



THE ROLE OF TRUST IN ADVANCING EQUITY IN INNOVATION

Prepared for Invent Together
by Research 2 Impact

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ABOUT THIS REPORT

This report explores the role of trust in whether and how inventors from historically underrepresented groups choose to engage in patenting, who they decide to collaborate with, and how their experiences with the process itself as well as working with others to navigate it can affect their level of trust and engagement. It draws on qualitative data from 8 focus groups, which included 12 potential inventors and 19 inventors from diverse backgrounds, as well as quantitative data from nearly 900 respondents to a survey developed specifically for this project. This report highlights major barriers faced by women and people of color in accessing and navigating the patenting process and the different ways in which a lack of trusting relationships may hinder their success. Based on our findings, we present several recommendations that educational institutions, government institutions, technology transfer offices, corporations, and other service providers can implement to build trust with inventors from historically underrepresented groups and drive more equitable engagement in innovation and patenting.

ABOUT RESEARCH 2 IMPACT

Research 2 Impact (R2I) is a research consulting practice started in 2021 by economist Jessica Milli, Ph.D. Our mission is to help organizations, philanthropists, and policymakers leverage research, data, and stories to drive social impact. R2I believes in the power of data and stories. We use a mixed-methods research approach to deliver compelling insights that can be leveraged to drive social impact. We also believe that there is no “one-size-fits-all” solution. Our experiences are shaped by our intersecting identities and, as a result, we face different challenges and have unique needs. This is why R2I strives to apply an intersectional lens to its work.

ABOUT INVENT TOGETHER

Invent Together is an alliance of universities, nonprofits, companies, and other stakeholders dedicated to broadening participation in inventing and patenting. Learn more at www.inventtogether.org.

ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

BACKGROUND

Research demonstrates that innovation and patenting are significant drivers of economic growth and individual opportunity.¹ Yet women and people of color are dramatically underrepresented among inventors in the United States.² Previous research has identified many factors that contribute to the lack of participation of people from historically underrepresented groups in patenting, including a lack of exposure to and education about patenting, limited connections to people who can help new inventors navigate the process, the financial cost of patenting, bias and discrimination, and institutional barriers.³

Even at universities and corporations where inventors have access to trainings, financial assistance, patent attorneys, technology transfer offices (TTOs), and other resources that can help break down many of the barriers to patenting that inventors face, women and people of color remain significantly underrepresented among inventors in those settings.⁴ This suggests that while access to resources in some settings can help some inventors from historically underrepresented groups participate in patenting, other factors may also contribute to a lack of participation. We hypothesize that inventors' trust in the patent system itself, the key individuals and institutions that inventors need to work with to patent their ideas, and even in themselves are important factors that may contribute to a lack of diverse representation. To our knowledge, the role of trust in innovation and patenting has not yet been explored in research.

The goal of this study is to understand the role of trust in whether and how inventors choose to engage in patenting, who they decide to collaborate with, and how their experiences with the process itself, as well as working with others to navigate it, can affect their level of trust and engagement. Trust, or a lack of trust, can shape how individuals consume information, who they seek out for support, how they engage with different people they may need to work with to pursue a patent, and how likely they are to pursue a patent for an idea.

We found that trust plays a pivotal role in an inventor's decision to pursue a patent when they have an idea for a new product or technology. Having a network of trusted support also significantly boosts inventors' confidence in navigating the different stages of the patenting process. Through our work in this study, we identified five key avenues for building trust in the patenting ecosystem: (1) Knowledge and Awareness, (2) Networks and Relationship Building, (3) Collaboration, (4) Transparency, and (5) Values Alignment. Each avenue presents unique challenges and opportunities for stakeholders to build trust and increase the participation of inventors from historically underrepresented groups.

1 Blind and Jungmittag, "The Impact of Patents and Standards on Macroeconomic Growth"; Rothwell et al., "Patenting Prosperity."

2 Toole et al., "Progress and Potential: 2020 Update on U.S. Women Inventor-Patentees"; Iancu and Peter, "Study of Underrepresented Classes Chasing Engineering and Science Success: SUCCESS Act of 2018"; Akcigit and Goldschlag, "Measuring the Characteristics and Employment Dynamics of U.S. Inventors."

3 Fechner, Schreurs, and Chung, "Increasing Inventor Diversity"; Shaw and Mariano, "Tackling the Gender and Racial Patenting Gap to Drive Innovation"; Milli et al., "Equity in Innovation: Women Inventors and Patents."

4 Toole et al., "Progress and Potential: A Profile of Women Inventors on U.S. Patents."

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KEY FINDINGS

Propensity to Trust: Survey respondents were generally trusting, particularly of those who were in a position to give them professional advice. However, most also exercise caution when seeking help at work or in their business.

- Two-thirds of survey respondents said they prefer to work through challenges related to work or business on their own.
- 73% of survey respondents agreed that it's best to keep ideas closely guarded to prevent others from stealing them.
- Black women were the wariest of trusting others. 97% felt it's best to be cautious before trusting people they don't know for professional advice and 91% said they would keep their ideas closely guarded.

Importance of Trust in the Decision to Pursue Patents: New inventors who were more trusting and had people in their networks that they trust were more likely to consider patenting and were more confident in their ability to navigate the different stages of the process.

- New inventors who were less trusting and more cautious when they needed professional advice were 18% less likely to consider pursuing a patent if they had an idea for a new product or technology.
- When they had people in their networks that they trust, they were:
 - 72% more likely to feel confident in knowing where to start and who to talk to.
 - 70% more likely to feel confident in being able to finance the cost of a patent.
 - 65% more confident in understanding what is required to apply for a patent.
 - 57% more confident in finding someone familiar with the process and can help them navigate it.

Lack of Patent Knowledge: When asked how trust could be built, focus group participants overwhelmingly felt that education and awareness were essential elements. They also noted that diversity and representation matter to women and people of color.

- 83% of potential inventors reported having minimal or no knowledge of patents.
- TV programming and news stories were common sources of information on patents for potential inventors, particularly among Hispanic and Black women and men.
- In many cases, fewer than 30% of potential inventors were aware of the different services and resources provided by key individuals and institutions in the patenting ecosystem.
- When they had little to no knowledge of the services and resources provided by key individuals and institutions, potential inventors were less trusting of them. They were 27% less likely to trust the USPTO, 24% less likely to trust patent examiners, and 25% less likely to trust their TTO if they had one.
- Focus group participants were more trusting of information presented by someone who looked like them and provided diverse examples that allowed them to see themselves as potential inventors.

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Negative Work Environments Erode Trust: Women and people of color were more likely to frequently experience behaviors such as people talking over them in meetings, coworkers taking credit for their ideas, being given undesirable work assignments, and being excluded from meetings or other social gatherings.

- More than 70% of women, regardless of race or ethnicity, reported frequent negative experiences in the workplace.
- Black women were the most likely to report such experiences (80%).
- More than half (55%) of Hispanic women said such experiences would have a moderate or significant negative effect on their willingness to share their thoughts and ideas with their manager(s). Similarly, 53% of Black women reported a negative effect on their willingness to share their thoughts and ideas with coworkers.
- More than 45% of Black and Hispanic women said that such experiences would negatively affect their willingness to ask questions or to seek help when they need it.
- Such experiences also eroded trust in coworkers and managers for nearly half of Black and Hispanic women.⁵

Transparency: Many study participants shared that their institution does not have clear policies and procedures in place that document how inventions should be disclosed and how they will be evaluated. This made them believe they were not being evaluated fairly, diminishing trust in their institution.

- When asked what institutions connected with patenting could do to build trust with them, nearly 10% of survey respondents who wrote in responses emphasized the need for greater transparency.
- One survey respondent described the need for clear communication and transparency throughout the process and its role in building a trustworthy reputation: “Increasing transparency and openness in decision making processes, being more responsive and communicative with stakeholders, prioritizing quality and consistency in the application and review of patents, and working to build a reputation for fairness and impartiality in dealings with inventors and businesses.”

Purpose-Driven Innovation: Women and people of color were more motivated to invent to solve societal problems and to benefit their communities. They were less likely to consider pursuing a patent for their inventions if they felt that patenting was at odds with their goals and motivations for inventing.

- This was particularly challenging for women and people of color in academic and corporate settings where inventors must disclose their inventions to their institution and assign them the rights. Focus group inventors struggled with this because they worried about how the invention would be used once they lost control over it.
- Among survey respondents, 35% of Hispanic women and 29% of Black women said that concerns about their invention not benefitting the populations they want to help may prevent them from pursuing a patent.

⁵ See Appendix Table A6.

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KEY RECOMMENDATIONS

The key findings in this study highlighted many ways in which stakeholders in the patent ecosystem can build trust within historically underrepresented communities and increase the participation of people from all backgrounds in patenting. These recommendations fall within three broad categories—Education, Public Policy, and Workplace Culture.

Education

We know that patent education is essential for navigating the patent process. Yet we found that most people have limited to no knowledge of patents and the key individuals and institutions that can help them protect their ideas. This lack of knowledge and awareness can make people less trusting of the patent system and the key individuals and institutions in the ecosystem.

Many study participants identified greater education about patents and the patent ecosystem as a key way stakeholders could build trust with potential inventors. Participants also stressed the importance of representation in educational materials and programming. Accordingly, stakeholders should make investments to:

- Develop and implement patent education curricula that are appropriate at different levels of educational attainment.
- Ensure that curricula emphasize diversity across different dimensions, including providing examples of diverse inventors, so that everyone can see themselves as inventors.
- Partner with trusted community leaders and organizations to deliver education and training on patenting.

Public Policy

Inventors need significant resources and support to patent their inventions successfully. They seek services from university TTOs, patent attorneys, and sometimes business support organizations. We found that some inventors have had bad experiences working with these organizations, making them less trusting of them. The inability of service providers to give adequate support and resources was the driving force behind some of the bad experiences, as was the adversarial nature of the patent examination process. Stakeholders should:

- Ensure service providers are equipped with educational resources about patents and appropriate resource referrals.
- Provide training to service providers on effective ways to engage with historically underrepresented communities and reimagine the patent examination process to be more collaborative and customer service oriented.

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Workplace Culture

Inventors most often work within teams. Workplace culture can tremendously affect how comfortable people feel in sharing their ideas, how they engage with their coworkers, and the extent to which they trust the different people they might have to work with to pursue a patent. However, more than 70% of women of all races and ethnicities experience behaviors such as people talking over them in meetings, coworkers taking credit for their ideas, being given undesirable work assignments, and being excluded from meetings or other social gatherings frequently.

As a result, they are far less trusting and less willing to share their ideas with others. This means that even at companies and institutions with the resources to support inventors, women and people of color are less likely to engage in patenting. Stakeholders must:

- Invest in strategies to promote inclusive and collaborative work environments to foster trust among employees.
- Develop clear and consistent procedures for the disclosure and evaluation of inventions and communicate these with employees. This ensures they understand why and how decisions are made and feel they are being treated fairly.

METHODOLOGY

In this study, we employed a mixed-methods approach that included initial focus groups with 31 individuals and a quantitative survey of nearly 900 individuals from diverse backgrounds and with varying degrees of engagement in innovation. The focus groups explored themes such as:

- What innovation meant to the participants.
- Who do participants have in their networks that they might seek help from if they had an idea for a new product or service they wanted to develop?
- What are participants' perceptions of patents and the patent system?
- What have inventors' experiences been in navigating the process and how their unique identities may have contributed to those experiences?
- The extent to which participants trust the different individuals and institutions in the innovation ecosystem.
- What factors were instrumental in building or eroding trust with specific individuals and institutions?
- How individuals and institutions in the patent ecosystem can build trust with women and people of color.

The themes from the focus groups then informed the development of the quantitative survey, which was designed to capture the full range of experiences and perceptions that individuals may have regardless of their background or level of engagement in innovation. Greater detail regarding the methodology employed can be found in the Methodological Appendix.

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**Prepared for Invent Together
by Research 2 Impact**

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TRUST AND ITS IMPORTANCE TO INNOVATION

KEY COMPONENTS OF TRUST

Generally, trust can be conceptualized as the expectation of one person or entity that a second person or entity will uphold their commitments and meet specific standards.⁶ Trust is a contextual, dynamic phenomenon that varies from situation to situation, and people experience trust in different ways.⁷ Many factors can contribute to the building of trust, including the fostering of interpersonal relationships and the sharing of knowledge and resources.⁸ For an individual to trust another person, they must have confidence in them, believe that they will not act in such a way as to harm them, and believe that they are concerned about their welfare.⁹ Distrust, on the other hand, is characterized by negative expectations of the intentions or behavior of others.¹⁰ When an individual trusts another, they may be more willing to rely upon, give control to, support, and otherwise “be vulnerable to” them.¹¹

In the context of patenting, we identified five key avenues for building trust in the patent system, the key individuals and institutions they need to interact with to patent their inventions, and even in themselves.

KNOWLEDGE AND AWARENESS

Knowledge and awareness can build trust in several ways within the context of patenting. First, individuals are more likely to trust other individuals, institutions, or systems if they have more knowledge of and experience with them.¹² This means that the more information and knowledge potential inventors have on the patent system and the key individuals that can help support them throughout the patenting process, the more trusting they will be. Individuals are also more likely to trust people that they view as knowledgeable and competent, which is important with respect to the service providers helping inventors navigate the patenting process.¹³ Finally, increased knowledge and competence also increases an individual’s trust in their own abilities.¹⁴ Inventors who are more confident in their abilities are more likely to share their ideas with others and pursue patents for their inventions.

KEY TERMINOLOGY

Throughout this report, we frequently characterize individuals based on their degree of exposure to and engagement in innovation and patenting. Below, we provide brief definitions of key terms.

INVENTOR: Anyone named as an inventor on at least one U.S. patent application, regardless of whether they have been granted a patent.

PATENT ADJACENT: Anyone who has not been named an inventor on a U.S. patent application but has engaged in at least some innovative activities independently or as part of their employment. This includes people contributing to the work of patenting teams but who have not yet been named on a patent application, people who have conducted work that could have led to a patent application or had an idea that they considered patenting but chose not to pursue an application, people who regularly engage in activities aimed at acquiring new knowledge or understanding, and people contributing to the development or improvement of new products, processes, technologies, or software.

POTENTIAL INVENTOR: Anyone who has not been named an inventor on an application for a U.S. patent and does not regularly engage in any of the innovative activities described above. These individuals may still have innovative ideas in the future that could potentially be patented.

NEW INVENTOR: Anyone pursuing a patent for the first time. This is often used in a hypothetical sense, as potential inventors and patent adjacent individuals were asked questions about their approach if they ever had an idea for a new product or technology they wanted to patent.

6 Nickel, “Trust in Engineering.”

7 Savolainen, Ikonen, and Ivakko, “Trust Development in Workplace Relations During Change.”

8 Duck, Handbook of Personal Relationships; Kramer and Tyler, Trust in Organizations.

9 Grovier, “An Epistemology of Trust.”

10 Lewicki, McAllister, and Bies, “Trust and Distrust.”

11 PytlikZillig and Kimbrough, “Consensus on Conceptualizations and Definitions of Trust: Are We There Yet?”

12 Conley, “Three Levels of Trust – Where Do Your Relationships Stand?”

13 Hill and Lineback, “To Build Trust, Competence Is Key.”

14 National Research Council, “Self-Confidence and Performance.”

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NETWORKS AND RELATIONSHIP BUILDING

Establishing positive interpersonal relationships and sharing knowledge are also associated with trust building.¹⁵ Individuals are more likely to trust people they know and who are able and willing to provide support when needed. This is important within the patenting ecosystem because networks can fill in knowledge gaps, provide technical assistance with the patenting process, and facilitate access to resources. Without trusted contacts in one's network, however, inventors may struggle to navigate the patenting process successfully.

COLLABORATION

Trust and collaboration go hand in hand. When a team is collaborative, individuals are more likely to feel comfortable sharing their ideas and feel that their input is valued. This, in turn, fosters trust between team members.¹⁶ This is vital in fostering innovation, which often occurs in team environments. Successful patent applications also require inventors to work with many stakeholders in the patenting ecosystem including patent attorneys, patent examiners, and TTOs or intellectual property (IP) departments. When these interactions are collaborative, trust can be built more effectively.

TRANSPARENCY

Transparency significantly influences the level of trust that employees have in their organizations.¹⁷ Patenting is a complicated process and companies, universities, and other institutions that pursue patents also have their own internal processes for invention disclosure and deciding which inventions to pursue. This means inventors are more likely to trust the systems and processes of their employers and the USPTO when they understand exactly what those processes are, what is required of them, and how their ideas are evaluated. Further, when these processes are clearly outlined and consistently implemented, inventors are more likely to trust that they are being treated and evaluated fairly.

VALUES ALIGNMENT

Inventors create new products and technologies for many reasons. Some are motivated by the ability to profit from their ideas. In contrast, others enjoy the process of creating, and still others are motivated by the ability to benefit society with their inventions. Shared values play an important role in building trust because when values are aligned, individuals are more likely to believe that others will act in a way that is in accordance with their own values.¹⁸ Thus, inventors are more likely to trust the patent system and pursue a patent if they feel that securing a patent is aligned with their own goals and values. They are also more likely to trust their employer and team members and disclose their inventions if they feel their values are aligned.

¹⁵ Duck, Handbook of Personal Relationships.

¹⁶ Crampton, "Building Stronger Teams."

¹⁷ Jiang and Luo, "Crafting Employee Trust."

¹⁸ Gillespie and Mann, "Transformational Leadership and Shared Values."

HOW THE EXPERIENCES OF WOMEN AND PEOPLE OF COLOR SHAPE THEIR WILLINGNESS TO TRUST

For women and people of color, trust can be a challenge to gain due to a history of marginalization. Within the Black community specifically, discrimination stemming from centuries of systemic racism in the form of chattel slavery, Jim Crow, redlining practices, and police brutality have contributed to a lack of trust in government institutions.¹⁹ People of color have also been prevented from accessing adequate housing, credit, insurance, and other financial services²⁰ and have historically faced barriers to accessing higher education.²¹

Even today, women and people of color experience discrimination and bias in the workplace. They face discrimination in hiring and are promoted at lower rates. Many experience overt sexism and racism at work.²² And many more experience more subtle forms of discrimination and bias such as having others talk over them or ignore them, receiving undesirable work assignments (such as taking notes, making coffee, or planning parties), and having others restate or take their ideas and receive credit for them.²³ Such experiences take a toll on the women and people of color who experience them, and often result in a reluctance to share ideas, disengagement from work, and diminished trust in coworkers and managers.

In the context of the key avenues for building trust in the patent ecosystem identified above, women and people of color are often at a disadvantage and less trusting as a result. We have found that they have less knowledge of patents, limited access to trusted support to pursue their ideas successfully, and have frequent negative experiences in the workplace, which can make them less trusting of others and less willing to collaborate with them. We have also found that they are more often motivated to innovate by the ability to solve social problems and benefit their communities. However, these motivations may conflict with the motivations of their institution for pursuing patents, and this can make them less trusting and wary of disclosing their ideas for fear that they will not be able to benefit the populations intended.

19 Hitlin and Shutava, "Trust in Government."

20 Lang and Nakamura, "A Model of Redlining."

21 Savolainen, Ikonen, and Ivakko, "Trust Development in Workplace Relations During Change."

22 Lean In and McKinsey & Company, "Women in the Workplace: Black Women"; St. Catherine University, "Gender Bias in the Workplace."

23 Doering, Doering, and Tilcsik, "'Was It Me or Was It Gender Discrimination?'"

TRUST AND ITS IMPORTANCE TO INNOVATION

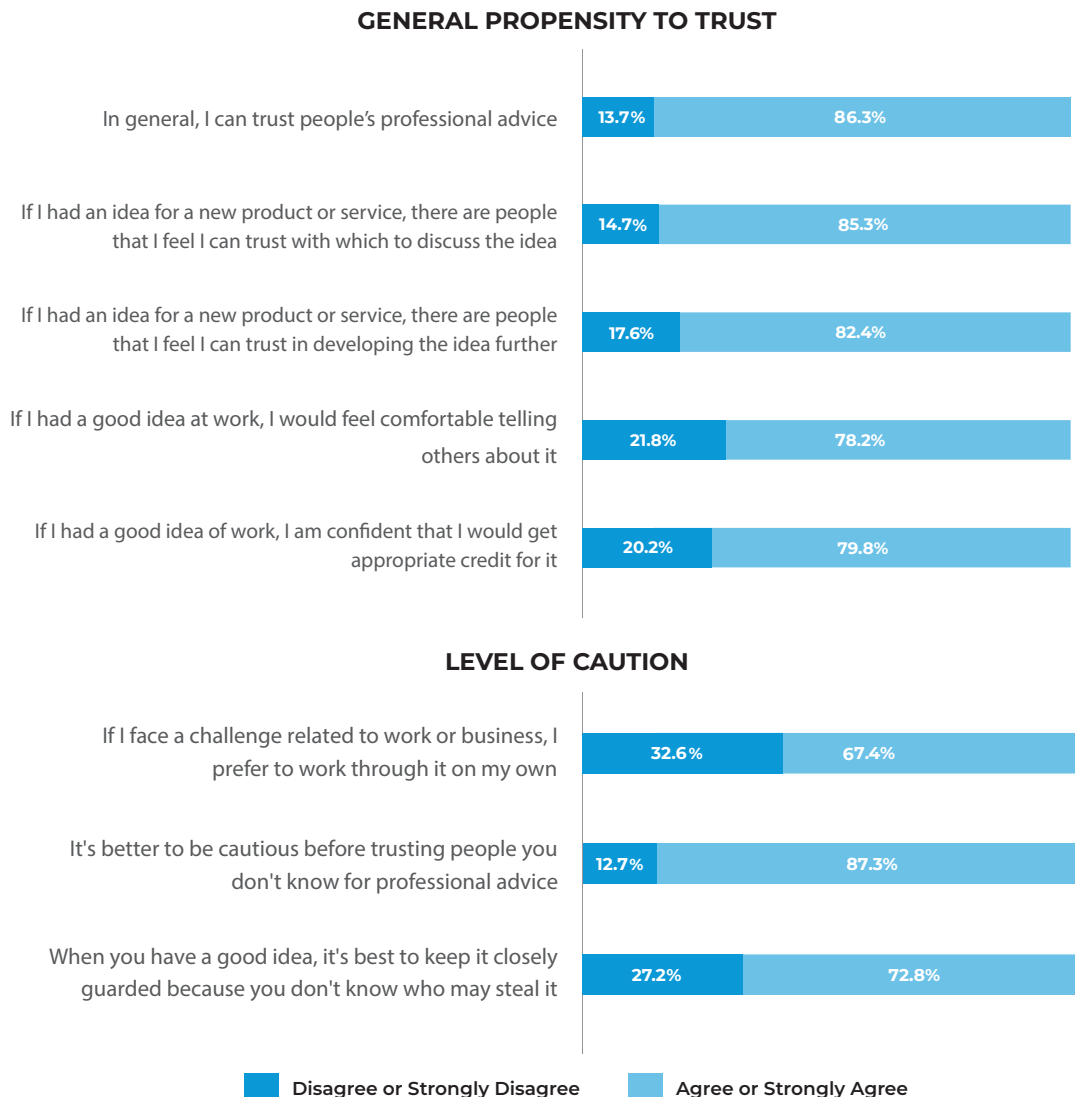
MEASURING TRUST

GENERAL PROPENSITY TO TRUST

As a baseline, we asked survey respondents to rate the degree to which they agreed or disagreed with five statements about their general propensity to trust the different people, organizations, and institutions that they might work with if they ever had an idea for a new product or technology and three statements about how cautious they are when working with others.

We found that survey respondents were generally trusting, particularly of those who were in a position to give them professional advice or help them develop their ideas. However, most respondents also exercised a certain amount of caution when seeking help at work or in their business. For example, most respondents preferred to work through challenges on their own when they could. Many were also cautious before trusting people they didn't know for professional advice and felt the need to keep their ideas closely guarded for fear of them being stolen (Figure 1).

Figure 1. General Propensity to Trust and Level of Caution



Note: Data are based on survey responses to the following prompt: "Please rate the degree to which you agree or disagree with the following statements about your general willingness to trust the different people, organizations, and institutions that you might work with if you ever had an idea for a new product or technology." This prompt was given to all participants.

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These measures of trust and caution varied considerably across the population. For example, our focus group conversations and survey responses highlighted that there was a trust gap between successful inventors and individuals who had not yet patented. Inventors reported a greater propensity to trust and were less cautious than individuals who had never patented.²⁴ While the data do not allow us to explore why this might be the case, we believe that it may partially stem from inventors' greater exposure to and opportunities to build relationships with different individuals, organizations, institutions, and other resources that support aspiring inventors.

Women and people of color also tended to be less trusting and more cautious. Black women were the wariest of trusting others and were more likely to keep their ideas closely guarded—97% agreed that it's better to be cautious before trusting people you don't know for professional advice and 91% agreed that it's best to keep ideas closely guarded because they could be stolen.²⁵ This theme also emerged in focus group conversations. The Black women that we spoke with linked this caution to, among other things, a long history of appropriation and Black innovators' ideas being stolen. Previous research has also demonstrated how a history of marginalization has contributed to a lack of trust among these groups.²⁶ Further, expectations of mistreatment, discrimination, and lack of advancement opportunities may make women and people of color less likely to trust others in their field. Experiences of being talked over or having their ideas claimed by someone else can also make them less trusting of their colleagues and less willing to share ideas.²⁷

TRUST IN INDIVIDUALS AND INSTITUTIONS INVENTORS MAY SEEK SUPPORT FROM WHEN PATENTING

We also asked survey respondents about the degree to which they trusted specific individuals and institutions connected with patenting or that they may have to work with if they pursued a patent application. Respondents were least likely to trust financial service providers and people who provide professional services. At the same time, they were most likely to trust individuals they know well and interact with often. Most respondents also trusted the USPTO, their university's TTO, their company's IP department, and patent attorneys (Figure 2). While not universally the case, women and people of color generally reported lower levels of trust in these key individuals and institutions, with notably lower levels of trust in patent attorneys, university TTOs and company IP departments, managers, and employers.²⁸

Black women were the wariest of trusting others and were more likely to keep their ideas closely guarded—97% agreed that it's better to be cautious before trusting people you don't know for professional advice and 91% agreed that it's best to keep ideas closely guarded because they could be stolen.

24 See Data Appendix Table A1.

25 See Data Appendix Table A2.

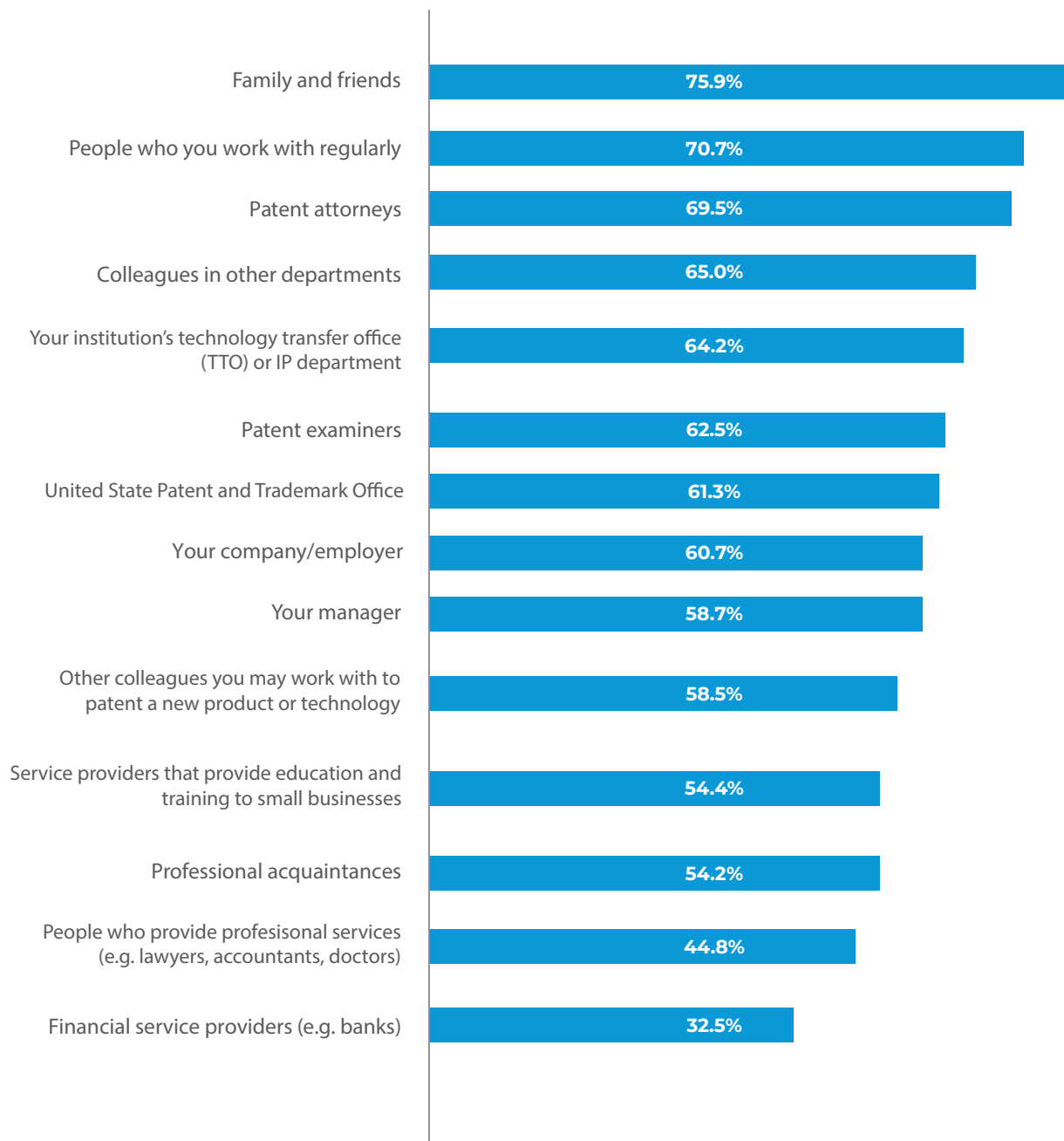
26 See for e.g., Smith, "Race and Trust."

27 Reichheld, Werner, and Katzenstein, "Research: Why Women Trust Their Employers Less Than Men Do."

28 See Data Appendix Table A3.

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Figure 2. Share of Respondents Reporting Moderate or Complete Trust in Individuals and Institutions They May Seek Support from or Collaborate with on Patent Applications



Note: Data are based on responses to the question, "To what extent do you trust the following organizations and institutions to treat you fairly and have your best interests at heart if you had an idea for a new product or technology that you wanted to develop?" This question was asked of all participants.

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WHY DOES TRUST MATTER TO INNOVATION?

At a fundamental level, the government provides and protects patents, and it is almost impossible to file a patent application alone. Filing a patent application requires knowledge of patent law as well as knowledge of the scientific or technical aspects of the specific invention. Without such knowledge, aspiring inventors can have a difficult time successfully navigating the process and adequately protecting their inventions.²⁹ As such, patenting requires trust in the patent system itself and the key people and institutions that inventors need to work with to successfully file a patent application, such as patent attorneys, patent examiners, the USPTO, TTOs, and IP departments.

INVENTORS ARE MORE LIKELY TO CONSIDER APPLYING FOR A PATENT AND ARE MORE CONFIDENT IN THEIR ABILITY TO NAVIGATE THE PROCESS IF THEY HAVE PEOPLE IN THEIR NETWORK THAT THEY CAN TRUST.

Most survey respondents who had never patented were open to applying for a patent if they had an idea for a new product or technology. Nearly 80% said they were somewhat or very likely to consider applying for a patent if they had a potentially patentable idea while just 30% said they were somewhat or very likely to do nothing with the idea. Respondents who were more trusting and less cautious were generally more likely to consider applying for a patent if they had a potentially patentable idea. For example, respondents who felt it best to be cautious before trusting others for professional advice were 18% less likely to consider pursuing a patent than those who are less cautious.³⁰

New inventors who had people in their networks that they could trust to help them develop their ideas were also more confident in navigating the different stages of the patenting process (Figure 3). Compared with those who did not have trusted network contacts, they were:

- 72% more likely to feel confident in knowing where to start/who to talk to.
- 70% more likely to feel confident in being able to finance the cost of the patent.
- 65% more confident in understanding what is required to apply for a patent.
- 57% more confident in finding someone who is familiar with the process and can help them navigate it.

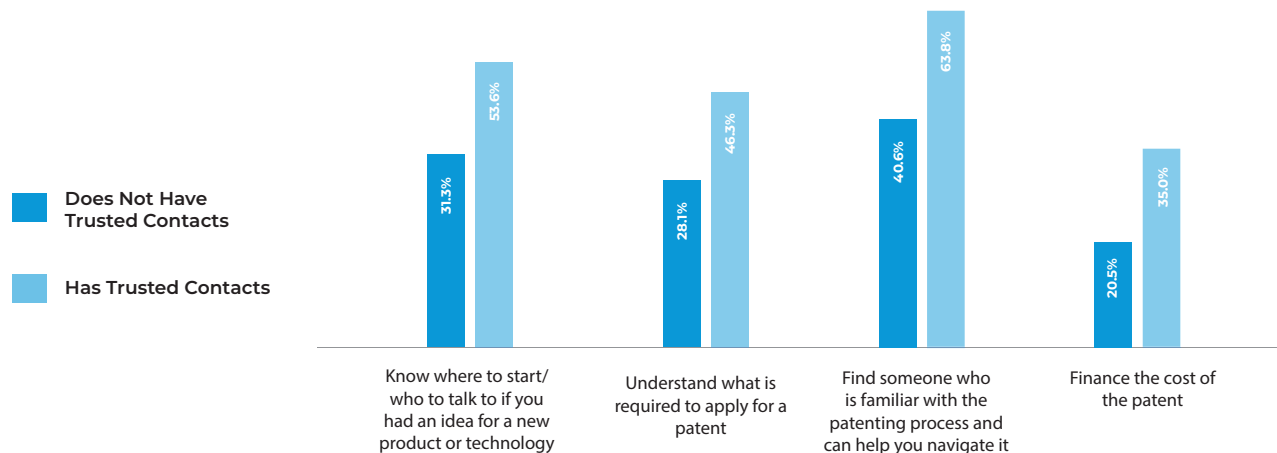
New inventors were also less likely to feel that resource challenges or concerns about the complexity of the process would prevent them from pursuing a patent if they felt they had people in their networks they could trust.

29 United States Patent and Trademark Office, "Patent Process Overview."

30 See Appendix Table A4.

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Figure 3. Confidence in Navigating Different Aspects of the Patenting Process by Whether Respondent Has People They Can Trust to Work with To Develop Their Ideas



Note: Respondents are defined as having trusted contacts if they agreed with the statement, “If I had an idea for a new product or service, there are people that I feel I can trust to work with in developing the idea further.” Percentages reflect the share of respondents who indicated that they were somewhat or very confident in their abilities to navigate the different aspects of the patenting process. Data are limited to respondents who were classified as “potential inventors” or “patent adjacent” and individuals who responded that there was at least some likelihood of them pursuing a patent if they ever had an idea for a new product or technology.

A RELATIVE LACK OF TRUST MAY HINDER WOMEN AND PEOPLE OF COLOR’S PARTICIPATION IN PATENTING.

While progress has been made over the past several decades, women and people of color are still dramatically underrepresented among inventors listed on U.S. patents.³¹ Researchers have identified numerous factors contributing to the relative lack of diversity among inventors, including a lack of exposure to and knowledge of innovation and patenting, limited networks and access to resources, bias and discrimination, and institutional barriers.³²

Our focus group participants, however, felt strongly that innovation is happening among people from these groups but that innovators from these groups do not pursue patents for their ideas or that their ideas are stolen by others. When asked about what they knew about patents, one Black woman who participated in a focus group shared:

“I don’t know much about it, but just knowing some history of it, or what I’ve seen, or what we’ve seen experienced with inventors, such as Black inventors, and somehow, some patents could be stolen. [...] Because Black creators have created—innovators have created a lot of things. But how many things do we actually own the patent to?” – Black Woman

Survey participants confirmed these sentiments. Black and Hispanic women and men were substantially less likely than their white counterparts to do nothing if they ever had an idea for a new product or technology and were more likely to consider pursuing a patent. However, they were also less trusting and, as a result, more likely to keep their ideas to themselves while considering what to do. Because of this, they often pursued patents independently with minimal to no support, which limited their success. Focus group participants expanded on these findings, sharing how they would seek out information through Google searches, YouTube videos, podcasts, and other online content if they wanted to pursue a patent and how they would be hesitant to share their ideas with others, even a patent attorney, unless it were absolutely necessary. One Black woman inventor was able to obtain a patent pending designation for her invention on her own, but due to a lack of trusted support and resources she was unable to file for a full patent.

31 Akcigit and Goldschlag, “Measuring the Characteristics and Employment Dynamics of U.S. Inventors”; Toole et al., “Progress and Potential: 2020 Update on U.S. Women Inventor-Patentees.”

32 See for e.g. Fechner, Schreurs, and Chung, “Increasing Inventor Diversity”; Shaw and Mariano, “Tackling the Gender and Racial Patenting Gap to Drive Innovation”; Milli et al., “Equity in Innovation: Women Inventors and Patents.”

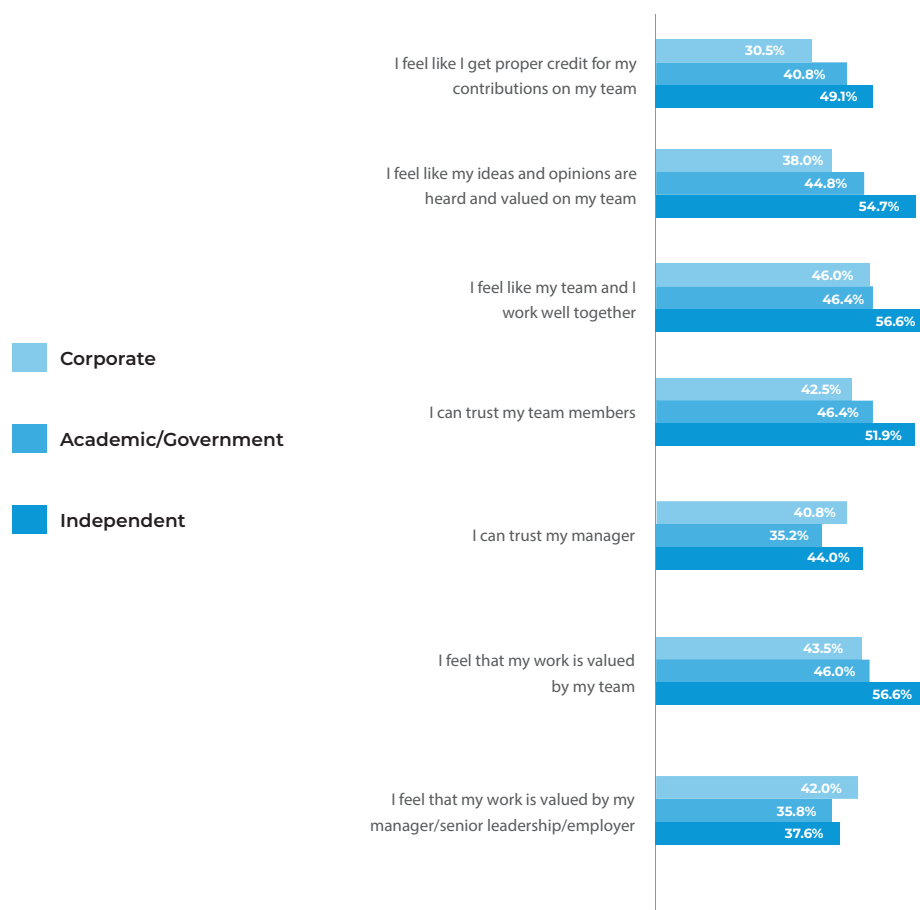
TRUST AND ITS IMPORTANCE TO INNOVATION

NEGATIVE EXPERIENCES IN THE WORKPLACE ERODE TRUST AMONG WOMEN AND PEOPLE OF COLOR AND MAKE THEM HESITANT TO PURSUE PATENTS, DESPITE ACCESS TO INSTITUTIONAL RESOURCES AND SUPPORT.

Even in academic or corporate settings where resources and support are more plentiful, women and people of color are still dramatically underrepresented in patenting. For example, a recent report by the USPTO found that the women inventor rate was highest on patents granted to universities and hospitals and to public research organizations and lowest on patents granted to businesses. However, even at universities and hospitals, the women inventor rate was below 20%.³³ This suggests that while access to resources in some settings does help people from historically underrepresented groups participate more in patenting, other factors may also contribute to a lack of participation.

In these settings, experiences in the workplace tend to be more negative. Innovators in corporate and academic settings were less likely to feel that they get proper credit for their contributions on their team, that their ideas and opinions are heard and valued, and that their team works well together compared with independent innovators (Figure 4). These negative experiences were also correlated with lower levels of trust and a hesitancy to pursue patents.

Figure 2. Share of Respondents Reporting Moderate or Complete Trust in Individuals and Institutions They May Seek Support from or Collaborate with on Patent Applications



Note: Percentages reflect the share of respondents who said that they “strongly agree” with the relevant statement. Data are limited to respondents who were classified as inventors or patent adjacent and those who said that they usually work as part of a small or large team. For inventors, setting is defined as the setting in which most of their patenting activities have taken place, regardless of their current employment setting. For patent adjacent individuals, setting is defined as their current employment setting.

³³ Toole et al., “Progress and Potential: A Profile of Women Inventors on U.S. Patents.”

CHALLENGES AND OPPORTUNITIES TO BUILDING TRUST IN INNOVATION

Through this work, we identified five key avenues for building trust in the patenting ecosystem: knowledge and awareness, networks and relationship building, collaboration, transparency, and values alignment. Below, we discuss challenges and limitations within the ecosystem in each avenue that may make some people less trusting and where there are opportunities for building trust. We then expand on these opportunities in the recommendations section.

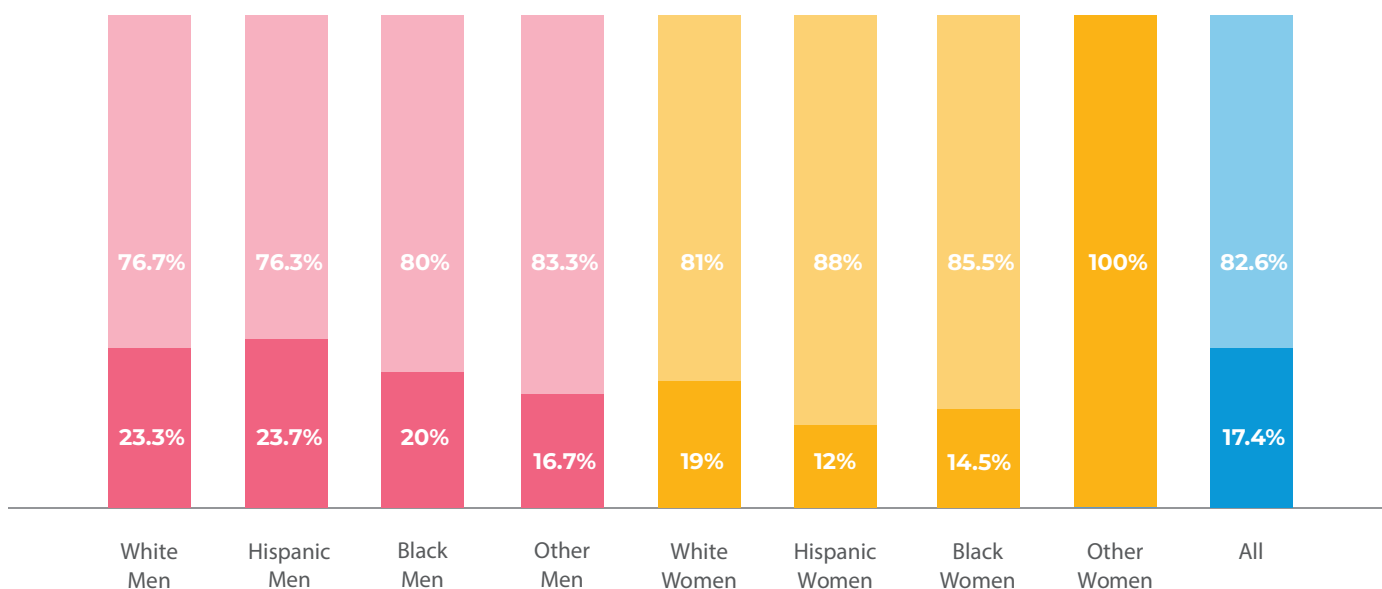
KNOWLEDGE AND AWARENESS

BUILDING KNOWLEDGE AND AWARENESS ABOUT PATENTS AND AVAILABLE RESOURCES IS CRITICAL IN BUILDING TRUST

Previous research has shown that there is a lack of formal education in the United States about patenting and that most inventors do not receive any formal education about the patenting process while they are in K-12 or even pursuing college degrees. This lack of formal education about patents as a way to protect one's intellectual property means that many people with potentially patentable ideas will never apply for a patent because they are unaware that patents are an option or do not have enough knowledge to navigate the system.³⁴ Our study overwhelmingly confirmed these findings.

More than 80% of potential inventors reported having minimal or no knowledge of patents. Black and Hispanic women were at the greatest disadvantage, with 88% of Hispanic and 86 percent of Black women reporting minimal or no knowledge (Figure 5). Focus group participants similarly lacked knowledge about patents beyond a vague idea of what they are.

Figure 5. Reported Level of Knowledge of Patents Among Potential Inventors by Gender, Race, and Ethnicity



Notes: Data are limited to respondents classified as potential inventors.

34 Shaw and Mariano, "Tackling the Gender and Racial Patenting Gap to Drive Innovation."

CHALLENGES AND OPPORTUNITIES TO BUILDING TRUST IN INNOVATION

Knowledge and awareness of the key individuals and institutions associated with the patenting process and the resources available to support inventors were also limited. In many cases, less than one-third of potential inventors indicated having at least some knowledge of available resources. Only one-quarter of potential inventors said they had at least some knowledge of TTOs and the services they provide.³⁵ This is important because a lack of awareness of such resources can leave inventors feeling unsupported in navigating the patenting process. Nearly half (46%) of respondents said that a lack of support might prevent them from pursuing a patent if they had an idea for a new product or technology.³⁶

The consequence of the lack of formal education about patents in school is that there are disparities in who ultimately receives information about patents. Inventors and patent adjacent individuals were most likely to report learning about patents at work (68 and 39 percent, respectively) or through independent research (45 and 50 percent, respectively). Focus group participants noted that this exposure was often due to chance. Those that did receive education and training about patents only received it because they happened to be working in a lab or on a team that pursued patents. On the other hand, potential inventors were most likely to learn about patents through programming on TV (43 percent) and through news stories (36 percent), which likely provide a more limited and potentially biased view of patents and the patenting system.³⁷ Several focus group participants noted that their only source of information on patenting and the patenting process was through shows like Shark Tank, which made the idea of patenting more intimidating to them as a result. Women and men of color were even more likely to learn about patents through TV programming and news stories.

Survey responses and conversations with focus group participants highlighted the broader significance of a lack of knowledge about the patenting process. Study participants felt that a lack of knowledge and transparency about the patenting process and awareness of the key individuals and institutions that can support aspiring inventors made them more wary and less trusting. For example, they were 27% less likely to trust the USPTO, 24% less likely to trust patent examiners, and 25% less likely to trust their TTO (if they had one) when they had little or no knowledge of the services and support they provided.

When asked what could be done to increase trust in the patent system, many focus group participants spoke about being less trusting because they felt they didn't have enough information about it and that the process wasn't transparent. Participants discussed how investments in early education and programs that children can participate in to gain exposure and learn more about patenting and innovation from a young age would be beneficial. They also emphasized the importance of making such content and programs accessible to children from all backgrounds.

We also found that the messenger of the information about patenting matters. Participants noted that organizations and entities with reputations for being experts in patenting are more trustworthy in their eyes, as are community organizations. They also expressed that they are more trusting of information provided by individuals from diverse backgrounds, and preferably those who have been through the patenting process themselves. This aspect can foster confidence in people from some historically underrepresented groups to see someone who shares their identity and is seen as an expert in the field. It can also help them feel more comfortable sharing their ideas, asking questions, and engaging in trainings or programs. Finally, participants felt it was important for educational content to incorporate diversity along as many dimensions as possible. Examples included providing profiles of diverse inventors and examples of different products and technologies that have been patented. Such examples help individuals see themselves as potential inventors and view the patent system as a resource for people like them.

³⁵ See Appendix Table A5.

³⁶ Authors' calculations based on survey data collected for this report.

³⁷ See Appendix Table A6.

CHALLENGES AND OPPORTUNITIES TO BUILDING TRUST IN INNOVATION

SERVICE PROVIDERS' EXPERIENCE AND EXPERTISE SIGNIFICANTLY AFFECTS INVENTORS' TRUST IN THEM.

Inventors' experiences working through the patent application process were generally positive. However, some inventors reported negative experiences when working with key resources and service providers. Among inventors who sought support from such resources:

- One-third were dissatisfied with the small business support organization they worked with.
- 24% were dissatisfied with their institution.
- 19% were dissatisfied with their TTO or IP department.
- 17.6% were dissatisfied with their manager.
- 9.1% were dissatisfied with their patent attorney.³⁸

These negative experiences were particularly damaging to inventors' trust. Of the inventors reporting negative experiences working with specific people and institutions:

- 80% reported diminished trust in their institution.
- 65% reported diminished trust in their TTO or IP department.
- 65% reported diminished trust in their patent attorney.
- 50% reported diminished trust in small business support organizations.³⁹

Perceptions of competency were a major factor in inventors' experiences with, and trust in, service providers. When asked about what factors contributed to their positive experiences working with different individuals and institutions to patent their inventions, inventors with positive experiences often wrote in responses to the survey citing how knowledgeable the person assisting was and how they could clearly and effectively explain each step of the process. This expertise and knowledge-sharing made inventors more trusting of service providers. On the other hand, when we asked what factors contributed to their negative experiences, inventors who had negative experiences felt that the person or institution providing support was not knowledgeable enough about the technology being used or the patenting process, and these perceptions reduced the inventors' trust in the service provider. This was particularly true among those seeking assistance from small business support organizations. These types of organizations are commonly sought out by first-time inventors who are unfamiliar with the patenting process and often think "business" rather than "patent" when they have an idea for a new product or technology. Unfortunately, these service providers are not always equipped with the knowledge or resources to support inventors in navigating the patent process.

³⁸ Authors' calculations based on survey data collected for this report.

³⁹ Authors' calculations based on survey data collected for this report.

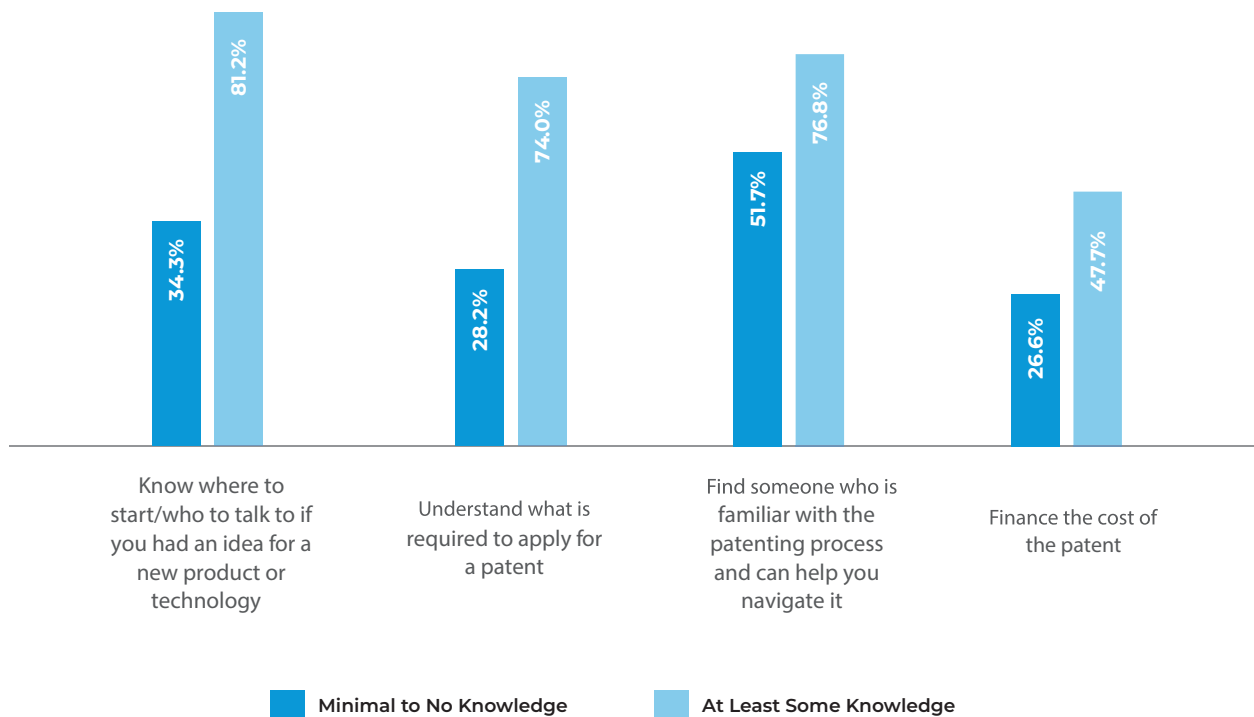
CHALLENGES AND OPPORTUNITIES TO BUILDING TRUST IN INNOVATION

HAVING SOME KNOWLEDGE OF PATENTS INCREASES POTENTIAL INVENTORS' SELF-EFFICACY AND CONFIDENCE IN NAVIGATING THE PATENT PROCESS.

Confidence in navigating the patenting process tends to be higher among new inventors with more knowledge of patents. Compared with those who had minimal or no knowledge of patents, new inventors with at least some knowledge were more than twice as likely to know where to start and who to talk to if they had an idea they wanted to patent as well as to understand what is required to apply for a patent. They were also 49% more likely to feel confident in their ability to find someone to help them navigate the process and 79% more likely to feel confident in their ability to finance the cost of the patent (Figure 6). Thus, addressing knowledge gaps and expanding opportunities for children and young professionals to be exposed to the patenting process may help foster self-efficacy and confidence. This could encourage greater participation in patenting among women and people of color who reported less knowledge of patents.

Compared with those who had minimal or no knowledge of patents, new inventors with at least some knowledge were more than twice as likely to know where to start and who to talk to if they had an idea they wanted to patent as well as to understand what is required to apply for a patent.

Figure 6. Confidence in Navigating Different Aspects of the Patenting Process by Reported Level of Knowledge of Patents



Note: Percentages reflect the share of respondents who indicated that they were somewhat or very confident in their abilities to navigate the different aspects of the patenting process. Data are limited to respondents who were classified as potential inventors or patent adjacent and individuals who responded that there was at least some likelihood of them pursuing a patent if they ever had an idea for a new product or technology.

CHALLENGES AND OPPORTUNITIES TO BUILDING TRUST IN INNOVATION

NETWORKS AND RELATIONSHIP BUILDING

A PERCEIVED LACK OF ACCESS TO SUPPORT, PARTICULARLY FROM TRUSTED RESOURCES, CAN PREVENT NEW INVENTORS FROM PURSUING PATENTS.

As previously discussed, most people who have never patented have minimal or no knowledge and awareness of the different supports available to aspiring inventors, including the USPTO, TTOs at universities, and patent attorneys.⁴⁰ While aspiring inventors generally trust available resources when they know of them,⁴¹ respondents who reported minimal or no knowledge and awareness of such resources were less trusting of them.⁴²

This lack of knowledge and awareness of available supports can limit potential inventors' trusted networks and access to resources that can help them navigate the patenting process. When asked about different challenges that may prevent them from pursuing a patent, both access to support and whether that support was trusted were important to participants. Nearly half of respondents who have never patented said not having a lawyer they could trust to advocate for them and their idea may discourage them from patenting. In addition, one-third of academics at universities with a TTO said that not having a relationship with their institution's TTO might prevent them from pursuing a patent. Finally, nearly a quarter felt that not having enough people at their institution that they could trust might affect their plans to patent (Figure 7).

Research has shown that women and people of color tend to have smaller and more limited networks and are less likely to be connected to others with the resources and expertise to help them patent.⁴³ Similarly, we found a few notable differences in access to trusted support by gender, race, and ethnicity. Women and men of color were more likely than their white counterparts to report that not having a lawyer they could trust might prevent them from pursuing a patent. They were also substantially more likely to lack a relationship with their institution's TTO—more than half of Black and Hispanic men and 44% of Black women said that this lack of relationship might prevent them from pursuing a patent (Figure 7).

More than half of Black and Hispanic men and 44% of Black women said that this lack of relationship might prevent them from pursuing a patent.

40 Authors' calculations based on survey data collected for this report.

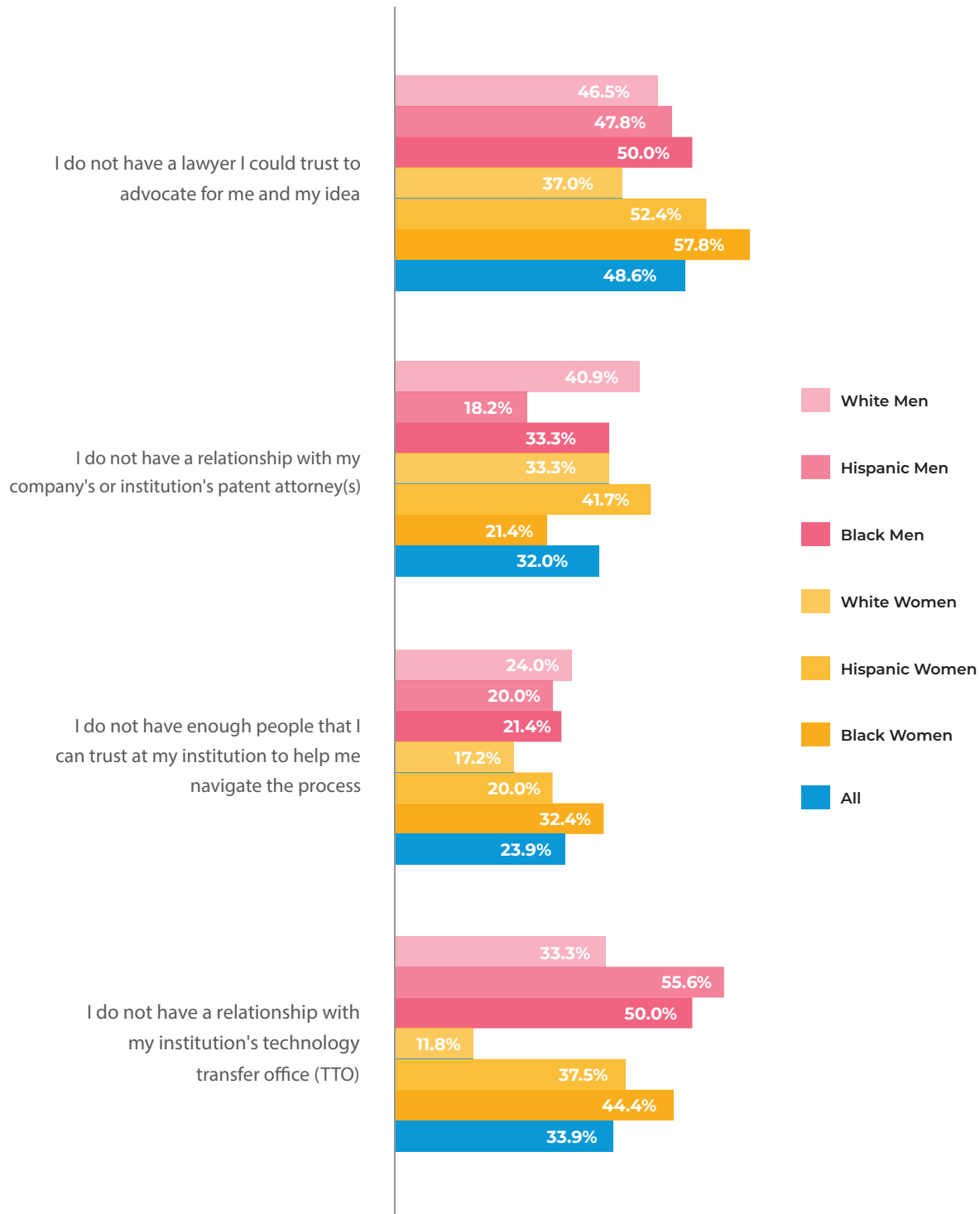
41 See Figure 2.

42 Authors' calculations based on survey data collected for this report.

43 Ding, Murray, and Stuart, "Gender Differences in Patenting in the Academic Life Sciences"; Shaw and Mariano, "Tackling the Gender and Racial Patenting Gap to Drive Innovation."

CHALLENGES AND OPPORTUNITIES TO BUILDING TRUST IN INNOVATION

Figure 7. Anticipated Network Challenges That May Prevent New Inventors from Pursuing a Patent by Gender, Race, and Ethnicity



Notes: Percentages represent the share of respondents who said that the relevant challenge may prevent them from pursuing a patent for an idea they may have for a new product or technology. Data are limited to respondents who were classified as potential inventors or patent adjacent and individuals who responded that there was at least some likelihood of them pursuing a patent if they ever had an idea for a new product or technology. The question relating to an established relationship with the respondent's TTO was asked only of respondents who said they were most likely to pursue a patent through their academic institution.

CHALLENGES AND OPPORTUNITIES TO BUILDING TRUST IN INNOVATION

SERVICE PROVIDERS CAN HELP ESTABLISH TRUST BY PROACTIVELY BUILDING RELATIONSHIPS WITH POTENTIAL INVENTORS.

When asked how trust could be built with the key individuals and institutions that can help inventors navigate the patenting process, most study participants discussed the importance of building relationships, noting that they were more likely to trust someone they knew and had interacted with for some time. One academic inventor we spoke with highlighted how proactive outreach on the part of her TTO raised her awareness of the resources they provided and helped her build a strong and trusted relationship with them:

“I think within like the first three to six months of starting here, the [TTO] reached out to me, and they were like, ‘Can we set up a one-on-one meeting so we can talk to you about who we are, what we do, and how to file?’ [...] And what’s nice is I feel like they’re very involved. And so, the next time somebody met with me, because they do check in about every one year to six months, but the next time they’re like, ‘Oh, last time you talked about this, where is it? Have you decided you want to file?’ I just feel like they are, like they’re very good at establishing those relationships.”
– Native American Woman

Thus, key service providers and institutions in the patenting ecosystem can help broaden potential inventors’ networks and foster trust by proactively building relationships with them.

COLLABORATION

NEGATIVE WORK AND TEAM ENVIRONMENTS CAN ERODE TRUST, PARTICULARLY FOR WOMEN AND PEOPLE OF COLOR.

While collaborative work environments are associated with greater trust, women and people of color frequently have negative experiences in the workplace. More than 70% of women regardless of race or ethnicity reported frequent negative experiences in the workplace. Black women were the most likely to report such experiences (80%). Study participants shared many negative experiences that they had to deal with regularly, including:

- Being talked over or ignored during meetings.
- Having another coworker or manager take credit for their ideas.
- Being excluded from invites to meetings or social gatherings.
- Having ideas frequently rejected.
- Feeling that their work was under greater scrutiny.
- Being mistaken for someone in a lower-level position.
- Being assigned undesirable tasks, such as notetaking or making coffee for the office.
- Being passed up for promotions.
- Having slurs, jokes, or other inappropriate comments made about their identity.

More than 70% of women regardless of race or ethnicity reported frequent negative experiences in the workplace. Black women were the most likely to report such experiences (80%).

CHALLENGES AND OPPORTUNITIES TO BUILDING TRUST IN INNOVATION

The cumulative effects of such experiences can take their toll. Previous research has demonstrated how negative workplace experiences can adversely affect job satisfaction and organizational commitment.⁴⁴ We also found that they can negatively affect behaviors and attitudes important in successfully navigating the patenting process. Most notably:

- More than half (55%) of Hispanic women said such experiences would have a moderate or significant negative effect on their willingness to share their thoughts and ideas with their managers. Similarly, 53% of Black women reported a negative effect on their willingness to share their thoughts and ideas with coworkers.
- More than 45% of Black and Hispanic women said that such experiences would negatively affect their willingness to ask questions or to seek help when they need it.
- Such experiences also eroded trust in coworkers and managers for nearly half of Black and Hispanic women.⁴⁵

POOR EXPERIENCES WORKING WITH OTHERS IN PURSUIT OF A PATENT CAN ERODE TRUST AND MAKE INVENTORS WARY OF SHARING IDEAS IN THE FUTURE.

Beyond general experiences in the workplace, experiences working with different people and institutions in pursuit of a patent can also affect inventors' trust and subsequent decisions of whether to patent and who to work with. On a positive note, most inventors report good experiences working with others in pursuit of patents. Just 19% said they were dissatisfied or extremely dissatisfied with their experiences working with their TTO or company's IP department. Similarly, 18% reported dissatisfaction with their department chair or manager, 9% were dissatisfied with their patent attorney, and just 2% were dissatisfied with their team members.

However, negative experiences working with these different people and institutions substantially affect inventors' trust in them. Nearly two-thirds of inventors who had negative experiences working with their TTO, company's IP department, or patent attorney reported a decrease in trust in them as a result. Four in ten inventors who had negative experiences working with their manager also reported a decrease in trust, as did 33% of inventors who had negative experiences working with their team members. Further, negative experiences working in pursuit of patents were also associated with a decline in inventors' general propensity to trust and the amount of caution they exercise when developing their ideas. For example, those who had negative experiences working with their TTO or company's IP department were more likely to feel it best to work through challenges on their own and keep their ideas closely guarded. They were also less likely to feel comfortable sharing their ideas with others.

Even expectations of negative experiences can have a detrimental effect on the willingness of new inventors to pursue a patent for their inventions. Nearly two in ten people said that they didn't think that they would be treated fairly by the patent examiner throughout the process because of their identity and that those expectations might prevent them from applying for a patent if they ever had an idea for a new product or technology. This was also true of 31% of Black women and men. Two in ten people also said they were intimidated by the prospect of working with their institution's patent attorney, which may prevent them from applying for a patent. This was even more common among Hispanic women.

⁴⁴ Ensher, Grant-Vallone, and Donaldson, "Effects of Perceived Discrimination on Job Satisfaction, Organizational Commitment, Organizational Citizenship Behavior, and Grievances."

⁴⁵ See Appendix Table A6.

CHALLENGES AND OPPORTUNITIES TO BUILDING TRUST IN INNOVATION

When asked about the challenges they faced when patenting their inventions, inventors discussed their negative experiences with the process itself, noting that it seemed adversarial at times, especially when working with their patent attorney or patent examiner. One inventor described how intimidated he felt the first time he worked with his company's patent attorney:

"I especially remember, with my very first patent application, the IP attorney [...] was very difficult to work with. I didn't have much credibility with her, and she grilled me regarding the uniqueness and utility of the invention quite a bit. And it was hard to convince her that we had something that was worth patenting, even though I had worked in the area for a while [...]. And so, there was a little bit of intimidation there, because she was more experienced than I was and had been around the company a little bit longer, and she was an attorney. So, she knew what she was talking about when it came to patentability, so I had to kind of push hard." – Black Man

While it is the job of patent attorneys and patent examiners to evaluate the technical merit of inventions, participants who had negative experiences felt that the process could have been more collaborative. Rather than feeling like they were fighting to convince others of the worth of their invention, they wanted to find ways to collaboratively work with their attorney and examiner to find the right level of protection for their inventions, given the relevant prior art.

These findings, in conjunction with the findings above demonstrating that a lack of trust in available supports can prevent new inventors from pursuing patents for their inventions, highlight the need to both build relationships between inventors from historically underrepresented groups and key individuals and institutions that can help them navigate the patenting process, and to ensure that the relationships they form with those individuals and institutions are collaborative and conducive to building trust.

TRANSPARENCY

When inventors indicated a lack of trust in certain individuals and institutions connected with the patenting process, we followed up with an open-ended question about why they were less trusting of them. Inventors frequently brought up a lack of transparency and information about the process. Many inventors expressed that their institution does not have clear policies and procedures in place that document how inventions should be disclosed and how they will be evaluated. This made them assume their ideas would not be evaluated fairly and eroded trust in their institution. One inventor shared that there was a:

"Lack of transparency in the meaning and use of the many forms I was expected to sign, without explanation as to what I was signing away, and with the expectation that I should just sign whatever papers they put in front of me without any questions." – White Woman

Similarly, participants stressed the importance of transparency in building trust in corporations, universities, and TTOs. Nearly 10% of survey respondents who provided written responses to a question about what institutions could do to build trust with them emphasized the need for greater transparency. They specifically called out the need for consistency in the application process, information about what is required to disclose and apply for a patent, clear guidelines on how invention disclosures are evaluated, consistent application of review criteria, and more open communication throughout the process. One inventor summarized these sentiments, highlighting the need for:

"Increasing transparency and openness in decision making processes, being more responsive and communicative with stakeholders, prioritizing quality and consistency in the application and review of patents and working to build a reputation for fairness and impartiality in dealings with inventors and businesses." – White Man

CHALLENGES AND OPPORTUNITIES TO BUILDING TRUST IN INNOVATION

VALUES ALIGNMENT

Research has found that women and people of color are often more motivated by the ability to have a positive social impact through their work than potential financial gains. For example, women who choose to enter the engineering field are more likely to do so to solve societal problems.⁴⁶ Participants in this study expressed similar altruistic motives.

However, altruistic motives can cause tension for inventors in corporate and academic settings, where they must assign their inventions to their employers and may lose control over how their inventions are developed and commercialized. When asked about what factors and experiences contributed to a lack of trust in some of the key people, organizations, and institutions in the patent ecosystem, one academic inventor we spoke with shared her concerns about the perceived profit motivations of funders (and the university):

“I think there’s a long history of people filing patents because they wanted to make sure that technology was open for people to use. My concern is, well, what will be done with this information? How will charging structures go? [...] How will it go on to serve the communities that I anticipated it serving [...] And the big question is, well, how are we going to roll this out in a way that will be affordable to communities [...] because the end goal is so that everybody has access to care. And I don’t think that is the primary goal of funders. I think the primary goal is the bottom line.”
– Native American Woman

Perceived misalignment in values and objectives between inventors and their employers could prevent some inventors from pursuing patents. More than one-third of Hispanic women (35%) and 29% of Black men and women said that concerns over their invention not benefiting the populations they want to help might prevent them from pursuing a patent.

More than one-third of Hispanic women (35%) and 29% of Black men and women said that concerns over their invention not benefiting the populations they want to help might prevent them from pursuing a patent.

⁴⁶ Buse, Hill, and Benson, “Establishing the Research Agenda for Increasing the Representation of Women in Engineering and Computing.”

THE ROLE OF INSTITUTIONAL SETTING

WHAT SETTINGS DO INVENTORS PATENT IN?

Independent, academic, government, and corporate inventors all pursue patents in different contexts with different levels of access to resources and support, and they face unique challenges in each context.

INDEPENDENT INVENTORS likely face the greatest challenges in successfully navigating the patenting process because they do not have the benefit of the resources and support of a company, university, or other institution. They must secure their own funding and personally identify any support they need to navigate the process.

ACADEMIC AND GOVERNMENT INVENTORS often have access to institutional support through their TTO (or other similar entity), which can cover filing fees, maintenance costs, and attorney fees and generally provide guidance and support to inventors throughout the patenting process. However, inventions pursued through a TTO are then assigned to the university or government institution at which they were created. This can mean that the inventors lose control over how their inventions are developed or commercialized. Staff must disclose their inventions to their institution's TTO if they are created with institutional resources. The TTO then decides whether to pursue a patent for the invention. Staff can personally pursue patents for inventions that the institution chooses not to pursue, but they usually do so without the support and resources of the TTO.

Like academic/government inventors, **CORPORATE INVENTORS** can access a wide range of support from their institutions such as IP departments, patent attorneys, and financial resources to cover the cost of filing. Inventions pursued through a corporation are also assigned to the corporation at which they were created. This means that corporate inventors may not have control over how the invention is developed or commercialized.

DIFFERENCES IN INVENTORS' EXPERIENCES ACROSS INSTITUTIONAL SETTINGS

While the smaller sample sizes that result from disaggregating inventors by institutional setting limit our ability to do an in-depth exploration of the differences in inventors' experiences across each setting, we present a few notable highlights that emerged in our study below. Further research is needed to confirm and expand upon these findings.

EXPERIENCES IN THE WORKPLACE

While independent inventors were more likely to report having frequent negative experiences in the workplace such as being talked over or ignored at meetings, having someone take credit for their ideas, or being assigned undesirable tasks, they also overwhelmingly reported the most positive experiences working with their teams on various projects. It is not possible in the data to determine why this might be the case. Still, it is possible that the negative work environment that they experienced led some independent inventors to start their own companies and pursue patents independently.

On the other hand, corporate inventors were the least likely to report frequent negative experiences in the workplace. Still, they were also the least satisfied with their experiences working with their teams. They were significantly less likely than inventors in other settings to feel that their manager valued their work and that they could trust their manager.

PROPENSITY TO TRUST

Considerable differences existed between inventors in each setting regarding their willingness to trust others' professional advice and to collaborate with others when they have new ideas they want to explore. Independent inventors were generally the most cautious, with the vast majority preferring to work through challenges alone and feeling that it's best to be cautious before trusting people they don't know for professional advice. On the other hand, corporate inventors were typically the most trusting and least cautious.

EXPERIENCES APPLYING FOR PATENTS

The experiences of academic and corporate inventors in applying for patents were often similar to one another, while the experiences of independent inventors were often quite different. Independent inventors were most satisfied with their experiences working with their patent attorney. In contrast, academic and corporate inventors were most satisfied with their work colleagues, including those they do not regularly work with. Independent inventors were far more likely to seek assistance from service providers that provide education and training to small businesses and to be dissatisfied with their experiences working with such organizations. Academic inventors were least satisfied with their experiences working with their institution and corporate inventors were least satisfied with their experiences working with their manager. Their TTO or company's IP department ranked second highest in rates of dissatisfaction among academic and corporate inventors.

The experiences of inventors in each setting also affected their levels of trust in the people and institutions they worked with in different ways. Independent inventors experienced the greatest increases in trust due to their experiences working with patent examiners and programs that provide education and technical assistance to aspiring inventors. They experienced the greatest decrease in trust in business support organizations. Academic and corporate inventors, on the other hand, reported the greatest increases in trust in colleagues they do not work with regularly, patent attorneys, and their TTO or company's IP department. They reported the greatest reduction in trust among their institutions, managers, and TTOs or IP departments.

THESE FINDINGS HIGHLIGHT SEVERAL OPPORTUNITIES FOR INSTITUTIONS AND CORPORATIONS TO BUILD RELATIONSHIPS AND FOSTER TRUST:

- Most potential inventors who participated in our focus groups had an aversion to working with attorneys. In addition, many were intimidated by the prospect of working with an attorney to pursue a patent. However, we found that once inventors start working with an attorney, the experience is usually positive and leads to a more trusting relationship. Because of this, institutions may benefit from fostering relationships between their patent attorneys and new staff before a patent disclosure is made. This can help break down any misperceptions that new inventors may have about attorneys and build trust earlier in the process.
- Academic and corporate inventors reported the greatest increases in trust in colleagues they do not regularly work with. This suggests that fostering cross-department or cross-discipline collaboration may help build trust across the institution, which can also open the door to greater innovative possibilities.
- Inventors' experiences working with TTOs, IP departments, and business support organizations had mixed effects on trust. They were among the institutions that experienced the greatest increases in trust but also among those that experienced the greatest decreases in trust. For TTOs, this could be due to variations in institutional resourcing, the proactiveness of the TTO in building relationships with potential inventors, the level of support provided, or the level of transparency in TTO decision making. For business support organizations, this might also be due to variations in institutional resourcing as well as the capability and capacity of the staff to support inventors in pursuing patents and to connect them with relevant resources. Thus, ensuring that the service providers inventors are seeking help from are adequately equipped and resourced to provide education, support, and referrals to inventors can help build trust and increase the likelihood of success.

RECOMMENDATIONS FOR IMPROVING TRUST IN INNOVATION AND PATENTING

Our findings highlight many ways in which key stakeholders in the innovation ecosystem can build trust within historically underrepresented communities and increase the participation of people from all backgrounds in patenting. Some of the recommendations supported by the data from our survey and focus groups echo the recommendations previously made by leaders in the field. We also expand the scope of these recommendations and weave in ways in which trust and trusted relationships are important factors to consider when implementing them, providing recommendations to stakeholders on how trust can be built at every step.

The recommendations in this section fall within three broad categories—Education, Public Policy, and Workplace Culture. Within each category we outline several recommendations that may be relevant to different stakeholders.

EDUCATION

EXPOSURE TO PATENTING SHOULD BEGIN EARLY, INCLUDING IN K-12 CURRICULA

Focus group participants highlighted the importance of patent education in building trust between potential inventors and the patent system. Further, addressing knowledge gaps and leveling the playing field so that everyone has access to information about patents and the patenting process can help potential inventors feel more confident in navigating the patenting process when they have an idea that they want to pursue and equip them to tackle challenges that they may face along the way. Early education can also help counter some misperceptions that people may have about patenting through exposure only to patenting through TV programming or other less credible sources. Patent education should begin in K-12 and continue through post-secondary education and should not be limited to individuals in STEM fields. TTOs and corporations that engage in patenting can also provide training to all new personnel on what patents are, how they fit in with the institution's mission and values, how individuals can disclose ideas, what the process of applying for a patent looks like at the institution, and who is available to help them navigate the process.

EMPHASIZE DIVERSITY ACROSS DIMENSIONS, INCLUDING DIVERSE INVENTORS, DIVERSE TECHNOLOGIES, AND DIVERSE INSTRUCTION

Women and people of color must see themselves as inventors before considering participating in patenting. Study participants noted the importance of representation in building trust and encouraging greater engagement in patenting among women and people of color. For this reason, educational materials and programming should integrate diversity along as many dimensions as possible. For example, they might include examples of patents awarded in various technology areas, demonstrating that many different products and technologies can and have been patented and that not all inventions are technologically complex. They might also include profiles of diverse inventors so that everyone can see themselves as a potential inventor. Potential inventors from historically underrepresented groups may also be more willing to trust the information provided by people from diverse backgrounds who look more like them.

RECOMMENDATIONS FOR IMPROVING TRUST IN INNOVATION AND PATENTING

PARTNER WITH TRUSTED COMMUNITY LEADERS AND ORGANIZATIONS TO DELIVER EDUCATION AND TRAINING ON PATENTING

Because women and people of color tend to be less trusting and more cautious before sharing their ideas and trusting others' professional advice, organizations and institutions that provide education and training on patenting to potential inventors may benefit from collaborating with trusted individuals, organizations, and institutions in their community to provide resources. These community resources can then be used as partners in disseminating educational resources or making referrals to service providers. Trusted community resources include teachers, youth organizations, social service agencies, nonprofit organizations, neighborhood groups, religious institutions, and local government offices.

DISSEMINATE INFORMATION ON PATENTING RESOURCES

We found through our focus group conversations and responses to our survey that the majority of potential inventors are not aware of many of the individuals, organizations, institutions, and other resources available to help inventors navigate the patenting process and that these knowledge gaps were often larger among women and people of color. A lack of awareness of available resources can mean that potential inventors either choose not to pursue patents for their inventions or try to navigate the process on their own with limited success. Further, limited knowledge of available resources may make potential inventors less trusting of them and therefore less likely to seek help. Therefore, patent education efforts should be paired with information on the resources available to help inventors navigate the patenting process.

PUBLIC POLICY

ENCOURAGE GREATER COLLABORATION BETWEEN THE USPTO, THE SBA, AND BUSINESS SUPPORT ORGANIZATIONS

Many people who participated in this study said they would reach out to someone they know who owns a business or a business support organization first if they ever had an idea for a new product or technology they wanted to develop further. However, not every business support organization is equipped to help individuals navigate the patenting process or even help them determine whether their idea may be patentable. Strengthening collaboration between the USPTO and SBA, through its extensive network of small business development centers and women's business centers, could be fruitful in filling this gap.

While The Small Business Innovation Protection Act of 2017 (SBIPA) did require the SBA to develop a partnership agreement with the USPTO and to work with the USPTO to provide training on IP protection through its small business development centers,⁴⁷ a report by the Government Accountability Office (GAO) found that by 2020, the two agencies had not fully implemented the law's requirements and that coordination at the local level was inconsistent.⁴⁸ Both agencies have since taken steps to follow the recommendations set forth in the GAO report. Continued support and accountability are needed to maximize the benefits of collaboration. The joint development and implementation of education and training programs and materials for small businesses to learn more about intellectual property and patents, for example, may prove particularly effective as their reach can be expanded through small business development centers and other business support organizations.

The USPTO may also benefit from further expanding their collaboration to include business support organizations and other organizations that are not affiliated with SBA but still provide services and support to small businesses. Such organizations are usually seen as trusted resources in their communities and equipping them with the resources that they need to educate and support inventors about patents can help build trust and engagement among underserved inventors.

47 Sen. Peters, Small Business Innovation Protection Act of 2017.

48 Government Accountability Office, "Intellectual Property: Additional Agency Actions Can Improve Assistance to Small Businesses and Inventors."

RECOMMENDATIONS FOR IMPROVING TRUST IN INNOVATION AND PATENTING

INCREASE ACCESS TO FREE LEGAL ASSISTANCE

Resource constraints mean that people from historically underrepresented communities may be less able to afford working with patent attorneys. Policymakers can address this through investing in the expansion of existing programs such as the Patent Pro Bono Program,⁴⁹ which offers free legal assistance in preparing and filing patent applications, and the Law School Clinic Certification Program, which includes over 60 law school clinics that provide pro bono legal service to the public.⁵⁰ They can also address this by investing in the development of new programs that seek to connect inventors with the legal support they need.

INVEST IN TECHNOLOGY TRANSFER CAPACITY AT UNIVERSITIES, ESPECIALLY HBCUS AND OTHER MINORITY-SERVING INSTITUTIONS

TTOs provide an invaluable service to faculty and students engaging in innovative research by providing support and resources to help them patent and commercialize their inventions. TTOs are seen as a trusted resource among many academic inventors and should be expanded and better resourced by both individual institutions and the government to serve additional academic inventors, including inventors from historically underrepresented groups. These investments should include the formation of new or shared TTOs at emerging research institutions and minority-serving institutions that do not have them.

REIMAGINE THE PATENT EXAMINATION PROCESS SO THAT IT IS MORE COLLABORATIVE

Many study participants suggested that they viewed interactions with patent examiners as adversarial and noted that a more collaborative examination process may encourage more potential inventors to participate in patenting. A more collaborative approach could make the examination process more efficient and build trust between inventors and patent examiners. This may involve establishing clear communication channels between patent examiners, patent attorneys, and inventors, offering training programs and resources to patent examiners on effective communication and collaboration, with a particular focus on engaging with historically underrepresented communities, and establishing feedback mechanisms to solicit input from all parties on the examination process.

Early evidence from a randomized control trial at the USPTO showed that when patent examiners provided additional education and support to inventors who did not have legal representation, inventors were more likely to be successful in their application. The effects were even stronger for women.⁵¹ These findings demonstrate the importance of a customer service-oriented approach in promoting the participation and persistence of inventors from historically underrepresented groups.

COLLECT DATA ON PARTICIPATION IN INNOVATION TO TRACK PROGRESS AND EVALUATE THE EFFECTIVENESS OF NEW PROGRAMS AND INITIATIVES TO PROMOTE DIVERSITY

The USPTO should consider collecting voluntary demographic data from inventors listed on patent applications, as has been proposed through legislation like the IDEA Act.⁵² Corporations and TTOs should likewise collect information on who is disclosing inventions, which inventions are pursued for patents, and any other relevant data. Stakeholders should also use the data collected to inform decision making and investments and track progress toward greater diversity and inclusion in their respective settings.

49 United States Patent and Trademark Office, “Patent Pro Bono Program.”

50 United States Patent and Trademark Office, “Law School Clinic Certification Program.”

51 Pairolero et al., “Closing the Gender Gap in Patenting: Evidence from a Randomized Congrol Trial at the USPTO.”

52 Sen. Hirono, Inventor Diversity for Economic Advancement Act of 2021 or the IDEA Act.

RECOMMENDATIONS FOR IMPROVING TRUST IN INNOVATION AND PATENTING

WORKPLACE CULTURE

CONNECT INNOVATION AND PATENTING TO ORGANIZATIONAL MISSION AND VALUES

For corporations and TTOs, it is important to consider how patents connect with their mission and communicate these linkages to their employees. This can help address potential inventors' concerns about patenting through their institution and losing control over how their invention is developed and commercialized by helping them understand how their work fits in with the broader mission and goals of the institution. Such efforts can also help build trust between potential inventors and institutions because it helps demonstrate the value that the institution places on their ideas and work.

ENCOURAGE COLLABORATION ACROSS DISCIPLINES AND DEPARTMENTS

We found that because potential inventors often did not have much experience working with colleagues from other departments or disciplines, their level of trust in such colleagues was lower than in colleagues they worked with more regularly. However, the patenting process often provided inventors the opportunity to collaborate more with colleagues they don't regularly work with. These experiences were generally quite positive, leading to greater trust. Corporations and academic institutions should, therefore, identify opportunities for individuals from different disciplines or departments to collaborate or otherwise interact with one another and encourage such collaborations. This can help build trust between people who may need to work together to pursue patents but otherwise may not have previously worked together. Fostering these trusting relationships before a patent application is filed can make such collaborative efforts more effective.

IDENTIFY OPPORTUNITIES TO INCREASE NETWORKING AND BUILD CONNECTIONS AMONG INVENTORS, PRACTITIONERS, AND SERVICE PROVIDERS

Diverse networks are vital to successfully navigating the patenting process, and women and people of color tend to have smaller and more limited networks.⁵³ Organizations and institutions seeking to expand the participation of people from historically underrepresented groups in innovation and patenting should be intentional about providing opportunities for peer learning and networking among potential inventors and between potential inventors and IP practitioners and other service providers. TTOs, corporations, and service providers can host networking events that include potential inventors, IP practitioners, and other service providers. These events provide a platform for individuals to connect, share ideas, and explore potential collaborations, all of which can help build relationships and foster trust between potential inventors and those they may work with to patent their inventions.

⁵³ Sen. Peters, Small Business Innovation Protection Act of 2017.

RECOMMENDATIONS FOR IMPROVING TRUST IN INNOVATION AND PATENTING

ADOPT POLICIES AND PRACTICES THAT FOSTER AN INCLUSIVE WORK ENVIRONMENT AND FACILITATE THE OPEN SHARING OF IDEAS

To prevent a negative climate and culture from developing in the workplace that can erode trust, institutions can create a positive workplace culture that fosters an inclusive environment by creating equitable policies and practices that actively address and mitigate biases and microaggressions, create team norms where everyone is respected and heard, establish safe spaces for employees to gather, share experiences, and contribute to a supportive workplace culture (such as employee resource groups or affinity groups), and create systems for accountability by implementing reporting structures, conducting regular training, and ensuring consequences for inappropriate behavior at all levels of the organization.

EMPOWER MANAGERS TO BUILD A TEAM CULTURE THAT FOSTERS TRUST, COLLABORATION, AND CREATIVITY

A trustful team is characterized by cooperation, collaboration, and mutual respect. Members feel safe to voice their opinions without fear of criticism or judgment, knowing their thoughts are valued and respected. Cultivating trust involves ongoing efforts to strengthen interpersonal connections, communication, and mutual support, ultimately contributing to a resilient and high-functioning team. Managers can help create an environment that fosters trust by building rapport with individual team members through one-on-one meetings, promoting clear and open communication within the team, building the connection between team members through group activities, mentorship programs, and affinity groups, and fostering an environment in which everyone can communicate openly and honestly with each other without fear of judgment or criticism.

DEVELOP A STANDARD PROCEDURE FOR INVENTION DISCLOSURE AND ENSURE THAT ALL EMPLOYEES UNDERSTAND THESE PROCEDURES AND PROCESSES

Throughout our focus group discussions and in the responses to our survey, we discussed what factors may make individuals more trusting of their organization or institution, and transparency was a common theme. Transparent invention disclosure and review procedures and processes can foster open and honest communication between leadership and employees regarding decisions about authorship/inventorship, how inventions are evaluated, and which inventions are ultimately pursued for patents. When inventors understand what is expected of them when they disclose an invention or put together a patent application and understand how their inventions will be evaluated by their company, they are more likely to trust that they are being treated fairly. Institutions should establish standard procedures for employees to disclose their inventions, including guidance on what information is required for the invention disclosure. They should also work to establish standard evaluation criteria that are consistently applied in the review of each invention disclosure. These standard procedures and review criteria should be made clear to all employees. Finally, institutions should communicate clearly with inventors throughout the disclosure and review process, providing any relevant feedback so that they understand the decision and why it was made.

CONCLUDING REMARKS

This report represents a first look at the potential role of trust in the participation of people from historically underrepresented backgrounds in the patenting ecosystem. We found that greater knowledge of patents and having access to trusted support is important in determining who chooses to pursue patents, their confidence in navigating the different stages of the process, and the extent to which potential challenges may prevent people from applying for patents. Due to both a history of marginalization and discrimination, as well as current experiences of discrimination and bias, women and people of color tend to be less trusting and more cautious when they have ideas for new products or technologies. They also have fewer people in their networks that they can trust to help them navigate the patenting process. As a result, many either choose to pursue patenting independently with minimal access to resources and support or do not apply at all.

We also identified opportunities for stakeholders in government, academic institutions, corporations, and organizations that support aspiring inventors to build trust and encourage people from all backgrounds to engage in patenting. These opportunities largely focus on addressing knowledge gaps through formal education and on-the-job training, promoting inclusive workplace environments, increasing access to resources, enhancing relationships between service providers and inventors, and developing consistent and transparent policies and procedures for disclosing and evaluating inventions.

Because this was the first study to explore this topic, we wanted to cast a wide net to explore the many ways that trust plays a role in the participation of people from historically underrepresented groups in patenting. This, of course, limited our ability to explore any one topic in great detail. Future research could deepen our findings by considering:

- Whether and how trust is formed differently across institutional settings and how trust affects individuals' behaviors and attitudes differently in each setting.
- The specific role of trust at different stages of the patenting process, from learning about the patent system to filing an application and responding to examiner decisions.
- What factors can improve the trust of academic inventors in their university's TTO and increase the participation of more women and people of color? Are there effective models and best practices that can be scaled with greater investments?
- What factors can improve the trust of corporate inventors in their institution, IP department, manager, and coworkers? How do team dynamics support or hinder the participation of women and people of color?

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METHODOLOGICAL APPENDIX

To explore the role of trust in whether and how inventors choose to engage in patenting, who they choose to collaborate with, and how their experiences can affect their level of trust and engagement, we employed a mixed-methods research design which included both focus group discussions and a quantitative survey. The mixed-methods approach was ideal for this project because it was the first (to our knowledge) to try and answer these research questions. The focus group conversations were held initially to learn about the experiences and perceptions of people from diverse backgrounds and to identify themes that would be important to explore further with the survey.

This study is exploratory and was not designed to be representative of the wider population at this stage. While many of the findings we describe are consistent with what we might expect given previous research, readers should be aware of this limitation when interpreting the findings.

FOCUS GROUPS

To capture the different thoughts and experiences of people with varying degrees of engagement in innovation, we conducted two types of focus groups. One type of focus group included people who didn't regularly engage in innovation in their day-to-day lives (potential inventors). The other type of focus group included inventors and people who regularly engage in innovative activities but have not yet patented, or patent adjacent individuals. Focus groups were semi-structured. A discussion protocol was developed for each focus group type but allowed for free-flowing dialogue based on points raised by participants.

Focus groups with potential inventors covered topics such as:

- What does "innovation" mean to you? Who do you think of when you think of innovators? Do you see yourself as an innovator? Why/why not?
- Who do you know in your network that you might seek help from if you had an idea for a new product or service you wanted to develop? Why would you seek help from them? Are there any other "experts" you think you might need help from that you don't currently have in your network? How comfortable would you feel seeking help from different resources if you didn't know them already? Why is this? What could make you feel more comfortable seeking help from them?
- What opportunities might there be to build trust in and increase the utilization of the patent system among women, people of color, individuals with lower incomes, and other underrepresented groups?

Focus groups with inventors and patent adjacent individuals covered topics such as:

- How has your identity contributed to your experiences as an inventor and in navigating the patenting process? What barriers you have faced in patenting your inventions, if any? How, if at all, were these barriers related to your identity?
- To what extent do you trust the different people, organizations, and institutions that can help you bring your inventions from idea to market? If you haven't worked with certain key individuals or institutions, why haven't you? Do you trust these people, organizations or institutions? Why or why not?
- To what extent has your trust in these people, organizations, and institutions influenced your approach to patenting your ideas?

METHODOLOGICAL APPENDIX

In total, we held 11 focus groups that included 31 participants. Of the 31 participants, 12 were potential inventors and 19 were patent adjacent individuals or inventors. Among the potential inventor focus group participants, 10 were women and 7 were women of color. Among the patent adjacent and inventor focus group participants, 8 were women, 16 were people of color, and 6 were women of color.

	POTENTIAL INVENTORS	PATENT ADJACENT + INVENTORS
White Men	2	1
Men of Color	0	10
White Women	3	2
Women of Color	7	6

Within the focus groups conducted with inventors and patent adjacent individuals, most participants were academics. Fourteen were from academia, four were from corporate settings, and one participant was an independent inventor.

It was communicated to all participants that their participation in the focus groups was completely voluntary, that they could withdraw their consent to participate at any time during the process without penalty, and that all measures would be taken to ensure that their privacy was protected. We informed them that neither their name nor any other identifying information such as audio of their voice would be used in presentations or written products resulting from their participation. In addition, we communicated that the conversation was being recorded for notetaking purposes only and that only the research team would have access to and be able to listen to the recordings.

We started each session by introducing Brave Space Ground Rules⁵⁴ and the Courageous Conversation⁵⁵ framework to foster participation and trust. These ground rules help to facilitate difficult conversations involving issues of identity, race, oppression, and to center historically marginalized groups in a discussion.

Focus group conversations were conducted and recorded via Zoom video conferencing platform. Transcription and coding were completed using Otter.ai Software. During the report-drafting process, quotes were edited lightly for clarity.

Our focus group protocol is available upon request.

⁵⁴ Arao and Clemens, "From Safe Spaces to Brave Spaces"; Landreman, The Art of Effective Facilitation.

⁵⁵ Singleton, Courageous Conversations About Race; Stone, Patton, and Heen, Difficult Conversations.

METHODOLOGICAL APPENDIX

SURVEY

The quantitative survey was informed by the themes that emerged from the focus groups, as well as existing literature on the challenges and barriers women and people of color face in accessing and navigating the patent system.

It was built in Qualtrics and was designed to take participants 15-20 minutes to complete. Individuals were initially sorted into different survey paths based on their responses to questions about whether they had applied for a patent before, and whether they regularly engaged in different innovative activities. This enabled us to identify inventors, patent adjacent individuals, and potential inventors. From there, we further classified inventors and patent adjacent individuals into settings based on whether they largely engaged in innovation and patenting at academic or government institutions, corporations, or independently.

The survey questions that respondents received depended on their classification. We focused our questions of inventors on their general experiences patenting rather than their experience patenting for the first time. For potential inventors and patent adjacent individuals, we focused our questions on anticipated challenges and access to resources. All participants received questions related to experiences in the workplace and their general propensity to trust. Survey questions were tailored, where appropriate, to each classification.

As with our focus groups, we aimed to have a sample that was diverse with respect to gender, race, and ethnicity as well as with respect to level of engagement in innovation and patenting. We used several different distribution channels to field the survey and gather responses. We contacted more than 70 organizations and associations related to patenting to request assistance distributing the survey. We posted about the survey on social media, including Twitter/X, LinkedIn, and Facebook. We built a landing page on the Research 2 Impact website that provided more information about the project and directed people to free resources for potential inventors. We also engaged in individual outreach to people in our networks, principal investigators on previous SBIR/STTR grants, inventors listed on patents assigned to U.S. universities, and industry professionals identified through LinkedIn. Because of the distribution methods employed to ensure an adequate sample size, readers should note that the results obtained through analysis of survey responses should not be interpreted as representative of all inventors, patent adjacent individuals, or potential inventors.

In total, 1,062 individuals participated in the survey, and 894 completed at least 70%. We utilized the 894 responses from individuals who could be classified based on the definitions above and who completed most of the survey in our analysis. The table below provides sample sizes for each major categorization utilized in this report.

SAMPLE SIZES BY ANALYSIS CATEGORY

Finally, the tables and figures presented in this report frequently present data disaggregated by gender, race, and ethnicity. To be reported, however, we required the sample size to be at least 10. This threshold is consistent with cell size suppression requirements across disciplines and both minimizes disclosure risk and mitigates some of the estimate variability risk from having small sample sizes.

The survey protocol is available upon request.

CATEGORY	SAMPLE SIZE
Potential Inventor	311
Patent Adjacent	316
Independent	35
Academic/Government	32
Corporate	210
Inventor	267
Independent	98
Academic/Government	117
Corporate	39

DATA APPENDIX

Table A1. General Propensity to Trust and Level of Caution by Level of Engagement in Innovation

	Disagree or Strongly Disagree	Agree or Strongly Agree
In general, I can trust people's professional advice.		
Inventor	17.8%	82.2%
Patent Adjacent	11.8%	88.2%
Potential Inventor	12.3%	87.7%
All	13.7%	86.3%
If I had an idea for a new product or service, there are people that I feel I can trust with which to discuss the idea.		
Inventor	8.7%	91.3%
Patent Adjacent	13.2%	86.8%
Potential Inventor	21.6%	78.4%
All	14.7%	85.3%
If I had an idea for a new product or service, there are people that I feel I can trust to work with in developing the idea further.		
Inventor	10.0%	90.0%
Patent Adjacent	16.4%	83.6%
Potential Inventor	25.3%	74.7%
All	17.6%	82.4%
If I had a good idea at work, I would feel comfortable telling others about it.		
Inventor	20.0%	80.0%
Patent Adjacent	17.5%	82.5%
Potential Inventor	33.9%	66.1%
All	21.8%	78.2%
If I had a good idea at work, I am confident that I would get appropriate credit for it.		
Inventor	15.9%	84.1%
Patent Adjacent	27.1%	72.9%
Potential Inventor	22.9%	77.0%
All	20.2%	79.8%
If I face a challenge related to work or business, I prefer to work through it on my own.		
Inventor	43.7%	56.3%
Patent Adjacent	31.0%	69.0%
Potential Inventor	26.0%	74.0%
All	32.6%	67.4%
It's better to be cautious before trusting people you don't know for professional advice.		
Inventor	20.2%	79.8%
Patent Adjacent	10.5%	89.5%
Potential Inventor	9.3%	90.7%
All	12.7%	87.3%
When you have a good idea, it's best to keep it closely guarded because you don't know who may steal it.		
Inventor	51.3%	48.7%
Patent Adjacent	21.7%	78.3%
Potential Inventor	15.1%	84.9%
All	27.2%	72.8%

Note: Data are based on survey responses to the following prompt: "Please rate the degree to which you agree or disagree with the following statements about your general willingness to trust the different people, organizations, and institutions that you might work with if you ever had an idea for a new product or technology." This prompt was given to all participants. Percentages represent the share of respondents who agreed or strongly agreed with each statement.

DATA APPENDIX

Table A2. General Propensity to Trust and Level of Caution by Gender, Race, and Ethnicity – Share that they Agree or Strongly Agree

	White Men	Hispanic Men	Black Men	Other Men	White Women	Hispanic Women	Black Women	Other Women	All
If I face a challenge related to work or business, I prefer to work through it on my own	59.2%	74.7%	63.9%	72.1%	64.0%	74.3%	78.4%	61.5%	67.4%
It's better to be cautious before trusting people you don't know for professional advice	80.7%	86.2%	91.5%	86.0%	86.7%	90.1%	96.8%	88.5%	87.3%
When you have a good idea, it's best to keep it closely guarded because you don't know who may steal it	58.5%	81.6%	78.3%	74.4%	66.0%	83.0%	91.2%	65.4%	72.8%
In general, I can trust people's professional advice	86.0%	86.6%	82.9%	82.1%	90.9%	90.3%	82.8%	81.0%	86.3%
If I had an idea for a new product or service, there are people that I feel I can trust with which to discuss the idea	88.2%	82.9%	88.2%	84.6%	87.1%	79.6%	81.9%	85.7%	85.3%
If I had an idea for a new product or service, there are people that I feel I can trust to work with in developing the idea further	88.5%	76.5%	85.5%	84.6%	82.6%	81.7%	73.3%	76.2%	82.4%
If I had a good idea at work, I would feel comfortable telling others about it	81.3%	78.8%	87.5%	82.6%	80.0%	71.4%	67.4%	64.3%	78.2%
If I had a good idea at work, I am confident that I would get appropriate credit for it	89.9%	81.8%	83.3%	60.9%	73.5%	71.4%	69.0%	71.4%	79.8%

Note: Data are based on survey responses to the following prompt: "Please rate the degree to which you agree or disagree with the following statements about your general willingness to trust the different people, organizations, and institutions that you might work with if you ever had an idea for a new product or technology." This prompt was given to all participants. Percentages represent the share of respondents who agreed or strongly agreed with each statement. Racial groups are non-Hispanic. "Other" includes individuals identifying as Native American, Asian, or two or more races. None of these groups had sufficient sample sizes to report disaggregated data.

DATA APPENDIX

Table A3. Share of Respondents Reporting Moderate or Complete Trust in Individuals and Institutions They May Seek Support from or Collaborate with on Patent Applications by Gender, Race, and Ethnicity

	White Men	Hispanic Men	Black Men	Other Men	White Women	Hispanic Women	Black Women	Other Women	All
Family and friends	80.0%	73.1%	77.2%	84.2%	86.3%	73.6%	61.7%	66.7%	75.9%
People who you work with regularly	85.3%	60.5%	61.3%	76.9%	67.7%	62.2%	48.1%	70.6%	70.7%
Patent attorneys	77.3%	70.7%	68.1%	71.1%	66.7%	65.9%	61.7%	61.9%	69.5%
Colleagues in other departments	72.3%	68.8%	50.0%	63.6%	61.3%	83.3%	45.5%	44.4%	65.0%
Your institution's technology transfer office (TTO) (IP department)	71.6%	63.6%	70.8%	72.7%	52.1%	57.1%	53.5%	57.1%	64.2%
Patent examiners	59.5%	64.6%	75.0%	76.9%	59.0%	63.5%	58.6%	42.9%	62.5%
United States Patent and Trademark Office	61.8%	55.1%	67.3%	81.3%	62.7%	53.8%	63.0%	42.9%	61.3%
Your company/employer	74.8%	44.7%	64.5%	64.0%	56.7%	47.2%	44.2%	52.6%	60.7%
Your manager	73.3%	50.0%	60.0%	61.5%	56.7%	41.7%	39.0%	66.7%	58.7%
Other colleagues you may work with to patent a new product or technology	70.1%	48.5%	50.0%	65.2%	54.0%	50.0%	48.8%	35.7%	58.5%
Service providers that provide education and training to small businesses	41.6%	55.1%	57.7%	62.5%	67.5%	49.2%	57.5%	28.6%	54.4%
Professional acquaintances	59.2%	47.2%	63.6%	66.7%	57.0%	49.3%	47.5%	33.3%	54.2%
People who provide professional services (e.g. lawyers, accountants, doctors)	66.7%	40.0%	28.6%	0.0%	31.3%	55.6%	55.6%	60.0%	44.8%
Financial service providers (e.g. banks)	33.1%	30.0%	41.5%	38.7%	28.5%	29.1%	35.5%	23.8%	32.5%

Note: Data are based on responses to the following question: "To what extent do you trust the following individuals, organizations, and institutions to treat you fairly and have your best interests at heart if you had an idea for a new product or technology that you wanted to develop?" This question was asked of all participants. Percentages represent the share of individuals who said they trusted each individual or institution "moderately" or "completely." Racial groups are non-Hispanic. "Other" includes individuals identifying as Native American, Asian, or two or more races. None of these groups had sufficient sample sizes to report disaggregated data.

DATA APPENDIX

Table A4. Likelihood of Taking Specific Actions if an Idea for a New Product or Technology Emerges by Gender, Race, and Ethnicity

	Not at All Likely	Not Very Likely	Somewhat Likely	Very Likely
Start a Business				
White Men	3.7%	22.2%	56.5%	17.6%
Hispanic Men	2.8%	21.1%	45.1%	31.0%
Black Men	0.0%	15.1%	52.1%	32.9%
Other Men	4.8%	19.1%	57.1%	19.1%
White Women	7.1%	33.1%	51.2%	8.7%
Hispanic Women	5.4%	29.4%	54.4%	10.9%
Black Women	3.4%	12.8%	47.0%	36.8%
Other Women	11.1%	16.7%	72.2%	0.0%
All	4.3%	22.5%	52.0%	21.2%
Look Into Pursuing a Patent				
White Men	4.6%	15.7%	60.2%	19.4%
Hispanic Men	2.8%	7.0%	54.9%	35.2%
Black Men	2.7%	13.7%	43.8%	39.7%
Other Men	19.1%	9.5%	33.3%	38.1%
White Women	3.9%	23.6%	52.8%	19.7%
Hispanic Women	5.4%	21.7%	46.7%	26.1%
Black Women	4.3%	12.8%	42.7%	40.2%
Other Women	5.6%	22.2%	50.0%	22.2%
All	4.6%	16.4%	49.8%	29.2%
Pitch the Idea to a Company				
White Men	9.3%	26.9%	39.8%	24.1%
Hispanic Men	8.5%	32.4%	36.6%	22.5%
Black Men	16.4%	30.1%	42.5%	11.0%
Other Men	19.1%	23.8%	42.9%	14.3%
White Women	9.4%	43.3%	37.0%	10.2%
Hispanic Women	15.2%	39.1%	39.1%	6.5%
Black Women	18.0%	29.1%	40.2%	12.8%
Other Women	11.1%	55.6%	27.8%	5.6%
All	12.9%	34.1%	38.9%	14.0%
Keep the Idea to Yourself While Pursuing It				
White Men	0.9%	33.3%	29.6%	36.1%
Hispanic Men	5.6%	16.9%	45.1%	32.4%
Black Men	2.7%	13.7%	45.2%	38.4%
Other Men	4.8%	14.3%	61.9%	19.1%
White Women	2.4%	21.3%	52.0%	24.4%
Hispanic Women	4.3%	16.3%	52.2%	27.2%
Black Women	8.5%	17.1%	27.4%	47.0%
Other Women	11.1%	11.1%	61.1%	16.7%
All	4.3%	19.9%	42.6%	33.2%
Do Nothing				
White Men	31.5%	36.1%	24.1%	8.3%
Hispanic Men	54.9%	23.9%	15.5%	5.6%
Black Men	50.7%	23.3%	19.2%	6.8%
Other Men	38.1%	38.1%	9.5%	14.3%
White Women	24.4%	34.7%	28.4%	12.6%
Hispanic Women	29.4%	43.5%	20.7%	6.5%
Black Women	49.6%	28.2%	16.2%	6.0%
Other Women	27.8%	27.8%	16.7%	27.8%
All	38.1%	32.4%	20.7%	8.8%

Note: Data are based on survey responses to the following question: "If you had an idea for a new product or technology, how likely is it that you would..." This question was asked of respondents who were classified as either patent adjacent or potential inventors. Racial groups are non-Hispanic. "Other" includes individuals identifying as Native American, Asian, or two or more races. None of these groups had sufficient sample sizes to report disaggregated data.

DATA APPENDIX

Table A5. Share of Respondents Reporting at Least Some Knowledge of Key Individuals and Institutions in the Patent Ecosystem by Gender, Race, and Ethnicity

	White Men	Hispanic Men	Black Men	Other Men	White Women	Hispanic Women	Black Women	Other Women	All
Patent Attorneys	39.5%	39.5%	30.0%	8.3%	39.7%	28.0%	43.5%	18.2%	35.7%
USPTO	39.5%	34.2%	36.7%	8.3%	39.7%	26.5%	46.4%	27.3%	36.5%
Patent Examiners	38.1%	21.1%	30.0%	0.0%	31.0%	24.0%	39.7%	9.1%	29.4%
Programs that Provide Assistance to Aspiring Inventors	37.2%	18.4%	33.3%	0.0%	27.6%	24.0%	40.6%	9.1%	28.9%
TTOs	30.2%	21.1%	20.7%	0.0%	25.9%	20.0%	34.8%	9.1%	24.8%
Financial Institutions and Other Funders	37.2%	36.8%	26.7%	25.0%	22.4%	28.0%	47.8%	0.0%	32.5%
Service Providers that Provide Education and Training to Small Businesses	27.9%	26.3%	26.7%	8.3%	20.7%	24.0%	44.1%	9.1%	27.7%

Note: Data are based on survey responses to the following question: "If you had an idea for a new product or technology, how likely is it that you would..." This question was asked of respondents who were classified as either patent adjacent or "potential inventors. Percentages represent the share of participants who reported at least some knowledge of the relevant individual or institution. Racial groups are non-Hispanic. "Other" includes individuals identifying as Native American, Asian, or two or more races. None of these groups had sufficient sample sizes to report disaggregated data.

Table A5. Sources of Information About Patents by Level of Engagement in Innovation

	Inventor	Patent Adjacent	Potential Inventor
K-12 classes	10.0%	18.2%	29.3%
Community college	3.4%	10.4%	13.3%
Undergraduate program	21.8%	31.8%	14.2%
Graduate or postdoctoral program	33.9%	14.3%	4.4%
Courses offered to the community through various organizations or institutions	4.6%	7.9%	1.3%
Courses offered online through various organizations	5.4%	16.1%	2.7%
At work	67.8%	39.3%	12.4%
Conferences or professional organizations	25.5%	18.9%	4.4%
From family, friends, or other acquaintances	19.7%	30.7%	35.6%
Through news stories	6.7%	28.6%	36.4%
Through programming on TV	2.9%	27.9%	42.7%
I sought out the information on my own (e.g. through Google searches, reading books, etc.)	45.2%	50.0%	32.4%
Other	10.0%	4.3%	2.7%

Note: Data are based on survey responses to the following question: "Where have you learned about patents?" This question was asked of respondents who were classified as either patent adjacent or potential inventors. Racial groups are non-Hispanic. "Other" includes individuals identifying as Native American, Asian, or two or more races. None of these groups had sufficient sample sizes to report disaggregated data.

DATA APPENDIX

Table A6. Negative Effects of Frequent Negative Workplace Experiences Related to One's Identity by Gender, Race, and Ethnicity

	White Men	Hispanic Men	Black Men	Other Men	White Women	Hispanic Women	Black Women	Other Women	All
Your willingness to stay with your employer	26.1%	31.6%	46.2%	37.5%	42.6%	50.0%	39.0%	37.5%	40.7%
Your willingness to engage in programming, events, employee resource groups, or other activities offered by your employer	30.4%	47.4%	46.2%	12.5%	39.3%	33.3%	45.8%	50.0%	39.8%
Your productivity at work	34.8%	21.1%	34.6%	12.5%	29.5%	42.9%	35.6%	37.5%	33.3%
Your confidence in your abilities	30.4%	26.3%	34.6%	12.5%	35.5%	45.2%	35.6%	25.0%	34.8%
How connected you feel with people at work	31.8%	42.1%	46.2%	37.5%	47.5%	38.1%	55.9%	62.5%	46.1%
How you choose to interact with people at work	40.9%	42.1%	46.2%	25.0%	50.8%	47.6%	59.3%	62.5%	49.8%
How you choose to interact with people outside of work	31.8%	10.5%	23.1%	25.0%	29.0%	33.3%	39.0%	62.5%	31.3%
Your willingness to ask questions or seek help when you need it	31.8%	42.1%	34.6%	0.0%	32.3%	45.2%	50.8%	62.5%	39.8%
Your willingness to share your thoughts and ideas with coworkers	27.3%	42.1%	34.6%	25.0%	41.0%	45.2%	52.5%	50.0%	42.4%
Your willingness to share your thoughts and ideas with your manager(s)	45.5%	63.2%	34.6%	37.5%	38.3%	54.8%	47.5%	50.0%	45.9%
Your willingness to trust your coworkers or manager(s)	31.8%	47.4%	38.5%	50.0%	39.3%	47.6%	45.8%	62.5%	43.3%
Your willingness to trust other people, organizations, or institutions	45.5%	47.4%	26.9%	37.5%	38.7%	40.5%	49.2%	50.0%	41.9%

Note: Data are based on survey responses to the following question: "Overall, to what extent do you feel that these experiences or expectations of differential or poor treatment have influenced the following measures of your engagement and performance at work?" This question was asked of all participants. Percentages represent the share of respondents who frequently had at least one of the 13 negative workplace experiences identified in this study and who said that those experiences had a moderate or significant negative impact on the relevant indicator of performance or engagement. Racial groups are non-Hispanic. "Other" includes individuals identifying as Native American, Asian, or two or more races. None of these groups had sufficient sample sizes to report disaggregated data.