A Message from the 2020-21 Chair:  
A Constant Reminder

By Denis Yanishevskiy, Immediate Past Chair

It would be impossible for me to en-compass in any kind of brief message everything that the year 2020 has wrought in our lives, not only, of course, as attorneys, but as members of the human race. In a word, 2020 was a year of unprecedence. The world saw radical developments at every end of every spectrum, in both mobilization and dissipation, in both innovation and stagnation, and in both continuity and interruption. Vaccines to battle COVID-19 were developed, tested, and put into use in under a year, companies digitized their transactions and interactions on a global scale up to ten years ahead of schedule, and remote and distanced education took on a life of its own. Simultaneously, however, the pandemic threatens food security, blockades necessary health care, and shoves the populace into poverty. Lives were ended and upended, and yet simultaneously, for a majority of the year, we were stuck inside our four walls. A microcosm of the world stage played out in my life over the past year as well.

And yet, despite it all, as a small reminder of life in the before-times, I continued to share in the fellowship of the PBA Intellectual Property Section and my colleagues in the legal world. For a brief hour every month, we tread familiar ground, glimpsed friendly faces, and heard reassuring voices. That comradery served as an anchor to some semblance of constancy, or normalcy, when we no longer bumped into each other at CLE events, no longer scheduled meals together, no longer socialized in the same room, but instead when every contact with the outside world was suddenly cautious, measured, and deliberate.

This issue of the newsletter celebrates my favorite accomplishment in the life of the PBA IP Section: the law student writing contest. The writing contest exemplifies the best of human endeavors, the perspective and thoughtfulness of the next generation of lawyers, who will undoubtedly continue to improve the practice of IP and the practice of law at large. They will form the next fellowship to see one another through the next crisis, and so on, and so on.

Although this present crisis is itself far from over, I think of the words of Samwise Gamgee: “How could the world go back to the way it was when there’s so much bad that had happened? But in the end, it’s only a passing thing, this shadow. Even darkness must pass. A new day will come, and when the sun shines, it will shine out the clearer.”

I do hope that our new day is coming, and until then, let us continue to find solace, strength, and perseverance in our shared experience as attorneys, colleagues and friends. Thank you all for your commitment and contributions to the section. It was a pleasure serving as your chair.
Progress and Potential – USPTO Study on U.S. Women Inventor-Patentees

Nicole J. O’Hara


By all accounts, we’re moving in the right direction, and focused on the right metrics. The PTO looks not only at numbers of applications and issued patents naming at least one woman, but also more meaningful statistics such as improvement of representation among leading corporate filers, and longer-term participation in the patent system by tracking new women inventors who file another application within five years.

• By the end of 2019, 21.9% of patents had at least one woman inventor, up from 20.7% in 2016.
• In 1980, the share of women among new inventors on issued patents was around 5%; in 2016, it had increased to 16.6%; and in 2019, it climbed to 17.3%.
• The “Women Inventor Rate,” tracking the percentage of patents issued to women inventors, jumped from 12.1% in 2016 to 12.8% in the subsequent three years.
• Finally, the gender gap in patenting longevity has been steadily closing. 46% of women inventors filing for the first time in 2014 filed another application within the next five years (i.e., by 2019), compared to 52% of new male inventors filing again in the same window. In contrast, in 1980, 28% of women inventors were repeat applicants, compared to 38% of male inventors.

While gains continue to be made, statistical disparities in indirect measures of equality, such as these by the USPTO, help us continue to identify underlying inequity and inadequacies and work towards a more resource-efficient society and economy. As summed up by Tian Wei, journalist and World Economic Forum leader: “A society that fails to harness the energy and creativity of its women is at a huge disadvantage in the modern world.”


How to contribute to the PBA Intellectual Property Law Section newsletter

All Intellectual Property Law Section members are invited to contribute to the section newsletter. Articles must be related to intellectual property and preferably between 500 and 1,500 words long.

To submit an article or for inquiries, please contact Denis Yanishevskiy. To avoid duplication of topics, it is suggested that you submit your topic to the editor before writing your article.

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Introduction

The United States patent system is not a natural vehicle for feminist objectives.1 “The history of intellectual property is a history of expansion ... of both the subjects protectable and the rights given individuals over their property.”2 However, this expansion has not encompassed all people or all ideas. In fact, the patent system is often criticized as being distinctly anti-feminist.3 The history and persevering gender disparities in the patent system ought not to be used to close off a valid avenue for women’s empowerment. “Women’s bodies and minds are storehouses for potential patentable subject matter.”4 These storehouses remain largely untapped. Rather than getting hung up on the classic question, “Where are the women?,”5 we should focus more on the question, “Where can they be?” Feminist objectives that have not been adequately incentivized are underrepresented in the field of innovation. One such feminist objective that can be—and was—achieved by means of the patent system is the development and dissemination of the hormonal birth control pill (the pill).

Birth control has long been acknowledged as a critically important invention in equalizing the roles of men and women.6 “[T]he biological family unit has always oppressed women ... but now, for the first time in history, technology has created real pre-conditions for overthrowing these oppressive ‘natural’ conditions along with their cultural reinforcements.”7 Many researchers have sought to prove the correlation between pill access and women’s improved position in society.8 These endeavors have proved largely successful, as pill access and metrics to analyze women’s societal improvements have increased in lockstep.9 However, little research has been done to connect the inventive activity relating to pills with feminist goals of equality and liberty. In fact, little research has been done to show relationships between inventive activity and any societal result at all. This article seeks to prove correlation between relevant inventive activity at the United States Patent and Trademark Office (USPTO) and various metrics that relate to women in society.10

Patents existed before the United States was founded, but find their domestic origin in the United States Constitution.11 They play an undisputedly important role in the United States economy.12 Because of the massive financial gains limited monopolies promise to inventors, patents are important tools to ensure a steady and exclusive flow of money for inventors and their assignees. In no field is this more apparent than the pharmaceutical industry.13 “[D]espite its meteoric rise, the contraceptive industry remains an unexplored chapter of American history. Studying the birth control movement chiefly as a medical or political phenomenon, historians have discounted the social significance of its commercialization.”14 Rather than discounting the scientific aspects of this movement in favor of the social aspects, this article seeks to relate the two. Often, the claim that the patent system promotes inventive activity is announced as fact without analyzing its truth.16 This article seeks to provide evidence of correlation between patent protections and utilitarian benefits.

Because intellectual property rights may result in increased product prices, protection incentivizes inventive activity.17 The monopolistic right guaranteed by patent protection reduces the free flow of inventions into the public

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domain. Although the exclusive rights guaranteed by patent protection are subject to criticism, in a capitalist society, extrinsic motivation to invest in, develop, test, market and sell inventions, such as pharmaceuticals that are known for their high costs and even higher failure rates, is essential.\(^{18}\)

Without the limited monopoly granted to patent owners, incentives to invent would be reduced, as generic competitors would have quick and unrestricted access to the marketplace. Therefore, innovation requires a reward for increasing research and development—as well as other expenses—of new and useful drugs.\(^{19}\)

Despite the now-wide dissemination and long-standing use of the pill,\(^{20}\) this “wonder drug”\(^{21}\) is far from perfect.\(^{22}\) For this reason, continued incentivization by means of temporary monopolies is essential to continue fostering innovation and improvements in the field of contraceptive technologies. It has long been acknowledged that economics are a driving force behind innovation, especially where industries recognize a gap in available technologies—an opportunity.\(^{23}\) The utilitarian function of the United States patent system weighs particularly in favor of the public in the pharmaceutical industry, which includes hormonal birth control, because of the longer period of time necessary between filing for patent protection and the first introduction to the marketplace; therefore, inventors’ exclusive rights only exist for a shorter period.\(^{24}\) This promises maximum public benefits from technological innovation, as they gain liberal and cheap access sooner than in other industries.

**Background**

The infrastructure that forms the basis of our society was built by and for men.\(^{25}\) Patriarchal beliefs—those that assume men are superior to women—have been a cornerstone of many cultures across the globe.\(^{26}\) It is natural to conclude that a society that was built by those who believed that women are less capable and deserving than men would result in “political, economic, social, and cultural” inequalities across gender lines.\(^{27}\) It is also natural to conclude that many of these inequalities are based on perceived differences between men and women.\(^{28}\) The most fundamental of these differences is the role of men and women in reproduction.\(^{29}\)

While it takes two to tango, women are typically expected to take a more active role in the bearing and rearing of children.\(^{30}\) This default responsibility has been true for so long that it is mere speculation as to cause of these dividing lines between the genders, although it is probable that women’s exclusive ability to carry children was a contributing factor.\(^{31}\)

Martha Nussbaum’s capabilities approach to social justice encompasses how patriarchal assumptions about the roles of men and women and their respective innate capabilities affect women’s abilities to gainfully interact with and within their communities.\(^{32}\) “Unequal social and political circumstances give women unequal human capabilities.”\(^{33}\) While Nussbaum’s approach, as well as most Western feminist approaches, has been criticized as attempting to define equality and a “good life” through one lens, I believe that an approach that relies on maximizing individual liberties to find freedom is as fair a view as there is.\(^{34}\) Nussbaum argues that, despite some requisite level of abstraction, her theory does more to actually help individual women by defining and demanding a certain degree of freedom and rights for all.\(^{35}\)

Nussbaum emphasizes that capabilities, not functionings, are the metric by which to measure women’s flourishing.\(^{36}\) This is portrayed by the freedom of choice that comprehensive, effective and readily available contraceptives promise women. Arguably, however, women do have the “capability” to have children, whereas men do not. However, the social cache of capabilities relates to the choice to exercise abilities to which one has access. When discussing women’s empowerment, it is important not to “romanticize the control that comes from [women’s] biological connection to childbearing, or to underestimate its repressive social aspects for women.”\(^{37}\) “Pregnancy is barbaric ... Childbirth hurts. And it isn’t good for you.”\(^{38}\) Despite the pride that can come as a result of having and raising children, that pride can only be improved when there was an actual choice made to do it. Contraceptives do not mandate that women restrict, limit

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or control their reproduction—they merely give them the freedom to do so. Women have been trying for as long as society can remember. Because women’s right to control their reproductive health operates at both the macro level—political, social and technological trends—as well as the micro level—each individual woman’s choice that she makes, when given the opportunity—increasing freedom for all results in greater freedom of choice for each. By maximizing the ease with which individual women can exercise control over their reproductive health, the macro level will reflect a steady change in the economic, social and political roles of women. Although “our control over this familiar and precious possession is never total,” it is still critical to continue working towards extending and expanding it.

Further, by achieving overarching societal changes, each woman will benefit in turn. This positive feedback loop of gradual and incremental changes will be the best avenue by which to achieve equality between men and women. When women have the freedom to control their own reproductive health, they are able to engineer themselves to fit within a society not built for them. With the advent of the pill, equality between the genders finally became possible.

Nussbaum’s capabilities approach is no stranger to the patent law discussion. In fact, her theory has often been used in order to reconcile the apparent dichotomy between the utilitarian benefit of patent protections with the apparent removal of inventions from the public domain. In order to truly view patent law as a utilitarian public good, however, one must first trust that the monopoly is essential to incentivize innovation, rather than a superfluous benefit for what an inventor would already have done. Especially with pharmaceutical patents, this assumption is an easy one to make—all the pride in the world cannot incentivize a company to spend more than $800 million on research and development without the promise of an added economic incentive.

A Discussion of Patent Law and a Survey of Relevant Patents

This section will discuss patents in general, pharmaceutical patents specifically, the methodology of this study, and the results of the patent survey. The discussion of patent law and pharmaceutical patent law is relevant to understanding the basis of and desire to conduct the correlation analysis below.

Patents are critical to innovation and are based exclusively on utilitarian grounds, as opposed to other forms of intellectual property. In fact, most scholars believe that “[p]atent law is our primary policy tool to promote innovation, encourage the development of new technologies, and increase the fund of human knowledge.” Therefore, patents are believed by economists to be critical to the market for new and useful inventions. This is mainly theoretical: as the patent system is so essential to the foundation of the United States, the country has never existed without patent law. However, strong evidence supports America’s pride in its patent system; foreign inventors often utilize its patent system to protect their inventions. The United States, despite being crowned the “largest single source of new inventions,” is faced with increasing competition for that title as the “innovation capacity” of other countries grows. Despite this, other countries’ weak, unenforced or nonexistent patent protections spur foreign inventors to file in the United States. Although the innovation is taking place outside of the United States, the promise of patent protection is still a motivator in a global economy that allows for international patent protection. It is logical to conclude that within the United States, the highly protective patent system is a strong incentive to innovate.

Despite the existence of some evidence that supports the utilitarian lens of the United States patent system, there is little quantitative evidence to support the benefits of its monopolistic rights. The idea that “[p]atents encourage individuals to develop, disclose, and popularize new technological
inventions” is repeated by theorists, but is no more than a truism without evidence to support it.\textsuperscript{54} Joseph A. Schumpeter, a noted economist, was the first to attempt to analyze the economic, political and social effects of patent systems.\textsuperscript{55} He found that post-invention investment activity was critical to making true large-scale change and that patents were an important way to encourage it.\textsuperscript{56} The role patents play in investment activities is now generally accepted, further evidencing the social benefits of patent law.\textsuperscript{57} Although this research lays the groundwork for supporting the utilitarian lens of patent law, it does not provide enough support for the claim that the patent system actually causes—or is at least associated with—increased social benefits.

Improving access to yet more “public goods” necessitates the patent system.\textsuperscript{58} Patents, though a reward in and of themselves, do not operate in a vacuum. Rather, the true reward is the market advantage of creating something worthwhile. Patents are merely a means to that end as monopolies would otherwise be far more difficult to possess, if not impossible.\textsuperscript{59} The market is in turn impacted “(1) by increasing transaction efficiencies and stimulating competition, (2) by establishing ... the market for innovative control that provides incentives for efficient investment, and (3) by promoting the financing of invention and innovation.”\textsuperscript{60} Patents help inspire innovators to develop their inventions, but also are critical in obtaining investments and commercializing inventions.\textsuperscript{61} Truly beneficial innovations can be extremely valuable assets to society; however, such inventions are often faced with the highest upfront costs.\textsuperscript{62} These patents are only as strong of market forces as the market’s demand for them allows.\textsuperscript{63} Therefore, the patent system typically only allows profits proportionate to utilitarian value. This prevents, to some extent, patent claim holders from setting abusive prices that deny their target market from reaping the rewards of their innovation. One of the classifications of patents that provides a high percentage of these beneficial innovations is pharmaceutical patents.

Pharmaceutical patents play an important role in the drug industry, as well as the field of patent law. They are “often held out as an example of the patent system at its best.”\textsuperscript{64} Hormonal birth control fits squarely within this industry, and the significance of patents specific to the field—that the formula must be disclosed to be distributed—applies equally.\textsuperscript{65} Despite the shorter duration of pharmaceutical patent protection as a result of longer wait periods related to testing and approval, the pharmaceutical industry is still lucrative enough that patent protection is an important and valuable asset and incentive to innovate.\textsuperscript{66} In fact, patent protection is hailed as one of the primary reasons for the success of the pharmaceutical industry, as without it, initial inventors would not be able to delay generic competition and would thus not be able to recover their research and development costs.\textsuperscript{67} Pharmaceutical innovators are denied the choice as to whether to “maintain their innovations as trade secrets or disclose them in exchange for patent protection,” as they are required to disclose to comply with FDA requirements.\textsuperscript{68} For that reason, the pharmaceutical industry is the perfect view of what happens when innovation and patent protection most overlap.

Although there are criticisms of the United States patent system and the veracity of the assertion that it truly inspires innovation and benefits the public, it is clear that the promise of a limited monopoly promotes inventive activities.\textsuperscript{69} However, some do still attempt to deny the importance or ethicality of the patent system.\textsuperscript{70} This article operates under the opinion that increasing drug prices, frivolous litigation by nonpracticing entities and evergreening are “ancillary to patent theory, policy, and reform.”\textsuperscript{71} These phenomena, although blights on the system and in need of serious and concerted efforts to remedy, are the exceptions to the general rule that patents are a net positive for society. Unlike those useless inventions used to inequitably leverage economic power over those who have created truly valuable contributions to society, the pill has an undeniable value that has a well-researched and nearly universally appreciated beneficial impact on society.\textsuperscript{72} This well-developed area of study provides a unique opportunity to observe and quantify the relationship between patent protection and societal change.

In order to analyze the role of pill patents in women’s continued fight for equality, various patents needed to be found and examined. The methodology is relevant in showing how these patents relate to one another and in showing the limitations in the process.

First, several keyword terms were used to search the USPTO’s Patent Full-Text and Image Database.\textsuperscript{73} These terms included, but were not limited to, the following and combinations thereof: oral, contraceptive, birth control, ovulation, progestin, estrogen, androgen, hormone and fertility. This search resulted in 35 patents. Only inventions that eventually issued as patents were used in this analysis.

The patent numbers that these searches generated were then searched in the Google Patents database.\textsuperscript{74} PDF documents of these patents were downloaded. Each of these patents have a list of References Cited, which includes United States Patent Documents. No foreign patent documents

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were used in this analysis. Each of these cited documents were searched on Google Patents, and PDF documents of relevant patents were downloaded. This yielded 63 additional patents. Again, the References Cited sections were used to find additional relevant United States patents. This yielded another 37 patents.

This process resulted in 135 total patents. The title, patent number, assignee, earliest filing date and patent date of each of these patents were collected. While extensive, this pool of patents clearly does not encompass all of the those relating to pills, partly because the search was limited to the United States, despite the market for drugs being international. Additionally, it was not possible to encompass all other forms of birth control, which certainly affected the totality of contraceptive use in the United States. Rather than attempt to create a holistic view, this study is intended to be limited and more exemplary of a form of study that could be conducive to more thoroughly understanding the patent system and its potential impacts on society. The pill was selected because it has consistently been the most popular form of nonpermanent contraception in the United States, and its development and dissemination most closely relates to the improved situation of women in society. This sample does not need to be exhaustive in order to analyze the relationship between pill patents and women's liberation. This sample size is large enough to be illustrative.

The number of patents, as broken down by decade, directed towards hormonal contraceptives is shown in Table 2 and in Graph 1. Graph 1 shows that these patent filings follow an approximately normal curve, indicating that patent filings ramped up, peaking in the 1990s, then dropped off.

### Table 2:

<table>
<thead>
<tr>
<th>Decade</th>
<th>Number of Patents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960s</td>
<td>11</td>
</tr>
<tr>
<td>1970s</td>
<td>22</td>
</tr>
<tr>
<td>1980s</td>
<td>33</td>
</tr>
<tr>
<td>1990s</td>
<td>43</td>
</tr>
<tr>
<td>2000s</td>
<td>21</td>
</tr>
<tr>
<td>2010s</td>
<td>5</td>
</tr>
</tbody>
</table>

Many of the patents were directed towards methods, which can often result from patentees wishing to extend the life of patented inventions. Of the 135 patents, forty-one had “method” or “methods” in their titles. This is because a new use of a patented invention is itself a patentable invention.

### Feminism by the Numbers

Many scholars have dedicated concerted effort towards evaluating the effects of contraceptive access on women's changing roles in society. Others are less convinced that women's roles in society have changed in the last several decades, alleging that the purveying view that women are seeing rising employment rates is merely a myth. Much of this relates to increased demand for women to step into the workforce when men were absent because of wars overseas. This resulted in increased employment rates for women, but without any of the ancillary benefits, such as improved wages and education. However, almost every valuation has confirmed what instinct would have you believe: Contraceptives benefit women. Beyond this, they also benefit the children of the women who have access to contraceptives, as well as men. By every metric, adequate and accessible family planning is good for society and good for individuals. This section will discuss several studies briefly to give an idea of the many ways in which life is improved by contraceptives.

Mortality rates have decreased in the decades since the pill was invented and disseminated. In 1965, the maternal death rate was 0.032% in the United States. This was reduced to 0.013% by 2007, a reduction of approximately 60%. Infant mortality rates decreased by 76% between 1965 and 2011. Mistimed pregnancies, discussed above as being particularly harmful to women's flourishing, decreased from 45% of all births to married American women in the 1960s to just over 16% in 2006 to 2010.
Patents as an Avenue for Women’s Empowerment: The Birth Control Pill

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“The pill had a direct positive effect on women’s career investment by almost eliminating the chance of becoming pregnant and thus the cost of having sex. The pill also ... encourage[ed] the delay of marriage generally and thus increasing a career woman’s likelihood of finding an appropriate mate.”

Women’s ages at the time of their first marriage increased drastically in 1972, soon after the pill entered the market. Even the way people, including women, view women’s freedom to choose what to do and when to do it has changed in the decades since the pill was introduced to the market. This also results in a less off-center “balance of power” within couples.

Women’s representation in the labor force increased from just over 26 million in 1965 to 73 million in 2014. Married women’s participation in the labor force nearly doubled between 1960 and 2013. By 2012, approximately 29% of women in heterosexual dual-income families earned more than their husbands. This number appears to have increased further, as in 2015, in more than 40% of households with children, women were the primary earners. Between 1960 and 2014, women increased from 3% of the lawyer population to 33%. In the same period, women who had four or more years of college increased from nearly 6% to 37%. The percentage of doctorates awarded to women in the same period increased from 10% to over 50%. Women’s wages have increased since the 1960s, with some commentators alleging that one-third of the wage gains are attributable to access to the pill. The wage gap continues to narrow further in younger generations, in addition to over time. Because of the extensive research regarding the impacts of dissemination of the pill, this technological development provides an avenue by which to examine the relationship between patent filing activity and social changes.

Correlation of Contraceptive Technology and Its Availability with Women in Society

In order to prove correlation, I grouped the data into ten-year increments. These data are found in Tables 3 to 6. Table 2, above, represented the decade-value of the patents, which was compared against values relating to Female Employment (Table 3), Female Education Attainment (Table 4), Female Earnings (Table 5), and Employment of Women Married to Men (Table 6).

### Table 3: Percent of Female Population Working

<table>
<thead>
<tr>
<th>Decade</th>
<th>Average Percent of Employed Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970s</td>
<td>43.00</td>
</tr>
<tr>
<td>1980s</td>
<td>50.29</td>
</tr>
<tr>
<td>1990s</td>
<td>55.41</td>
</tr>
<tr>
<td>2000s</td>
<td>56.00</td>
</tr>
</tbody>
</table>

### Table 4: Percent of Female Population with at Least a College Degree

<table>
<thead>
<tr>
<th>Decade</th>
<th>Percent College Graduates</th>
</tr>
</thead>
<tbody>
<tr>
<td>post-1960s</td>
<td>11.2</td>
</tr>
<tr>
<td>post-1970s</td>
<td>18.7</td>
</tr>
<tr>
<td>post-1980s</td>
<td>24.5</td>
</tr>
<tr>
<td>post-1990s</td>
<td>30.1</td>
</tr>
<tr>
<td>post-2000s</td>
<td>36.4</td>
</tr>
</tbody>
</table>

### Table 5: Average Woman’s Earning as Percent of Average Male Earnings

<table>
<thead>
<tr>
<th>Decade</th>
<th>Average Percent of Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980s</td>
<td>68.00</td>
</tr>
<tr>
<td>1990s</td>
<td>75.31</td>
</tr>
<tr>
<td>2000s</td>
<td>79.48</td>
</tr>
<tr>
<td>2010s</td>
<td>79.31</td>
</tr>
</tbody>
</table>

### Table 6: Wives in Opposite-Sex Marriages Who Work

<table>
<thead>
<tr>
<th>Decade</th>
<th>Percent of Wives Working Average</th>
</tr>
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<tbody>
<tr>
<td>1960s</td>
<td>46.50</td>
</tr>
<tr>
<td>1970s</td>
<td>50.33</td>
</tr>
<tr>
<td>1980s</td>
<td>58.13</td>
</tr>
<tr>
<td>1990s</td>
<td>63.76</td>
</tr>
<tr>
<td>2000s</td>
<td>63.05</td>
</tr>
</tbody>
</table>

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Graph 2: Metrics of Female Flourishing by the Decade, 1960s-2010s

Each of these values from Tables 3 to 6 was measured against the values from Table 2 in order to calculate the Pearson correlation coefficient. The Pearson correlation coefficient is calculated as follows:

The n-value is the number of values that are in both the patent column (Table 2) and the second column (Tables 3 to 6). The x-value is the number from the corresponding decade in Table 2. The y-value is the number from the corresponding decade in one of Tables 3 to 6. The results, rounded to the nearest hundredth, are as follows:

<table>
<thead>
<tr>
<th>Table 7: Pearson Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Population Who Work</td>
</tr>
<tr>
<td>Female Population with at Least a College Degree</td>
</tr>
<tr>
<td>Average Woman's Earning Compared to Average Male Earnings</td>
</tr>
<tr>
<td>Wives in Opposite-Sex Marriages Who Work</td>
</tr>
</tbody>
</table>

Correlation coefficients are classified as "very weak," "weak," "moderate," "strong" or "very strong." They are also either negatively correlated or positively correlated.

The correlation between hormonal contraceptive patents and the percent of female population working, 0.40, is classified as moderately positive. This indicates a potential moderate relationship between these two variables, wherein increased patent filings are correlated with increased percentages of women working.

The correlation between hormonal contraceptive patents and the percent of female population with at least a college degree, 0.54, is classified as moderately positive. This indicates a potential moderate relationship between these two variables, wherein increased patent filings are correlated with increased percentages of women with college degrees.

The correlation between hormonal contraceptive patents and the average of women's earnings as percent of average male earnings, -0.59, is classified as moderately negative. This indicates a potential moderate relationship between these two variables, wherein increased patent filings are correlated with decreased female earnings as a percentage of male earnings. Notable of this correlation coefficient specifically is the period of overlap between the two data sets. Unfortunately, the data set relating to women's earnings begins in 1980 and does not encompass the 1960s and 1970s, decades with increasing frequency of pill patent filings. Rather, this data set was tested against the period of time in which patent filings were on the decline, causing this value to possibly be skewed. This correlation coefficient being negative, whereas the other three are positive, is indicative of the above-discussed limitations of this study, as well as correlation analyses in general.

The correlation between pill patents and the percent of wives in opposite-sex marriages who work, 0.73, is classified as strongly positive. This indicates a potential strong relationship between these two variables, wherein increased patent filings are correlated with increased wives working. This makes logical sense, as married women were the first ones to have access to birth control legally in the United States; therefore, their use frequencies are most likely to track along with the accessibility of pill technologies. This provides a strong basis to argue that patent filings and women's flourishing are correlated and other metrics would also be more strongly correlated if access were permitted.

What Next

Incentivizing innovation is, admittedly, a double-edged sword when it comes to patent law. I acknowledge that, in recommending increased inventive activity, I am advocating for expensive, and often unattainable, medicines. However, "[a]lthough the temporary high prices that result from patent protection are a significant problem, the benefits of the patent system can sometimes outweigh these costs." I believe that in the field of contraceptives, it is particularly true...
that the monopolistic harms are outweighed by the eventual gain of society. Because there is already an abundance of contraceptives on the market, ranging from free to quite expensive, there is not currently an innovation vacuum. While this may decrease the demand for new and innovative inventions, it also decreases the social harm of dangling unreachable commodities just out of reach. Despite the benefits promised by patent law, the patent system has, in recent years, been subject to public and political scrutiny.

Much of this scrutiny is the result of the public belief that evergreening and patent trolling are widespread and large-scale issues. Additionally, patents being used to escalate prices—especially drug prices—to abusive and unreasonable levels have caused a public outcry to curtail the monopoly power of patents. However, for the above-discussed reasons, the monopoly power is an essential incentive for innovation in a marketplace with such high upfront costs as pharmaceuticals. The “bad apples”—nonpracticing entities, patent trolls and evergreen filers—cannot be found to spoil the patent system for everyone. This would have echoing effects among private inventors, innovative companies and the public at large.

Beyond a blanket recommendation to continue incentivizing innovation, I would also suggest that more targeted incentives are in order. Certain demographics are woefully underrepresented in the field of intellectual property. When asked what the connection between feminism and patent law is, scholar Peter Jaszi concluded that they “lacked any connection[] whatsoever.” Because of the important role that intellectual property can play in furthering human progress, it is critical that it furthers all human progress, regardless of race, gender, sexual orientation, or religion. This article joins several others that, in response to Jaszi’s pronouncement of disconnectedness, attempt to find some connection between women and patent law. It is accepted that “[i]ntellectual property laws can play a critical role in promoting or hindering human progress,” but I argue that the products and the protection are both means to end goals.

By ignoring much of the work done by women—as was criticized above in Part II—the patent system joins many of the other institutions of society that undervalue women’s work. This disparity is present at every level of the patent system, to a degree that is not explainable as just relating to the underrepresentation of women in STEM fields. “One of the ways in which women are subordinated to men is through the devaluation of their work.” Women are underrepresented in intellectual property litigation, commercialization of inventions, and in the USPTO itself.

When human progress and wellbeing are intended goals of the patent system, and more people from more walks of life are welcomed into the system, the resultant inventions will benefit those groups that had been previously left behind by the patent system. Intellectual property rights present a unique opportunity for social uplift for underrepresented communities, as they do not inherently require extrinsic tools; rather, they rely on what originates from within. For this reason, the “progress” promised by Article I, Section 8, Clause 8 of the Constitution should be used for social progress in addition to technological. President Obama criticized the United States’ rate of invention, questioning “whether the United States was innovating at its fullest potential.” Encouraging women to participate more fully in innovation would allow the United States to perform closer to what is possible.

This study was intended to be focused and narrow. However, that does not mean that this is as far as this area of research can go. In fact, I have several suggestions for what can come next. First, I suggest connecting FDA drug approval with the date of patent issuance in order to correlate access with patent filings and dissemination. Second, I suggest conducting a differences-in-differences analysis between patent filings and quantitative measures of women’s flourishing. Finally, I suggest a study regarding the correlation or causation between all contraceptive patent filings—or isolated studies of the other forms of contraceptives—and metrics of women’s flourishing. These other avenues for studying the relationship between patents and societal effects would provide a more holistic view of the utilitarian goal of the patent system.

Conclusion

Much like the innovation vacuum that spurred inventive activity of contraceptives, there is currently a dearth of academia relating to the societal impacts of patent activities and the relationship between women and the patent system. This study does not purport to fill this entire gap; rather, it attempts to provide a base point for academics to more thoroughly address the relationship between patenting activity at the USPTO and social impacts of these inventions. Through the correlation analysis, there does appear to be some connection between hormonal birth control patent filings and the social benefits attributed to the dissemination of the pill. Women, however, remain an underserved market, an unresearched topic of intellectual property law, and an underutilized pool of inventors that should be embraced by the field of innovation.
Endnotes

1 See Wendy W. Williams, The Equality Crisis: Some Reflections on Culture, Courts, and Feminism, 7 Women's Rts. L. Rep. 175, 175 (1982) (“To say that courts are not and never have been the source of radical social change is an understatement.”).


4 See Laura A. Foster, Patents, Biopolitics, and Feminisms: Locating Patent Law Struggles Over Breast Cancer Genes and the Hoodia Plant, 19 Int'l J. Cultural Prop. 371, 371 (2012). Foster's article discusses women as sources as "biocapital" predominantly, rather than this article's discussion of women as beneficiaries of technical developments, as well as contributors to the innovation field.


6 The Birth Control Pill: A History, Planned Parenthood, https://www.plannedparenthood.org/files/1514/35187/100/Pill_History_FactsSheet.pdf (2017) (“In 1993, The Economist named the birth control pill one of the Seven Wonders of the Modern World because ‘When the history of the 20th century is written, it may be seen as the first [time] when men and women were truly partners. Wonderful things can come in small packets.”).


9 Goldin, supra note 8, at 3-4 (discussing direct effects on women's career investment, delaying marriages, and attending professional school).

10 Although I would have liked to, I do not intend to argue that I can prove causation here. Suggestions for a study that could potentially illuminate potential causation are discussed in VII(f) below.

11 “To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.”

12 See David F. Spilber, How Patents Provide the Foundation of the Market for Inventions, Northwestern University, 58 (2014) (“The market for inventions, whether in the form of disembodied technology or discoveries embodied in products, services or production processes, offers efficiencies that are closely related to how markets perform in other areas of the economy.”).


16 See infra Part IV.


18 Id. at 5.

19 Risa Kumazawa, Patenting in the Pharmaceutical Industry, http://dx.doi.org/10.5772/68102, 2 (“Economists have long established a positive link between research and development (R&D) expenditures and innovation, as measured by patenting activity.”).

20 Tone, supra note 15, at 485 (calling dissemination of birth control a “meteoric rise”).


23 See Tone, supra note 15, at 485 (“Decades before the Pill became a household word, the political economy of birth control in the United States had already been shaped.”).

24 Lehman, supra note 13, at 7.

25 See Williams, supra note 1, at 175 (“women's equality as delivered by the courts can only be an integration into a pre-existing, predominantly male world.”). See also Preeti S. Rawat, Patriarchal Beliefs, Women’s Empowerment, and General Well-being, 39 The J. for Decision Makers 2 (2014); Ritu Prasad, Eight Ways the World is Not Designed for Women, BBC News (June 2019).

26 Rawat, supra note 25, at 43. It is important to note that this article is written about Indian society, which differs from the political economy of birth control in the United States had already been shaped.

27 Id.

28 Although there is a discussion to be had regarding the appropriateness of discussing “inherent biological differences” between the two sexes and the role of gender identity in a heavily gendered society, this article does not intend to have that discussion. Much, if not all, of the discussion of what women and men should do is inherently based in perceived differences between the two, but I acknowledge that, when discussing cisgender men and women, the ability to reproduce is a critical difference. Further, statistical data are divided along binary gender lines, requiring this lens to view the effects of the birth control pill. See Gender Roles, ILO International Training Centre, http://www.glopp.ch/AS/en/multimedia/AS_1_pdt1.pdf (2008). It is worth noting, however, that similar discussions may be had with regards to other marginalized communities and the role of technology in exasperating disparities, but also as a means to improve those communities’ situations. From this point forward, "men" and "women" will be used to refer people of reproductive age who were assigned male at birth and assigned female at birth, respectively.

29 See id.

30 See id.


33 Id.


35 Additionally, Nussbaum's attempts to create a "normative theory responsive to empirical facts" are greatly appreciated when trying to relate feminist issues with numerical data. Id. at 257.

36 Id. at 257-58 ("Nussbaum defines a certain level of abstraction as necessary but also criticizes feminist philosophy influenced by postmodern literary theory as being too abstract and of no practical value because, in her own words, it 'does not help us see or understand real women's lives better.' Nussbaum describes instead a 'threshold' level of capabilities that forms the basis for constitutional principles citizens can demand from their governments.").

37 Nussbaum, supra note 32, at 132.


39 Firestone, supra note 7, at 198 (emphasis omitted).

40 Id. at 129 (“The central question asked by the capabilities approach is... What is [the woman] actually able to do and to be?”).

41 See Petchesky, supra note 37, at 661 (“The lengths to which women go to control their conditions of reproduction—whether, when, how, and with whom they would bear children—are amazing and persistent.”).

42 Id. at 663 (“The author’s argument is that reproductive freedom—indeed, the very nature of reproduction itself—is irreducibly social and individual at the same time; that is, it operates ‘at the core of social life’ as well as within and upon women’s individual bodies.”).


marketing this technology, I found no indication that this was something that actually occurred in this field. I do, however, acknowledge that a system that allows filers to maintain exclusive rights over technology that would benefit others does have some downsides.

See, e.g., E. Richard Gold et al., Are Patents Impeding Medical Care and Innovation?, 7 PLOS Medicine, 1 (2009).

Contra Devlin & Sukhatme, supra note 48, at 901 ("As a patent monopoly carries with it potentially large social welfare costs, it can be condensed only when necessary to incentivize the creation and dissemination of disproportionately valuable information.").

http://patft.uspto.gov/netahml/PTO/search-adv.htm

https://patents.google.com/


See, e.g., Valerie Kinside Oppenheimer, Demographic Influence on Female Employment and the Status of Women, 78 Am. J. Sociology 946, 947 (1973) (discussing women’s changing input in economy starting in 1940s).


Id.

Id.

Id.

Id.

Id.

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