises, among others, women and exacerbates existing social and economic divisions.

While recognising that the TRIPS agreement, with its global protectionist stance, can perpetuate market-based inequalities, Shiva\(^ {29}\) suggests the development of ‘social patenting’, a shared legal protection that would recognise the on-going work of the communities that leads to the end result, the invention. This would address the disparities that are seen to arise in the individualistic, winner takes all current patent law framework. However, support for such a fundamental change is lacking.

**Debate 2: Does copyright law protect women’s creativity equally?**

While the low number of female patent holders is a statistically verifiable indication of gender disparities in IP law, other areas show more nuanced patterns. Unlike patents that require strict registration standards to be met, copyright, following the principles laid down in the Berne Convention, does not require registration to be afforded protection. Copyright protection is, in most jurisdictions, automatic on fixation, with countries of the Union created by the Convention

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\(^{24}\) Ortner, S. Is Female to Male as Nature Is to Culture? Feminist Studies 1 (2) (Autumn, 1972), pp5-31

\(^{25}\) Harding, S. The Science Question in Feminism (Cornell University Press, 1986) p143

\(^{26}\) Above: n:2

\(^{27}\) Barwa, S. and Rai, S. Knowledge and/as Power: A Feminist Critique of Trade Related Intellectual Property Rights, Gender, Technology and Development 2003 7 (1)

\(^{28}\) Barwa, S. and Rai, S.

\(^{29}\) Shiva, V. Poverty and Globalisation In: Goldstein, N. Globalization and Free Trade Checkmark Books, 2008 pp226-238
protecting ‘production in the literary, scientific and artistic domain’\textsuperscript{30} being open to legislate on the specific rules on categories that do not attract protection unless they are ‘fixed in some material form’.\textsuperscript{31}

The Berne Convention was the culmination of a series of conferences beginning in 1858 with the Congress of Authors and Artists,\textsuperscript{32} its main driving force was the Association Littéraire et Artistique Internationale (ALAI) and its founder, the author Victor Hugo. Its key aims included securing international copyright standards and ensuring ease of protection. With prominent novelists as key proponents of the legal harmonisation, the approaches taken were based on the individualised protection of the artistic, literary work. As with the debate above on patent law, this leads to collective production of knowledge, often carried out by women, struggling to fit within existing frameworks.

Halbert\textsuperscript{33} analyses the position of knitting, a predominantly female craft-based activity in which patterns were traditionally handed down by relatives and shared and transformed through communal interaction. Increasingly, however, knitting patterns are published in commercial publications with copyright asserted that, for example, prohibits the knitter from sharing the pattern or a modified version of it with others, or selling the finished article for profit. Knitters are increasingly aware\textsuperscript{34} of this profit-focused use of copyright that hampers organic creative development. This is supported by copyright law provisions, developed within a framework that prioritises ownership and market relations. As Halbert states:

\begin{quote}
A feminine way of producing knowledge within the realm of craft has been replaced with a way of producing knowledge that emphasizes abstract originality and authorship in the production of knowledge, instead of the relations built into culture and custom.\textsuperscript{35}
\end{quote}

Similarly, the practice of quilting as a predominantly female craft that strengthened intergenerational ties and depicted complex narratives\textsuperscript{36} revolves around collective production which, while original and artistic, does not fit with the individualised legal concept of for-profit IP protection.

Wider movements to address global inequalities in IP protection could have some impact on shaping future legal developments. In 2003 UNESCO adopted the Convention for the Safeguarding of the Intangible Cultural Heritage (ICH Convention), an international instrument developed in order to protect traditional culture across the globe, particularly in the face of increasing globalisation. Its creation rests on two key aims: to regulate the interaction of copyright protection and ownership of cultural heritage, and, secondly, to protect activities deemed important to cultural patrimony.\textsuperscript{37} It lists, among others, knowledge and practices concerning nature and the universe, and traditional craftsmanship as domains that comprise “intangible cultural property”.\textsuperscript{38} States Parties are tasked

30 Art 2(1) 
31 Art 2 (2) 
32 S. Ladas, S. The International Protection of Literary and Artistic Property New York: The Macmillan Co. 1938 pp71-72 
33 Halbert, D. Feminist Interpretations of Intellectual Property Journal of Gender, Social Policy & the Law 2006 14 (3) 1 
34 Copyright for Crafters (2008) http://girlfromauntie.com/copyright/ 
35 Halbert p442 
38 Article 2 (2)
with creating and updating inventories in order to protect the activities identified as cultural heritage. The effectiveness of the measures relies upon clarifying the nature of the Convention rights and finding methods of translating these rights into tangible legal protections. Brown highlights the potential for “sweeping claims of cultural ownership that have little basis in fact” and holds that a balanced approach to protecting valid cultural heritage needs also to facilitate open creative development. Cominelli and Greffe examine the interaction of the culturally developed creativity with traditional IP rights, highlighting problematic issues such as collective authorship, duration of protection, and the fixation of traditional knowledge which by its very nature is usually created through flexible, evolutionary interaction.

While the ICH Convention runs alongside the individualistic, market-driven IP framework, its operation can, argues Lixinski, empower communities to have some power over collective heritage. Furthermore, there is potential for this recognition of collaborative creation, often the realm of women, to draw new values into the concept of artistic creativity and production. Tellingly, however, the UK and the USA have not, as yet, ratified the ICH Convention, this follows an identified trend of Western States undervaluing protections for cultural heritage. Blakely outlines the position of the tartan as intangible cultural heritage, with the majority not covered by copyright due to difficulties relating to determining authorship or expiration of a potential term of protection. She sees the protection of intangible cultural heritage as providing ‘the opportunity for community groups to leverage the existing knowledge of that heritage for further social and cultural protection’ and calls for measures to protect tartans in the light of increasing commercialisation, including the UK’s ratification of the ICH Convention. The discussion follows the theme of collaborative, community-driven creative production not conforming to the male-designed notion of authorship.

Underscoring this approach, Bartow highlights how female creative production is, on the whole, given less attention and is deemed to be less valuable than male. She highlights how male, for example, writers, directors, composers, visual artists are dominant across the cultural sphere. In copyright law the wider framework of licensing and distribution has a fundamental impact on the prominence given to production emanating from certain sectors of society. These factors lead to the financial benefits of a framework that commodifies creativity being enjoyed more by males than females. She states: ‘Copyright laws were written by men to embody a male vision of the ways in which creativity and commerce should intersect’. Negotiating complex distribution and licensing arrangements and access to the law require resources and access to male-dominated structures and frameworks. At a basic level, the lack of formalities and low minimum threshold to attract copyright protection could, following the resource argument, be held to act in favour of women. However, this very lack of formalities, it is argued leads to a lack of clarity in relation to what is due copyright protection, which, in turn, disadvantages those creators who do not have equal access to legal advice and frameworks.

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39 Cominelli, F. and Greffe, X. Intangible cultural heritage: Safeguarding for creativity City, Culture and Society 2012, 3 pp245-250
40 Lixinski, L. Selecting Heritage: The Interplay of Art, Politics and Identity European Journal of International Law, 2011, 22 (1)
Writing in relation to fanfiction, Katyal emphasises how the traditional construction of intellectual property laws needs to evolve to address new issues of production in the online sphere. Fanfiction, at a basic level, involves building upon elements of existing works, such as characters, to develop storylines and situations. It covers a diverse range of creative activities in which, for example, new narratives are developed in existing worlds or characters in the original works move on different trajectories. The Harry Potter and Twilight books and films are examples of works that have spawned extensive fanfiction communities, strengthening end user connections to the works and creating new, dynamic, interactive worlds. The Internet provides a space, free from fixed structures and identities, that has facilitated collaborative production, mainly carried out by females, in a reflection of the discussion on craft protection above. In the UK, under the Copyright, Design and Patents Act 1988 the rights of an original author can be infringed if a substantial aspect of that original work is used. A core premise of copyright law is that the protection extends to the expression relating to a work, for example, dialogue, characters and situations, rather than its core central idea, for example the idea of a boy wizard at school. Depending upon the nature of the fanfiction, it often involves infringing activities due to unauthorised use of protected works.

In the USA, the doctrine of fair use can be applied to fanfiction, with its assessment of the purpose and character of the use, the nature of the copyrighted work in question, the proportionate amount of the copyright work that is used, and the effect on the market relating to the copyright work. In a recent US case relating to the publication of a book emanating from the online community site, the Harry Potter Lexicon, focused on the ‘transformative’ nature of the use of the original work. In the UK, following recommendations in the influential Hargreaves report, which stated: ‘Government should firmly resist over-regulation of activities which do not prejudice the central objective of copyright, namely the provision of incentives to creators’, an exception has been introduced into the statutory framework to allow fair dealing with a work for the purposes of parody, caricature or pastiche. Within the UK framework it provides protection for those extending original works in this manner, based on fair dealing principles which require an assessment of the scale of the copyrighted work used, the actual use made of the work, and the potential for the works to be in direct commercial competition. This reform is to be commended as it allows for more flexibility in relation to user-generated works but it is unclear the extent to which fanfiction will be protected as, it has been identified, it does not always specifically parody or criticise the original but adds to and extends it.

Conclusion
With a lack of clarity in the legal framework, fanfiction is an example of another area of IP law in which predominantly female creativity has been marginalised through the framework of legal protection. Coombe evaluates how this framework can either support or damage the interests of

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45 Jenkins, H. Textual Poachers: Television Fans and Participatory Culture 24-27 (1992)
48 Directive 2001/29/EC on the harmonisation of certain aspects of copyright law in the information society. Article 5(3)(k)
creators and the wider availability of certain kinds of works. She argues that the commodification of these rights of ownership have served to benefit those operating in the accepted mainstream while so-called outsider groups, including women, have been increasingly marginalised. Collective, collaborative, responsive, community-based forms of creation are not protected on the same basis as the mainstream in, what Craig identifies as:

a copyright regime which propertizes and over-protects the works of some authors while dismissing others as copiers and trespassers; which encourages some kinds of creativity while condemning others as unlawful appropriation; which values so-called original contributions but silences responses in the cultural conversation.51

While copyright law may operate under a substantive guise of neutrality it is its wider application, particularly in relation to its commercialisation, that leads to an unequal enjoyment of the wealth created by the legal framework.

Further reading:

- Burk, D. Do Patents have Gender? Journal of Gender, Social Policy and the Law 19(3) 6, 2011

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