CLOSING THE GENDER GAP IN CANADIAN MINING:

AN INTERDISCIPLINARY MIXED METHODS STUDY

A Thesis Submitted to the
College of Graduate and Postdoctoral Studies
In Partial Fulfillment of the Requirements
For the Degree of Master of Science
In the Interdisciplinary Studies Program
University of Saskatchewan
Saskatoon

By

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Abstract

In response to societal pressures and a looming labour shortage, the Canadian mining industry has recently embarked on a journey to welcome gender diversity and inclusion in its male-dominated workforce. The purpose of this two-phase, transformative mixed-methods study was to understand how Canadian mining companies are working to close the gender gap in the industry. In the first phase of the study, a qualitative, rhetorical criticism-based methodology was used to analyze over 75 public documents from ten companies involved in Canadian mining, which represent approximately half of the Canadian mining sector employees (Mining Industry Human Resources, 2017). Rhetorical analysis applied theoretical approaches drawn from cluster, fantasy-theme, generative, and generic criticism (Foss, 2004); continuum analysis (Brummett, 2011); and consideration of the construction of a Second Persona (Black, 1970). Findings from the top-down analysis indicate that some individual mining companies are employing targeted strategies but ultimately companies are at different positions on their journey to create an industry that is reflective of the communities in which they operate.

The bottom-up approach of the second phase, informed by the first phase outcomes, involved an anonymous online survey that was intended to capture perceptions and experiences of current and former workers in the Canadian mining industry. 540 respondents completed the survey and responses were analyzed using statistical and rhetorical methods to distinguish differences and similarities. The respondents identified as men (n = 318) and women (n = 220) [1], and current (n = 459) and former (n = 81) mining workers. Second phase results showed a divide between the primarily positive messaging coming from the top of organizations and the needs of employees. Findings included a lack of open communication, a disconnect to the personal benefits of gender equity strategies, and flaws in the current discrimination and harassment reporting systems.

The industry still has a long way to go to achieve gender equity; however, early signs of culture change are evident, and the goals of inclusion and diversity in the workforce have the potential to be achieved with a multi-fronted communication strategy that encourages shifting mindsets and behaviours.

[1] Two respondents identified with the other gender.

Acknowledgements

First, I am grateful for all the support from current and former mentors in inspiring me to not accept that how things are is how things should always be. Your encouragement helped me in getting one step closer to furthering my education. Specifically, I would sincerely like to thank my co-supervisors, Emily McWalter and John Moffatt, for their guidance, and their willingness to share their expertise as we explored new subjects together. Their support and dedication also helped me to secure funding from Canadian Institute of Mining, Women in Mining and Women in Nuclear Saskatchewan Inc., the Association of Professional Engineers and Geoscientists of Saskatchewan, Engineers Canada, and the University of Saskatchewan. Thank you to my committee members for their inspiration, thoughtful questions, and helping me to right-size my master's project.

Lastly, I am forever grateful to my loving and supportive husband, Steve, and my daughters, Abygail and Alexandra, for their confidence in me.

Dedication

This work is dedicated to my parents who instilled in me the values of hard work, continous learning, and a desire to solve complex problems.

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Glossary of Terms

Benevolent sexism

A form of subtle sexism where women are viewed in stereotypical or restricted roles; a positive tone is often used in communicating paternalistic views; and communication or actions are perceived by the receiver as negative (Glick & Fiske, 1996, pp. 491 - 492).

Cluster criticism

A rhetorical analysis method developed by Kenneth Burke which provides deep insight into the worldview of the communicator by looking at the types of words used around key terms (Foss, 2004).

Discrimination[2]

Subtle or exclusionary behaviour or actions from an aggressor to a receiver based on a difference in perceived categorization of diversity, often including an imbalance in power; behaviour may be unintentional, written or verbal; although the receiver may feel threatened and insulted, the aggressor's behaviour may not be intended to commit a personal attack, but likely is due to the aggressor's categorization of the differences of the receiver.

Diversity[2]

Variety; can indicate a variety of ways of thinking, or be used to measure and describe educational, physical, gender, sexual orientation, religious beliefs, and/or racial differences; a lagging indicator often used to measure the demographics of men and women in an organization.

Ethos

The credibility of the speaker as demonstrated in the message; involves: good will, good judgement, and good character; one of the three appeals defined by Aristotle (MacLennan, 2009).

Fantasy-theme criticism

Is a rhetorical analysis method developed by Ernest Bormann in 1983 "to provide insights into the shared worldview of groups" through examining the three components of setting, character, and action (Foss, 2004, p. 109).

Feminist lens

A critical perspective which draws on feminist theory and seeks to understand inequities between women and men (Creswell & Plano Clark, 2011; Mertens, 2007).

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[2] The definition for this term can vary and was developed for the purpose of this thesis.

Feminist theory

Is complex, intersectional and interdisciplinary while seeking equality, freedom, and justice for all, not just for women (Ferguson, 2017, p. 269).

Gender

"Refers to the social differences and relations between men and women which are learned, vary widely among societies and cultures, and change over time" (Pavlic, Ruprecht, & Sam-Vargas, 2000, p. 6). For the purposes of this study and to protect the identities of survey participants, gender refers to the sex categories of male, female, or other.

Gender equity

A "means of fairness of treatment for women and men, according to their respective needs. This may include equal treatment or treatment that is different but which is considered equivalent in terms of rights, benefits, obligations, and opportunities" (Pavlic et al., 2000, p. 5).

Gender equality

A basic human right which denounces discrimination based on gender; included in the Universal Declaration of Human Rights (United Nations, 2015b).

Generic criticism

A rhetorical analysis method used to analyze the intersection of the rhetorical situation, the content and form of the rhetoric, and the organization of the rhetoric to look for common themes or patterns (Foss, 2004).

Generative criticism

A rhetorical analysis method offered by Foss (2004) as a method for digging deeper into artifacts which catch a researcher's attention and a means for researchers to answer specific questions related to those artifacts.

Harassment[2]

Overtly inappropriate behaviour that is communicated by physical, written, and/or verbal means and directed from an aggressor to a specific receiver at a specific time and place. A personal attack that is often directed due to an imbalance in power and has an element of unacceptance of diversity. Bullying is a form of harassment.

Human rights

The inherent rights that all people are born with as outlined in the Universal Declaration of Human Rights (United Nations, 2015b).

Inclusion[2]

The acceptance and celebration of differences in an organization; verbal and non-verbal inclusionary behaviors may be required due to educational, physical, gender, sexual orientation, religious belief, and/or racial differences.

Logos

The logical argument that supports the speaker's claim; involves tailoring and organizing the message; one of the three appeals identified by Aristotle (MacLennan, 2009).

#MeToo movement

The MeToo Movement was founded in 2006 by Tarana Burke to support survivors of sexual assault (Me Too Movement, 2018). In the fall of 2017, the hashtag #MeToo gained in popularity due to the promotion of celebrity, Alyssa Milano and her cries to call out media mogul Harvey Weinstein's predatory behaviour towards women in the entertainment industry (Khomami, 2017). The movement has since spread to other countries and industries around the world.

Microaggression

Brief, common, verbal or non-verbal discriminatory slights or insults which are intentionally or unintentionally directed towards women and are experienced by women on a regular basis in male-dominated workplaces; however, they are seldom brought to light (Harris, 2016; McKenzie & Halstead, 2017; Offermann, Basford, Graebner, Basu Degraaf, & Jaffer, 2013).

Mining Industry Human Resources (MIHR)

A not-for-profit organization that analyzes and forecasts labour market trends in the Canadian mining industry.

Nominal

Data types defined by classification. The order of nominal data types is not important.

NVivo

A packaged software used to complete qualitative, rhetorical analysis within this study.

Ordinal

Data types defined by a ranked order.

Pathos

The connection to the audience's needs, values, emotions, and expectations; one of the three appeals identified by Aristotle (MacLennan, 2009).

Rhetoric

Aristotle defined rhetoric as: the art of finding in any given case the available means of persuasion.

Rhetorical analysis

A form of qualitative analysis that helps with understanding how communication is or is not persuasive.

Rhetorical audience

The person or people in a position to solve the problem (exigence) through means of persuasion (Bitzer, 1968).

Rhetorical criticism

A qualitative analysis method which allows for "systematic investigation and explanation of symbolic acts and artifacts for the purpose of understanding rhetorical processes" (Foss, 2004, p. 6).

Rhetorical constraints

"Persons, events, objects, and relations which … have the power to constrain decision and action needed" to solve a problem (Bitzer, 1968, p. 8).

Rhetorical exigence

A problem, with a sense of urgency, which can be solved with communication or discourse (Bitzer, 1968).

Rhetorical situation

Bitzer (1968) outlines that three requirements are necessary for a situation to be rhetorical in nature: exigence, audience, and constraints.

Transformative mixed-methods design

Lifts up the voices of participants to develop a call for action using data sources that can challenge injustices and provide evidence that is acceptable to stakeholders (Creswell & Plano Clark, 2011, pp. 96 - 97).

Transformative paradigm

Acknowledges that multiple, socially constructed, realities can emerge; that knowledge is socially and historically located within a complex cultural context; that methodology should address power issues and discrimination through participant participation; and that ethical considerations should include respect, beneficence, and justice (Mertens, 2007, p. 216).

SPSS

A packaged statistical software used to complete quantitative, statistical analysis in this study.

United Nations Sustainable Development (UNSD) goals

A frame-work of 17 global goals set in 2015 that aim to be realized in 2030. The goals address common concerns to humanity and the planet. Goal #5 aims "to achieve gender equality and empower all women and girls" (United Nations, 2015a).

Workplace culture

"A set of shared rules, beliefs, behaviours, values, and systems that are held in common by the people who make up the organization" (Kitchin, 2018, p. 28)

1 Introduction

Women continue to be under-represented in the Canadian mining industry, filling only 16% of jobs even though the industry is currently facing a projected labour shortage in critical roles such as engineering (Mining Industry Human Resources, 2017, 2018). In the mining industry, engineering is a highly sought-after profession for filling leadership roles, which currently have similarly low levels of female representation. Furthermore, less than 13% of practising licensed engineers are women (Engineers Canada, 2016). The United Nations 2030 Sustainable Development (UNSD) goal for gender equality (United Nations, 2015a) was set to aid with closing gender gaps around the world. Gender "refers to the social differences and relations between men and women which are learned, vary widely among societies and cultures, and change over time" (Pavlic et al., 2000, p. 6). Furthermore, gender equality is a basic human right included in the Universal Declaration of Human Rights which denounces discrimination based on gender (United Nations, 2015b). The UNSD goal to achieve gender equality is already exerting a positive influence, as can be seen in many stock exchanges around the world, which have adopted regulations that now require companies to report both gendered data and strategies to reduce gender gaps (Ramchandani, Seville, Johnson, & Tolias, 2018; Sustainable Stock Exchanges Initiative, 2017).

Prior to the establishment of UNSD goals, there had been a growing global awareness that the traditionally male-dominated culture of the mining industry poses problems for the recruitment and retention of qualified women due to a lack of gender equity (Minerals Council of Australia, 2009; Mining Industry Human Resources, 2016; Women In Mining, 2010). Gender equity is defined as a:

> *Means of fairness of treatment for women and men, according to their respective needs. This may include equal treatment or treatment that is different, but which is considered equivalent in terms of rights, benefits, obligations, and opportunities.* (Pavlic et al., 2000, p. 5)

Many mining companies have recently embarked on journeys to increase the number of women within their organizations by improving gender diversity and gender equity. Gender diversity can be thought of as the demographic measure of men and women in an organization. In October 2016, the world's largest mining company, BHP, announced an "aspirational target" to reach company-wide gender parity, or equality, by 2025. BHP's CEO, Andrew Mackenzie,

stated that "Without new initiatives it would take us 30 years just to get to 30% female representation. More must, and will be done" (Koh & Stringer, 2016). BHP's ambitious stance leads that of many other mining companies, who in recent years, have announced their own gender diversity and inclusion strategies to close their own gender gaps (Agrium, 2016; Barrick, 2017; BHP, 2017; PotashCorp, 2017; Teck, 2017). While "diversity focuses on organizational demography, inclusion focuses on the removal of obstacles to the full participation and contribution of employees in organizations" (Roberson, 2006, p. 217). Therefore, both diversity and inclusion are necessary elements of equity.

1.1 Problem Statement

The mining industry needs to address common challenges both inside individual companies and in the image of the overall industry. There is a growing need for appropriate messaging to drive forward initiatives of promoting gender equity through diversity and inclusion. Appropriate messaging needs to incorporate rhetoric, which Aristotle defined as the art of finding in any given case the available means of persuasion (MacLennan, 2009). Persuasive messaging must maintain a balance of the three rhetorical appeals:

- Ethos, the industry's credibility as agent for change;
- Logos, its ability to make a logical case for change; and
- Pathos, its appeal to the values of stakeholders in a time of change.

Bitzer (1968) outlines three requirements that are necessary for a situation to be rhetorical in nature: exigence, audience, and constraints. Considering the gender gap in the mining industry, the rhetorical exigence consists of concern over the low levels of women working in mining and a looming labour shortage, along with individual mining companies' time-bound strategies. Next, the rhetorical audience consists of leaders at all levels and of both genders within mining organizations who need to change both their mindsets and their discourse to persuade others in their organizations to open their minds to change. Lastly, the rhetorical constraints are driven by positive influences of the UNSD goal for gender equality which have inspired regulatory requirements for setting gender gap reduction strategies and reporting on progress, as well as the negative influences of the history and viewpoint that the male-dominated industry resists acceptance of the need for gender equity and changes to the status quo.

To date, there has been little or no rhetorical analysis or criticism of gender equity strategies in the Canadian mining industry nor has there been concentrated academic effort

aimed at understanding mining employees' adoption of these strategies. Consequently, this research provides a much-needed perspective on the persuasive communication dimensions required to achieve gender equity. This transformative mixed-method study utilizes a feminist lens to increase awareness, with the goal of empowering leaders to aid with transforming the male-dominated mining culture towards a diverse and inclusive work environment.

1.2 Thesis Overview

The purpose of this thesis is to explore how culture change is occurring to close the gender gap in the Canadian mining industry. This study focuses on workplace culture and draws on scholarship in the fields of sociology, rhetorical theory, human resources, and societal impacts of engineering. Kitchin (2018) defines workplace culture as "a set of shared rules, beliefs, behaviours, values, and systems that are held in common by the people who make up the organization" (p. 28). The study was completed in two phases by examining signs of culture change from both the top down and the bottom up, as is shown in Figure 1-1.

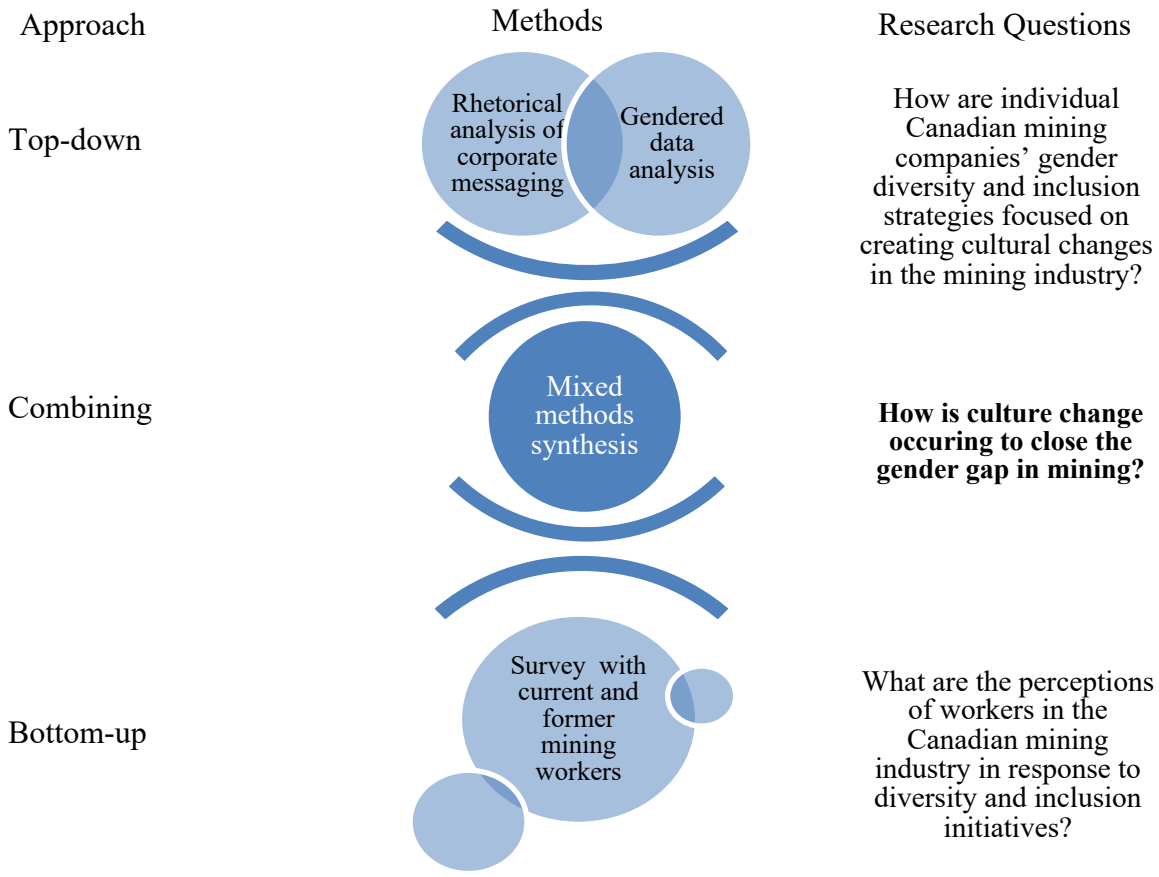

Figure 1-1: Overview of study

Looking from the top down in mining organizations, a rhetorical analysis was completed with publicly available information from 10 individual mining company's corporate websites and can be found in Chapter 3. Looking from the bottom up in Chapter 4, the experiences and perceptions of 540 men and women within the mining industry were captured through an anonymous survey. This thesis gives an overview of the context in which in the mining industry operates in Canada by describing the literature and gaps in Chapter 2. An outline of the methodology and methods to be used are described in sections 3.1 and 4.1 for the top-down approach and bottom-up approach, respectively. The individual outcomes from the top-down and bottom-up research approaches are captured in sections 3.2 and 4.2, respectively. Finally, the

combined outcomes from the two phases are found in Chapter 5. The research questions considered in the study will be discussed in section 1.2.4.

1.2.1 Methods Overview

A transformative mixed-methods design was used in a two-phase study, along with a feminist theoretical lens to provide an overarching framework for the study. A transformative design is one that lifts up the voices of participants to develop a call for action using data sources that can challenge injustices and provide evidence that is acceptable to stakeholders (Creswell & Plano Clark, 2011, pp. 96 - 97). Mixed-methods involves using both qualitative and quantitative data and analysis. The first, top-down phase of the study incorporated primarily qualitative analysis that informed a second bottom-up phase of concurrently collected qualitative and quantitative data, which was then mixed in the bottom-up phase of analysis.

A feminist lens utilizes a critical perspective that draws on feminist theory and seeks to understand inequities between women and men (Creswell & Plano Clark, 2011; Mertens, 2007). Ferguson (2017) describes current thinking on feminist theory as complex, intersectional and interdisciplinary while seeking equality, freedom, and justice for all, not just for women (p. 269). A feminist theoretical lens was primarily used to understand gender inequality and, where possible, investigate inequalities of other minority or marginalized groups.

Transformative mixed-methods research typically adopts a transformative paradigm, or belief system (Creswell & Plano Clark, 2011). A transformative paradigm acknowledges that:

- Multiple, socially constructed, realities can emerge;
- That knowledge is socially and historically located within a complex cultural context;
- Methodology should address power issues and discrimination through participant participation; and
- Ethical considerations should include respect, beneficence, and justice (Mertens, 2007, p. 216).

While this study could potentially utilize an alternative worldview and focus on purely qualitative data, I believe there will be a greater chance of success to change mindsets, or values, by taking an influential approach over a confrontational one. The mining community, which may be more comfortable with numbers due to their technical background, is the intended audience of this research. The use of a mixed-methods approach will create a common ground for the intended audience to venture out of their comfort zone into rich qualitative data source, that will

shed light on perceptions not previously highlighted and create space for empathy. Through sharing of different perceptions of culture within the mining industry, this study aims to create greater awareness of women's experiences within the majority male workforce.

The two study phases are summarized in Table 1-1. The methods for the top-down phase of study will be discussed in this Chapter 3 and the methods for the bottom-up phase of the study will be discussed in Chapter 4.

Table 1-1: Summary of key study phases

Phase	Objective	Data Collection Methods	Study Subjects
Top-down	Understand diversity and inclusion messaging and strategies coming from top of the organizations	Publicly available information from corporate websites	10 Canadian mining companies
Bottom-up	Quantify outcomes from top-down first phase and explore perspective of mining employees from the bottom-up	Online survey	People who currently or formerly worked in the Canadian mining industry

1.2.1 Validity

I am mindful that my research needs to meet validity expectations of both the intended audience in the mining community and the expectations of good research in the academic community. A transformative mixed-method approach inherently utilizes triangulation as a means of validity. Triangulation draws on multiple sources for the information or looking for truth through a variety of lenses (Creswell & Poth, 2018); this approach has inspired a multi-phased study.

In addition to triangulation, I drew on the following qualitative validation strategies outlined by Creswell & Poth (2018):

- Generating a rich, thick description of participant experiences;
- Engaging in reflexivity in order to acknowledge my own biases; and
- Seeking varied feedback through the survey design process.

1.2.2 Ethics

No research ethics approval was required for the top-down phase of the study as all information studied was in the public domain. Further details on the Behaviour Research Ethics Approval for the bottom-up phase can be found in section 4.1.1.2.

1.2.3 Significance

The significance of this work is to educate, enlighten, support, and encourage emerging influencers within the Canadian mining industry to be the change they want to see in their work-places and in the world. Emerging influencers include future and current leaders of all genders. As the men, who are the majority within the industry, may not be fully aware of the extent of issues that women face in their workplaces, men need to be a part of the target audience. This work will also target women as the audience; women need to be empowered to support each other and share their stories. It is possible that women looking to be taken seriously in their careers, may not want to be seen as complainers by speaking up about micro-aggressions that may seem on the surface to be trivial issues, or may be dismissed by their co-workers or supervisors when they bring forward complaints of gender-barriers or biases. With appropriate education, language, and awareness, both men and women may become empowered to become advocates to support a cultural shift towards an inclusive workplace. Showcasing experiences and perceptions of men and women with ties to the Canadian mining industry will emphasize workplace culture change that needs to occur. The outcome of this work will be a practical guide for emerging influencers to support the required cultural shift in their organizations and in the Canadian mining industry.

1.2.4 Limitations

This study involved focusing on the rhetorical audience within the mining community, namely, the leadership who need to change mindsets and behaviours to welcome a diverse workforce. The potential limitations in trying to reach a broad sample of individuals spread across Canada are time and access. Thus, in order to capture perspectives from a wide array of current, former, or future leaders within the mining industry, an online survey was used. Also due to time constraints with completing a master's project, a projected series of interviews were not able to be fit into the scope of this research. I recommend future research consider semi-structured interviews with mid-career highly qualified women and leaders who are already acting as change agents. In particular, interviews would have provided additional insight into how mindsets were changed and give insight into the speaking up and outcomes phase of discrimination and harassment incidents.

Boundaries of the study, or delimitations, were chosen by the researcher to focus the study on the Canadian mining industry, the management level as the rhetorical audience, gender as a

marker of diversity, and understanding the impact of gender equity strategies occurring within the context of the workplace.

Firstly, this study did not include the population of the mining industry outside Canada, and those who have not worked in the mining industry. The decision was made by the researcher to focus on the Canadian mining industry due to the gaps in research identified in Chapter 2 and the researcher's experience with working in the Canadian mining industry for 13 years. Secondly, the study focused on the management level in the mining organization, rather than on front-line workers who typically represent the unionized workforce within a mine site. The delimitation to not include the (typically) unionized or front-line workforce was due to an increased scope of understanding about site-specific collective agreements and the challenges involved in accessing a population which is likely without workplace email access. The front-line workforce is often on the tools, in the plant, or at the mine face and thus, does not have regular workplace computer access.

Thirdly, the study also did not take into account the complex nature of gender and gender identity or intersectionality aspects of sexuality, race, and gender. The reason for the focus on gender as a marker of diversity is the relatively easy access to gendered information. Public reporting of demographics information is primarily by gender and often does not include aspects of gender identity, sexual orientation, or race. Where this information was available, it has been noted in the study. There are definite gaps in both the literature and available information on the issues of other marginalized groups and compounded impacts of intersectionality within Canadian mining which could be a focus of future research.

Lastly, I recognize that life can have a major impact on individual work experience, from my own experience as a mother, as a wife to a professional engineer, and losing a father to a critical illness. We cannot control many of our personal life challenges, but we can work in places which recognize that life's ups and downs will occur. As such, the final choice for this study was to not consider the intersectionality between personal and professional life, instead focusing primarily on the context of the workplace. As such, the following were not included as a focus of this study:

- The challenges and dynamics of dual-income households;
- The challenges and dynamics of parenthood or access to daycare;
- The demands of remote work locations; and

- The shift work frequently required in the mining industry.

1.3 Research Questions

Several questions were considered in this study, with the main focus being: *how is culture change occurring to close the gender gap in Canadian mining?* Due to the complex nature of measuring culture change, this question was considered with both a top-down and bottom-up approach in a two-phase study. The integrated discussion and conclusion in Chapter 5, synthesizes the overall findings from the top-down and bottom-up approaches.

1.3.1 Top-down Approach

The primary research question for the top-down approach was: *how are individual Canadian mining companies' gender diversity and inclusion strategies focused on creating equitable organizational cultural changes in the mining industry?* To answer the larger question, this analysis considered the sub-questions that examine the rhetorical appeals of ethos, logos, and pathos. The sub-questions were:

- Where do individual companies sit on the Inclusion Growth Curve as outlined in the Women in Mining National Action Plan (Women in Mining, 2017)?
- What is the progress on individual mining companies' strategies to date?
- What does the terminology individual companies use in their messaging say about their motivations?
- Is messaging consistently and compellingly asking the audience to bring about change?
- Is the messaging aimed at addressing issues solely within their own organizations or within the overall industry?
- Who are the intended audiences of this messaging?

1.3.2 Bottom-up Approach

The primary research question for the bottom-up approach was: *what are the perceptions of workers in the Canadian mining industry in response to diversity and inclusion initiatives to change the organizational culture and close the gender gap?* To answer this large question, this analysis considered the following sub-questions:

- Is there a difference in perceptions of gender diversity and inclusion between men and women who work in the Canadian mining industry?

- Is there a difference in perceptions of gender diversity and inclusion between current and former workers in the Canadian mining industry?
- How were employees made aware of the need for gender diversity and inclusion within and/or outside their organization?
- What barrier or supports have employees experienced in response to recent gender diversity and inclusion initiatives within their organizations?
- In what ways might diversity and inclusion initiatives within mining facilitate or inhibit cultural changes in support of gender equity?
- Can health and safety culture and language be used as common ground to motivate gender diversity and inclusion culture change?
- Can health and safety processes be used to deal with harassment and discrimination issues?

2 Background of the Gender Gap in the Canadian Mining Industry – The Rhetorical Situation

When studying how gender is done or undone, West and Zimmerman (2009) recommend the importance of understanding "how historical and structural circumstances bear on the creation and reproduction of social structure in interaction, and how shifts in the former result in changes in the latter" (p. 119). Gender "refers to the social differences and relations between men and women which are learned, vary widely among societies and cultures, and change over time" (Pavlic et al., 2000, p. 6). To understand the gender gap in Canadian mining, aspects of historical and social interactions will be explored in this chapter.

2.1 Overview of Mining in Canada

Canada is a country rich in natural resources and has a long history in mining, which started thousands of years ago among the Indigenous peoples (Hughes, 2012; Mining Association of Canada, 2016; Udd, 2000). The Canadian mining industry has the potential to influence both regional and global economies. The mining industry is present in all provinces and territories in Canada, other than Prince Edward Island, and provides excellent opportunities for employment. In 2015, the Canadian mining industry contributed 3.4% to Canada's Gross Domestic Product and employed more than 373,000 people directly in more than 1,000 mining or processing operations (Mining Association of Canada, 2016). An overview of the mining locations in Canada is shown in Figure 2-1.

Mining is an industry with global impact and influence on the economy, politics, and society. Due to the capital required to explore and develop new mines, the industry is controlled by a limited number of major transnational companies. Canada has been a major player in the global mining community with nine of the top 50 global mining companies headquartered here and with an additional eight of the top 50 involved in Canadian mining (Els, 2017). Despite Canada being a developed country, women continue to be grossly under-represented in Canadian mining and research in the industry has only recently to explores implications of gender and women in mining. The next section (2.2) will explore the representation of women within the Canadian mining industry.

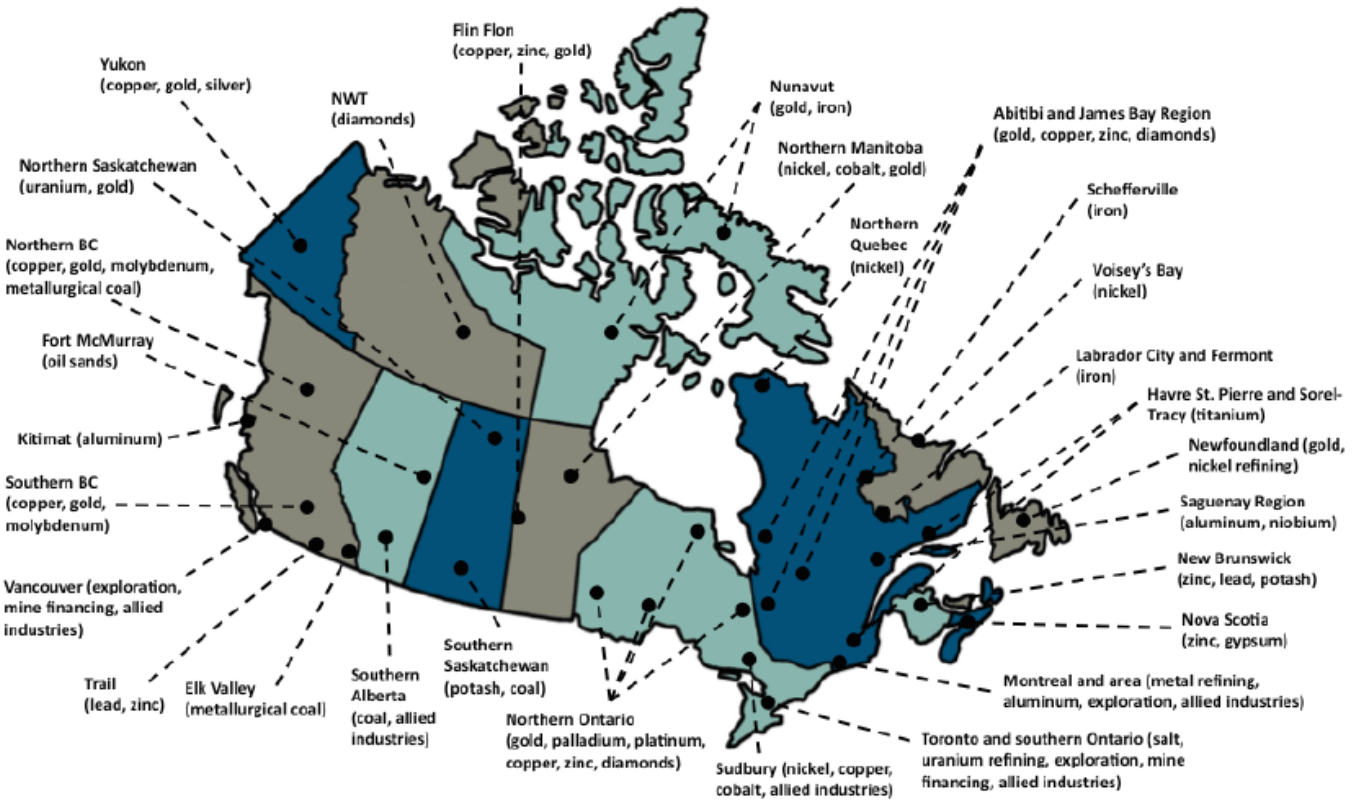

Figure 2-1: Canadian mining industry clusters [Used with permission of the Mining Association of Canada (2016)]

2.2 Women in Canadian Mining

In 1890, the *Ontario Mining Act* banned women from working in mines, and it was not until 1978 that women could work underground in this province (Keck & Powell, 2000). This law mirrored the 1842 *Mines and Collieries Act* from the United Kingdom, in keeping with the colonial mindset prevalent in Canada in the Victorian era to adopt British laws. The 1890 *Ontario Mining Act* not only banned women from working in Canadian mines but laid the foundation of a male-dominated culture in the Canadian mining industry. Despite repealing the laws barring women from mining, the popular image of the miner as male remains (Mining Industry Human Resources, 2017), and persists in mining culture and company policies today. Both inside and outside the mining industry, the image of a women's place in mining needs to extend beyond administrative support.

The industry currently relies on Mining Industry Human Resource Council (MiHR) to gather and publish data on gender representation for the Canadian mining industry. MiHR's highly aggregated information provides an overall picture of the industry, with a demographic of

84% men (Mining Industry Human Resources, 2017, 2018); however, it does not highlight where individual companies are making progress on what has become a near industry-wide goal: to increase female representation within mining. Furthermore, the cultural impact from mining laws banning women's participation have persisted and are evident in the low numbers of women working in the Canadian mining industry today. Female participation in Canadian mining is only 2% higher today than 30 years ago (Mining Industry Human Resources, 2017). My study examines gendered data by company, see section 3.2.4.5, to better understand where change may be occurring. The growing awareness of gender in the mining industry will be explored in the next section (2.2).

2.3 Mining and Gender Awareness

In the last decade, global mining booms have driven increased attention in both popular media and academic research circles to the challenges facing women miners in a masculine-dominated culture (Benya, 2017; Jenkins, 2014; MacPherson, 2017a; Minerals Council of Australia, 2009; Nyabeze, Espley, S., & Beneteau, 2010). This emerging body of gendered mining research originated in Australia where the commodity cycle started its last mining boom in the early 2000s, well ahead of the most recent mining boom that started in Saskatchewan around 2010 (Brier, 2012; Phillips, 2016). This section will categorize the problems experienced by women in mining and consider gendered research in mining and male dominated fields while reflecting on the implications from discourse studies and intersectionality.

Much of the early studies on gender in the mining industry aimed to quantify the problems faced by women in mining. The Minerals Council of Australia (2009) and Women In Mining Canada (WIMC) (2010) both identified the top three common problems for women in the mining industry as:

- A lack of flexible work arrangements, including options for part time work;
- Workplace culture; and
- Travel or working in remote mine sites.

To understand workplace culture, travel, and working at mine sites the research is often bound within regions and particular time periods. Botha (2016; 2015) explores the experiences of women in South African mines related to sexual harassment; Mayes (2014) questions a common narrative requiring a business case to employ women in mining, in the context of Australian culture; Nyazbeze et al. (2010) identified the rewarding work that draws women to the mining

sector in Canada; and Hughes (2012) studied the underutilization of these "highly qualified [Canadian] women". MIHR (2018) continues to reiterate that women are needed to fill labour shortages in Canadian mining roles, especially during globally-driven resource booms. However, in times of downturn women may be more susceptible to losing their employment in mining, due to their relatively lower status and seniority within their organizations (Hughes, 2012; Nyabeze et al., 2010). The predominant message from the literature is that a cultural shift is required to attract and retain women in mining (Benya, 2017; Botha, 2016; Hughes, 2012; Lahiri-Dutt, 2015; Mayes & Pini, 2014; Mining Industry Human Resources, 2016). This required cultural shift can be thought of as inclusion, or the acceptance and celebration of differences within an organization.

In support of advancement, Laplonge (2016) argues that gendered research in mining needs to expand beyond the current "liberal feminist goal of equality for women in the workplace" (p. 802) and needs to consider the body of gendered research that exists beyond the context of mining. For instance, gendered studies have found that women have less power and privileges in male dominated workplaces (Dubbelt, Rispens, & Demerouti, 2016; Stainback, Ratliff, & Roscigno, 2011). Allen (2017) recommends gendered research also examine aspects of intersectionality, which includes belonging to more than one marginalized group. Intersectional studies in mining often combine impacts of belonging to both a minority race and gender (Faircheallaigh, 2013; Hammond, 2015; Nightingale, Czyzewski, Tester, & Aaruaq, 2017). Where possible, aspects of intersectionality will be explored in this study.

We can also look to gendered studies on women in science, technology, engineering, and mathematics (STEM) fields to further explore cultural concerns in male dominated workplaces. For instance, gendered studies in engineering also conclude that workplace culture is an areas of concerns for women (Hatmaker, 2013; Nadya, Wen-Hsin, Min, & Romila, 2017). Nadya et al.'s (2017) study of (n = 1,464) women who left engineering found that:

> *Women left engineering even though their needs were in line with needs provided by the occupation, but not adequately reinforced through the organization's work design, systems, and practices…. [Furthermore, women were] actively discouraged from using work-life benefits.* (p. 9)

Additionally, Nadya et al.'s (2017) study found:

- That push factors for women to leave the workplace overpowered the pull factors to stay;
- That there was a lack of clear communication from leaders on benefits;
- That there was a lack of flexible work options, and
- Anti-harassment and anti-discrimination policies were poorly communicated.

This study will consider how gender awareness is communicated in the workplace and industry.

Previous discourse studies have indicated that the promotion of gender equity in alignment with the benevolent intent of the UNSD goals may not be the primary motivation of recent mining industry messaging; moreover, the messaging does not seem to be targeted primarily at the retention of the qualified women whom the industry ultimately seeks to recruit (Fältholm & Norberg, 2017; Laplonge, 2016; Mayes & Pini, 2014; Mining Industry Human Resources, 2016). Rather, messaging is often focused on the business case for departing from the status quo of the male-dominated culture present in the industry (Fältholm & Norberg, 2017; Mining Industry Human Resources, 2016), or in other instances the onus of changing the culture is placed on the under-represented demographic of women in mining (Laplonge, 2016; Mayes & Pini, 2014). The effectiveness of the current communication methods related to gender equity will be explored throughout this thesis.

While there is much to be learned from similar gendered research in resource-rich regions such as Australia and South Africa, gaps exist in peer-reviewed Canadian literature. In particular, there is little information about the personal experiences of current and former women miners, considerations of intersectionality for these workers in the Canadian mining industry, and the communication practices being used to address the much-needed shifts in culture. These gaps make it difficult to understand where culture change is occurring to welcome equity for marginalized and minority groups in the context of Canadian mining. Signs of culture change will be looked at both from the top-down in Chapter 3 and from the bottom-up in Chapter 4. For the purposes of this study and to protect the identities of survey participants, gender will simply refer to the sex categories of male, female, or other, and, where possible, aspects of intersectionality, such as race and sexual orientation, will be considered. A negative aspect of mining culture experienced by women will be explored in the next section (2.4).

2.4 Sexism in Mining

The culture of the mining industry has traditionally been male dominated, in part due to colonial laws banning women from working in mining operations, as referred to earlier. In 1978, the Ontario government lifted its 1890 ban on women working in the mining industry (Keck & Powell, 2000). However, the incorporation of the women into the mining industry has been slow, leading to only a 2% increase in over a nearly 30 year period (Mining Industry Human Resources, 2017). Lackluster improvements in women's participation in mining signals a problem with workplace culture, or collective values and beliefs towards women. Furthermore, a 2016 (Mining Industry Human Resources) study found that a greater number of women (32%) have experienced harassment in the mining industry than men (16%). Aspects of sexual discrimination and harassment will be explored in this section.

A company's corporate vision of a diverse and inclusive work place may inevitably be sabotaged by unaware leaders who tolerate or even perpetuate various forms of sexism (Basford, Offermann, & Behrend, 2014; Nadya et al., 2017; Offermann et al., 2013). As has been shown in other studies, a patriarchal work culture can bring with it an unconscious bias, or belief system, which excludes or penalizes women through biased human resource systems or processes (Dubbelt et al., 2016; Nadya et al., 2017; Yaghi, 2016). As is true in many industries, mining companies have human resources policies that aim to prevent overt forms of sexism such as sexual harassment and sexual assault, and these policies are also enforced by human rights laws (Barrick, 2016, 2017; BHP, 2017; Teck, 2017). As a result, it is rarer to find overt forms of sexism; however, a subtle form of sexism called "benevolent sexism" still persists in mining (Rubin, Subasic, Giacomini, & Paolini, 2017; Women In Mining, 2010). Benevolent sexism is a form of subtle sexism where women are viewed in stereotypical or restricted roles; a positive tone is often used in communicating paternalistic views; communication or actions are perceived by the receiver as negative (Glick & Fiske, 1996, pp. 491 - 492). Micro-aggressions are another form of sexism that are experienced by women on a regular basis in male-dominated workplaces. Micro-aggressions are brief, common, verbal or non-verbal discriminatory slights or insults, which are intentionally or unintentionally directed towards women and are experienced by women on a regular basis in male-dominated workplaces; however, they are seldom brought to light (Harris, 2016; McKenzie & Halstead, 2017; Offermann et al., 2013). Moreover, when

micro-aggressions progress to bullying or harassment, they may be dismissed as being isolated incidents (Botha, 2016).

It is believed that by raising awareness and utilizing various communication strategies sexism can be combatted (Becker & Swim, 2011; McKenzie & Halstead, 2017; Mortenson, 2017; Parker, Monteith, Moss-Racusin, & Van Camp, 2018). Importantly, strategies to combat sexism need to take into account gender. As found by Becker and Swim (2011), to change women's beliefs to reject sexism, women merely needed to become aware of sexism; however, in order to get men to reduce perpetuating sexism, men need to be aware of their sexist biases and also have empathy for the receiver. Another study found that pointing out gender or racial biases to study participants caused guilt, which encouraged awareness and monitoring of one's behaviour in future interactions (Parker et al., 2018). Studies have also found that women are more likely to speak up when they believe that speaking up will have a positive impact (Good, Moss-Racusin, & Sanchez, 2012) and men are likely to be defensive when their undesirable biases are brought to light (Parker et al., 2018). It is therefore important to ensure that systems to deal with discrimination and harassment incidents are transparent with a potential for favorable outcomes for the receiver. McKenzie & Halstead (2017) recommend that aggressors' will lose their power and stop their inappropriate behaviour as speaking up against sexism becomes normalized. Consequently, after a sexist incident occurs there is an opportunity for speaking up which may prevent future occurrences. Prior to speaking up, Mortenson (2017) suggests that the person speaking up about sexism should separate the aggressor from the aggressor's biases and behaviours, as biases are a learned behaviour which can be modified. McKenzie & Halstead (2017) then recommend using one of 6 strategies to prevent reoccurrence of a sexist incident:

- Assertive accommodation, which involves the woman speaking directly to the aggressor about the microaggression by offering her perspective, encouraging empathy, and relaying that the behaviour was inappropriate (Becker & Swim, 2011);
- Assertive communication, which utilizes direct confrontation to point out inappropriate behaviour and put an immediate halt to the discrimination;
- Humour, as a less confrontational way to point out inappropriate behaviour;
- Bystander interpersonal communication, which is a form of communication mentoring where a bystander supports the receiver;

- Collaborative communication, which involves a network of women supporting each other, and;
- Inclusive communication, which involves sharing insights between male diversity champions and women.

While there has been studies to quantify the occurrences of sexism in Canadian mining (Mining Industry Human Resources, 2016; Women In Mining, 2010) there have been no studies which highlight the outcomes of the speaking up or potential resolution phases after a sexist incident occurs. This study will raise awareness of discrimination and harassment in the mining industry by highlighting company's attempts to combat sexism and mining workers experience with sexism, including speaking up and outcomes, in Chapters 3 and Chapter 4, respectively. The organization of women to address inequalities in mining will be explored in the next section (2.5)

2.5 Organized Feminism in Canadian Mining

Pressures from society, policies, and industry have helped to organize feminism within mining (Lahiri-Dutt, 2015). Ferguson (2017) explains that current thinking on feminism is both intersectional and interdisciplinary, due to it is complex nature, and generally seeks equality, freedom, and justice for all, not just for women (p. 269). In Canada, organized feminism has been a relatively recent occurrence. Besides regulatory changes introduced by the government and company driven initiatives, groups, such as Women in Mining Canada (WIMC), which was formed in 2009, are working on changing the gender divide in mining. WIMC's (2018) vision is:

> *As Canada's leading organization for women in mining, WIMC envisions an industry that fosters, promotes and empowers women. We see a future where the possibilities, opportunities and dreams are the same for all, regardless of gender.*

As a not-for-profit organization, WIMC collaborates and partners with the industry to advance gender equity through case studies, policies, and best practices. WIMC has funded two major studies to identify the extent of the problem (2010) and offer solutions for addressing the gender divide in Canadian mining (2017). The outcomes of these studies will be further discussed in section 2.6.

Organizations are also needed to support women to call out inappropriate behaviours, which is not an easy thing to do. In 2018, an Ontario woman initiated a #MeTooMining movement (Rolfe, 2018) in order to "facilitate a conversation about sexual violence, sexual harassment, intimidation, and discrimination that women experience in the Mining and Mineral

Exploration Industries and communities" (Me Too Mining Association, n.d.). The MeToo Movement was founded in 2006 by Tarana Burke to support survivors of sexual assault (Me Too Movement, 2018). In the fall of 2017, the hashtag #MeToo gained in popularity due to the promotion of celebrity Alyssa Milano and her cries to call out media mogul, Harvey Weinstein's predatory behaviour towards women in the entertainment industry (Khomami, 2017). Many prominent men have lost their jobs and many of the cases are still proceeding through the legal system (Carlsen et al., 2018). The impact of the #MeToo movement is still being felt around the world and has quickly spread to many industries and countries around the globe, including the Canadian mining industry. The goals of #MeTooMining reinforce the view that more research is required to document the size and effect of the sexism problem in mining.

Lahiri-Dutt (2015) suggests that organized feminism has the potential to raise awareness on power relations, such as experiences with sexism, and show how taking a gendered approach can improve the work environment, allowing, for example, for flexible work opportunities. My research will help to shed light on the power relations, frequency, outcomes, and impact of sexism in mining as well as highlight how gender equity initiatives may also improve working conditions in Chapter 4.

2.6 Suggestions for Improving Gender Equity In Mining

Across industries and in many countries around the world, organizations are focusing on increasing female representation by setting targets. Thirty percent is a commonly reoccurring target number, thought to be the start of sustainable levels of female representation and is used by Catalyst (2016), Engineers Canada (2019), and the 30% Club (2019). Mining industry organizations have not set hard targets, instead there have been various suggestions from a number of mining related organizations. These industry-driven studies have recommended what policies and practices need to be incorporated by individual companies and the industry as a whole to improve gender equity (Mining Industry Human Resources, 2016; UN Women National Committee Australia, 2015; Women In Mining, 2010; Women in Mining, 2017). Recommendations from these studies can be categorized into five main areas:

- Senior leadership-driven accountability, which includes the business case, targets, and strategies for diversity;
- Training or programs for employees, which includes female-focused leadership training, flexible work programs, and unconscious bias awareness training;

- Leaderships actions, which includes individuals actively sponsoring or championing women;
- Company governance, which include company policy review and audits to check for biases in human resources hiring and promotions; and
- Public awareness, which includes company and industry re-branding and partnerships with post-secondary institutions.

There has been little research on which of these recommendations have been adopted by individual mining companies. This thesis will summarize the ways in which mining companies are incorporating these recommendations in Chapter 3 and look at how mining employees perceive their implementation in Chapter 4. An additional outcome of the thesis will be to provide recommendations on specific actions and communication strategies that mining leaders can take to promote diversity and inclusion on a regular basis in Chapter 5. An example of successful culture change in the mining industry will be explored in the next section (2.7)

2.7 Mining Cultural Shifts – Safety as an Example

Full scale cultural changes are not new to the mining industry. The mining industry was once known to be a dangerous workplace where fatalities and serious injuries were commonplace. A reputational and cultural transformation has occurred over the past two decades in response to wide improvements in health and safety of mining employees (Energy and Mine Minister's Conference, 2013). As a result, the rate of fatalities in Canadian mining decreased from nearly 50 deaths per 100,000 workers in 1998 to around 10 deaths per 100,000 workers in 2012 (Energy and Mine Minister's Conference, 2013). Similarly, the rate of non-fatal injuries decreased from 2,200 to 750 injuries per 100,000 workers over this same time period (Energy and Mine Minister's Conference, 2013). These impressive improvements to health and safety would not have been possible without a multi-front strategy.

Regulatory requirements were imposed by provincial governments to improve reporting, incident investigations, and redefine regulations to prevent incident reoccurrence (Energy and Mine Minister's Conference, 2013). The mining industry came together via various health and safety associations to share best practices, learn from incidents, and identify common goals to shift their unsafe image. Within the public-eye, health and safety have become a focus of mining stakeholders such as local communities, and shareholders who require a safety-focused work culture as part of the unofficial social license to operate.

Within individual mining companies, behavioral-based safety programs and safety audits were adopted. These increased awareness and empowered workers to speak up for their own safety. Overall this shifted the workplace culture to one that prioritizes and expects safe work (Energy and Mine Minister's Conference, 2013). Behavioral-based safety programs are premised on recognizing and changing unsafe behaviors. Near-miss incidents are monitored with the aim of correcting behaviors that may otherwise lead to more serious incidents, such as fatalities. Impacts of behavioral-based safety programs are measured through tracking of individual incidents that are then reflected in the safety triangle, shown in Figure 2-2.

Figure 2-2: Safety triangle

Transformations in mining health and safety have been made possible because a top-down and bottom-up approach was used to shift mining culture, from one that once prized production at any costs, to one that expects safe production or no production at all. Similar to the full-scale shifts in mining safety culture, this study aims to take a top-down and bottom-up approach to studying the gender gap in the Canadian mining industry. Rhetorical theorists, such as Bitzer (1980), suggest that areas of strong alignment, such as shared values or interests, can be used as common ground when creating persuasive communication strategies. Current common beliefs and messages being perpetuated in the mining industry and individual companies will be explored in Chapter 3. Opportunities to build on the common ground of language and systems that support a strong health and safety culture in the mining industry and will help with advancing the cause of gender diversity and inclusion will be further explored in Chapter 4.

3 Phase One – The Top-down Approach

3.1 Rhetorical Analysis Methods

The first phase of the study utilized qualitative, rhetorical analysis to examine 10 individual Canadian mining companies' gender diversity and inclusion strategies and highlighted early signs of organizational cultural changes that may lead to sustainable positive improvements for women in the mining industry. The rhetorical analysis was used to determine where each of the companies is situated on their journey to close the gender gap in their organization and identified recommendations to improve communication strategies.

This qualitative portion of the study utilizes rhetorical criticism, a form of rhetorical analysis, to understand how persuasive communication is being used promote cultural change within the Canadian mining industry, as it seeks to become more inclusive, and to embrace diversity and gender equity in particular. This work examines publicly available artifacts in the form of discrete reports, and diffuse texts and images from 10 mining companies' corporate websites.

The theoretical framework for this rhetorical criticism was undertaken from a feminist viewpoint that seeks to understand gender inequities between women and men in the context of the culture of the Canadian mining industry. To holistically answer the research questions, the following qualitative critical rhetorical methods were utilized: cluster, fantasy-theme, generative, and generic criticism (Foss, 2004); continuum analysis (Brummett, 2011); and consideration of the construction of a Second Persona in the materials/webpages (Black, 1970). Packaged software (NVivo, QSR International Pty Ltd, Victoria, Australia) was used to thematically code and analyze the artifacts using the rhetorical methods. As part of the general discussion of the texts' rhetoric, a check of the companies' ethos, logos, and pathos balances was considered. A summary of the selection process for the 10 companies examined and the individual methods are described in the remainder section 3.1.

3.1.1 Company Selection

This study focused on ten transnational mining companies that are on the list of top 50 global mining companies (Els, 2017) and either have their headquarters, operations, or offices in Canada. The 10 companies analyzed were: Barrick, BHP, Cameco, Glencore, Goldcorp, Mosaic, Nutrien, Rio Tinto, Teck, and Vale. For the purposes of this analysis, Nutrien is considered one of the ten companies as Agrium and PotashCorp merged into a new company, Nutrien, in early

2018. Available historical sustainability reports were utilized for Agrium and PotashCorp, while Nutrien's website was used to analyse the *Career* and *People* pages. Appendix Table A-1 shows an overview of the companies analyzed, along with a summary of the location and number of employees in their operations, both globally and within Canada as of March 2018. The ten companies analyzed represent approximately half of the mining and milling workforce captured in Mining Industry Human Resources' (MiHR) analysis (2017).

3.1.2 Generic Criticism

Generic criticism is a rhetorical analysis method used to analyze the intersection of the rhetorical situation, the content and form of the rhetoric, and the organization of the rhetoric to look for common themes or patterns (Foss, 2004). In this study, generic criticism was used to determine how individual companies are participating in common rhetorical methods through their webpages. Commonalities and differences between individual corporate *People* and *Career* pages were then analyzed against the common themes related to diversity and inclusion of the websites seen across the industry. An understanding of the genre of these webpages and what should and should not be included on them was gained. This method provided insight into the persuasiveness of the intended messages as well as aided in determining the intended audience.

3.1.3 Cluster Criticism

Cluster criticism was developed by Kenneth Burke as a means of uncovering rhetors' world views that are implicit, if not overt, in their messages (Foss, 2004). Burke believed that by grouping key words and looking at the connections of words around these clusters, a broader range of understanding and motivation will be revealed. Through this analysis of word clusters, themes were determined, and the ideologies or motivations implied in the individual strategies were considered.

Cluster criticism analysis was used to analyze the diffuse texts and images on Canadian mining companies' corporate *People* and *Career* webpages. Key words were selected from the first few passes of analysis; the occurrence of the key terms were indicated to either be present or not on a given webpage and recorded in Excel. The key words were then categorized as *God* or *Devil* terms, which indicates their positive or negative connotations, respectively. These key words were ranked as being more positive (+1), neutral (0), or negative (-1) and sorted to gain a deeper understanding of the tone of the messaging. NVivo was then used to confirm if a term or branch of the term appeared on the *People* or *Career* pages.

Groupings of words surrounding the most common *God* or *Devil* key words were found using the Word Tree function in NVivo. The *People* and *Career* pages were analyzed separately in order to examine potential differentiate themes between them. The resulting themes from the cluster analysis across the individual companies were then discussed.

3.1.4 Fantasy-theme Criticism

Fantasy-theme criticism was created by Ernest Bormann in 1983 "to provide insight into the shared worldview of groups" and examines the three components of setting, character, and action (Foss, 2004, p. 109). The method for fantasy-theme included: 1) coding the artifact for setting, character, and action themes; and 2) constructing the rhetorical vision(s) from the fantasy theme (Foss, 2004). NVivo's tools were used for both coding and capturing themes.

A summary of the word count for the 50 most frequently occurring words was created using the Word Cloud function in NVivo to highlight common setting, character, and actions. The outcome of the fantasy-theme analysis results in an interpretation of the future state, or rhetorical vision, which the mining industry is promoting to increase diversity and inclusion and give insight into motivations and intended audience that are implied through the fantasy-theme.

3.1.5 Generative Criticism

Generative criticism is offered by Foss (2004) as a method for digging deeper into artifacts and a means for researchers to answer specific questions to artifacts that catch their attention. The method for using generative criticism in this study included: 1) selecting the artifact; 2) broadly coding the artifact; 3) formulating an explanation; and 4) detailed coding of the artifact (Foss, 2004). In this study, generative criticism was used to look for consistency of the rhetorical vision found in fantasy-theme and the origins of the strategy by looking at individual mining companies' annual sustainability reports over a five-year period from 2012 to 2017.

Sustainability reports are discrete texts that were accessed through companies' corporate websites. Both the CEO's opening address and the *People* sections of the sustainability reports were broadly coded. The sustainability reports then were analyzed by a detailed coding using the words identified in the cluster criticism and monitoring references to gender over time. Quantitative gendered data was captured in this review and tabulated by company and year. The purpose of this analysis was to understand how companies' motivations aided with evolving from passive awareness of the problem, to the development and implementation of companywide strategies.

An understanding of the progress to date of diversity was also captured. Observations on the gendered data observed in the annual sustainability reports are also included, although inconsistencies in the data, which are reported by either commodity or country, did not allow for further analysis.

3.1.6 Continuum Analysis

Each company's messaging was analyzed through four of the interpretive continua outlined in Chapter 3 of *Rhetoric in Popular Culture* (Brummett, 2011):

- Broad to narrow meaning;
- Original to new context;
- Reactive to proactive relationships; and
- Direct tactics through implied strategies and structures.

Texts were assessed in terms of the contexts in which the readers are prompted to interpret them, including the application of broad to narrow approaches to meaning, evaluation in the original context versus new contexts, and differing levels of engagement with direct tactics, implied strategies, and deep structures. Continuum analysis gives insight into the compelling consistency of the messaging despite superficial differences in presentation and will continue to profile the intended audience of the texts.

3.1.7 Second Persona Analysis

The application of the theory of the Second Persona (Black, 1970) highlights disconnects between the ideal audiences, who are accepting of and motivated towards a commitment to diversity and inclusion, which mining companies are requesting the actual audiences to become, and the real audiences, who are required to make the necessary changes to the mining culture. Black approaches texts to determine how rhetors motivate the implied audience to adopt a common world view.

3.1.8 Inclusion Growth Curve

Lastly, synthesizing all of the information gathered and analyzed, individual companies have been placed on the Inclusion Growth Curve (Women in Mining, 2017). The symbol portrays the spectrum from meeting the minimum regulatory compliance, through six stages to gender equity champions who are actively promoting a diverse and inclusive mining industry, leading the way. The six stages on the Inclusion Growth Curve are: comply, begin, adapt, realize,

integrate, and lead the way (Women in Mining, 2017). A summary of quantitative findings will be incorporated into the symbol.

3.2 Top-down Analysis

The top-down analysis provides insight into the current state of diversity and inclusion in the mining industry through analyzing where individual companies are on their gender equity journeys. Outcomes from six rhetorical analysis methods described in section 3.1 will be discussed and then synthesized in section 3.2.

3.2.1 Generic Criticism

Generic criticism, described in section 3.1.2, is used to look for similarities and commonalities across the web pages and sustainability reports of the ten companies that were analyzed. Generic criticism was used to describe the artifacts' content, form, and organization (Foss, 2004). Features of the external websites, imagery, internal websites, and sustainability reports will be explored in this section.

3.2.1.1 External Websites

Websites are diffuse texts that allow for movement in multiple directions through the use of separate webpages with hyperlinks to other pages and the use of search engines. It is common for mining companies' corporate websites to contain information on the company's history, location of operations and potential projects, an overview of their products, biographies of leadership teams and board members, values and mission statements, opportunities for employment, and regulatory financial and sustainability reports. Corporate websites are set up for use by shareholders, potential future employees, local communities, regulators, media, and mining opponents and proponents. In addition, discrete texts in the forms of regulatory reports, Code of Ethics, or corporate values often are made available on the websites.

Branding, such as colours, text style, and logos, differs by company and helps to create consistency as one moves through the website. Consistency in branding maintains focus on the individual company and often is found on discrete texts available through the websites.

Websites that have both *People* and *Career* pages may direct marginalized groups, such as women or Indigenous people, from the *Career* pages to the *People* sections because they have information regarding the ways in which the company is welcoming these demographics. On the *People* page, readers will learn about strategies that are working towards inclusion and diversity, which may be a work in progress. The *People* page describes how potential employees and other

stakeholders can be supported by company policies that prohibit discrimination. Progress on strategies may be indicated through improvements in gendered statistics or foreshadowing that a plan is in the works, which signals at the least a level of awareness. In general, the main *Career* pages tend not to focus on any particular minority group, perhaps to avoid alienating the majority demographic in mining: white males. Ambiguity on *Career* pages is a theme that is common across all companies that have both *People* focused and *Career* webpages.

The *People* page is also accessible from the *Sustainability* section of the webpage, which indicates that it is a forum for relaying a company's values or beliefs towards its employees. The accessibility of the *People* page indicates that the intended audience could also include an external stakeholder. Stakeholders may range from shareholders who want to ensure their money is contributing to an ethically sound corporation through to other stakeholder who are keeping an eye on a company's commitments. Other stakeholders who may look to the *People* pages could include labour unions, government and non-governmental organizations, media, and local communities.

3.2.1.2 Imagery

Photographs of people in mining or processing environments, or in mining attire are used frequently on many of the webpages. The people in the images tend to be wearing personal protective clothing, such as hard hats, coveralls, reflective clothing, safety glasses, gloves, and hearing protection, all of which would be worn often at a mine site. The miners in safety gear symbolizes the safe work procedures that the industry expects to occur in a Canadian mine. In some instances, safety attire is not worn, suggesting that the photograph may be staged, and the person may not actually be working for the corporation (Cameco, 2018b; Nutrien, 2018). As an example, Nutrien's website utilized a diversity photograph, which originates from Agrium (2016), where a diverse group of people are wearing business clothes, not typically worn in mining or processing operations. The purpose of these images may be to present the office occupations found within mining as welcoming of diversity; however, due to the staged nature of the photograph, authenticity comes into question and it makes one wonder if the workforce is actually this diverse. Generally, photos that appear to be staged have a reduced effectiveness.

3.2.1.3 Internal Websites

Mining corporations also have internal websites that restrict access to employees and board members. These internal sites may contain more information on happenings within the company

such as highlights of corporate culture, employee recognition, internal policies, and company updates that may link back to the external webpage. In general, the internal websites are focused inward, while the external websites are outward focused with the aim of showcasing the public brand.

3.2.1.4 Sustainability Reports

Annual sustainability reports highlight company's strategies and progress in areas such as the workforce, environment, community relations, and corporate sponsorship. Unlike annual financial reports, which focus primarily on profit and production, sustainability reports address corporate citizenship. Typically, five years of sustainability reports are available through the corporate websites, although some companies may house more in the public archive. Sustainability reports tend to follow Global Reporting Initiative's (2018) standards; however, the layout, format, and data types reported vary between companies.

The genre of a sustainability report includes:

- A message from senior leadership, such as the CEO;
- Data on environmental emissions, health and safety, training, and workforce demographics;
- Community engagement;
- Strategies related to the various aspects of corporate citizenship; and
- Case studies highlighting individual sites or employees.

Most companies format their sustainability report with text providing context in the main body and detailed tables in appendices (Barrick, 2017; BHP, 2017; Teck, 2017). Some companies, such as Mosaic (2017), may publish separate documents to capture the text and data tables. Sustainability reports align with the fiscal reporting calendar. Note that for BHP and Rio Tinto, fiscal reporting starts mid-way through the calendar year while the remaining companies' fiscal year aligns with the calendar year.

The wording, imagery, and data in the most recent sustainability report often are duplicated on the corporate website. For example, Barrick (2013, 2014, 2015, 2016, 2017, 2018b) has consistently reiterated its:

> *Commitment to fair employment practices and a workplace in which all individuals are treated with dignity and respect. We do not tolerate discrimination.*

By analyzing annual sustainability reports, in the Generative Criticism section (3.2.4), an understanding of historical data, origins of philosophies, and strategies of a company will be gained.

3.2.2 Cluster Criticism

As described in section 3.1.3, cluster criticism is a rhetorical analysis method developed by Kenneth Burke and provides insight into the worldview of the communicator by looking at the types of words used around key terms (Foss, 2004). For the cluster criticism analysis, word searches were completed in NVivo on the corporate webpages commonly called *People* or *Career* pages. *People* pages were segregated from *Career* pages as they were often found through a link other than *Careers*. Examples of names for the *People* pages are Our People, Non-Discrimination, or Diversity and Inclusion. It should be noted that not all websites are organized to have separate *People* pages, so only seven *People* pages were analyzed while 18 *Career* pages were analyzed amongst the 10 companies.

A total of 43 commonly occurring words were analyzed on the two sets of pages: 30 of the words were deemed to be *God* words, indicating a positive and inspiring connotation (Burke, 1950), and the remaining 13 were deemed to be *Devil* words, indicating a negative or unsavory association (Weaver, 1953). A summary of the cluster analysis, including listing of the *God* and *Devil* terms can be found in Appendix B.

3.2.2.1 God Terms

God terms were words that were considered to have a positive association. The most common word sets which appeared on five to seven of the companies' *People* pages and had positive connotations were: *inclusion and diversity*; *respect* or *respectful*; *engaged* or *engagement*; *develop* or *development*; *attract* or *attractive*; *potential*; *women*; and *Indigenous*.

The *Career* pages most frequently used terms such as: *diversity and inclusion*, *respect* or *respectful*; *develop* or *development*; and *grow*. These *God* terms appeared on five to nine of the companies' *Career* pages. There was less mention of *gender*, *women*, or *Indigenous* on the *Career* pages. The lack of terms referring to minority groups may be a way to appeal to the majority audience, who is male and non-Indigenous. An analysis of individual words was done through using the Word Tree function in NVivo. *Inclusion and diversity* will be discussed as the most commonly used *God* term and one that gives particular insight into motivations and audience, in the next subsection.

3.2.2.2 Inclusion and Diversity

The word set *inclusion and diversity* is found frequently on both the *Career* and *People* page as shown in the Word Trees in Appendix B. Upon first glance, it appears that *inclusion and diversity* is more commonly used on the *People* page than on the *Career* page. This discrepancy suggests that the intended audience for the two pages may not be the same.

The *Career* pages speak of companies being committed to, encouraging, and promoting *inclusion and diversity*. The motivations for these actions are generally linked to community engagement or increasing company productivity. Support of *inclusion and diversity* is manifested through auditing processes for biases and training and is enforced in policies.

The messaging on the *People* pages echoes that of the *Career* pages and brings with it new elements. On the *People* page there is admission that stakeholders are watching what companies are doing in regard to *inclusion and diversity* (Rio Tinto, 2018). *Diversity* is discussed at the board level, across the organization, and even offered by BHP (2017) as a value that extends to the mining supply chain. Motivations are inspired by supporting human rights. On the *People* pages, marginalized groups, such as women and Indigenous people, are given targeted and special attention through wording such as "strives" and "aims". The problem may be quantified by indicating the percentage of workforce or leadership group that is female, Indigenous, or local. Progress may be indicated by comparing an improvement from past year's statistics. There is an admission to perhaps having contributed to marginalization, through "potential biases in our systems, behaviours, policies, and processes" (BHP, 2018a), although admitting to fault is not as common as admitting to being aware of cultural or gender biases (Goldcorp, 2014, 2015, 2016; Nutrien, 2018; Teck, 2016, 2017). Mechanisms for raising human rights complaints are discussed, although the discussion falls short of details on rights-based governance systems or on how effectively and frequently the complaints systems are used.

3.2.2.3 Devil Terms

Devil terms were considered to carry a negative connotation. On the *People* pages the most commonly occurring *Devil* terms were *discrimination, tolerant, bias,* and *harassment*. While words such as *tolerant* may not be negative on their own, the negative connotation resulted in how it was used due to a "symbolic merger" (Burke, 1959). When viewed as a "symbolic merger", other key terms surrounding *tolerant,* for example*,* tend to be seen as negative in character and therefore constrain the reader's response, so that a normally positive term comes to

seem negative in implication (Burke, 1959). Being *tolerant* suggests putting up with unwelcome difference, rather than embracing inclusion. The companies that used *Devil* terms on their *People* pages were Barrick (2018b), Glencore (2018a), and Nutrien (2018). Similarly, on the *Career* pages *discrimination,* and *harassment* were the most common terms. The companies most likely to use *Devil* terms on their *Career* pages were Barrick (2018b), Cameco (2018b), and Nutrien (2018). Both BHP (2018a) and Rio Tinto (2018) admitted to having *issues,* which was considered a mild *Devil* term. *Discrimination* will be discussed in the next section as the most commonly used *Devil* term.

3.2.2.4 Discrimination

Discrimination appeared in the context of rhetorical containment strategies on many of the webpages by indicating the company did not support discrimination, either through *non-discrimination* or *anti-discrimination*. Similar to *inclusion and diversity, discrimination* appears more frequently on *People* over *Career* pages, further details can be found in Appendix B. The rate of occurrence of *discrimination* signals a potential difference in intended audience between the two page types.

Barrick (2018b) used *Devil* terms most frequently on their *People* page, which is labelled "Non-discrimination". This title on Barrick's *People* page is in response to the Porgera Joint Venture sexual violence complaints arising in 2010 in Papua New Guinea, where it was brought to light that Barrick's contractors were gang-raping local women while on duty (Barrick, 2017). The impact of this human rights violation is less evident on the *Career* page than on the *People* page. The messaging on Barrick's *Career* page is aimed at what employees can do for Barrick, and in contrast, the *People* page is directed at what employees cannot do at Barrick, namely discriminate within their workforce (2018b). The tone of Barrick's (2018b) *People* page is legalistic and unambiguous and opens with:

> *The extractive sector remains male-dominated. Numerous studies – including our own internal reporting, assessments and investigations – have confirmed that gender equality, sexual harassment, and gender-based violence are very real risks in the mining industry.*

This passage reveals that Barrick is unable to distinguish between a positive measure of "gender equality" and negative actions of "sexual harassment" and "gender –based violence". Labelling gender equality as a "risk", rather than an opportunity, calls into question Barrick's ability to champion diversity within its organization. Barrick's (2018b) *People* page also discussed the

barriers and issues associated with their male-dominated workforce and how they were addressing issues of retaliation, gender bias, sexual harassment and gender-based violence, to prevent further incidences from occurring in their work places. This page has a high logos appeal; however, pathos is lacking due to the lack of warmth and empathy radiating from legal tone of the messaging. It is questionable whether many women would be inspired to work in an industry where your protection from the "very real risks" of being victims of harassment or violence are merely policies.

Both Glencore and Nutrien (2018) also have acknowledged that *discrimination* occurs in their workplaces and that they support human rights regulations. Although they do not admit to discrimination directly, Cameco (2018b) and Glencore (2018a) likewise both speak of prioritizing the abolition or eradication of *discrimination* from their workplaces. In contrast, BHP (2018a), on its *Career* pages, says it is working on "potential bias in [their] systems, behaviours, and policies", and does not expand on the order of magnitude nor the rate of occurrences of these "potential bias". Other than Barrick calling out the 2010 incident in Papua New Guinea, companies do not indicate either the order of magnitude or rate of occurrences of biases or discrimination within its workplace.

Harassment and *discrimination* are often paired and offered as an example of human rights violations in the workplace that are not acceptable. Freedom from *harassment* and *discrimination* is echoed on the *Career* pages of Barrick (2018b) and Cameco (2018b), which signifies its importance to these two companies. Policies to provide a work environment free from *harassment* and *discrimination* are discussed more frequently on the *People* over the *Career* pages. Other than not tolerating infractions, it is not clear how workplaces are made free proactively from *harassment* and *discrimination.*

3.2.2.5 Motivations and Audience

Differences in motivation are revealed through cluster criticism analysis of the *People* and *Career* pages and discussion of the intended audiences. These two types of pages relay related, but different levels of information on the key *God* term *inclusion and diversity* and its opposite, *discrimination*. The audiences for the *Career* and *People* pages may not be one-and-the same. The *Career* webpage would be utilized primarily by future and current employees, which is evident by the frequent use of the word *you* to communicate to someone interested in applying for a job. *You* is a term rarely used on the *People* page. The *People* page does not speak directly

to *you*, which signals a wider audience is considered for this message. The discussion of a wider audience will be explored further in the context of Fantasy-theme criticism.

3.2.3 Fantasy-Theme Criticism

Fantasy-theme criticism, described in section 3.1.4, and was used to determine the rhetorical visions, or common belief systems, found in the Canadian mining industry by analyzing the *Career* and *People* pages of individual companies separately. Fantasy-theme criticism methods were used to code the character, setting, and actions in the *Career* and *People* pages. Figure 3-1 provides an overview of the most frequently occurring words. For the creation of Figure 3-1, individual company names were excluded from the word count, which was necessary because producing the pdf of the website to analyze in NVivo also created headers or footers that contained the company's name.

Figure 3-1: 50 Most frequent words found on *Career* and *People* pages

3.2.3.1 Character

The most common characters observed across *People* and *Career* were *The Company* (n = 132), *Our People* (n = 94), and potential future employees or *you* (n = 34). The predominant character that appears across both pages is *The Company*, sometimes also referred to by the company name, or *we*. *The Company* can signify the entire workforce, or in other instances, it

could indicate the management or leadership within a given company. *The Company* is the main character and is often the speaker as the company website is a communication tool to relay who, what, where, how, and why the organization functions. *Our People is also* a common character seen across many of the *People* pages that also appears in the *Career* pages; *Our People* signifies the workforce or employees who work for *The Company*. Depending on the actions associated with *Our People*, this group could include or not include management. *Our People* were discussed in greater detail on the *People pages.* As was identified in the cluster criticism, *you* is used often across all *Career* pages to refer to a potential future employee who may be reading the *Career* page.

Less commonly used terms were used to differentiate the common characters, as was indicated in the generic criticism. This differentiation is likely due to recognizing a range of audience. The audience members may be referred to an experienced professional (n = 17), woman (n = 13), Indigenous (n = 4), student (n = 6), or a new graduate (n = 5). These distinct groups may be called out separately, and even linked to a page that caters to their specific needs. Distinct groups also may be shown in imagery, as was also indicated in the generic criticism analysis. While the *Career* pages are aimed at employees, this group does not include contractors. The character *Contractors* appears in *Sustainability* reports but are not often mentioned on the websites. Goldcorp (2018b) was the only company to talk about using contractors to supplement their workforce on their *People* page. The lack of mention of contractors is surprising since Barrick (2017), BHP (2017), Goldcorp (2017), and Vale utilize contractors to supplement nearly 50% of their global workforces.

When preparing messaging it is important to know who the audience is in order to customize the context and influence the audience's understanding of the company. Yet *stakeholders,* which appears on five webpages, is an ambiguous term. Cameco (2018b) defines stakeholder as "a person, group or entity [who] are affected by us [or] we are affected by them, [through] legal, financial, or operational obligations." Therefore, all of the main characters identified through Fantasy-Theme criticism can be considered stakeholders.

The range of characters found through the Fantasy-Theme criticism, along with the observations of the Cluster criticism, indicates that the *Career* page has a narrower audience than the *People* page. The full range of characters implied as stakeholders along with their ability to influence diversity and inclusion strategies will be further discussed in the section 3.2.6.

3.2.3.2 Setting

Situational characteristics such as location and time were tagged as part of setting. Common settings found in *People* and *Career* pages were *the globe* (n = 28), *our sites* (n = 21), *communities in which we operate* (n = 19), *our industry* (n = 17), and *time* (n = 9). The most common setting, *the globe,* was mentioned as the place in which many of the mining corporations operate. All of the companies analyzed are transnational corporations that operate mines, sales, distribution, and marketing centres in multiple countries. Companies may identify the actual countries they operate in, or simply the number of countries in which they operate in order to signify the extent of their operations. *The globe* is mentioned predominantly on *Career* pages as a means to entice new or current employees who may wish to work in different countries in a global setting. *Our sites* is used to signify the work environment at the operations that make up the company. *Our sites* are commonly referred to as an exciting and safe place to work. This setting also is one where inclusivity and diversity are encouraged while discrimination is not tolerated.

New mines cannot proceed through environmental permitting without the support of the local communities, which are most impacted by positive socio-economic benefits and potentially negative environmental consequences of mining. *Communities in which we operate* signifies the importance of the unofficial, *social license to operate* in modern day mining. *Our industry* refers to a collection of companies. Sometimes this setting is used as a scapegoat for industry-wide issues. For instance, negative images of the industry, such as dangerous work environments, poor environmental stewardship, discrimination, and male-dominated culture happen within *our industry*, but are not mentioned directly in relation to *The Company*. Using the industry as a scapegoat may be an effort to protect *The Company* from negative views in the eyes of the community.

Time is mentioned on five of the *Career* pages to convey how long *The Company* has been in business. The importance of *time* is to convey stability in an industry that is known for large-scale mergers, selling of operations, and boom and bust cycles. Boom cycles are typically characterized by spending and hiring frenzies while bust cycles inevitably result in restructuring and employee layoffs. The setting for mining occurs both in local and global settings. Mining companies rely on the appeals of being a good neighbour while emphasizing their importance on the global stage by discussing their long operating history within the mining industry.

3.2.3.3 Action

Actions tend to center on themes of supporting *The Company* or supporting *Our People*. The common actions are *offer of responsibility* (n = 39), *supporting Our People* (n = 31), *supporting The Company (n* = 25), *being wonderful* (n = 24), and *strengthening diversity and inclusion* (n = 21). Often there is an *offer of responsibility* or opportunity from *The Company* to *you,* as a potential new employee, with the goal of *you* realizing your potential if *you* become one of *Our People*. There is therefore a win-win agreement between *offer of responsibility* and *supporting* each other. For example Glencore (2018a) offers to "treat our people fairly and ensure they have the opportunity to develop careers that match their potential".

Many of the pages speak to how *The Company* is *being wonderful* at something, and usually within the setting of a *global* scale. For instance, Mosaic's (2018b) *Career* page says, "Mosaic is the largest producer of potash and phosphate fertilizers in the world." Also, Cameco's (2018b) *Career* page claims "We're a nationally recognized, top employer in Canada and employ a highly diverse workforce here and around the world."

Strengthening diversity and inclusion is indicated either through indicating a promotion, or commitment to improve diversity and inclusion. Barrick (2018b) indicates their *strengthening of diversity and inclusion* through "[training] 3,000 employees … in preventing harassment, including sexual harassment", while Cameco (2018b) "promote[s] an inclusive and diverse workforce and respect[s] cultural traditions in communities where [they] operate". Nutrien (2018) uses stronger language and "is committed to supporting the diversity of our people and encouraging inclusive workplace practices" while being "committed to making a positive contribution to diversity and inclusion across [their] operations". Glencore (2018a) "believes a diverse workforce is essential to sustainable business" but not indicate how they may be promoting or strengthening it within their company. BHP, Goldcorp, Teck, and Rio Tinto also discuss *strengthening diversity and inclusion* through their webpages.

The Company has wants or aims, at times makes commitments, and offers rewards through the potential of an exciting and supported career. These desires or commitments are countered by the requirement that the company needs the support of their workforce to grow and prosper. The actions are centered around inspiring and supporting the workforce that in turn supports the company.

3.2.3.4 Rhetorical Vision

The common vision seen across the websites welcomes the potential future employee character, who has valuable skills and who as a respected employee will be able to enhance their *potential.* The vision of the future employee is *being wonderful* with *Our People* at *our* [*wonderful] sites*. As an example, Rio Tinto (2018) is "looking for candidates with outstanding ability and specialist experience… [who will] gain lifelong experience as part of a successful and dynamic organization." The motivation lies with *The Company* to support *Our People* to be successful in their careers*,* who in turn, support *The Company* to grow.

In relation to diversity and inclusion, the predominant rhetorical vision is to be seen as acting as a good neighbour within local communities by hiring a local and representative workforce. The company vision, however, does not always provide much detail about the specific demographics present in the neighbourhood or the ways in which the company is being a good neighbour. Section 3.2.4 will take a deeper look at annual sustainability reports over a five-year period to look for signs of being a good neighbour, as well as the origins and consistency of the rhetorical vision identified through Fantasy-Theme criticism. Since not all companies outlined their strategies towards diversity and inclusion on their *Career* and *People* pages, further discussion of individual companies' rhetorical visions will be covered in section 3.3.

3.2.4 Generative Criticism

Generative criticism, described in section 3.1.5, was used to better understand sustainability reports which provide insight into a company's key strategies and social responsibility efforts over a time period. The origins of diversity and inclusion strategies were analyzed through generative criticism. Generative criticism builds on the equity strategies highlighted in sections 3.2.1 through 3.2.2, and can be found in annual sustainability reports from the select mining companies over a five-year period. Three common motivation themes were identified with this method:

- We want to be representative of our local communities;
- Human rights or government regulations have inspired us; and
- No (diversity and inclusion) problems to see here.

Each of these motivational themes will be expanded on in the sections 3.2.4.1 through 3.2.4.3, and at least one company will be discussed as an example of the theme.

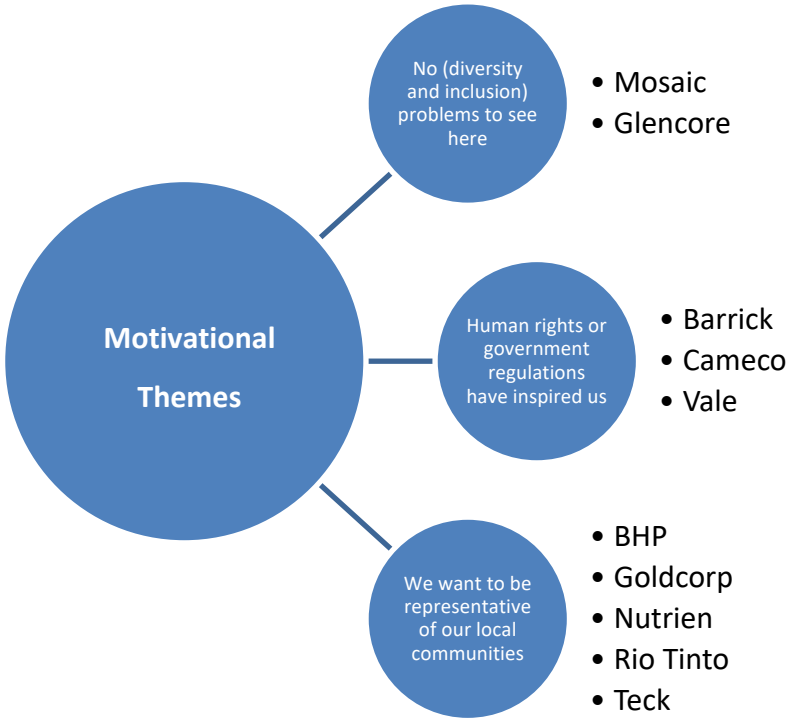

Figure 3-2: Mining company motivation themes

3.2.4.1 Reflective of Our Communities

As was identified in the fantasy-theme criticism analysis in Section 3.1.4, each company was primarily motivated to reflect the demographics of the communities in which they operate. The overt messaging signals welcoming diversity and inclusion due to altruistic beliefs of being a good neighbour. Subtle messaging also exists for direct benefits to the company. Some companies say they have done their own research and found that a diverse workforce helps the bottom line (BHP, 2017). BHP and Goldcorp, who have taken different approaches in their messaging and strategies, will be highlighted as two examples of this theme.

BHP has short, energetic messaging that focuses on how working for it benefits the employee or future employee. The *Career* page is filled with many pictures of diverse, happy people at home, in the office, and out in the field. BHP (2018a) has four priorities listed on their *Career* page:

- Flexible work;
- Encouraging the supply chain to support inclusion and diversity;
- Reviewing for and removing biases in systems and policies; and
- Branding to attract diverse groups.

Of these four priorities, flexible work options and mitigating biases benefit the employee. Viewed in light of Barrick's experience with human rights violations, all four of the priorities that BHP lists also aim to protect BHP. These main concerns aim to prevent human rights violations in their supply chain and to attract a wider talent pool. However, unlike Barrick, BHP's messaging comes across as simply wanting you for you, and not just as a mechanism for preventing human rights violations. BHP's approach to closing the gender gap involves using quotas that it calls "targeted sourcing" (2014). In a case study, BHP (2017) admits that moving towards gender parity "is a challenging goal," even at new or expanding operations, which may not be hindered with existing labour agreements. But BHP (2018a) recognizes that the "potential" biases and barriers indicated on their *People* page won't be easy to overcome, which may put their ambitious goal in jeopardy. The main motivations underpinning BHP's (2017) ambitious goal is to increase productivity at their operations and increase shareholder value.

Goldcorp (2015) appears to be heading in the right direction to make meaningful change in their organization and has taken an alternative stance by not promoting quotas but rather broader strategies. Goldcorp (2015) became the first mining company to sign onto the Catalyst Accord and set a goal of reaching 25% women on their board by 2017, which they achieved that same year (2016). Goldcorp have since established a gender-focused training program and increased female representation in management, senior leadership, and their board (2017); however, results have fallen short of ambitions as Goldcorp has failed to increase their overall representation of women, and in 2016 there was a large turnover of women due to restructuring in their corporate office (2017).

3.2.4.2 Human Rights or Government Regulations Made Us Do It

This theme is driven primarily by meeting regulatory compliance. Government compliance is a requirement of a license to operate in mining. Mining operations are subject to regulatory compliance for health, safety, and environmental reasons that ultimately impact their license to operate. In Canada, federally regulated resources, such as uranium, face additional regulation over benign resources, such as potash, which are readily available for public use. Federal regulatory processes, such as the Environmental Assessment process (Government of Canada, 2018), have increasingly required mining companies to offer education, employment, infrastructure, or profit sharing with local Indigenous peoples' communities in mitigation of mining impacts. Potentially because of government influence, Cameco has sustained higher

levels of Indigenous and female employment levels over a number of years. Cameco (2018b) "as a federally regulated company, … complies with the federal Employment Equity Act". Cameco (2018b) claims to be seeking a representative workforce; however, this goal also heavily influenced by government regulations, which signals a potential deeply structured conflict that will be further explored in the Continuum Analysis section (3.2.5).

In addition to government compliance, some companies align themselves with voluntary human rights goals, such as the UNSD goals (Agrium, 2016; BHP, 2015, 2016, 2018a; Glencore, 2017; Goldcorp, 2016; Teck, 2017, 2018b). In other cases, support for human rights maybe in response to a human rights complaint, such is the case for Barrick and Vale (2017). Barrick's motivations originate from the 2010 human rights complaint that occurred in Papua New Guinea as a result of Barrick's security guards, who, while on duty, sexually assaulted local women (2017). Barrick started mentioning diversity in its 2013 sustainability report (2014); however, it did not offer a concrete stance on human rights until 2016 (2017). The terminology used by Barrick: "Barrick's Management Approach to Diversity and Equal Opportunity and Non-Discrimination are the same" (2017). The messaging involves a humbling look back at the human rights violation that initiated their journey and is focused toward creating greater diversity and inclusion through preventing and addressing human rights complaints. Vale's (2013) human rights motivations are likely a result of involuntary relocation efforts with Indigenous communities that allowed for expansion of mining activity in Brazil.

3.2.4.3 No (Diversity and Inclusion) Problems To See Here

Denial is the underlying message seen in this theme. These companies may claim to support diversity and inclusion; however, the messaging is non-committal, and at times contradictory since there is no actionable call for change despite the company's own data showing gender gaps only widen as one climbs the corporate ladder. Glencore and Mosaic are examples of companies that seem to be taking no active steps in their corporate statements towards increasing the number of women within their companies. Mosaic has had an inclusion policy since 2012 that speaks to having a representative workforce, including increasing Indigenous representation (2018b). Despite this policy, Mosaic does not report on Indigenous representation in their Saskatchewan workforce in their annual sustainability report and have made no overall advancement in the number of women in their workforce since the policy was set (2013, 2014, 2015, 2016, 2017). Mosaic also took a few steps backwards in 2016 when it

downsized its workforce and effectively cut its percentage of female managers in half (2017). Mosaic's 2016 sustainability report messaging falls short of evidence because there are no actionable targets:

> *Mosaic recognizes that women are under-represented across the mining and metals industry. Women make up approximately 15% of our company's total workforce. In the face of challenging and persistent perceptions that our sector is traditionally "male" Mosaic strives to improve the number of women we recruit and retain.* (p. 6)

In comparison, Glencore's messaging seems to take on a gender-blind approach by denying that there are any differences in treatment between men and women (Allen, 2017). Glencore's People target (2017) is to:

> *Continue to foster development of talented people regardless of age, gender, or race through local employment, internships, scholarships or training.*

Previous studies have shown that denial of marginalization does not improve experiences for marginalized people (Allen, 2017; Handley, Brown, Moss-Racusin, & Smith, 2015).

3.2.4.4 Evolution of A Strategy

Through analyzing the *Sustainability* reports over a 5-year period there were often signs that gender equity strategies were evolving before they were rolled out to the entire company, as is shown in Figure 3-3. As an example of this evolution, PotashCorp set a target in 2015 to have their board consist of 30% women (2016) and the following year adopted a company-wide Diversity and Inclusion policy (2017). The dark grey boxes, in Figure 3-3, highlight where external factors may have led to corporate-wide strategies, and the lighter boxes indicate where strategies may have organically developed from within the organization.

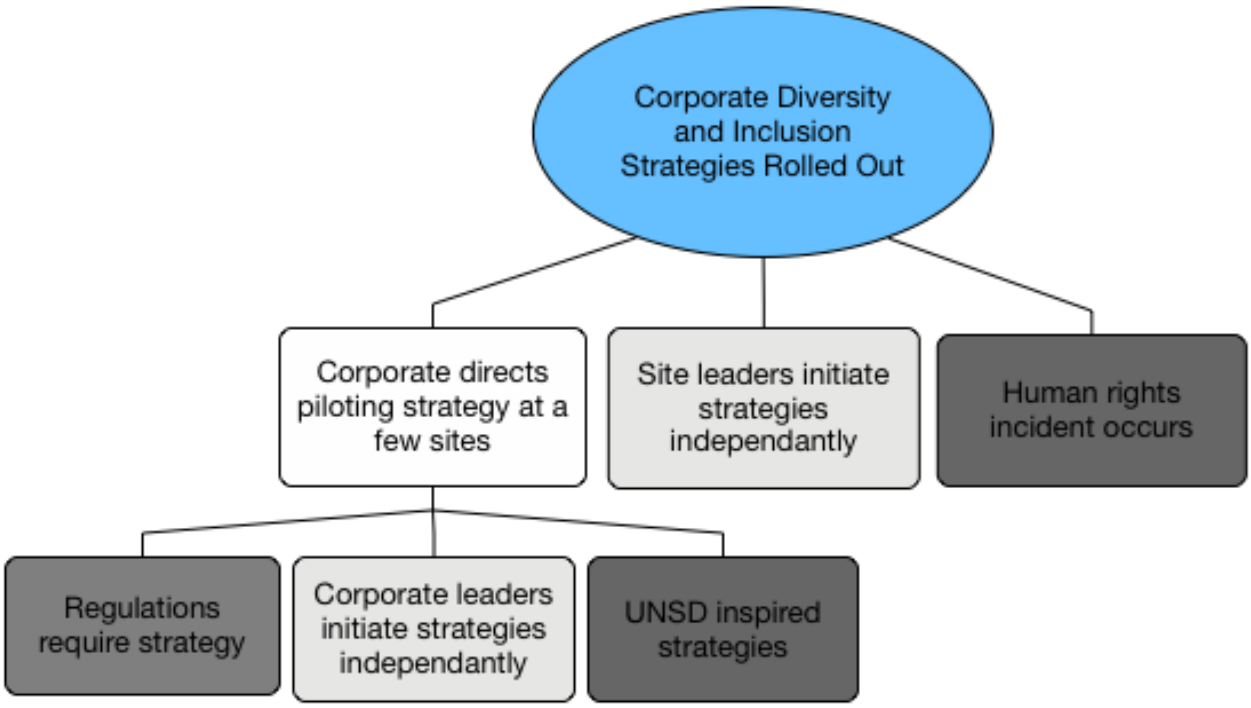

Figure 3-3: Origins of a diversity and inclusion strategy

Various companies began to message their intent to have a representative workforce, long before diversity and inclusion were rolled out to the entire company. Note that it is not clear from the publicly available information where or which individual leaders within a company, either at the site or corporate office level, may have spearheaded a strategy. If there is inconsistent or no support for an initiative at the senior leadership level, it is unlikely that a gender diversity and inclusion strategy would be rolled out on a large-scale basis.

3.2.4.5 Gendered Observations in The Numbers

Given the rising importance of gender equity in the mining industry we need to also consider how or if companies are improving in their efforts to attract and retain women within their companies. An observation from the five-year range of *Sustainability* reports is that the materiality, or importance, of diversity and inclusion is increasing. Materiality is determined through stakeholder consultation and signifies what the hot topics are in the mining industry. Teck (2017) summarizes this observation as:

> *Diversity is also becoming a more significant priority for the mining industry, where women, Indigenous Peoples and other minorities have typically been under-represented.*

As importance and the amount of effort is increasing, we might then to expect to see an increase in the diversity of a company's workforce. A summary of female representation in the 10 companies analyzed is shown in

Figure 3-4 and we can see recent marked diversity improvements in BHP, Barrick, and Teck. Cameco shows a sustained, and slight increase their gender diversity.

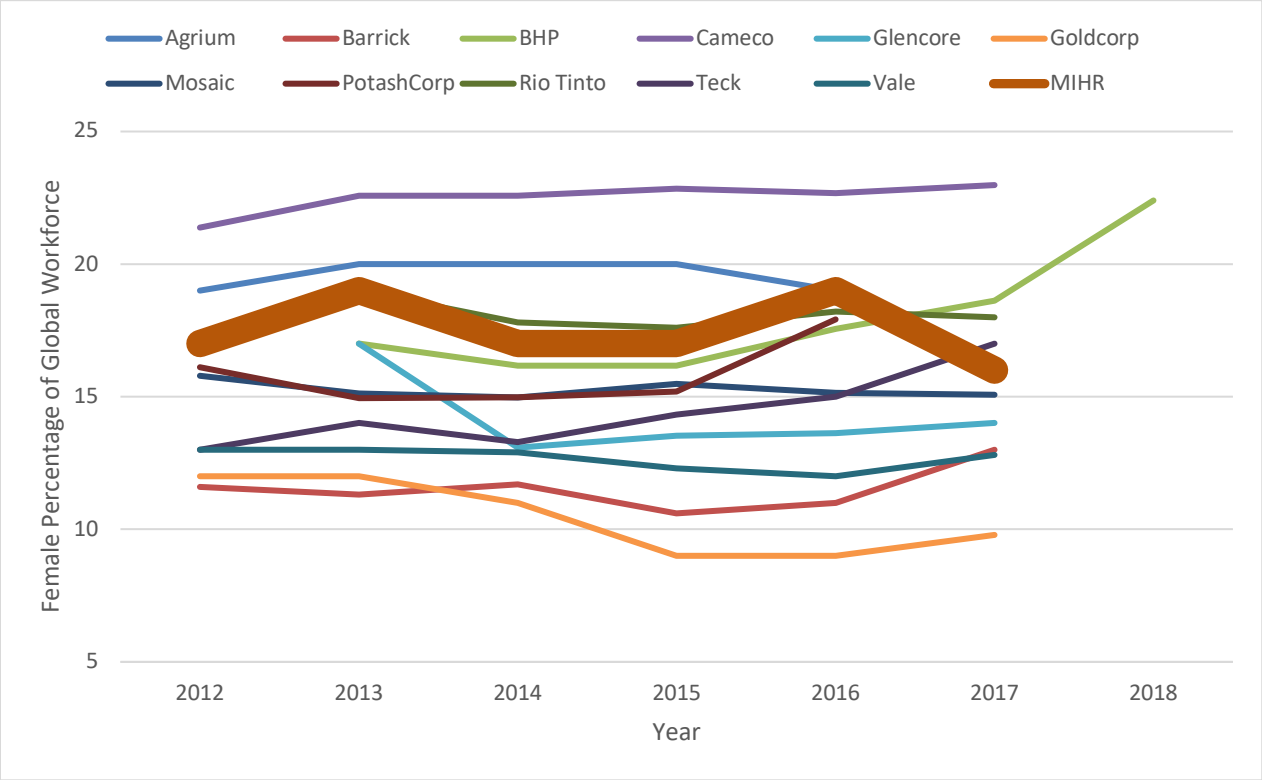

Figure 3-4: Female participation in workforce - global mining[3]

In Figure 3-4, global female representation is shown, along with overall Canadian industry data, as compiled by MiHR. The overarching observation from reviewing *Sustainability* reports

[3] Information was sourced from (Agrium, 2016, 2017; Barrick, 2013, 2014, 2015, 2016, 2017, 2018a; BHP, 2013, 2014, 2015, 2016, 2017, 2018b; Cameco, 2013, 2014, 2015, 2016, 2017, 2018a; Glencore, 2013, 2014, 2015, 2016, 2017, 2018b; Mining Industry Human Resources, 2017, 2018; Mosaic, 2013, 2014, 2015, 2016, 2017, 2018a; Rio Tinto, 2013, 2014, 2015, 2016, 2017; Teck, 2013, 2014, 2015, 2016, 2017; Vale, 2013, 2014, 2015, 2016, 2017, 2018b)

is that companies report what is regulated. Gendered data was reported by all companies studied, but other indicators of diversity such as education level, race, sexual orientation, and responsibility level in the company are not consistently reported amongst all companies. It is often difficult to see country by country workforce levels or gendered statistics in large companies like Vale (140,000 employees) and Glencore (146,000 employees), who tend to group their data by commodity rather than country. However, Glencore is listed on the London stock exchange, and is required to report detailed gendered data and gap- reduction strategies for a few hundred workers in the UK. This detailed information is presented on their *People* page (2018a), but is absent from their sustainability reports (2017). It is recommended that regulations be adopted which require reporting of gendered details and strategies on a country-by-country basis.

All of the companies have ethics hotlines that provide a means to report workplace issues, but employees do not often use this mechanism to make complaints about sexism, harassment, or sexual violence. For example, Glencore (2017) reported 963 complaints through their hotline, the majority of which were dust complaints from local communities. It is not known what the other complaints were or how they were managed. As another example, BHP does not report the number of complaints and instead indicates categories of complaints along with a percentage, as is shown in Table 3-1. Given the under-reporting and the seemingly absence of other mechanisms, it is not clear how many cases of sexism, harassment, or sexual violence occur within a company. In contrast, all companies report on health and safety statistics, suggesting that these organizations can collect data if required. To address the issues of inconsistent and unavailable incident data, it is recommended that regulations be developed and applied to ensure consistent reporting and oversight similar to workplace health and safety. Opportunities to report gendered discrimination ranging from sexism through to violence could potentially be managed under the existing provincial and company health and safety management systems and will be explored further in the bottom-up phase in section 4.2.2.

Table 3-1: BHP ethics hotline complaints (2017)

Category	Percentage of Complaints
Harassment and bullying	27%
Behaviour	19%
Other[4]	17%
Conflict of interest	13%
Health and safety	8%
Equality in employment	7%
Data accuracy	5%
Performance	4%
Ask a question	4%

Despite companies wanting to attract and retain more women, the level of female employee turnover remains higher than that for men in many organizations, such as BHP (2013, 2014, 2015, 2016, 2017, 2018b), Cameco (2013, 2014, 2015, 2016, 2017, 2018a), and Goldcorp (2015, 2016, 2017, 2018a).

Figure 3-5 gives an example of the differences in turnover between Teck and BHP, where Teck has a lower level of female turnover compared to overall turnover. One strategy to encourage women to attract and retain women is to offer part-time work within individual organizations, but part-time workers represent sometimes less than 1% of the workforce. As both retention and flexibility have been shown by many studies to be a priority for women (Mining Industry Human Resources, 2016; UN Women National Committee Australia, 2015; Women in Mining, 2017), it is expected that lower levels of female turnover would be associated with more part-time work.

[4] Other includes unfair dismissal; maintain supplier relationships; protecting BHP assets; personal information and privacy; corruption; intellectual property; competition and antitrust; physical theft or loss; alcohol, drug and tobacco use; communicating externally; absenteeism; use of business partners; etc.

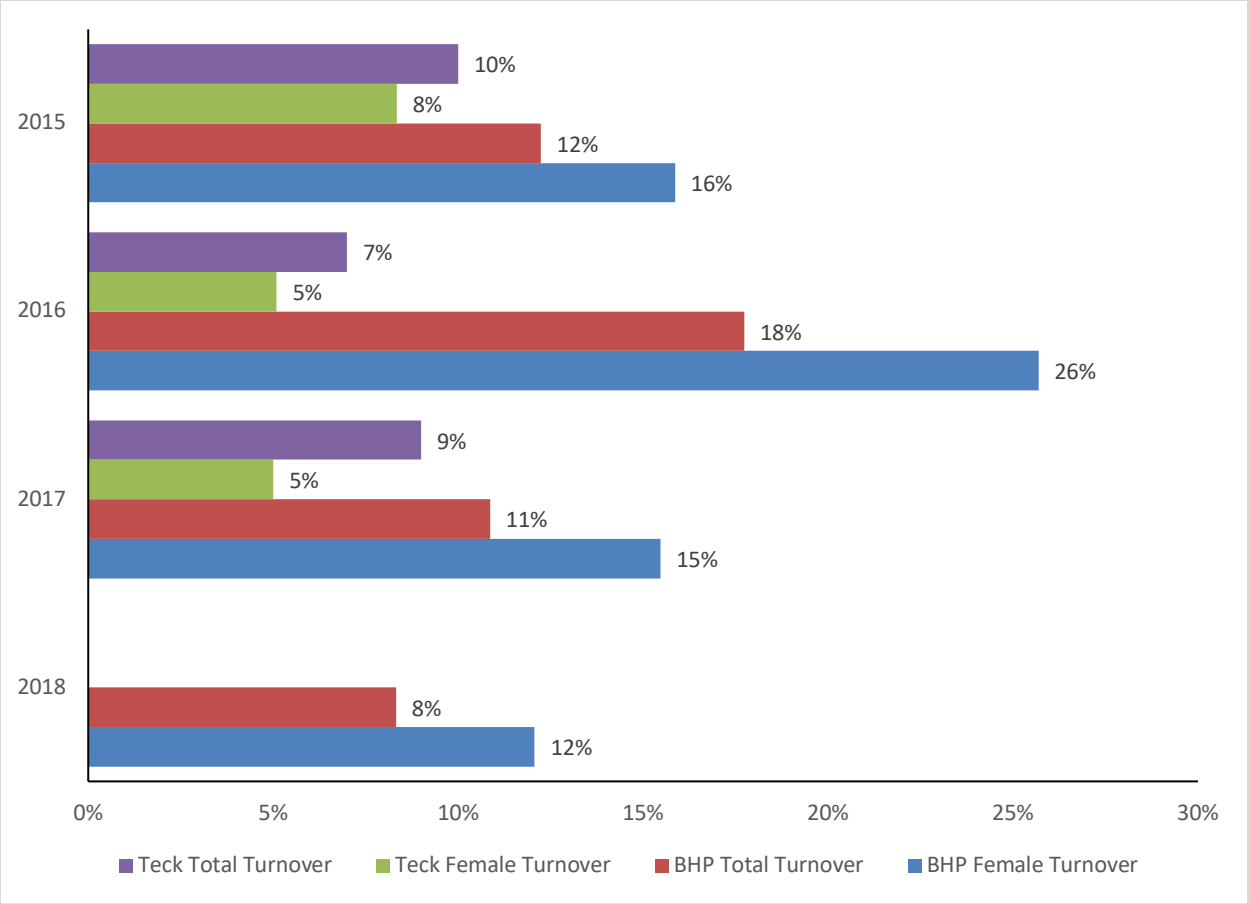

Figure 3-5: Comparison of total turnover to female turnover[5]

3.2.5 Continuum Analysis

3.2.5.1 Broad to Narrow Meaning

Brummett (2011) defines broad meaning as a belief that is widely held and narrow meaning as one that is not commonly shared. Figure 3-6 highlights some of the main truths across the mining companies and emerging solutions recommended by some companies or groups. The broad truths, shown on the left side of Figure 3-6, highlight normative or common beliefs that define the identity of the industry at this point in time. A predominant truth across the mining industry has been a relentless movement toward improving health and safety performance over the last 20 – 30 years. Through pressures from both inside and outside the

[5] Information was sourced from (BHP, 2015, 2016, 2017, 2018b; Teck, 2017, 2018a)

mining industry, drastic improvements in health and safety have been made. The same multi-fronted approach to diversity and inclusion is not yet happening across the mining industry.

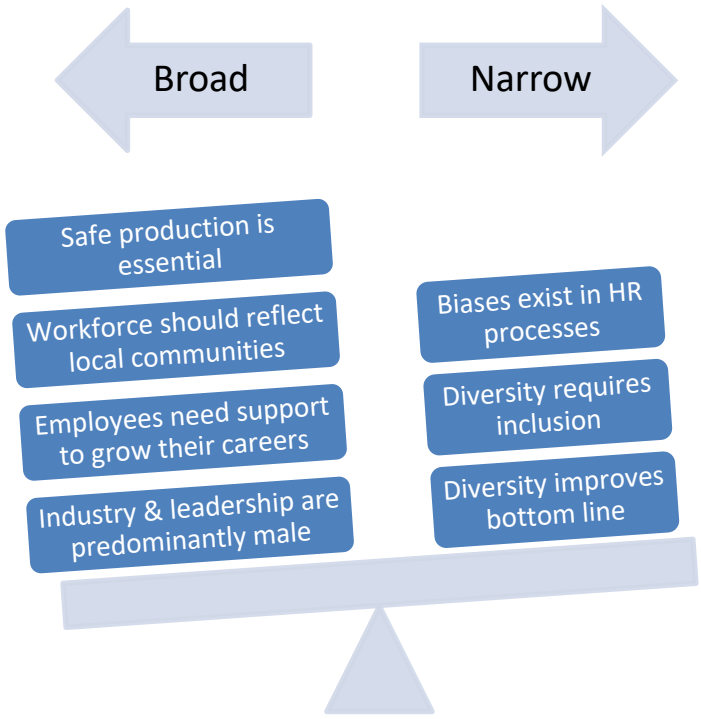

Figure 3-6: Broad to narrow meaning

The items listed under narrow meanings identify potential resolutions to move forward the cause of gender equity. These are the issues that some companies and groups are working to address. The narrow messaging is not consistent across the industry or between companies regarding the inclusion and diversity strategies necessary to close the gender gap. The narrow meanings are echoed in the literature that recommends similar specific changes to the mining industry (Hughes, 2012; Mining Industry Human Resources, 2016; UN Women National Committee Australia, 2015). To advance the cause of gender equity in mining, the narrow meanings need to become further entrenched in the identity of the mining culture.

3.2.5.2 Original to New Context

The context in which the messaging appears ranges from original to new (Brummett, 2011) and is summarized in Figure 3-7. Websites are continually rebranded and refreshed to look new; however, the content is not necessarily original. Due to the ever-changing context of global society and political influence, messaging is frequently being updated to provide a progressive appeal. Human rights legislation has been a part of the Canadian context since 1945, yet

provincial mining acts prevented women from having equal rights to the workplace for decades after this date (Keck & Powell, 2000). Diversity and inclusion strategies are considered new because they are presented as a response to the influence of the 2015 UNSD goals (United Nations). Therefore, mining companies' diversity and inclusion strategies are not original, but are new to the industry.

While original documents may be updated to incorporate new content, their influence may continue to show traces of the original context. Value statements, which are rarely changed, provide original context into how the company culture functions and what is considered essential. As the new context becomes normalized by society and the industry, it is then assimilated into the original context. For instance, many policies for hiring and promotion were originally designed under systems of merit, which are now known to incorporate biases that may prevent minority groups from reaching their full potential (UN Women National Committee Australia, 2015). Adopting new inclusion and diversity strategies and then incorporating policies into a company's existing policy structure may then provide a source of uncertainty since change is forced to fit into the existing cultural landscape. A ripple effect may necessitate reviews of related policies in light of the new way of thinking. Sustainability reports thus provide a vehicle for the assessment of tension between understanding the original context and adoptions of new context over time.

Figure 3-7: Original to new meaning

3.2.5.3 Reactive to Proactive Relationships

Brummett (2011) describes this continuum as one that is either reacting to a situation or is at the forefront of creating a new reality by being proactive. Reactive and proactive initiatives are summarized in Figure 3-8. The efforts related to increasing female participation and gender equity in mining are reactive to societal pressure and the UNSD goals (United Nations, 2015a). There has been little improvement in the rates of female employment in the mining industry over the last 30 years (Mining Industry Human Resources, 2017), and yet gender equity has not been a focus of the industry until recently (Women In Mining, 2010).

One of the few initiatives that could be taken as proactive, and only in relation to others in the mining industry, is BHP's (2018a) pledge to reach gender parity by 2025. Relative to other industries, BHP's initiative would not be considered proactive, but relative to the mining industry, this initiative can be seen as proactive.

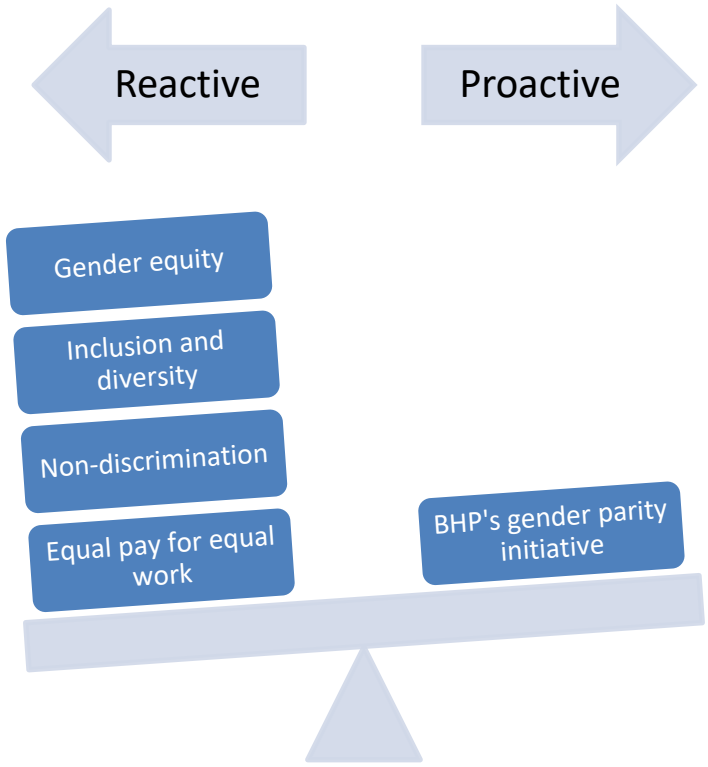

Figure 3-8: Reactive to proactive relationships

3.2.5.4 Direct Tactics Through Implied Strategies and Structures

The messaging of over 75 sources was reviewed through this rhetorical analysis of individual mining companies. A summary of this final continuum is shown in Figure 3-9.

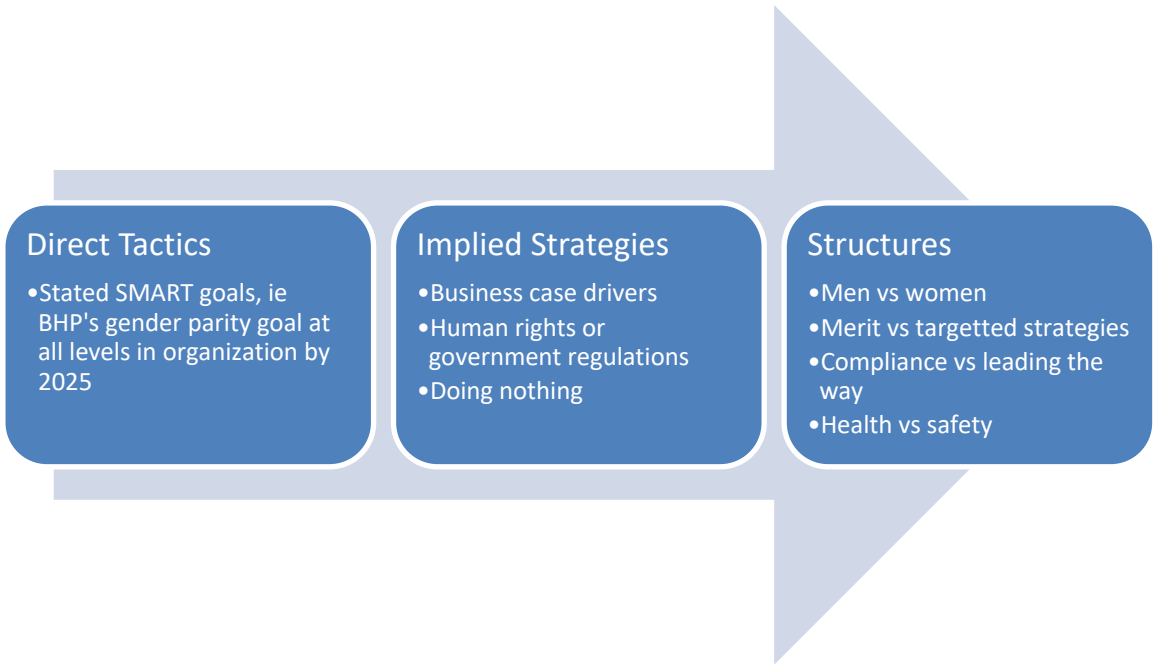

Figure 3-9: Surface to in depth continuum

Through the contents of the websites and sustainability reports, the direct tactical statements that clearly outline a company's plan forward are evident. There are also many signs of implied strategies, which can be seen as "aiming" to make changes, or indications that financial gain may be a secondary driver behind diversity and inclusion strategies.

Finally, through this detailed analysis a deeper understanding of conflicting motivations and a range of intended audiences has been uncovered. Potential conflicts may exist between wanting to welcome a diverse and inclusive workforce that includes women and other minorities within mining, while at the same time not wanting to appear to threaten the majority demographic of men. A company may claim to want to increase a minority demographic that may require targeted strategies and then claim to also hire and promote solely based on merit. Merited systems are known to carry biases that prevent the equitable hiring and promotion of all demographics (UN Women National Committee Australia, 2015). Companies reiterate how they are meeting minimum government regulations on human rights and are leading the way in the employee experience. There is also preferential focus put on safety over health, despite the fact that the two terms are often paired together. Expanding on the mental health and well-being of individuals is a potential means to drive forward diversity and inclusion initiatives by building on

the momentum seen in mining health and safety initiatives and will be explored further in the bottom-up phase in section 4.3.6.

3.2.6 Second Persona.

As outlined in sections 3.2.1 through 3.2.3, a multitude of stakeholders would have reason to pay attention to mining industry messaging through monitoring individual companies' websites and their sustainability reports. The stakeholders are summarized in Figure 3-10. Black's (1970) theory of the Second Persona argues that the implied audience can be motivated to adopt a common world view, in which the actual audience is persuaded because it is brought to see itself carry out an action and then experience the benefits of that action. In this case, that common world view is aligned with the fantasy-theme of being a good neighbour in the community that employs a representative workforce. The following paragraphs will further discuss which of these stakeholders can impact culture change and how they may or may not adopt the rhetorical vision.

Figure 3-10: Mining stakeholders

Of the demographics of stakeholders listed in Figure 3-10, some groups have the ability to drive change from within the organization and others have the ability to impact change from

outside. External pressures can come from customers, media, non-government organizations (NGOs), regulators, local communities, and shareholders. These groups are capable of, and in many cases already are raising awareness regarding the poor advancement of women in mining; they have highlighted the slow rise in numbers and the existence of sexual harassment (MacPherson, 2017b; Mining Industry Human Resources, 2016). One significant change in the external environment is the emergence of the #MeToo movement, which has ignited a call for change in the handling of harassment complaints which could lead to full scale changes in how harassment is treated in the workplace (Carlsen et al., 2018).

Suppliers have less potential for directly influencing the mining companies, but mining companies may be negatively influenced to a significant degree by the messaging and policies of mining suppliers. Mine supply companies contribute to MiHR data and are being pressured by mining companies to employ diverse workforces as part of their supply of services contracts. The hypocrisy of this stance is blatant in the case of mining companies who don't practice diversity and equity while making this demand on suppliers.

Employees, management, and shareholders have the ability to influence the company from the inside and arguably provide the largest force to drive or stall change. Potential employees also have an ability to influence the degree of change through the questions that they ask in the interview and job negotiation process. Both existing and potential employees have an ability to push for change by demanding flexible work and inquiring about how awareness is created towards preventing sexism, especially during a peak in the commodity cycles. Supervisors and managers then need to be onboard to support employees in realizing the benefits they are seeking. Shareholders, management, and unions can also demand mechanisms and processes that allow for harassment to be managed. The question is: are there appropriate prompts and rewards to warrant changing their world view, as Black (1970) suggests is required, or are strategies aimed at preventing sexism able to deploy Black's (1970) Second Persona? Messaging could be designed to address ways that allow those companies to see themselves carrying out and benefiting from the changes being promoted. It is evident from this study that there are many diversity and inclusion targets set within individual companies; however, it is not clear how leaders within the companies are being incentivized to actually lead culture change. With few women in the ranks of leadership within management, unions, and boards, change will also have to come from gender diversity champions who are men. Considering the Second Persona (Black,

1970), engagement of men then needs to occur such that they are capable and motivated to take action and see how the change benefits the overall well-being of the company, such as encouraging all employees to reach their full potential.

As the purpose of company websites is primarily for recruitment, and not necessarily for retention, there needs to be cultural changes that entice women to stay and men to support them in staying; that is, companies need to develop inclusion strategies. The narrative of being good neighbours could be extended to the workplace. Good neighbours watch out for the wellbeing of others and support each other to make the neighbourhood a welcoming place for all. Initiatives that support raising awareness, speaking out about diversity and inclusion, adopt focused programs to develop marginalized groups, and requiring individual performance targets that encourage diverse and inclusive behavior will help support women.

Individual groups will require a tailored message to address concerns and inspire an ideological change. A multi-fronted communication strategy has been recommended by others to advance gender equity (Christo-Baker & Stuart Wilbur, 2017; Mining Industry Human Resources, 2016). To build ethical appeal, the predominantly positive ideology originating from the top of these organizations needs to be balanced with discussion on elements in the workplace that has left the mining industry effectively stagnant in the advancement of women for decades. Continued discussion on the potentially negative aspects of the mining industry on women, such as their poor advancement, biases in human resource systems, and sexual harassment (MacPherson, 2017b; Mining Industry Human Resources, 2016), are required in order to allow for cultural changes that realize the full potential participation of women. The bottom-up phase of this study investigates how effectively adopted and impactful initiatives have been within organizations through surveying mining employee's perspectives.

3.3 Rhetorical Criticism Discussion

3.3.1 Rhetorical Visions.

With respect to diversity and inclusion strategies, the following table summarizes the individual company's visions.

Table 3-2: Diversity and inclusion visions

Company	Vision
Barrick	Has a "fundamental respect for … human rights" (2017) which does "not tolerate discrimination" (2018b) and is "committed to the localization of our workforce" (2018b).
BHP	Wants to "achieve an inclusive and diverse workforce that best represents the communities in which our assets are located" (2016) through "targeted affirmative action" (2014), and realizes "it's a challenging goal" (2017).
Cameco	Positive diversity outcomes have been driven by federal regulations and is "moving forward with [their] workforce diversity improvement plan" (2017) both inside and outside their organization.
Glencore	"We believe diversity is essential to our business" (2017) but have no specific targets to increase diversity.
Goldcorp	Will "continue rolling out [initiatives] and broaden the scope of diversity activities throughout the organization" (2017).
Mosaic	Recognizes underrepresentation of women in their "traditionally ***male*** sector [and] strives to improve the numbers of women we recruit and train" (2017) without any specific targets.
Nutrien	Equates the importance of health and safety with diversity and inclusion, which is advanced "by creating opportunities for education and awareness" (2018) both inside and outside their organization.
Rio Tinto	Values "the strength that a diverse workforce and inclusive culture brings to their business" (2017) through a number of initiatives inside and outside their organization.
Teck	"Recognizing and valuing differences" through "diversity focused [initiatives] that support advancement and development of under-represented groups" (2018b) both inside and outside their organization.
Vale	Has a "goal to help reduce historical and cultural differences regarding women in the job market… [by] recognizing and promoting female talent" (2017) in Brazilian operations.

3.3.2 Inclusion Growth Curve.

A compelling and summary symbol, in the form of a populated Inclusion Growth Curve (Women in Mining, 2017), can be used to communicate the progress, or lack thereof, of individual mining companies in the industry with respect to the inclusion of women. Based on a synthesis of the rhetorical criticisms in section 3.2, individual companies are ranked on the Inclusion Growth Curve shown in Figure 3-11. Where the information was available, the participation rates of women in the Canadian and global workforce, from

Figure 3-4, were included on the curve. This symbol can be used to communicate awareness on the status of the industry's efforts towards gender equity.

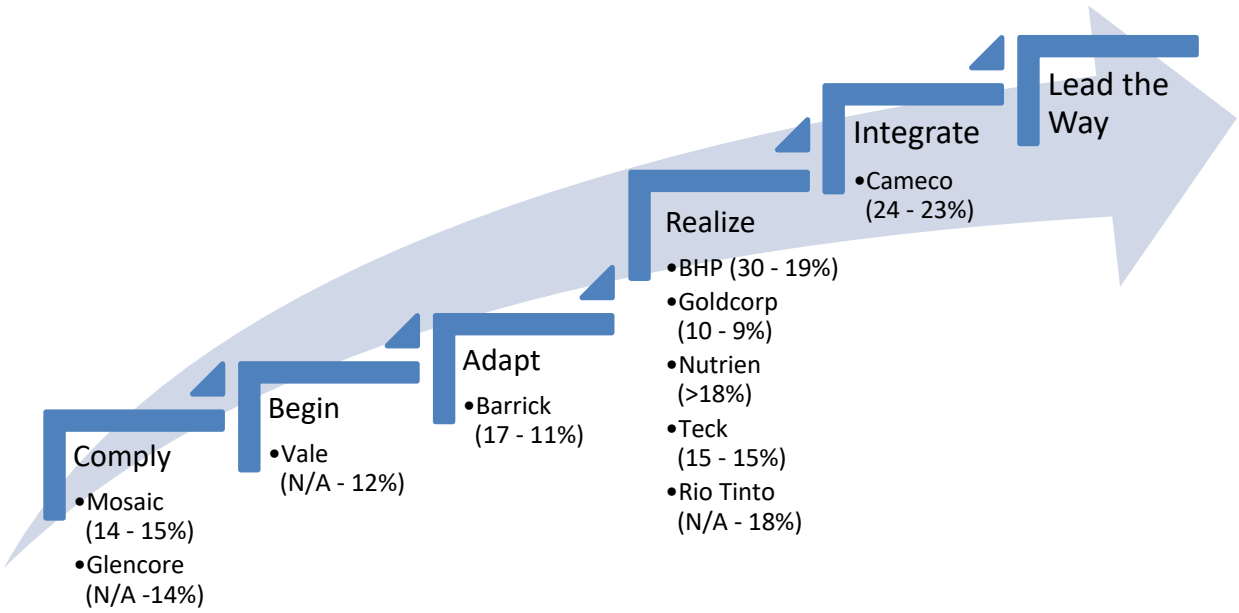

Figure 3-11: Inclusion growth curve with percentage of women (Canada – Global)

It should be noted that the location of a company at a certain step on the curve does not indicate they are not exhibiting characteristics of more advanced stages. For instance, Teck, Rio Tinto, and BHP are all outspoken about their desires to create diversity and inclusion within the mining industry, which is a characteristic of *Leading the Way*; however, their gendered data does not yet reflect the entrenchment of gender equity in their culture. The bottom-up phase of this study will examine if experiences of employees within the mining industry mirror the messaging coming from the top of the organization in section 4.2.2.1.

3.4 Top-down Conclusion

The purpose of the top-down analysis was to supply a previously missing or incomplete dimension to a critical rhetorical review of individual companies' messaging regarding diversity and inclusion strategies in the Canadian mining industry. There appears to be a growing and unified voice among mining organizations to reflect the communities in which they operate, and that companies should have a representative workforce composed equally of women and men. While the numbers of females within individual mining companies are not yet reflective of sustainable culture change, which is thought to occur at 30%, this analysis suggests that senior leaders are engaged with gender equity. However, some are further along this path than others. Through this analysis, there are signs of improvement, at least through a growing awareness, that gives hope to the cultural evolution process across individual companies and within the industry as a whole.

Inclusion and diversity are terms that are often paired together, and both are necessary to achieve equity. Diversity means variety and is a lagging indicator often used to measure the demographics of men and women in an organization. Diversity can also be indicative of differences in ways of thinking or be used to measure and describe differences in education, physical appearance, gender, sexual orientation, religious beliefs, and/or race. Inclusion is the acceptance and celebration of these differences in an organization. Inclusion is evident through verbal and non-verbal behaviors which may be required to welcome differences in education, physical appearance, gender, sexual orientation, religious beliefs, and/or race.

It is clear from the consistent logos of *wanting to be a good neighbour and have a representative workforce* that change needs to be driven from both inside and outside individual organizations. By highlighting improvements across individual mining companies, there are opportunities to build the ethos appeal by sharing lessons learned, creating greater awareness, and reinforcing gender equity strategies in an effort to close the gender gap. To ensure an appropriate pathos appeal, messaging should be strongly worded to support the wellbeing of individuals rather than relying on financial business drivers or regulatory impacts to motivate diversity and inclusion efforts.

4 Phase 2 – The Bottom-up Approach

4.1 Bottom-up Methods

The second phase of this transformative mixed-methods study was based on questions that arose from the literature review and the top-down phase outcomes. In a mixed-methods study "mixing is the explicit interrelating of the study's quantitative and qualitative strands and has been referred to as combining and integrating" (Creswell & Plano Clark, 2011, p. 66). Mixing of qualitative and quantitative outcomes occurred in four distinct phases throughout this study:

- Within the top-down phase,
- Between the top-down and bottom-up phases,
- Within the bottom-up phase, and
- Following the top-down and bottom-up phase.

First, mixing of the top-down phase outcomes occurred in the form of rhetorical analysis merging, where primarily qualitative data was merged with other qualitative data sets and a smaller quantitative data set. Creswell and Plano Clark (2011) define this as "mixing during data analysis" (p. 67). The outcome of the first phase mixing can be seen in the populated Inclusion Growth Curve, shown in Figure 3-11.

Second, mixing of study outcomes began to occur between the top-down and bottom-up approaches, as the primarily qualitative data analysis from the top-down approach informed the methodology and design of the second phase. Creswell and Plano Clark (2011) call this type of combining, "mixing at the level of design" (p. 67). The results of the second mixing were a new set of research questions (section 1.3.2) and the survey design, which included sampling and data collection strategies. Overarching research questions were crafted as part of the methodology design, when were then operationalized through the development of multiple survey questions. The design of the second phase of this study consisted of concurrently collected qualitative and quantitative data, which was then mixed in the second phase of analysis.

Mixed methods synthesis occurred within in the bottom-up phase following the completion of the survey. Qualitative and quantitative data were analyzed separately and were then mixed during data analysis to answer the phase two research questions, see section 4.3 for the outcomes.

Finally, the last synthesis stage, see section 5.1, involved looking at how the outcomes from the bottom-up phase confirmed or do not align with the results from the top-down approach

used in the first phase (Creswell & Plano Clark, 2011). Creswell and Plano Clark (2011) label this a “mixing during interpretation” (p. 66)

The remainder of the bottom-up phase methodology section will explain the survey design and analysis procedures used as part of the bottom-up approach.

4.1.1 Survey Design

An online survey was created with the intent of confirming the top-down approach study outcomes with a large sample size of current and former mining industry employees. Both qualitative and quantitative questions were included. A complete list of survey questions can be found in Appendix F. The survey questions were entered into *Survey Monkey*, an online accessible survey tool, and a link was then used by participants to access the survey. Following completion of the survey, data was retrieved from *Survey Monkey* and utilized in the data analysis phase.

4.1.1.1 Survey Participants

As was determined in the top-down phase of the study, the primary audience for gender equity communication strategies are leaders currently working within mining. Although it is essential for women to advocate for women, the majority of the workforce in mining is male, and therefore, it is as important for men to support equity for women, especially minority women. A secondary audience was determined to be professional women, including those who formerly worked in the mining industry. The desired pool of survey participants were those who currently or have previously worked in the Canadian mining industry, irrespective of role in the company or gender.

4.1.1.2 Behavioral Research Ethics Approval

Behavioral research ethics approval for the survey was sought and approved by the University of Saskatchewan Research Ethics Board under Beh ID 247 on September 5, 2018.

4.1.1.3 Survey Mobilization Strategy

Following research ethics approval, industry and professional associations were contacted to ask for their support in mobilizing the survey. Survey participants were targeted through industry and professional associations in British Columbia, Ontario, and Saskatchewan where mining is a major industry. Alberta was not a targeted province, as the oil sands industry, which some consider to be a mining operation, have a culture which more closely resembles that of the

oil & gas industry rather than the mining industry. People who have not worked in the Canadian mining industry were excluded from this survey.

Over 20 associations and various professional engineering and geoscience societies in the three target provinces were contacted. It was anticipated that these associations would directly send out the email to their contact lists due to a shared value of increasing gender diversity and inclusion. In actuality, privacy regulations related to emailing their member base prevented some like-minded organizations from participating as originally planned. Some associations agreed to promote the survey through social media, their personal networks, or through their association's websites. A complete list of industry and professional organizations that aided with survey mobilization can be found in Appendix Table C-2.

My own industry connections were also contacted through a snowballing recruitment strategy, and the survey was forwarded to my contact networks through LinkedIn, Facebook, and email. In some instances, individual corporations offered to send out the survey link within their organizations through email or by posting on internal company websites. The corporations who sent out the survey to a greater audience were BHP, Hatch, Mosaic, Orano, and Teck. The result of the snowballing effort was a higher rate of participation from organizations who shared the survey internally.

4.1.2 Survey Analysis Methods Overview

The bottom-up analysis involved analyzing qualitative data in packaged software (NVivo, QSR International Pty Ltd, Victoria, Australia) and analyzing quantitative data with packaged statistical software (SPSS, IBM, Armonk, New York). A summary of the relationship between the research questions, survey design, and analysis method is shown in Table 4-1. Further details on the qualitative and quantitative methods are outlined in the following subsections.

Table 4-1: Correlation of questions to methods and analysis

#	Research Question	Survey Questions	Method Overview	Analysis
1	Is there a difference in perceptions of gender diversity and inclusion between men and women who work in the Canadian mining industry?	Sixth section of survey (Perceptions on diversity and inclusion)	Compared means of responses between women and men using independent sample t-test in SPSS.	See sections 4.2.2.1 and 4.3.1.
2	Is there a difference in perceptions of gender diversity and inclusion between current and former work in the Canadian mining industry?	Third (former workers) and sixth section of survey (current workers and perceptions on diversity and inclusion)	Compared means of responses between current and former workers using independent sample t-test in SPSS.	See section 4.2.2.1.
3	How were employees made aware of the cause of gender diversity and inclusion within and/or outside their organization?	Fourth section of survey (Company strategies for diversity and inclusion)	Descriptive statistics used to correlate and summarize responses.	See sections 4.2.2.2 and 4.3.3.
4	What barriers or supports have employees experienced in response to recent gender diversity and inclusion initiatives within their organizations?	Fourth section of survey (Company strategies for diversity and inclusion)	Coded open-ended responses in NVivo using Cluster criticism. Examined correlation between men and women using Chi-squared test of independence.	See sections 4.2.2.3 and 4.3.4.
5	In what ways might diversity and inclusion initiatives within mining facilitate or inhibit cultural changes in support of gender equity?	Fourth section of survey (Company strategies for diversity and inclusion)	Coded open-ended responses in NVivo using Cluster criticism. Examined correlation between men and women using Chi-squared test of independence.	See sections 4.2.2.3 and 4.3.5.
6	Can health and safety culture and language be used as common ground to motivate gender diversity and inclusion culture change?	Fourth section of survey (Perceptions on health and safety) and fifth section of survey (perceptions on diversity and inclusion)	Compared means of responses between women and men using independent sample t-test from sections 4 and 5 in SPSS.	See sections 4.2.2.5 and 4.3.6.
7	Can health and safety processes be used to deal with harassment and discrimination issues?	Seventh section of survey (discrimination and harassment incidents)	Coded open-ended responses in NVivo using Fantasy-theme criticism.	See sections 4.2.2.4, 4.2.2.5, and 4.3.7.

4.1.3 Data Preparation in Excel

Following a preliminary read through of the summary data in *Survey Monkey*, the first step in data analysis was to prepare the data in Excel. Participants who had not worked in the Canadian mining industry, had not sufficiently completed the survey, or had obviously not completed the survey in good faith were excluded from the subsequent analysis. Spelling mistakes were corrected using spell check. Company names were summarized to ensure consistent naming practices and allow for sorting. For example, Mosaic, The Mosaic Company, Mosaic Potash, were all renamed to Mosaic. Categorical answers were converted to numerical responses in all but seven of the questions. The codebook for converting the categorical answers to numerical responses is included Appendix C.

4.1.4 Qualitative Analysis in NVivo

Nine of the questions in the survey allowed for participants to provide feedback in their own words. These open-ended responses were thematically coded in NVivo, which allowed for further statistical analysis using either cluster or fantasy-theme criticism as described in this section.

4.1.4.1 Cluster Criticism

Foss' (2004) cluster criticism was chosen as the method to analyze eight of the nine open-ended questions. Similar to the use of Cluster Criticism described in section 3.1.3, Word Count and Word Tree functions within NVivo were used as tools to guide thematic coding. Themes were then summarized to ensure that the identities of participants were kept anonymous. The positive, neutral, and negative connotations of these themes will be discussed in sections 4.2.3.1 and 4.2.3.2.

4.1.4.2 Fantasy-theme Criticism

The incident question allowed for the greatest qualitative insight into the experiences of discrimination and harassment among women and men who currently or formerly have worked within the mining industry. Fantasy-theme criticism (Foss, 2004) was chosen as the method to analyze this key question due to the natural narrative style that was utilized by most of the survey participants in describing the incidents they had witnessed or experienced. As described in section 3.1.4, characters, actions, and settings were thematically coded. The actions were further

divided into three parts: the incident, speaking up, and the outcome. The resultant rhetorical vision from these themes will be further discussed in section 4.2.3.3.

4.1.5 Quantitative Analysis in SPSS

When the sample data (n = 540) was transferred from Excel to SPSS, the type of variable and value labels were entered into SPSS's Variable View to allow for creation of tables and charts. Independent variables were treated as either ranked (ordinal) or classifications (nominal) (Witte & Witte, 2007). The only true scale value was the respondent ID number, which is the unique identifier for individual participants. The variable types and labels are summarized in the survey codebook in Appendix C.

The majority of the closed-ended questions on the survey allowed for single response outcomes in the form of nominal or ordinal responses. A few closed-ended questions allowed for multiple responses to a singular question either through multiple choice, where multiple answers could be selected, or through matrix style questions. When exporting the responses from *Survey Monkey*, multiple response questions were exported into separate columns to represent each response option. There is therefore a higher number of variables to be analyzed compared to the number of questions on the survey. Analysis methods of the various response outcomes will be discussed in the remainder of section 4.1.5.

4.1.5.1 Descriptive Statistics

Descriptive statistics summarize the demographics of the survey respondents, also known as the sample population. For all 65 quantitative questions, descriptive statistics were used to produce:

- The number of overall responses (N) for each question;
- The number of responses (n) by category, such as gender;
- The mean (M) for overall responses and gender;
- The standard deviation (SD) for overall responses; and
- The category of gender (men, women, or other).

For summarizing the responses from the *demographics* questions, the descriptive statistics frequencies and chart builder function were used. When data was available to compare the mining industry population to the survey sample, this comparison was done by first summarizing the sample in SPSS and then comparing to the mining population in Excel. For comparison

purposes, the categories of the mining population were primarily used, and the sample data was re-categorized. The original sample categorization is shown in full detail in the Appendix C. Using the chart builder function, all demographics were examined in SPSS by gender and included in Appendix E.

4.1.5.2 Analysis of Nominal and Binary Responses

A total of 20 questions allowed for binary yes-or-no responses or singular responses of yes. On some yes-or-no questions, additional options of *unsure* were included. These questions often were used as decision points to guide the survey participant to the appropriate section of the survey. For the purposes of analysis, responses from these questions were primarily treated as nominal, data was assumed to not be normally distributed, and results were primarily reported using a pie graph or in percentages.

4.1.5.3 Normally Distributed Ordinal Data Analysis

Statistical methods were used to examine relationships within the data sets for overall responses and between genders for 23 of the questions. Due to the large sample size (N = 540), a Mann-Whitney U test, which is normally used to test ordinal or ranked data, could not be used. Instead, an independent sample t-test was used to look for difference between the means was used when the data was normally distributed (Witte & Witte, 2007). In this study independent sample t-tests were used to examine differences in responses to ordinal questions between men and women.

Independent sample t-tests were run for all 23 questions in one simulation using SPSS. The resulting information was exported to Excel and conditional formatting was used to check for statistically significant t, p, d, and df outcomes. For this study a level of significance (α) of < 0.05 was used. The results from independent t-test is reported in paragraphs in the form [t (df) = X_1, p < X_2, d = X_3], where:

- df is degrees of freedom;
- p is the degree of rarity;
- d is Cohen's d; and
- X's will be outputs from SPSS.

A further theoretical description of independent sample t-test can be found in Appendix D.

4.1.5.4 Non-Normal Distributed Ordinal Data Analysis

Data which is not normally distributed or is categorical can be analyzed with a Chi-squared (χ^2) test of independence. This Chi-squared tests looks for correlation between two variables where data is not necessarily normally distributed (Witte & Witte, 2007). Individual Chi-squared test of independence were executed one at a time using the crosstab function in SPSS and by changing the Variable 2 to reflect the question being analyzed. The resulting information was transferred to Excel and conditional formatting was used to check for level of significance (α) < 0.05. The results from Chi-squared tests of independence are reported in in texts in the form [χ^2 (df, N = X_1) = X_2, p < X_3], where:

- df is degrees of freedom;
- p is the degree of rarity;
- N is the number of survey respondents analyzed, and
- X's will be outputs from SPSS.

A further theoretical description of Chi-squared test of independence can be found in Appendix D.

4.1.5.5 Analysis of Matrix Responses

Two matrix questions were utilized to allow for participants to rate the nominal benefits and ordinal risks of diversity and inclusion initiatives. The resultant responses from these questions were restructured in SPSS, which allows for each potential response to be saved as a unique row in SPSS and can then be analyzed using the cross-tabs option. The final outcome allows for the data to be displayed in a matrix or table similar to the original question. Matrix style questions were evaluated using Chi-squared as the data curves were predominantly not normal.

4.1.5.6 Analysis of Multiple Responses in a Single Question

Similar to ratings responses, multiple responses have a relationship between variables. The outcomes from multiple response questions were restructured, saved as a separate file, and then further review was conducted within SPSS. Either independent t-test or Chi-squared tests were used to identify gender differences on individual responses, depending on normality of data.

4.2 Bottom-up Analysis

The bottom-up analysis provides insight into current and former mining employees' perceptions of diversity and inclusion, and of health and safety in the mining industry. In this analysis section, a comparison of the survey sample demographics to the mining population is presented in section 4.2.1. Next, the outcomes from quantitative and qualitative questions will be discussed separately in sections 4.2.2 and 4.2.3, respectively. Finally, in section 4.3, the bottom-up research questions will be answered by synthesising the qualitative and quantitative survey results.

4.2.1 Survey Sample Demographics and Mining Population Demographics

In total 948 participants accessed the online survey, which was open for responses between October 3 and October 31, 2018. As a first step of data preparation, the survey responses were downloaded from *Survey Monkey* and reviewed in Excel. The first filter for removing responses included checking to see if respondents currently or had previously worked in the Canadian mining industry. Of the participants, 13.9% (n = 132) responded that they had not worked in the Canadian mining, and therefore were, not eligible to answer any but the first survey question. These participants were removed from the survey in Excel and not included in further analysis. A reason for the high number of respondents for this first filtering question may be due to interested friends and family, individuals with international mining experience, or diversity and inclusion enthusiasts who have not worked in Canadian mining.

The second filtering step included a check to see if survey had been substantially complete and if responses were presented in good faith. A further 28.7% (n = 272) of survey responses were removed from the survey sample in Excel as the survey was not completed beyond the demographics questions, or in a select few cases because the responses did not seem to be motivated by good faith or a desire to participate in a constructive manner. An example of a response that fell into this category involved repeating a racist profanity multiple times in one comment box.

In total, 540 survey responses were deemed to be appropriate for further analysis. Of this group, 40.7% (n = 220) were female, 58.9% (n = 318) were male, and 0.4% (n = 2) were "other." The result of this study show that women were over-represented in this sample compared to the representation in the mining labour force. According to MiHR (2018), women represented 16% of mining population compared to 84% for men. In the remainder of the analysis of

demographics, the sample demographics, where possible, are compared to the Canadian mining population. In order to protect the identity of the "other" gender (n = 2), categorical descriptors for this group will not be displayed in the remainder of this thesis.

4.2.1.1 Mining Connection for Sample and Population

The first question in the survey aided with categorized the respondent's connection to the mining industry. The categories included working directly for a mining or exploration company, working in support of mining, or formerly worked in the mining industry. Figure 4-1 gives an overview of mining connection. A breakdown of mining connection by gender is shown in Appendix E.

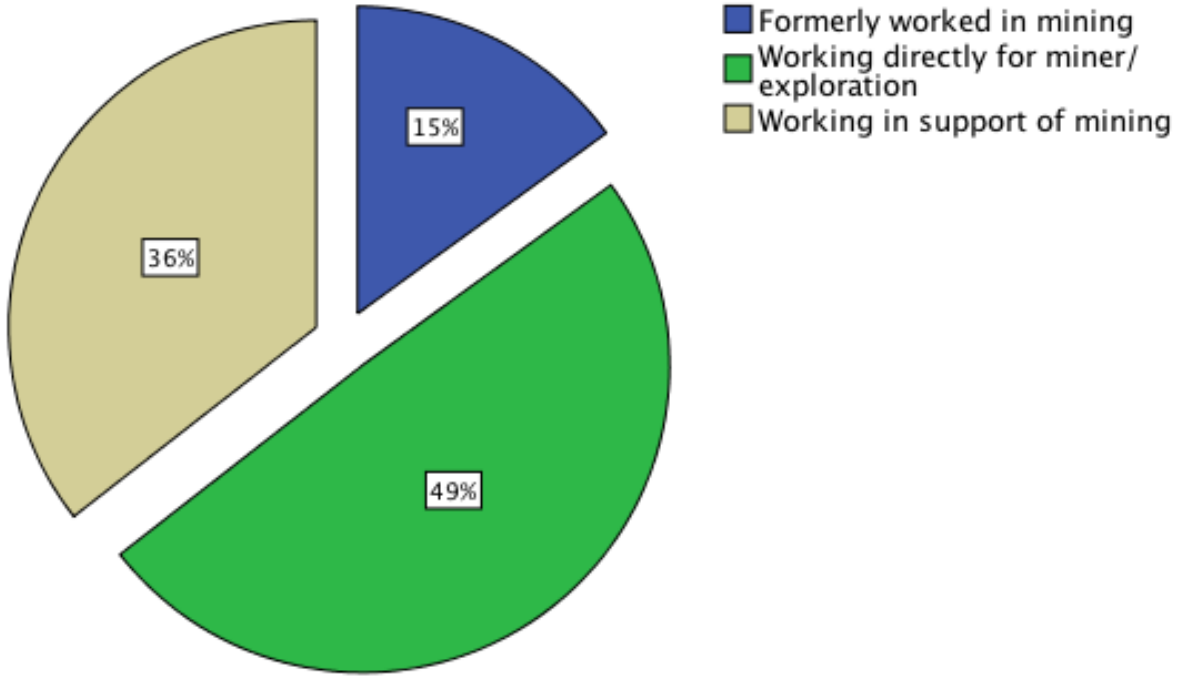

Figure 4-1: Mining connection of survey participants

Those currently working directly (n = 267) or in support (n = 192) of the mining industry were given the option of answering additional questions about their company's diversity and inclusion strategy, and perceptions of health, safety, diversity and inclusion. MiHR (2018) categorizes the make-up of the mining industry differently (19% exploration, 27% primary metal, 15% support services, and 39% extraction and milling) and is not directly comparable.

The former mining employees (n = 81) were asked a shorter subset of perceptions questions and were also asked additional questions surrounding their roles after leaving the industry and what it would take to gain them back. Of this group, 1.7% of the overall sample size

(n = 9) reported being unemployed, which compares to a 4% unemployment rate in the mining industry as reported by MiHR (2018). The remainder of the former mining employees had moved into roles in other organizations; see section 4.2.3.1.

4.2.1.2 Age of Sample and Population

Figure 4-2 gives an overview of the age demographic for the sample compared to the mining population reported by MiHR (2018). The mode of the survey sample is 35 to 44 years, compared to the population mode of 45 to 54 years. The categorization of age ranges and the mode both indicate that the sample size is slightly younger than the mining population. This difference could be due to older miners also being more senior in an organization and not having the time or interest to initiate or complete the survey. A breakdown of the survey respondents' age and gender is presented in Appendix E.

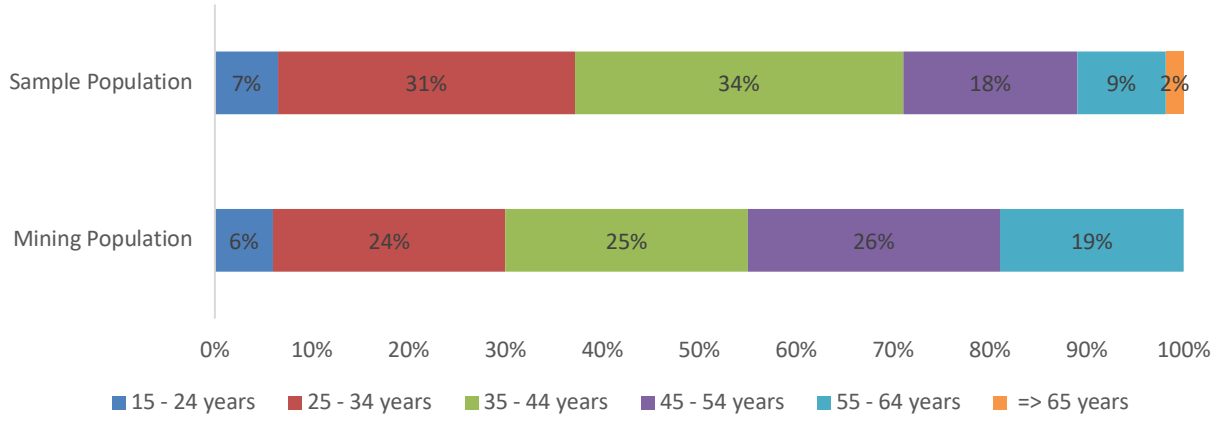

Figure 4-2: Survey participant demographics by age[6]

4.2.1.3 Education Level of Sample and Population

Management levels employees were the target respondents for this survey. As such, the highest level of education of the sample population is higher than that of the mining population. A comparison of the highest achieved education level of the sample and mining population is shown in

Table 4-2. A breakdown of education profile by gender is shown in Appendix E.

It was expected that the sample population would have a higher achieved education level due to the survey mobilization strategy. First, the survey was distributed through professional and industry associations which may have excluded the unionized work force. Second, it is more common for mining employees in management and administrative roles to have email and

computer access at work. Third, the survey was not translated into French and as a result, Quebec was not a specific target audience, so the respondents with CEGEP education were expected to be lower. An overview of province of employment will be discussed in section 4.2.1.6.

Table 4-2: Education profile of population and sample[6]

Highest Education Level	Mining Population	Sample Population
High School	10%	4%
CEGEP	23%	1%
Some Post-Secondary	N/A	5%
Diploma or Certificate	27%	15%
Trades	20%	
University Degree	20%	75%
Total	100%	100%

4.2.1.4 Profession of Sample and Population

The majority of survey respondents (n = 340, 63%) categorized their profession as *engineering, geoscience, and scientist*. A further 172 (32%) were associated with other professions and fields, such as accounting, administration, health and safety, human resources, internal or external communications, supply chain, trades, technologist, trades, or operations. The remaining participants (n = 28, 5%) did not indicate their profession or field. Comparable data on the mining population is not available since MiHR data does not differentiate between professional affiliation and responsibility level in an organization. For example, MiHR might categorize an Engineering Manager as a manager, not as an engineer and a manager.

4.2.1.5 Sample Role Level in Organization

The mode role or responsibility level of participants was non-supervisory, which includes. those who do not directly supervise other workers, such as front-line trades, operations, and administrators, as well as professional specialists such as human resources, accountants, engineers, and geoscience professionals. A hierarchal structure is common in mining organizations, so it is expected there should be a higher percentage of non-supervisory roles as individuals move up the company ladder. A breakdown of responsibility level of survey participants by gender is shown in Figure 4-3. Comparable data on the mining population is not

available as MiHR data does not differentiate between professional affiliation and responsibility level in an organization.

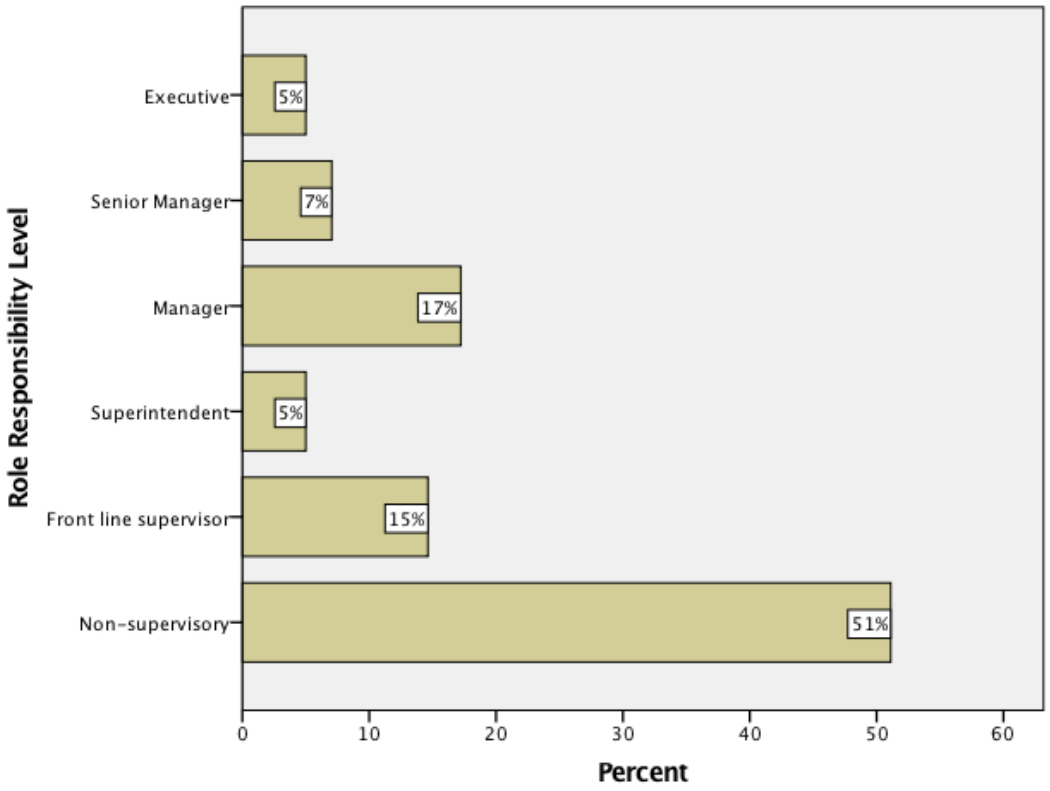

Figure 4-3: Role responsibility level of sample

The higher response rate by manager roles compared to superintendent or front-line supervisors may be explained a number of ways, First, managers may have been more willing to answer the survey than front-line supervisors because they may have increased awareness or accountability for advancing the diversity and inclusion initiatives in their organization. Second, different corporations may use different titles for the same role or not have the role at all. For example, the role of superintendent or senior manager may not exist in one corporation but does in others.

4.2.1.6 Province of Employment of Sample and Population

The three target provinces for the survey were Saskatchewan, Ontario, and British Columbia. The highest representation was then from Saskatchewan (42%), Ontario (21%), and British Columbia (17%), as is shown Figure 4-4. The higher response rate of Saskatchewan and British Columbia compared to the mining population was due to my personal connections in

industry associations and directly in industry from working in these provinces. As was discussed previously, Alberta and Quebec were not targeted for this survey, and as such, the sample population is lower in these regions than in the mining population. A breakdown of province of employment by gender is shown in Appendix E.

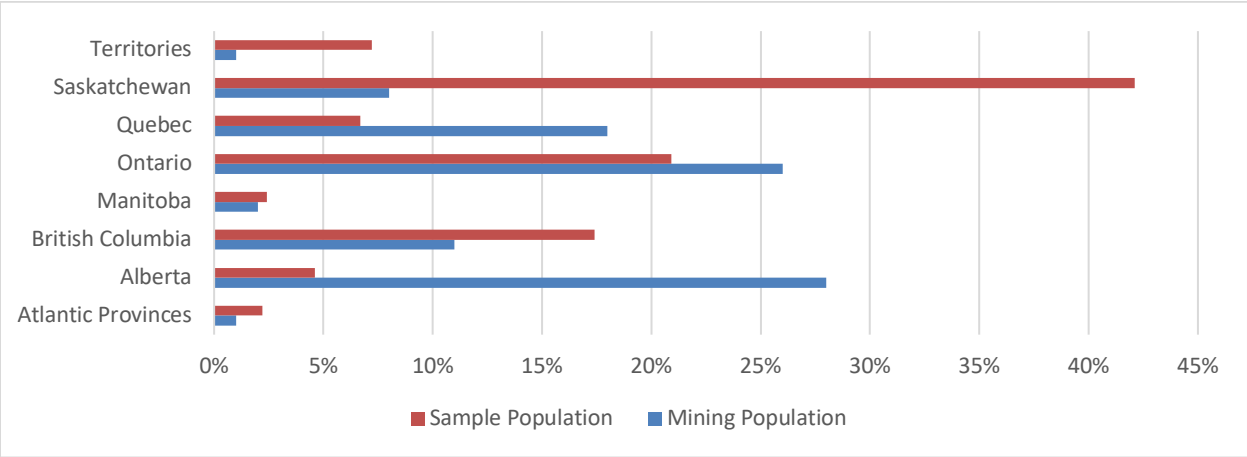

Figure 4-4: Province of employment[6]

4.2.1.7 Sample Work Experience

Respondents were asked to provide their overall work experience and their number of years of service in the mining industry. The mode years of service in mining was 5 to 10 years (n = 144, 27%) compared to the dual modes of 10 to 15 years and greater than 25 years (n = 105, 19% respectively) for overall work experience. Graphical representations of overall and mining work experience are shown in Appendix E. The difference in the modes can be explained by participants who do not necessarily spend their entire careers in mining. The second peak of participants with more than 25 years' experience perhaps means that experienced workers were sought out from other industries or that they have a passion for gender equity. The perceptions of these experienced workers, who have potentially worked a portion of their career outside of mining will be further explored in section 4.2.3.1.

4.2.2 Quantitative Analysis

A summary of the quantitative survey data analysis, outcomes, and its implications is discussed in section 4.2.2. Quantitative survey questions included:

[6] Mining population data interpreted from MiHR (2018).

- Yes-or-no responses;
- Multiple-choice questions, including using a five-point Likert scale to gauge perceptions; and
- Matrix-style questions where participants could rank their answers.

Individual questions were analyzed in SPSS by looking at the descriptive statistics and then statistical tests were used to check for differences in responses based on a participant's gender. Overall findings, summary tables, and figures are discussed in the following sections, while further details are available in Appendix E.

4.2.2.1 Overall Perceptions of Diversity and Inclusion

Perceptions of diversity and inclusion were gauged by asking a number of questions utilizing the Likert scale, where 1 is associated with a negative perception, and 5 is associated with a positive perception. Responses to questions related to an overall rating on diversity and inclusion within their organization, to likelihood of having a positive impact on diversity and inclusion, to gender diversity and inclusion's importance, to support of culture change to advance gendered strategies, and to importance of gendered strategies were analyzed using independent sample t-tests. A table of independent sample t-tests results is also shown in Appendix E.

There was a statistically significant difference and higher, and thus more positive, rating from men (M = 3.25, SD = 1.1) on the overall diversity and inclusion practices within their organizations than from women (M = 2.68, SD = 1.1) [t (338) = 4.9, $p<0.001$, d = 0.5]. Men (M = 3.79, SD = 1.0) were also more likely to believe that their company's initiatives will have a lasting and positive impact on diversity and inclusion than women were (M = 3.46, SD = 1.0) [t (387) = 3.09, $p<0.002$ and d = 0.3]. These responses indicate that men feel more positive and optimistic on the probability of culture change occurring within the mining industry than women. The reasons for women's less optimistic views on current practices and potential for success will be further explored through the remainder of the bottom-up phase analysis (section 4.2.2 and 4.2.3).

Women felt a stronger connection to the cause of gender diversity and inclusion than men. Women placed a higher importance on gender diversity and inclusion in the mining industry (M = 4.0, SD = 1.1) than men (M = 3.0, SD = 1.4) [t (536) = 8.58, $p <.001$ and d = 0.7]. Women (M = 4.0, SD = 0.99) also placed a higher level of importance on workplace gender diversity and

inclusion programs compared to men (M = 3.2, SD = 1.4) [t (453) = 5.96, p<.001 and d = 0.6]. Similarly, women (M = 4.4, SD = 0.89) supported more improvements in the workplace culture within the mining industry and welcomed gender diversity and inclusion compared to men (M = 3.7, SD = 1.3), who were closer to the neutral rating [t (536) = 6.55, p < .001 and d = 0.6]. The differences between importance and support indicates a movement from value towards action. This concept will be explored further in perceptions in reporting on discrimination and harassment incidents in section 4.2.2.4.

Men (M = 3.0, SD = 0.97) and women (M = 3.0, SD = 0.78) had no statistically different opinions on valuing physical or mental well-being [t (532) = 0.63, p > .5]. There was a strong alignment between both genders to see physical and mental well-being as equally important.

A strong recommendation from the literature has been to ensure support of diversity and inclusion from those higher up the organizational chart, namely, senior management (Mining Industry Human Resources, 2016; UN Women National Committee Australia, 2015; Women In Mining, 2010; Women in Mining, 2017). The survey included questions on the perception of importance of diversity and inclusion to supervisors, who can have a high impact on employees, and senior management, who need to be seen walking the talk for diversity and inclusion strategies to succeed. Leader's inclusive behaviours has been shown to have a large impact on employees engagement with minority groups in the workplace (Randel, Dean, Ehrhart, Chung, & Shore, 2016). An additional answer option of "unsure" was added to the five-point Likert scale response options on supervisors and senior management to reflect where little to no communication has occurred. A comparison of importance for respondent, supervisor, and senior management by gender is shown in Figure 4-5. Men (M = 3.5, SD = 1.2) perceived that gender diversity and inclusion was more important to senior management than women (M = 3.3, SD = 1.1) did [t (409) = -2.33, p<.02 and d= 0.23]. Men also frequently tended to be more unsure about how important gender equity strategies were to their supervisors than women. The differences in perceptions of participant's supervisors indicates that men are perhaps not being brought into the discussion as much as women are, which will be further explored in the following section on awareness. As "unsure" was given an arbitrary value of 6, the curve was skewed, particularly for the supervisor question so there was no statistical difference found between men and women's responses [t (453) = -0.74, p<0.5].

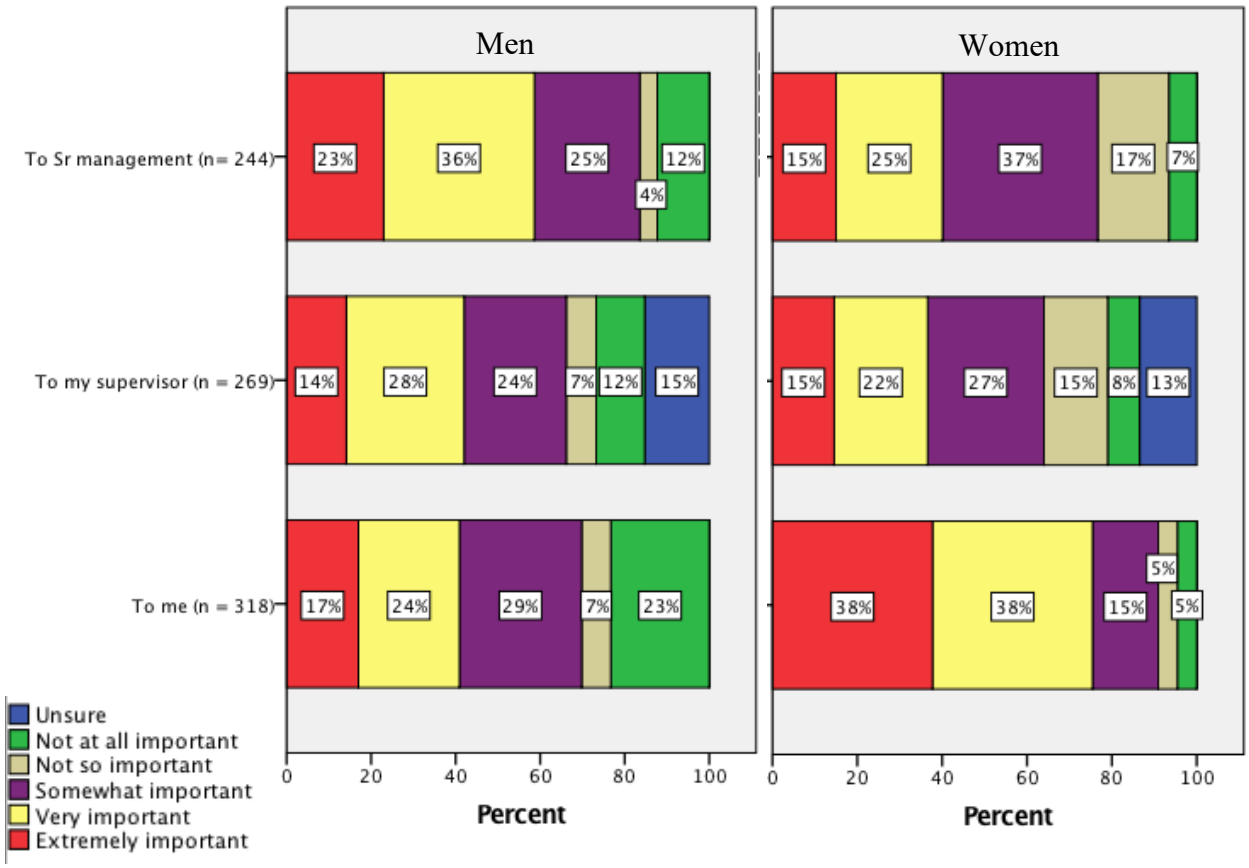

Figure 4-5: Perceptions of the importance of diversity and inclusion by gender

In summary, men who work in the mining industry felt positive and optimistic that senior management is guiding their organizations to have a lasting and positive impact on gender diversity and inclusion. Women in the mining industry had strong values tied to gender diversity and inclusion and are ready to take action; however, they do not see their values reflected in their organization's senior leaders. These findings support Randel et al.'s (2016) study which found that minority groups will tend to have stronger values towards diversity and that their values can differ from the majority. Men and women have common ground in believing mental health is as important as physical health, and that their supervisors do not have strong values toward gender diversity and inclusion. To further understand these differences and commonalities in perception, current communication practices will be explored in the next section (4.2.2.2).

4.2.2.2 Gender Diversity and Inclusion Initiative Awareness

Four hundred and fifty-nine participants were eligible to answer the question set on their company's diversity and inclusion strategy because they currently work in the mining or mining

support industry. To qualify to answer this question set, those working in mining also had to indicate that their company had a strategy, or that they were unsure if their company had a strategy or initiative. A series of questions were included in the survey to gain a better understanding of employee's experiences with gender diversity and inclusion initiatives in the workplace. To gauge levels and modes of awareness, survey participants were asked questions about:

- If their company had a target or strategy related to diversity and inclusion;
- On what basis were groups targeted (gender, sexual orientation, or ethnicity);
- What organizational levels or roles were targeted;
- How initiatives were communicated; and
- How frequently diversity and inclusion were discussed in the workplace.

As shown in Figure 4-6, 76% (n = 339) of respondents indicated that their company had a diversity and inclusion strategy, and 362 respondents gave more details on these strategies. The most common strategy was related to gender (n = 332 or 72%), then ethnicity (n = 292 or 64%), and lastly, sexual orientation (n = 171 or 37%). Almost half or 44% (n = 160) of respondents indicated their company's strategy included all three target groups, 31% (n = 113) indicated the strategies included two of the groups, and 25% (n = 89) were focused on just one. The most common pair of targets were gender and ethnicity, and the most common single targets were either gender or ethnicity.

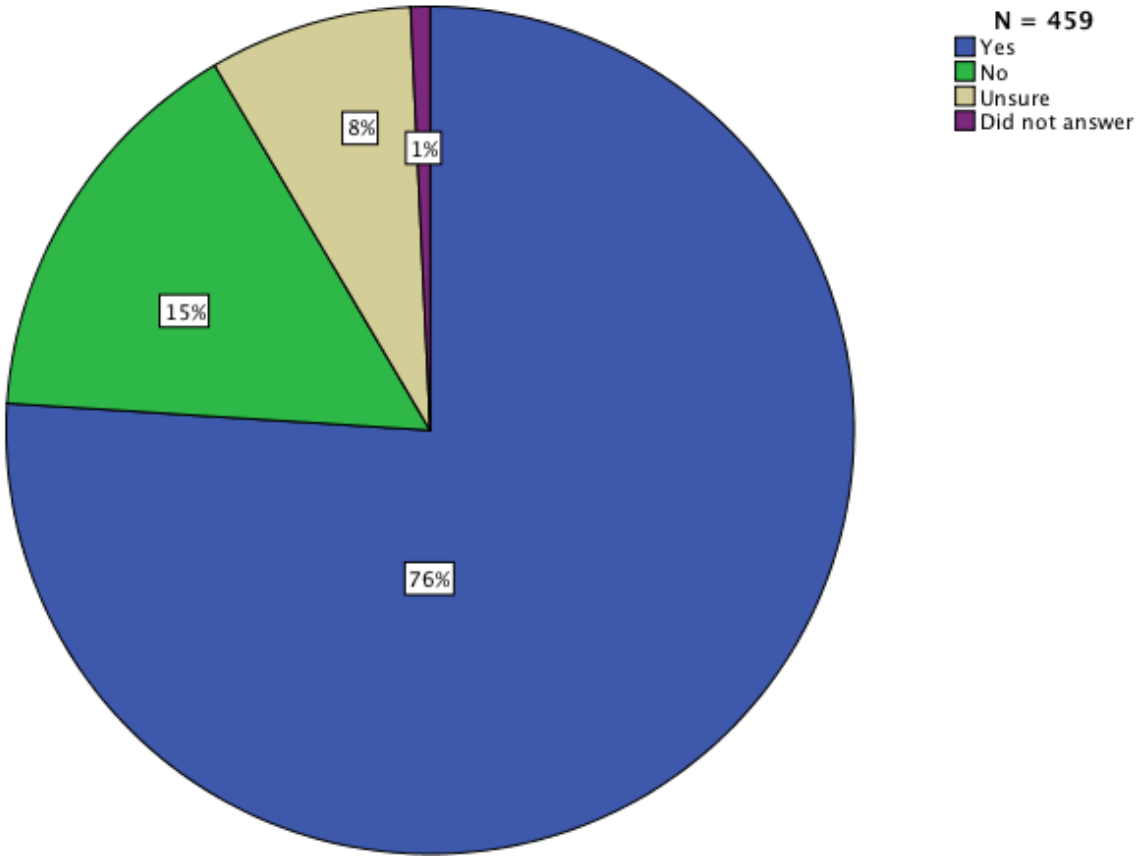

Figure 4-6: Respondent's companies who have a diversity and inclusion strategy

The majority of survey participants believed that their company is targeting improvement in diversity and inclusion across the company (n = 328). The next most common responses were targeting improvements at management (n = 105) and senior management levels (n = 103), followed by technical roles (n = 90), board levels (n = 64), and at trades or operations levels (n = 57). Further details can be found in Appendix D.

Generally, mining employees are mainly being made aware of diversity and inclusion strategies through passive means, such as email, internal websites, and newsletters, as is shown in Figure 4-7. These methods of communication do not allow for two-way dialogue that might empower individuals to take full advantage of the initiatives or resolve any concerns they may have. The method with the lowest frequency of communication is from an employee's supervisor, which could explain why employees may feel unsure about the level of importance that supervisors have towards diversity and inclusion. Managers are more likely to discuss

diversity and inclusion with employees than the direct supervisors, which could be an indicator that that supervisors need additional support or training to initiate these conversations.

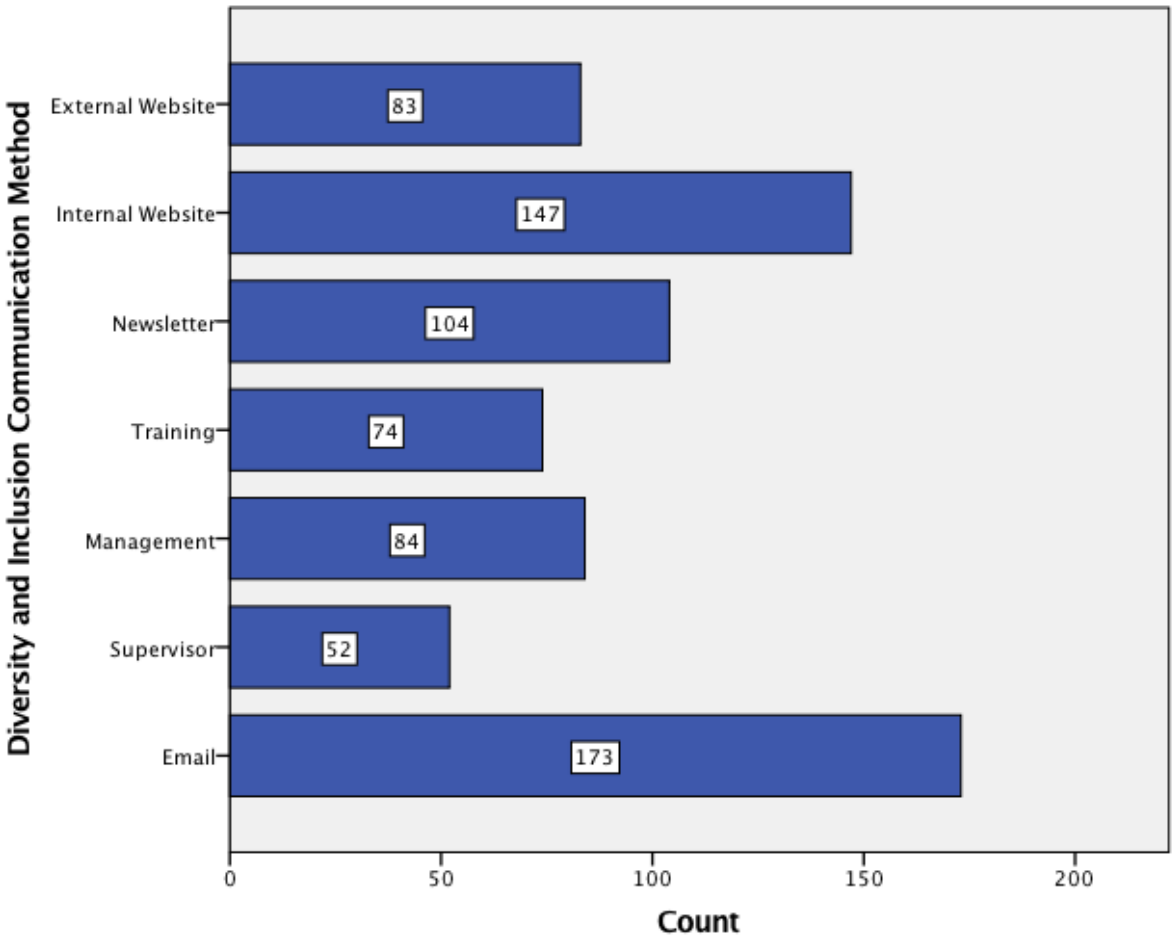

Figure 4-7: Diversity and inclusion communication methods

Diversity and inclusion are not discussed frequently in the workplace. Almost one-third or 35% of respondents say they talked about diversity and inclusion less than once a month, while another 22% say they never talked about diversity and inclusion in their workplace. Only 3% of respondents talked about diversity and inclusion on a daily basis.

Gender diversity and inclusion initiatives in Canadian mining have increased by 30% since MiHR's 2016 study. Gender diversity and inclusion initiative awareness occurs infrequently through means of passive communication, which does not allow for two-way dialogue. Most notably, supervisors do not have frequent discussions about gender diversity and inclusion with their subordinates. These findings indicate that the culture change required to welcome inclusion and diversity have not permeated down to the supervisor level in organizations. Workers,

including leaders, will not be empowered to support changes related to gender equity in the absence of dialogue. A lack of two-way communication also does not allow for individual concerns to be addressed or gender equity issues in the workplace to be fully understand. There were no significant differences in how men and women answered the questions related to initiative awareness. Perceptions on benefits and risks of diversity and inclusion initiatives will be further explored in the next section (4.2.2.3).

4.2.2.3 Benefits and Risks of Gender Diversity and Inclusion Strategies

Survey participants were asked to rate a list of potential benefits and risks of their company's diversity and inclusion strategies that had been compiled from recommendations in the literature, as well as examples of initiatives identified in the top-down phase that companies claimed to be using. Matrix-style questions were used to gather the ratings for both the benefits and the risks. Only people who had identified that their company had an initiative or strategy toward diversity and inclusion (N = 459) were eligible to answer these questions. Chi-squared test of independence was used to analyze the gendered responses on the potential risks and benefits questions and is also shown summarized in Appendix E.

The rating scale for benefits of diversity and inclusion ranged from *not available in my company*, through to a more individual verification that *I have personally benefited from this*, as is shown in Figure 4-8. Flexible work hours were the largest personal benefit identified by participants. Both men (27%) and women (37%) felt they were benefiting from flexible work arrangements, although women felt they were making more use of this benefit [χ^2 (5, N = 385) = 20.2, $p < .001$]. The benefit that was least available in participants' companies was audits to check for biases in hiring and promotion; 49% of men and, significantly, 79% of women did not feel that this benefit existed at their company [χ^2 (5, N = 377) = 37.8, $p < .001$]. Men (6%) who answered this survey had made less use of parental benefits over and above government benefits than women (18%) [χ^2 (5, N = 383) = 20.7, $p < .001$]. Nearly all companies appeared to have an anti-harassment and anti-discrimination policy; yet few people (n = 7 or 2%) reported having personal experience with it; this latter question regarding benefits was the only one that did not show a significant difference between responses of men and women. The significant ($p < .001$) and overall trend for the benefits matrix question was that women felt more negatively than men about the lack of benefits available at their company or they were out of reach for them to use

personally. An open-ended question also was used to capture other benefits that may not have been listed and will be discussed in the qualitative analysis section.

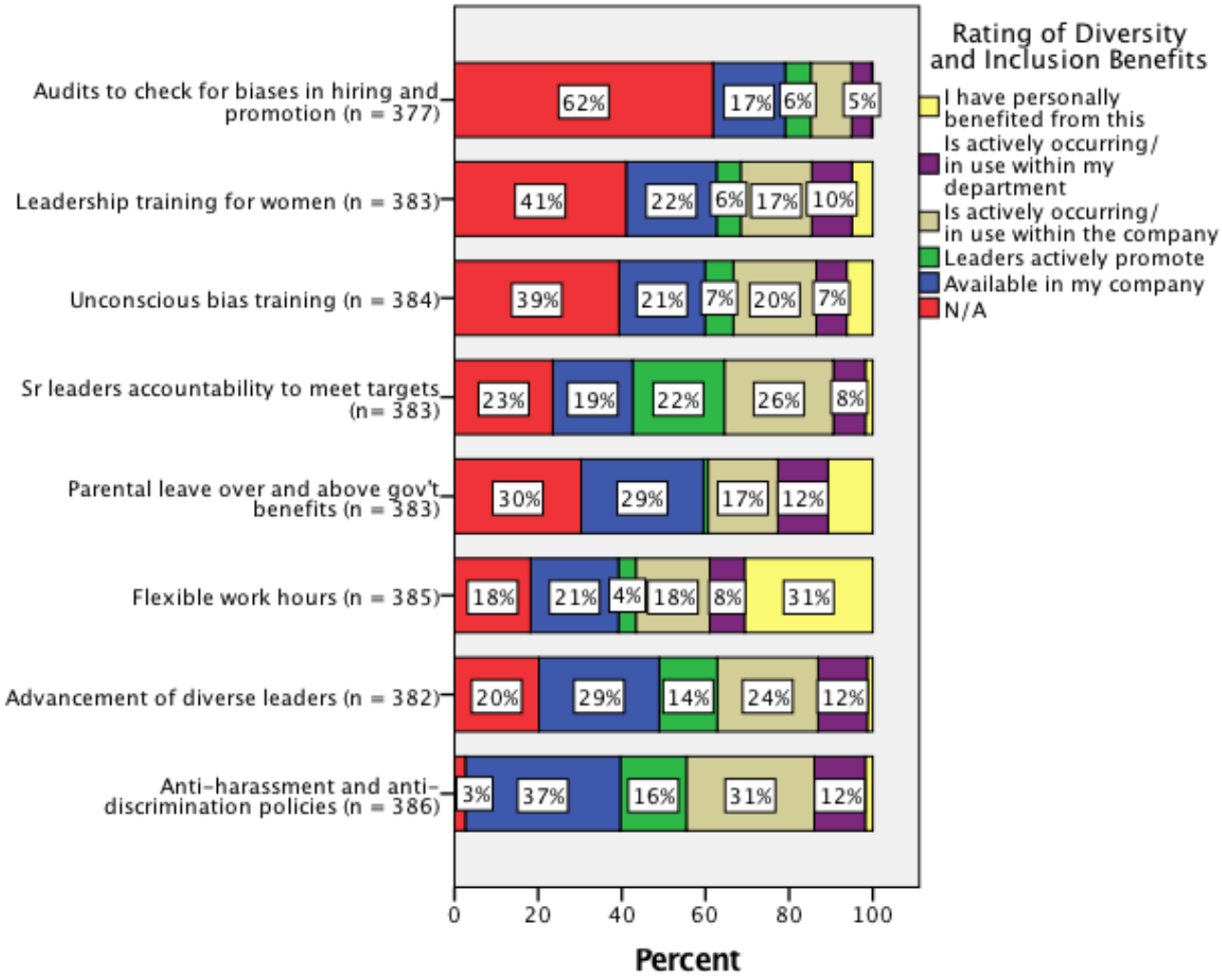

Figure 4-8: Exposure to diversity and inclusion benefits

The risks of, or to, diversity and inclusion strategies were also captured in a matrix-style question that participants could indicate their top five risks. The outcomes from this question, shown in Figure 4-9, indicate that the top five concerns are, in order of highest risk:

- That there may not be enough qualified diverse people to meet targets;
- That quotas could undermine the credibility of diverse leaders;
- That subtle sexism is not being addressed;
- That all leaders do not support diversity and inclusion; and

- That current employees feel their jobs are at a threat of being lost due to their company's initiatives.

A significant difference existed in the concerns between men and women on the consequences of not dealing with subtle sexism [χ^2 (4, N = 225) = 25, p<.001] and having unclear or ineffective harassment and discrimination complaint processes [χ^2 (4, N = 207) = 14.7, p = .005]. In both cases women saw a greater degree of risk than men.

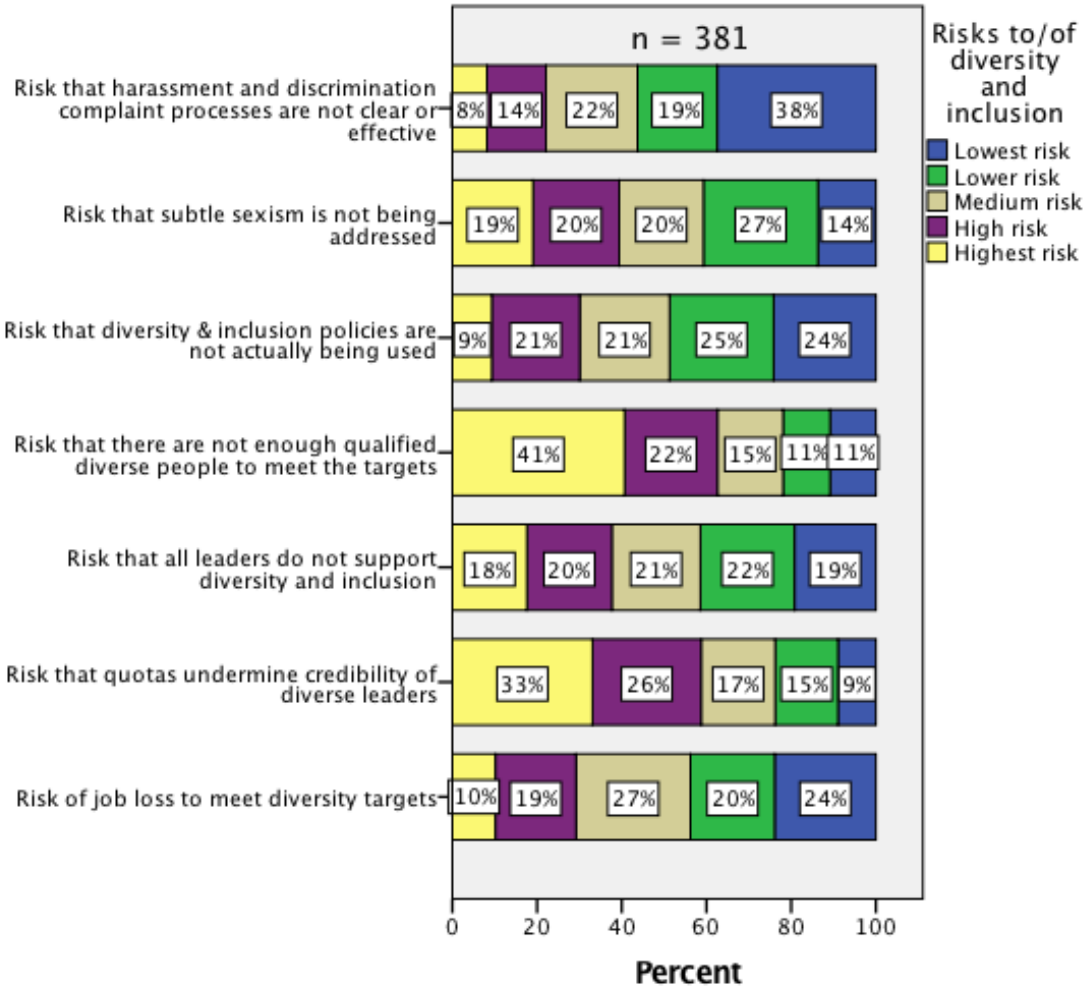

Figure 4-9: Risks of or to diversity and inclusion initiatives

Table 4-3: Top risks to diversity and inclusion initiatives by gender

Risk Level	Men	Women
Highest	Lack of qualified diverse people	Quotas undermining credibility
Second highest	Quotas undermining credibility	Subtle sexism not being addressed
Third highest	Threat of job loss	Lack of qualified diverse people

As shown in Figure 4-3, when the top risks are looked at through a gendered lens, the ranking shifts slightly. First, women were primarily concerned with quotas undermining the credibility of diverse leaders; second, that subtle sexism was not being addressed; and, third, there were not enough qualified diverse people to meet targets [χ^2 (4, N = 277) = 13.1, p = .01]. By comparison men were predominantly concerned with not having enough qualified diverse people to meet targets; second, that quotas undermined diverse leaders; and third, with the threat of job loss due to diversity and inclusion targets [χ^2 (4, N = 226) = 8.8, p = 0.07]. Since the concerns were not consistent among all miners, there need to be open channels of communication to understand and address individuals' issues. Fears that are left unaddressed are at risk for breeding discontent with the diversity and inclusion strategies, which may exacerbate a divide between men and women in the workplace. If risks have or not have been realized, then they will exist mainly as perceptions of fears or unknowns in employees' minds.

To gain a better understanding of which risks may have been realized, survey participants (n = 333) were asked about their experiences or observations with barriers, discrimination, or exclusion in their organizations due to diversity and inclusion strategies. The majority (82%) of respondents indicated that they had not experienced or observed negative impacts due to diversity and inclusion, while 18% had. There was no significant difference in how men and women answered this question. More information on these negative experiences or observations related to diversity and inclusion initiatives will be further discussed in section 4.2.3.2.

The differences in the responses of men and women to the benefits matrix questions signals a disconnect between the message from above and the employees' experiences. Based on communication methods used to relay diversity and inclusion strategies, it is likely that a lack of messaging contributes to the disconnected perceptions on benefits and risks between men and women. These disconnects also indicate a lack of inclusive culture change from the bottom-up.

The next section (4.2.2.4) will explore negative experiences and observations due to a lack of strong diversity and inclusion strategies.

4.2.2.4 Perceptions on Reporting Discrimination and Harassment

Incidents of exclusion, discrimination, and harassment need to be better understood in order for an inclusive workplace culture to be built and thrive. Survey participants were asked a series of questions regarding their exposure to these incidents, along with their willingness to report incidents, either informally or formally. An informal report may involve discussing the incident with a co-worker or person in authority; however, such a report would not result in any documentation that would remain on a personnel file. A formal report would involve documentation, including a record that would remain in a personnel file, and the involvement of human resources. Only participants who were actively working directly in, or in support of, the mining industry (N = 459) were eligible to answer this set of questions.

As shown in Figure 4-10, the majority of respondents (54%) had experienced or witnessed a discrimination or harassment incident; 51% of incidents were informally or formally reported; and only 34% of respondents were comfortable sharing more details as part of the survey. Of the incidents that respondents (n = 272) experienced or witnessed, 25% (n = 68) occurred less than a year ago, 27% (n = 74) occurred between 1 to 3 years ago, 16% (n = 43) occurred 3 to 5 years ago, and 32% (n = 87) occurred more than 5 years ago.

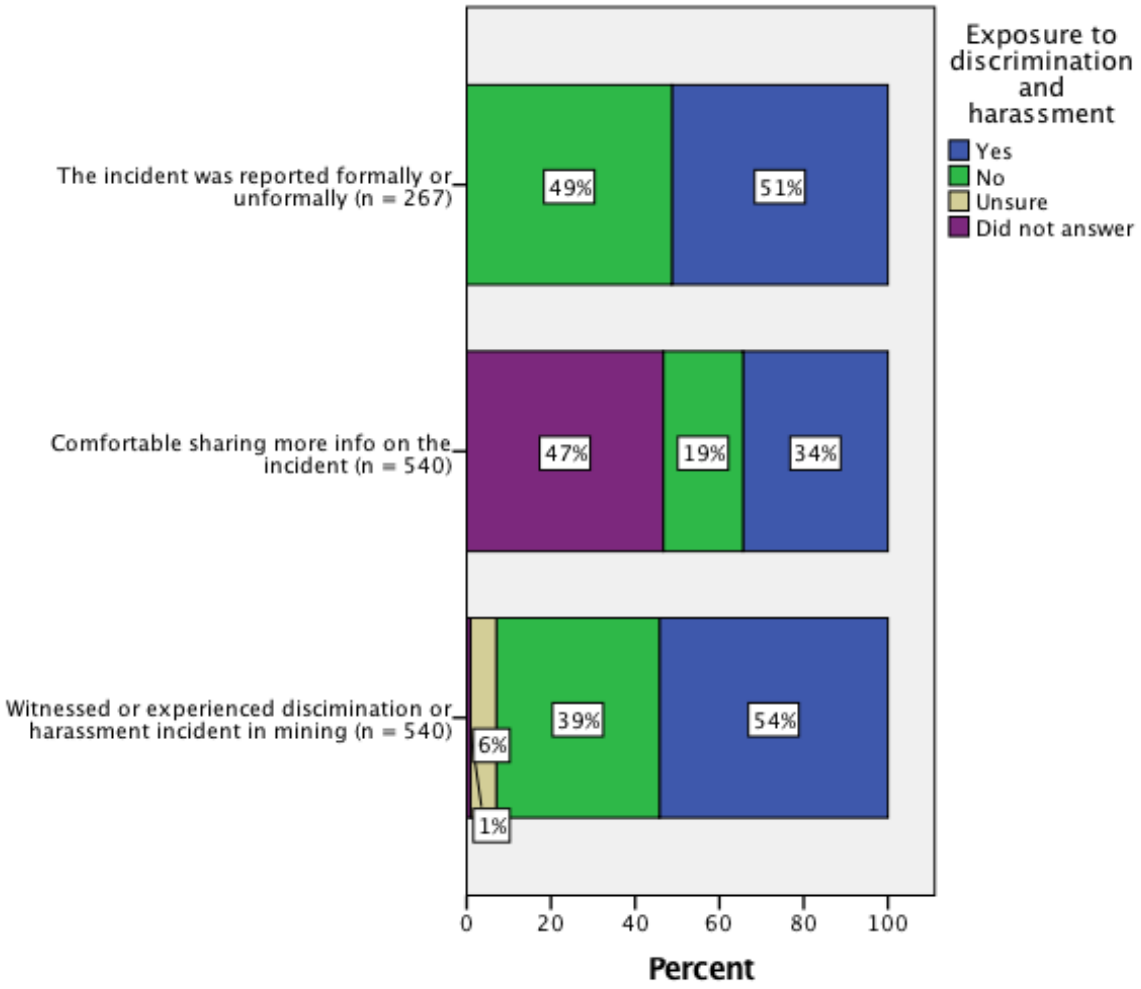

Figure 4-10: Exposure to discrimination and harassment in mining

When these same incident experiences were observed through a gendered lens it is evident that:

- Women (69%) were more likely to witness or experience incidents than men are (44%);
- Women (44%) were more comfortable to share details of their incidents than men are (28%); and
- Incidents were slightly more likely to be reported formally or informally by women (54%) than by men (51%).

There was a significant difference between men's and women's answers to the question on how long ago the incident occurred; women were more likely to describe incidents that occurred in the last 1 to 3 years while men were more likely to describe incidents that were from more

than 5 years ago [χ^2 (3, N = 272) = 10.7, p = .01]. Women who stated that they were exposed to discrimination and harassment in the last 3 years also tended to be serving in more junior roles than men, as is shown in Figure 4-11 and they were also younger in age, as is shown in Figure 4-12.

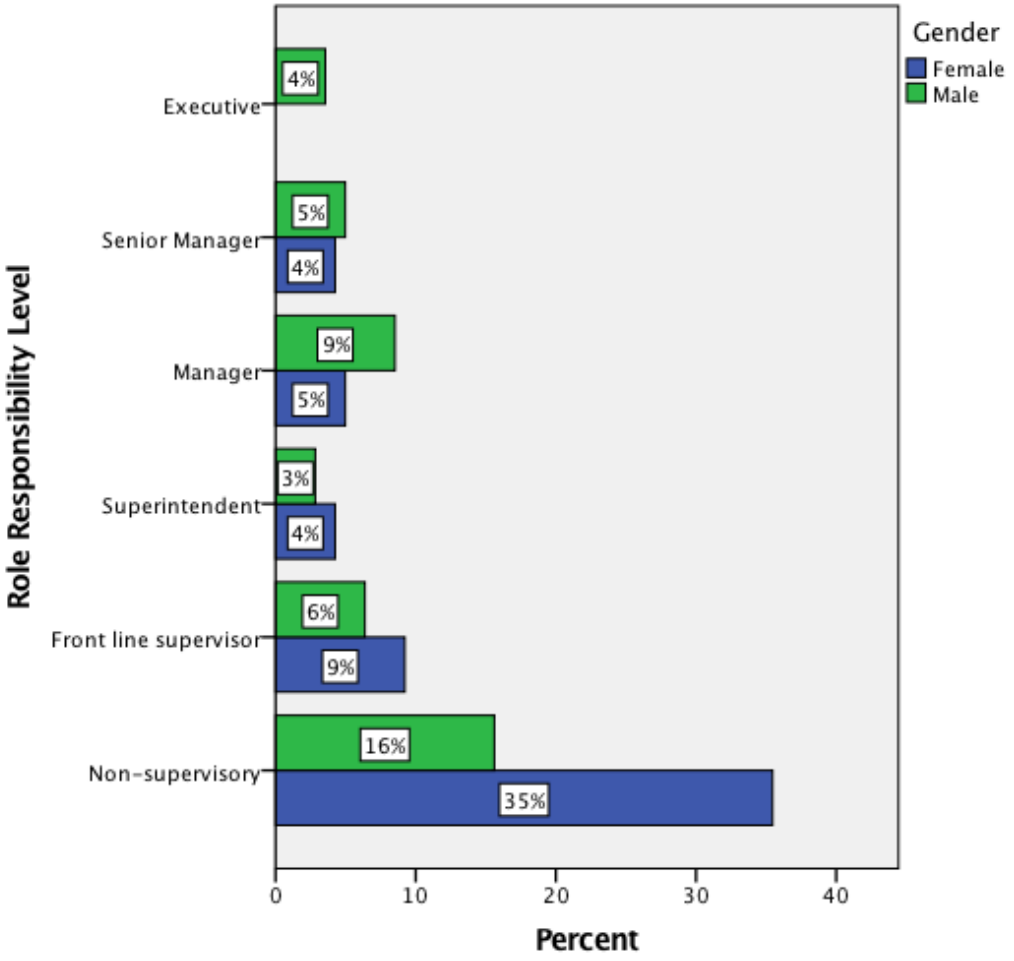

Figure 4-11: Role levels and gender of respondents exposed to discrimination and harrassment within the last 3 years

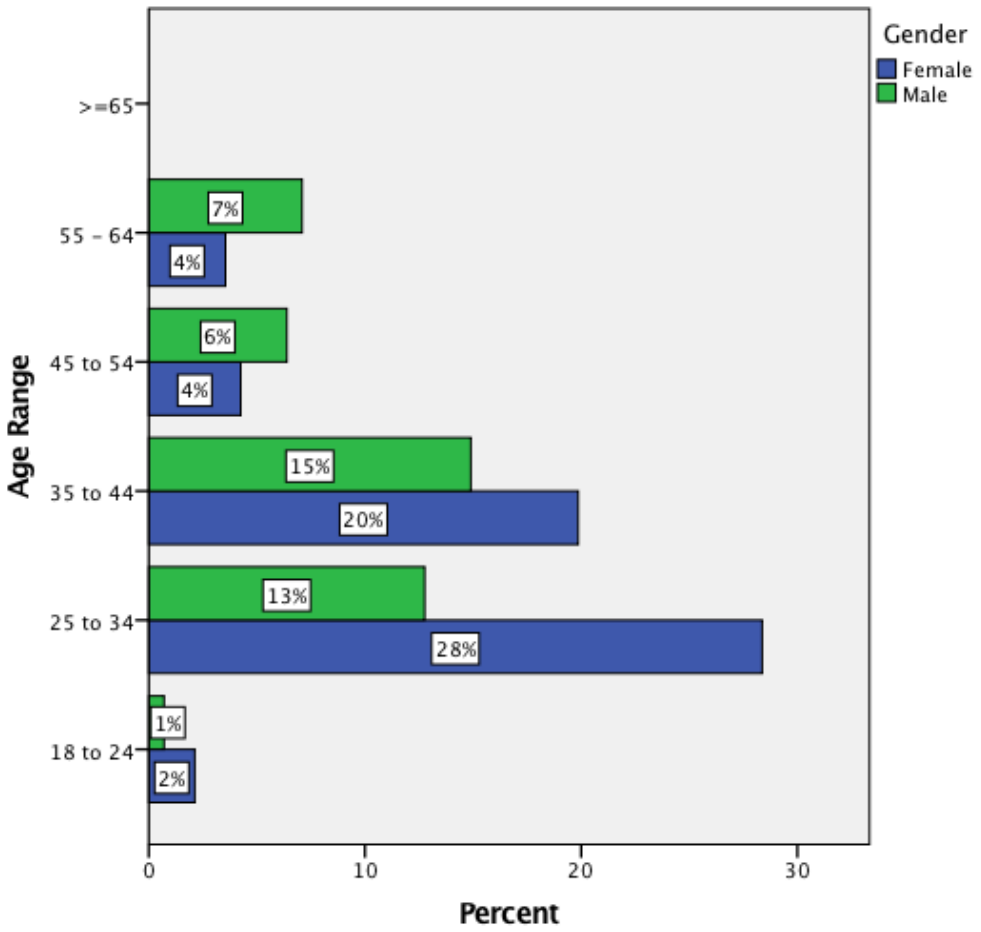

Figure 4-12: Age and gender of respondents exposed to discrimination and harrassment within the last 3 years

Survey participants were asked how confident they were in discussing diversity and inclusion issues, such as discrimination and harassment in their workplace. Men (M = 3.8, SD = 1.4) felt a much higher degree of confidence discussing these issues than women did (M = 3.2, SD = 1.2) [t (456) = 5.1, $p<0.001$, d = 0.5]. Men (n = 251, 86%) also felt more confident that they knew the process for formally reporting a discrimination and harassment incident than women (n = 165, 75%). Participants then were asked how they would respond if they experienced, witnessed, or learned of a discrimination or harassment incident from a co-worker. There were no significant differences in men and women's responses in informally reporting an incident if they experienced it (N = 427, M = 3.9, SD = 1.3), witnessed it (N = 428, M = 4.0, SD = 1.1), or if they were confided in by a co-worker (N = 428, M = 3.7, SD = 1.3). However, if the incident involved formally reporting it, men were more likely to take action than women in all three scenarios. Men (M = 3.7, SD = 1.3) were slightly more likely to report an incident than

women were (M = 3.4, SD = 1.3) if they experienced it first-hand [t (427) = 2.4, p<.02, d = 0.2). There is a statistical significance that men (M = 4.0, SD = 1.5) were more likely to report an incident if they witness it than women were (M = 3.3, SD = 1.4) [t (261) = 3.6, p<.001, d = 0.5). Lastly, there is also a statistical significance that men (M= 3.7, SD = 1.2) were also more likely than women (M = 3.2, SD = 1.2) to formally report an incident if they hear about it happening to a co-worker [t (425) = 4.0, p<.001, d = 0.4]. A table of independent sample t-tests results showing gendered responses to discrimination and harassment reporting is also shown in Appendix E.

There is a discrepancy between men's intentions with being more likely to formally report incidents and the actuality of women having more recent experiences or witnessing incidents. As men are more likely to formally report an incident than women, women could potentially benefit from confiding in men when about their personal experiences with discrimination and harassment; however, there is also a risk that that men, when confided in, downplay the severity of the events and attempt to deal with them informally. Further details on the incidents reported by survey participants are discussed in the qualitative analysis section. Opportunities to enhance clarity on processes and definitions of discrimination and harassment will be explored by examining perceptions of health and safety in section 4.2.2.5.

4.2.2.5 Perceptions of Health and Safety

Health and safety is an area where the mining industry has successfully changed its culture, including systems and behaviors, to be one that values safe production and safe work. As discussed in section 2.7, the Canadian mining industry has reduced the rate of fatalities from nearly 50 deaths per 100,000 workers in 1998 to around 10 deaths per 100,000 workers in 2012 (Energy and Mine Minister's Conference, 2013). Similarly, the rate of non-fatal injuries decreased from 2,200 to 750 injuries per 100,000 workers over this same time period (Energy and Mine Minister's Conference, 2013). There are then potential lessons to be learned from better understanding workplace health and safety culture with respect to improving workplace gender equity. Participants were asked questions about their perceptions of the importance of health and safety, to rate the overall safety practices in their workplaces, to comment on how frequently they discuss health and safety, and to relay their exposure and knowledge of reporting health and safety incidents. Participants who are actively working directly in, or in support of the mining industry were eligible to answer the health and safety perceptions questions.

Survey respondents rated the importance of health and safety culture highly. While both men ($M = 4.4$, $SD = 0.90$) and women ($M = 4.0$, $SD = 0.92$) rated the overall health and safety practices in their workplace positively, men rated them slightly higher [$t(456) = 3.8$, $p<.001$, $d = 0.4$]. Men ($M = 4.5$, $SD = 0.78$) were also slightly more confident with reporting a health and safety incident in their workplace than women ($M = 4.3$, $SD = 0.77$) [$t(456) = 3.0$, $p=.003$, $d = 0.3$]. Men ($M = 3.8$, $SD = 1.2$) significantly rated health and safety in their workplace as more important than women ($M = 3.2$, $SD = 1.2$); however, both were positive [$t(456) = 5.1$, $p<.001$, $d = 0.5$]. The higher confidence of male respondents in this survey related to health and safety also may be correlated with some of the higher confidence levels that men had toward diversity and inclusion perceptions. A table of independent sample t-tests results for health and safety perception is also shown in Appendix E.

Unlike diversity and inclusion, health and safety was reported as being discussed very frequently in the workplace. 91% of survey respondents discuss health and safety on a daily to weekly basis, while only 28% of respondents discuss diversity and inclusion over the same time frame. There were no significant differences in how frequently men and women discuss workplace health and safety. The vast majority or 98% ($n = 448$) of respondents know the process for reporting health and safety incidents, and 67% ($n = 456$) of respondents have reported a health and safety incident. Note that the differences between formally and informally reporting a health and safety incident were not differentiated in the survey, as it is common that even near-miss accidents are reported and therefore recorded in the mining industry. Near-miss accidents are incidents where contact did not occur such that anyone was actually hurt, and no equipment or property was damaged; however, there is considerable value in learning from a close-call to prevent future or more serious incidents from occurring.

Health and safety culture is very strong in the mining industry. It is evident that there are well-used and understood processes for dealing with incidents that threaten a safe and healthy environment, and there is frequent communication on the subject in workplace. These findings suggest that there are opportunities to build on the common ground that men and women in mining feel toward mental and physical wellbeing and toward existing health and safety culture to improve diversity and inclusion awareness. Comparisons between health and safety culture and implications for diversity and inclusion are further discussed in section 4.3.6.

4.2.3 Qualitative Analysis

Participants were provided opportunities to write comments in their own words through nine open-ended questions in the survey. Four open-ended questions captured former mining employees' reasons for leaving the mining industry, what would entice them to come back, and details on the roles and industry to which they had moved. Four questions were asked around the benefits, risks, barriers, and opportunities from diversity and inclusion. Lastly, personal experiences with discrimination and harassment incidents were captured in the final survey question. Open-ended, qualitative questions were imported into NVivo to allow for thematic coding of phrases and words. The resulting thematic coding for these questions are summarized and discussed throughout section 0.

4.2.3.1 Learning from Former Mining Employees

Seventy-four (14%) former mining employees shared their perceptions about the Canadian mining industry in the survey. The gender of the former mining employees were 57% male (n = 42), 42% female (n = 31), and 1% other (n = 1). Former mining employees were given a shorter subset of questions to answer, which included four open-ended questions to allow for them to present their career journey since leaving the industry. Open-ended questions were thematically categorized in NVivo using cluster criticism methods. NVivo's word clouds and word tree tools were used to look for common themes. Then the comments thematically coded using these common themes.

By definition, former mining employees moved to non-mining industries after leaving the mining industry. The categories of industries they moved to included: consulting (n = 18 or 24%), manufacturing or construction (n = 18 or 24%), oil (n = 10 or 14%), none (n = 9 or 12%), technology (n = 6 or 8%), academia (n = 5 or 7%), and other (n = 8 or 11%). The roles that former mining employees switched to after leaving the mining industry were:

- Similar roles in different industries (n = 25 or 34%);
- Lateral moves to a different type of role (n = 19 or 26%);
- Promotions in similar field (n = 15 or 20%);
- Leaving the workforce (n = 9 or 12%); and
- Upgrading or finishing education (n = 6 or 8%).

An example of a similar role in a different industry would be if a project engineer moved from the mining industry to a project engineering role in the construction industry. An example of a

lateral move to a different type of role would be moving from an engineering role to nursing. Employees who left the workforce were categorized in the industry of *none*.

Former mining employees were asked if they would work in the mining industry again and what would entice them to come back. Of former mining employees, 75% (n = 56) indicated that they would come back to work in the industry, 16% (n = 12) would not, and 8% (n = 6) were unsure. Of the former group of mining employees, 52 (70%) participants provided further details on why they would come back to mining. The top three reasons and potential enticements for re-entering the mining industry were the opportunities and challenges (n = 23); improvements in diversity and inclusion (n = 18); and pay (n = 10). Both the *pay* and *the opportunities and challenges* categories highlight the positive aspects about the mining industry that former workers value. The *diversity and inclusion* category grouped negative aspects of the mining industry which survey respondents (n = 18) indicated need to be improved. Of the survey respondents (n = 18) who desired that the industry make improvements in diversity and inclusion, 72% (n = 13) were women and 27% (n = 5) were men. One participant said they would only come back to work in the mining industry "if attitudes towards women change, [there are] greater resources available, and training to employees on respectful engagement with women and visible minorities." Another participant echoed that the mining industry "need[s] action not words or promises!" in regard to changing attitudes towards women.

When looking to hire experienced mining workers in times of labour shortages the mining industry could consider recruiting those that have left the industry. The industry can entice former mining workers with well-paid, challenging work opportunities. The recruitment strategy also needs to be balanced by what has changed in the industry, specifically in regard to strategies or improvements to inclusion and diversity.

4.2.3.2 Supports, Barriers, Risks, and Opportunities to Diversity and Inclusion

Current mining and support industry employees (N = 459) were asked sets of questions surrounding the benefits and risks, personal opportunities, and experienced barriers due to diversity and inclusion initiatives. Using a matrix-style question, survey respondents were encouraged to provide answers in their own words through open-ended questions. Open-ended responses were thematically categorized in NVivo using cluster criticism methods similar to the procedure used for examining the experiences of former mining employees.

The first open-ended question focused on the potential benefits respondents see as a result of their organization's initiatives towards diversity and inclusion. Thirty-five (8%) of the 459 participants gave additional responses following the matrix-style question which listed potential benefits of diversity and inclusion. The three most common benefit themes were, *I don't know* (n = 8); *initiatives are too new to see benefits* (n = 6); and *increased gender awareness* (n = 5). Many of the comments indicated frustration at not seeing these benefits actively occurring within their organization rather than listing additional benefits.

Next, participants were able to leave additional comments on risks due to diversity and inclusion initiatives that were not listed. Of the 459 respondents, 4% (n = 20) of participants provided comments in addition to the matrix-style question. The three most common risk themes were *systemic issues not being addressed* (n = 8); *diversity and inclusion hurts the company or industry* (n = 7); and, echoing one of the risks previously identified, that *unqualified candidates were being hired* (n = 5). Examples of systemic issues included not addressing domestic gender imbalance, poorly handled harassment complaints, and persistent issues with unconscious biases. A respondent's comment reflecting diversity and inclusion hurting the company was "Forcing diversity in a domain where skill and knowledge is the most important [thing], results in putting people's lives in danger. We need the best, indifferent of ethnic background or race."

Next, participants were asked what opportunities or supports they have personally experienced due to their organization's initiatives towards diversity and inclusion. Of the respondents to this question (n = 290 or 63%), 44% (n = 130) were women and 55% (n = 159) were men. Figure 4-13 shows the top 25 words that were used to answer this question.

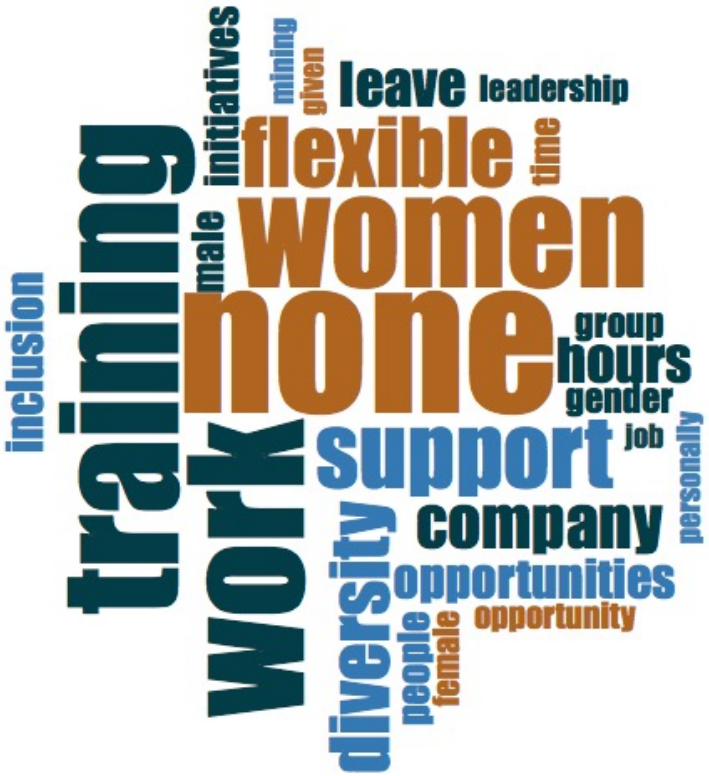

Figure 4-13: Top 25 personal opportunities from diversity and inclusion

The most common themes that participants personally experienced due to their company's initiatives were: *none* (n = 129 or 44%), *training* (n = 47 or 16%), *flexibility* (n = 37 or 13%), improved recruitment or promotion (n = 36 or 12%), and increased awareness (n = 36 or 12%). The most common theme, *none*, indicates that many people did not see a space for themselves within diversity and inclusion. In particular, white males, many of whom were in the early stages of their careers, did not see their place in diversity and inclusion. As one participant commented: "How is a privileged white male supposed to answer this question?" Companies can help employees to understand the personal benefits of inclusion and diversity by providing stories that show how everyone within the organization can benefit from training, flexibility, and transparent recruitment or promotion practices. One way to raise awareness of inclusion and diversity is to include elements of diversity and inclusion awareness, strategy overview, and benefits in new employee orientations. In order for continued understanding to occur, ongoing dialogue is also required.

Next participants were asked to describe experiences or observed barriers, discrimination, or exclusion due to their organization's initiatives towards diversity and inclusion. The gender

ratio of responses to this question was 44% (n = 24) women and 53% (n = 29) men. The main theme from this question was that diversity efforts fall short on inclusion (n = 29). Both men and women addressed this issue but offered different interpretations. Men (n = 18), specifically white men (n = 11), felt excluded from the diversity initiatives because they "regularly discriminate and hinder white men from employment and promotion". Women (n = 9) also felt excluded as strategies were not benefiting them. One woman commented that: "diversity is being promoted, but I have seen very competent women being overlooked for promotions. Our diversity policy is relatively new, so this may change, but I believe that our leaders are not truly committed yet." The lack of leadership was echoed by another participant who demonstrated the ways in which a manager can undermine diversity and inclusion policy by presenting the hiring of more women as a threat: "the mine manager 'warned' the mine that they were going to hire more women, making it seem like a negative thing. Workers were angry that all of the new jobs would be given to women and not the most qualified." The lack of support from leadership may intensify the fears of the majority workforce and can also lead to women feeling excluded.

A perceived lack of leadership support for inclusion and diversity strategies may also be due to poor communication practices. One participant commented (reiterating the findings from the communication practices surrounding diversity and inclusion) that the "policies themselves do not allow for debate and understanding." Companies, therefore, need to consider how strategies are rolled out and communicated to their workforce at all levels. The communication needs to leave room for dialogue which fosters inclusion and understanding.

4.2.3.3 The Incidents

A total of 214 (39%) respondents shared 251 stories of their experiences with (n = 109 or 43%) or observations of (n = 96 or 37%) discrimination (n = 116 of 46%) and harassment (n = 117 or 47%) incidents in the mining industry. Fantasy-theme criticism was used to thematically code the experiences into actions, settings, and characters. The actions were coded into three categories: the incident itself, speaking up, and the outcome. These three acts allow for a better understanding of who the main characters were and what the setting was at each stage. The characters also were further categorized to indicate if the survey participant was a receiver or bystander, who was the aggressor, and what other characters were involved in each of the three acts.

Act 1 – The Incidents

The first act: the incident involved the aggressors (n = 156) and receivers (n = 164) as the most common characters. Both an aggressor and receiver character need to be involved for a discrimination or harassment incident to occur, although many incidents were worded in such a way that is was not clear who the receiver or aggressor was. For example, one participant comment was "bullying based on race and gender," but failed to specify if they were the aggressor or the receiver.

The word clouds, shown in Figure 4-14, highlights who the aggressors and receivers are, where the larger text indicates a higher word frequency. The most common aggressors were identified as male or men (n = 33 or 21%), supervisor (n = 30 or 19%), worker (n = 18 or 12%), manager (n = 16 or 10%), and senior (n = 12 or 8%). The main conclusion from this word cloud is that aggressors are often in a position of power (n = 75 or 48%), such as a client, supervisors, or manager. The receivers were most often identified as: *I* (n = 56), indicative of a first-hand account or by their gender: female or women (n = 52). There were a few accounts of women being the aggressor (n = 4) toward other women or men, or men being the receiver of aggressions (n = 7) from other men. The term "bullying" was used most often when men received inappropriate behaviour from other men.

Figure 4-14: Top 25 descriptions of aggressors (black background) and receivers (white background)

In describing the action in the first act, the severity, method of administering the offence, the nature of the offence, and how the participant heard about the incident were coded thematically. The severity of the event was coded as either discrimination or harassment. Harassment (n = 116) included the attacks which were personal in nature, overt, and may have occurred on multiple occasions, such as bullying. Discrimination (n = 117) incidents were more general, less personal, and often subtle in nature. Some incidents (n =18 or 7%) were described in such a way that it was not possible to determine the severity of the action. The method of administering the offence was described in terms of involving physical contact (n = 16 or 6%) or comments (n = 107 or 43%). Comments could include texting, emailing, or verbal communication. The nature of the offences was identified in 161 (64%) cases. The nature of offences were deemed to be sexual and/or sexist (n = 144 or 89%), racist (n = 11 or 7%), religious (n = 4 or 2%), or homophobic (n = 2 or 1%). All of the 16 incidents involving physical contact were also sexual in nature. Of the 251 incidents, 109 (43%) involved first hand experiences; the vast majority (n = 98 or 84%) of those at the receiving end of the incident were women. A further 46 (18%) incidents were witnessed by the survey respondent, where 60% (n =

28) of the witnesses were men. 78% (n = 36) of the survey participant who were confided in after the incident occurred (n = 46 or 18%) were male.

The setting in which these incidents occurred were mainly at the workplace (n = 184 or 73%). Some incidents occurred off-site, such as at a conference, or after work hours (n = 16 or 6%). Thirty-seven (17%) of the 214 respondents who shared their experiences with harassment and discrimination in the Canadian mining industry indicated they had multiple examples of inappropriate behaviour to share.

Act 2 – Speaking Up

After a discriminatory or harassing incident occurred, receivers and bystanders had an opportunity to speak up. A significant number of the 214 respondents did not share (n = 98 or 42%) what happened in the speaking-up phase. This high percentage of people who did not share further details could be due to survey fatigue, as this was the last question; a lack of knowledge as to what happened after the incident occurred; a survey design which lacked a multi-phased question to specifically draw out this information; or they didn't want to get involved. Nearly (n = 132 or 53%) half of the 251 experiences shared information on the speaking-up phase. Of these 132 stories where the speaking up phase was distinguishable, 41% (n = 54) involved a formal complaint, 36% (n = 48) involved trying to deal informally with the incident, and in 23% (n = 30) of situations no one spoke up at all.

Matrix coding tools in NVivo can be used to see who the characters are in the second act. The (n = 64) main characters mentioned in formal complaints were:

- Human resources (n = 19 or 30%);
- A person in a position of power, such as a supervisor, superintendent or manager (n = 12 or 19%); and
- Co-workers (n = 3 or 5%).

It was identified in the incident phase that nearly half the aggressors (n = 75 or 48%) were identified as a person in a position of power. As such, during the speaking-up phase, it was found that the person in the position of power was as likely to be supporting the receiver of the discrimination (n = 6), as they were to have acted as a roadblock to resolution (n = 6).

In the informal resolution processes, the most common characters (n = 55) were:

- The supervisor, superintendent or manager (n = 15 or 27%);
- Co-workers (n = 6 or 11%); and

- Human resources (n = 3 or 5%) was less likely to be involved.

Co-workers did not play a large role in the informal or formal reporting process; involvement of bystanders (n = 3) was the same in both formal and informal complaint processes.

Act 3 – The Outcome

The outcome for the receivers and aggressors involved in the discriminatory or harassing act were often not shared in the survey (n = 95 or 38%). Most commonly, where the outcomes were distinguished in the survey, nothing happened (n = 56 or 22%) as no one had spoken up. One participant, upon reflection, wished they had treated the situation differently: "It was not dealt with and in fact I didn't realize how inappropriately I was treated until after I left the job." In only 17% (n = 42) of incidents did the inappropriate behaviour that was experienced in the original incident stop, which was often described as being sudden and final. As some participants commented "[the receiver] took action and the bullying stopped," and "I personally intervened and put a stop to it."

Of the 156 incidents with a notable outcome, 17 (11%) of the receivers experienced some form of retaliation from others within their company. In 11 (7%) cases, the receiver eventually quit because they spoke up. For example, one receiver reported he/she left her/his job due to "The lack of response to this incident [which] contributed to my leaving the company." Sadly, nearly half (n = 5 or 45%) of the receivers who quit their jobs after being discriminated or harassed, no longer work in the mining industry. In one instance, the receiver was given a severance package to their relief: "I was glad the pain was over, I got a good severance. However, experiences like these made me understand why many women leave the profession. No job is worth that kind of abuse."

Overall, receivers often did not feel supported (n = 34 or 22%): "The lack of response to this incident contributed to my leaving the company" and "I informally reported the incident to a previous supervisor who was uncomfortable talking about it and posed the question 'what do you want to do about it?' Leaving it to me to deal with was daunting and potentially career limiting. I chose to let it continue..." As one participant commented "[it] makes me feel I can't trust the HR department or management for dealing with problems that arise." Another participant recounted that "This was a terrible time for [the receiver]. [The receiver was] not supported during the process. They had to tell their story over and over again. No apologies have been made, even though they were promised. This issue did not have a satisfying resolution for [the receiver]." A

participant echoed this sentiment, indicating that they felt alone through the resolution process: "It was handled in such a way where things were just swept under the rug and made me feel like I didn't have the right support and like I couldn't talk about the difficulties I was having."

In the few outcomes reported which resulted in aggressors being punished for their inappropriate behaviors, the aggressors were fired (n = 17 or 11%), forced to give apologies (n = 8 or 5%), or forced to retire (n = 5 or 3%). In one case, "all parties involved with the incident were reprimanded with the complainant and primary offenders removed from their positions or terminated within 2 years of the incident." Successful punishment of the aggressor appears to have been contingent upon due process being followed. For example, one participant reported that "An investigation into the harassment took place, resulting in significant disciplinary action against the harasser. Throughout the investigation, care was taken to ensure the confidentiality, safety and security of all parties involved." Another participant explained that it took a formal investigation to get resolution in the incident they described: "A third-party was brought in to assess the *he said/she said* situation. The third-party reviewer concluded that the female had been harassed and the male supervisor was released for cause." When the formal process is used, the time frame to resolution is not necessarily quick. Some participants described the process for firing or forcing retirement as "lengthy."

In general, there was no resolution when incidents occur between companies or in off hours, suggesting that companies need to develop policies and strategies when dealing with other corporations. As one participant observed, accommodations needed to be made to safe-guard the receiver as "our company has no control over our Client's Contractors, so my co-worker felt our company's only option would be to not put [the receiver] in those situations anymore, i.e. restricting the work [the receiver] is able to do, which [the receiver] did not want." In cases with low levels of resolution, participants questioned the processes and support systems for receivers. For example, one participant reported that he/she knew someone who "had a long history of [harassing others]. [The aggressor] harassed all kinds of people, not just women, and even got promoted after this." The participant attributed the failure to deal with the aggressor in a timely manner was due to a lack of clarity in the process.

The process, roles, and responsibilities in the reporting and resolution of incidents of harassment and discrimination should be:

- Clearly communicated to new employees in an orientation;

- Reviewed with existing employees when moving into supervisory roles; and
- Made generally available to the workforce, such that receivers of discrimination and harassment feel supported to speak up.

If receivers, witnesses, and co-workers are not empowered to speak, the trend of "it was not reported so it was not dealt with" will lead to continued discriminatory and harassing behaviour in the workplace.

4.3 Bottom-Up Discussion

Following the separate qualitative and quantitative analysis of the survey data, there were a number of outstanding questions that potentially could be answered by looking across both data types and mixing the data outcomes. The findings for the research questions from the bottom-up approach is discussed in this section, including the implications for the sub-groups of current and former mining employees, female and male employees, and the support systems required to move diversity and inclusion forward.

4.3.1 Female and Male Employees

The research question was: *is there a difference in perceptions of gender diversity and inclusion between men and women who work in the Canadian mining industry?* The result was that, yes, women reported having more first-hand experiences with discrimination and harassment. Men were more likely to believe that actions suggested by their companies are sufficient to address the problem faced by women, while more women saw that the strategies did not address the underlying issues. Women saw the subtle differences in support from their supervisors or managers when diversity and inclusion initiatives are implemented. Generally, men were not as aware of incidents of harassment and exclusion that women primarily experience, so men were more likely to believe the positive message from upper management at face value. Since men, however, felt excluded from the conversation about inclusion and diversity, they were also more likely to feel negatively toward diversity and inclusion if they did not see what is in it for them.

Employees look to their supervisors to model the values of the organization, but conversations about diversity and inclusion initiatives and discrimination and harassment incidents do not appear to be happening at the supervisory level. In particular, men can help to empower women to speak up about discrimination and harassment issues in the workplace (McKenzie & Halstead, 2017). Two-way dialogue should be used so that men and supervisors

can learn how they can support and drive forward inclusion. Furthermore, supervisors who have established a positive stance on gender equity may be given leeway in the event they commit a microaggression (Offermann et al., 2013). Inclusion in the workplace will also benefit men who are looking to work flexibly or make use of parental leave benefits. These benefits will only be in reach of men if they become normalized in the workplace, in part because a diverse workforce requires them. If men and supervisors do not get onside with gender diversity and inclusion, there is a high risk of them unconsciously or consciously contributing to exclusionary behaviors and undermining the intent of inclusion strategies in particular.

4.3.2 Current and Former Mining Employees

The research question was: *is there a difference in perceptions of gender diversity and inclusion between current and former workers in the Canadian mining industry?* The result was that, yes, former mining workers (M = 3.1, SD = 1.6) had a lower set of values towards gender diversity and inclusion in the mining industry than current workers (M = 3.5, SD = 1.3) [t (538) = 2.69, p = .007 and d = 0.3]. Former mining workers (M = 2.7, SD = 1) also believed, based on their experiences in mining, that physical well-being is valued over mental well-being, compared to the beliefs that current workers have that they are equal (M = 3, SD = 0.9) [t (534) = 2.59, p = .01 and d = 0.3]. The difference in these values may be due to the relatively recent change in dialogue regarding gender diversity and inclusion in the mining industry in the last 2 – 3 years, as was found through the top-down analysis.

Women (n = 12 or 39%) who used to work in mining also stated that there would need to be improvements made to gender diversity and inclusion strategies/practices before they would consider coming back to mining. Eighteen women (58% of former female mining employees) and 7 men (17% of former male mining employees) who formerly worked in mining reported incidents of harassment and discrimination compared to 19% of men (n = 60) and 41% of women (n = 91) who currently work in mining. Since women were more much likely to experience both first-hand and multiple accounts of discrimination and harassment than men, there is much to be learned from former female mining employees who no longer are at risk of retaliation from their former employers or of reputational damage from their co-workers if they choose to speak up. However, the highest number of respondents who chose not to share details on the speaking out and outcomes phases are currently working directly or in support of the mining industry. It is not surprising that receivers of discrimination and harassment are not

supported to speak up when there is a high number of incidents where their aggressors are in a position of power.

4.3.3 Awareness of Diversity and Inclusion and Discrimination and Harassment

The research question was: *how were employees made aware of the cause of gender diversity and inclusion within and/or outside their organization?* The findings indicate that women were aware of the need for diversity and inclusion because they are experiencing higher rates of discrimination and harassment incidents than men in the mining industry. In this study, women were also younger and were more junior when they are exposed to discrimination and harassment than men. Female survey respondents primarily described incidents that occurred in the last 3 years (60%, n = 82), while men primarily described incidents that had occurred more than 5 years ago (19%, n = 52). There was also a statistically higher number of women (60%, n = 82) who have experiences with discrimination and harassment within the last 3 years than men (44%, n =59) [$t(139) = 3.06$, $p < .003$, $d = 0.6$].

Over half of survey participants (n = 293 or 54%) acknowledged that they had witnessed discrimination and harassment in mining yet, contradictorily, only 1% (n = 4) indicated that they have personally benefited from anti-discrimination and anti-harassment policies. Due to the current processes and confidentiality, there are not opportunities to share lessons learned and empower others to speak up. People do not know if others are speaking up, or if there are opportunities for a positive resolution due to speaking up or reporting incidents. Many receivers will share their experiences with discrimination and harassment with a trusted source before bringing it forward formally or informally. Therefore, training and empowerment needs to happen at all levels of the organization, not just at supervisory or management, or within the human resources department.

Men, on the other hand, are learning about the need for diversity and inclusion either through their company's corporate strategies, which they feel positive will bring about change, or through witnessing discrimination and harassment in the workplace via another employee and likely later in their career than women. Results from this survey showed that men were three times as likely not to support diversity and inclusion initiatives if they had not previously experienced the impacts of discrimination and harassment in the workplace. Sharing stories of impacts may help with building empathy towards women that may lead to greater inclusionary behaviour (Becker & Swim, 2011; McKenzie & Halstead, 2017; Parker et al., 2018).

4.3.4 Support Systems & Barriers

The research question was: *what barrier or supports have employees experienced in response to recent gender diversity and inclusion initiatives within their organizations?* The largest benefit in the workplace resulting from diversity and inclusion initiatives is flexible work. The mining industry involves 24 hour per day operations, which can involve shift work and working in remote locations. Allowing and encouraging flexible ways for employees to contribute to the workplace is beneficial to both men and women. The main problem with the recent introduction of gender diversity and inclusion initiatives is that the benefits of and support from them are not visible to employees. Men, in particular, did not feel that the benefits that are extended to women, such as parental leave, are always available to them. Corporations should take opportunities to highlight how men and women can use these benefits; they also need to be explicit in connecting that the benefit of flexible work or enhanced parental leave "is brought to you by our company's initiatives towards creating an inclusive or equitable workplace."

4.3.5 Change Agents and Roadblocks

The research question was: *in what ways might diversity and inclusion initiatives within mining be facilitating or inhibiting cultural changes in support of gender equity?* Diversity and inclusion initiatives have helped increase awareness in the workplace; however, diversity cannot be successful without inclusion, and inclusion will not be successful if it is not measured. The number of individual change agents within the mining industry could be increased by taking down the privacy roadblocks surrounding incident reporting discussed in section 4.2.3.3. Current processes for dealing with discrimination and harassment are promoting exclusionary behaviour in Canadian mining. Current processes do not allow for openly sharing information on discrimination and harassment incidents with employees and do not empower people to speak up without the threat of retaliation. Measuring discrimination and harassment incidents is still a lagging indicator; however, tracking exclusionary incidents may be more indicative gender equity strategies success than annual diversity statistics.

4.3.6 Health and Safety as Common Ground

The research question was: *can health and safety culture and language be used as common ground to motivate gender diversity and inclusion culture change?* Health and safety culture is very strong within the mining industry because it is heavily regulated, the processes are well known, it is discussed on a frequent basis, and allows for lessons to be learned from past

incidents. Mining employees already believe that mental health and physical health are equally important. Therefore, the definition of mental health could be extended to include well-being arising from a diverse and inclusive workplace. In order to enforce a strong connection between mental and physical health, the incidents that threaten mental health need to be tracked and monitored under a common system.

4.3.7 Treating Harassment and Discrimination Like Health and Safety

The research question was: *can health and safety processes be used to deal with harassment and discrimination issues?* Health and safety training is central to working in the mining industry. This issue is introduced in orientation, is included in annual refreshers, and discussed on a nearly daily basis. Incorporating inclusion into health and safety is a natural fit for those who already equally value physical and mental well-being. Incorporating inclusion into health and safety may result in increased empathy that will naturally lead to valuing a diverse workforce.

Current health and safety regulations in mining give all workers the right to speak up to stop unsafe acts. In comparison, there are no regulations that empower workers to speak up about discrimination and harassment because non-physical incidents are not currently included in health and safety reporting. Any unsafe health and safety act, including many near-miss incidents, must be reported to someone in management; this information is then entered into a documentation system, which then notifies the appropriate people based on the severity of the act. A more severe incident also will be forwarded to regulators as prescribed by provincial or federal regulations. Methods for managing discrimination and harassment incidents could be added into existing health and safety systems with minimal efforts. As is true for health and safety incidents, the privacy of individuals involved in harassment and discrimination incidents should be protected by confidentiality. Like the reporting of health and safety incidents, the workforce can be notified about harassment and discrimination cases, without including the name or other identifying information about the people involved. Nonetheless, this information can be stored and available to those who are authorized.

Health and safety documentation systems often utilize algorithms and logic-driven databases that ensure that corrective actions are tracked and completed. Utilizing a common documentation system for physical and mental health incidents allows for the ease of creating and tracking trends. The system also could be used as a communication tool for the receiver of

the incident to know their case is being handled according to a clear and established procedure. Having a clear and trackable system will increase employee's confidence that the company takes the reporting of discrimination and harassment seriously while empowering others to report incidents they experience or observe. The data then can be used to support increasing or modifying any training, and sharing lessons learned between sites and across the industry.

5 Integrated Discussion and Conclusion

5.1 Integrated Discussion

Culture change is beginning to occur at the tops of many Canadian mining companies in response to the recent global rise in awareness of the need for diversity and inclusion. Senior leaders within many of the individual companies in this study have taken the initiative to roll out diversity and inclusion strategies aimed at diversifying employee representation in the areas of gender, ethnicity, and to a lesser extent, sexual orientation, such that the workforce reflects the demographics of the local communities in which they operate. These initiatives are strategic; they encourage goodwill between communities and companies who provide local employment while enabling mining companies to maintain their unofficial, yet socially critical, license to operate within these communities. These strategies are also important to aid in reducing the risk of unfavourable publicity or legal action, which has been seen, for example, in the #MeToo movement when corporations harbour or excuse aggressors' poor behaviour.

Culture change also can be measured as a summation of individuals' behaviours by looking from the bottom up in organizations. The story from the bottom up acknowledges that the initiatives have been communicated, in many cases, well by senior leaders; however, they are not being communicated equally well by supervisors. Survey respondents indicated that they can easily spot a supervisor who is not dedicated to the gender equity movement because they will let slip "warn[ings] that they were going to hire more women;" or give a defence in support of harassing or discriminatory behaviour by saying "I'm sure it wasn't meant in that way" if a complaint is brought forward. In general, communication is not frequent enough at all levels on the subject of gender equity; nor is it effective if conversations do not include the ways in which diversity and inclusion benefit individuals. Companies need to develop two-way communication strategies on gender equity in order for companies to hear the concerns of the workforce or to dispel myths. In the absence of open-communication, current and former workers will create their own narratives, which may reinforce an exclusionary divide between men and women.

In a mine site where half of health and safety incidents were not reported, there would be calls to action for those in leadership roles to take immediate corrective action to fix any roadblocks preventing a safe workplace. But, in the Canadian mining industry, there are systemic and cultural barriers that currently prevent men and women from reporting half of harassment and discrimination incidents, namely:

- Receivers and bystanders are not obligated or empowered to speak up, or to put a stop to exclusionary behaviour;
- Those in positions of power are frequently committing these exclusionary acts; and
- Receivers feel they are not always being supported through the resolution process.

One result of these inactions and mis-actions is a high turnover rate of female miners, already a minority, within individual mining companies and that women who leave an individual mining company will also more likely leave the mining industry altogether. The Canadian mining industry will not realize its vision of employing a representative workforce if it continues to ignore exclusionary behaviours happening within its mine sites and offices.

5.2 Theoretical Implications

As recommended by West and Zimmerman (2009) aspects of historical and social interactions were explored through this study on gender in the Canadian mining industry. Specifically, my study analysed a five-year period of gendered data from 10 individual mining companies, which had not previously been studied. I believe my study was the first of its kind to utilize rhetorical analysis to understand the communication strategies being used in 10 individual mining companies related to their equity strategies. I also believe that my study is also the largest nationwide survey exploring gendered perceptions in Canadian mining (n = 540).

My study found that 72% of participants who are Canadian mining employees work for companies that have gender equity strategies, which is an increase from MIHR's (2016) study which found only 46% of employers had a gender diversity strategy. Furthermore, equity strategies are expanding beyond gender to include aspects of intersectionality, such as ethnicity and sexual orientation. As found in other studies, the majority (men) and minority (women) have different perceptions about the risks and benefits of their company's diversity and inclusion initiatives (Allen, 2017; Randel et al., 2016). My study provides new insight into where benefits, such as flexible work, are actually being used and highlights the gross quantity that are not accessible to the workforce. Flexible work was previously identified as the largest concern for women in mining (Minerals Council of Australia, 2009; Women In Mining, 2010). I have found that men (27%) and women (37%) are both benefiting from flexible work opportunities within the Canadian mining industry.

The second concern previously identified for women in mining was for improvements to workplace culture (Minerals Council of Australia, 2009; Women In Mining, 2010). Nadya et

al.'s (2017) study found push factors for women to leave the workplace overpowered the pull factors to stay, that there was a lack of clear communication from leaders on benefits, that there was a lack of flexible work options, and anti-harassment and anti-discrimination policies were poorly communicated. In comparison to Nadya et al's (2017) study, my study found:

- That push factors which contributed to former mining employees leaving their employees and often the industry was due, in part, to instances of discrimination and harassment;
- That the pull factors for gender equity are not strong, such that nearly a third of survey participants who currently work in mining (n = 129 or 28%) see no personal benefits to gender equity strategies;
- That communication from leaders is often passive and infrequent which does not allow for it to be effective when addressing individual's concerns or changing people's beliefs towards gender.
- That anti-harassment and anti-discrimination policies are poorly understood and poorly utilized in the workplace.

Future research could highlight case studies where leadership communication is being effective at shifting minds and where anti-harassment and anti-discrimination policies and procedures are proving to be effective.

My survey participants' experiences with discrimination and harassment highlighted that the largest issues with workplace culture are largely related to gender (89%). McKenzie and Halstead (2017) recommended 6 communication strategies for combatting sexism, as described in section 2.4. My survey participants shared examples of all 6 strategies in the speaking-up phases which they experienced or witnessed. In my study, participants were more likely to have a positive resolution if their communication efforts to speak up were not dismissed. Similar to Good et al's (2012) study, my study also found that sometime receivers would choose to not speak up as they did not see that their speaking up would make a difference. Not speaking up does not allow for an aggressor's behaviours to be modified, as is recommended by many studies (Becker & Swim, 2011; McKenzie & Halstead, 2017; Parker et al., 2018). Instances where women did speak up and share their stories, as recommended by Becker and Swim (2011), McKenzie and Halstead (2017), and Parker et al. (2018), allowed for men to become more aware of women's struggles in mining which increases their chances of supporting women. Results

from my survey showed that men are more likely to support diversity and inclusion initiatives if they have some experience with the impacts of discrimination and harassment in the workplace.

My study found that there may not be adequate supports or knowledge of supports for addressing discrimination and harassment in Canadian mining, especially for women early in their careers. Organized feminism can provide an avenue for support of equality, freedom, and justice for those experiencing discrimination and harassment. Future research could expand on how organized feminism, such as WIM or #MeTooMining, can or is supporting those working in mining who experience inequalities. In particular future research could explore how these and other organizations contribute towards gender equity awareness in the industry and aid with supporting receivers through resolutions of discrimination and harassment incidents.

Many studies have recommended changes to the mining industry to advance gender equity (Mining Industry Human Resources, 2016; UN Women National Committee Australia, 2015; Women In Mining, 2010; Women in Mining, 2017). My study compared gendered data from individual companies and found signs of culture change occurring via increases in the number of women in organizations. These organizations which show recent or sustained improvements to gender diversity have adopted the recommendations from the literature, outlined in section 2.6, into their equity strategies. Uniquely, my study expands the theory of rhetorical criticism into the gender equity strategies of the Canadian mining industry and found that the organizations that are having the most success with recent improvements to gender diversity have also adopted world views that imply these organizations *want to be a good neighbour and have a representative workforce*. Lastly, my study adds to the existing common (5) recommendations on advancing gender equity in Canadian mining, summarized in section 2.6, by offering a new recommendation which challenges mining companies to utilize the common values, processes, systems, and culture associated with health and safety to advance gender equity. While there have been previous gendered approaches to health and safety, to the best of my knowledge, I am the first to suggest using health and safety as a means to advance gender equity strategies. Specific recommendations on how gender equity can be incorporated into health and safety will be discussed in the following section (5.3).

5.3 Recommendations

My recommendations from this study are to take a multi-fronted approach to addressing gender equity in the Canadian mining industry and as such, my recommendations are directed to

regulators, companies, and individuals. Starting from the top, regulations have the power to create change in the mining industry. Positive impact of regulations can be seen in the consistent and relatively high number of women who work at Cameco. Despite focusing their diversity and inclusion efforts, primarily with Indigenous Peoples in their local communities, Cameco also has also unexpectedly opened its door to women. The following recommendations are for regulators to:

- Ensure consistent and transparent reporting of gendered data (flexible and part-time work, demographics, turnover) at all levels, occupations, and locations for individual companies;
- Ensure labour data, used by groups such as MIHR, is made available for categorizing both profession and role/occupation to allow for targeted efforts to increase diversity in professions;
- Ensure appropriate mental health support and resolution mechanisms are in place for receivers of workplace discrimination and harassment incidents;
- Ensure appropriate public reporting mechanisms are in place for tracking occurrences and outcomes of workplace discrimination and harassment incidents;
- Consider how mental health and gender can be managed through existing health and safety systems and regulations;

Regulatory drivers are important; however, they should not be solely relied on for gender equity in the mining industry. Companies who rely on the messaging of meeting the minimum regulations required by government do not create a positive ethical appeal and imply no extra effort is being put in. Instead, companies need to consider a balanced use of the rhetorical appeals of ethos, logos, and pathos in their gender equity communication strategies. To ensure a balanced communication strategy my recommendations are for companies to:

- Re-examine their communication practices in relation to diversity and inclusion strategies to build pathos appeal. Suggestions include:
    - Using authentic imagery of your workforce in your mine sites;
    - Sharing your story about how and why gender equity strategies are important to your company, the industry, and society (UNSD goals); and
    - Telling stories from within your workforce on how gender equity strategies are being used throughout the company, not just at the top.

- Re-examine their communication practices in relation to diversity and inclusion strategies to build ethos appeal. Suggestions include:
    - Discussing how you are dealing with discrimination and harassment in your workplace; specifically, be clear and transparent on human rights reporting, governance, and resolutions of discrimination and harassment incidents;
    - Owning up to past mistakes, such as poor advancement of women, unconscious biases, and biases in human resource systems; and
    - Not placing blame on the mining industry as whole for past practices or mistakes.
- Re-examine their communication practices in relation to diversity and inclusion strategies to build logos appeal. Suggestions include:
    - Tailoring messages for individual groups to address their concerns and inspire an ideological change; for example, have avenues for customized messaging on websites by using audience-focused links, such as for professionals, women, Indigenous peoples, etc.;
    - Sharing your journey through your website, at conferences, and through organizations that are supporting diversity and inclusion;
    - Clearly communicate your SMART (specific, measurable, achievable, realistic, and timely) gender equity goals;
    - Fostering increased frequency and opportunity for two-way communication to allow for individual concerns to be addressed and gender equity issues in the workplace to be fully understood; and
    - Taking opportunities to build on the common ground that men and women in mining feel toward mental and physical wellbeing and toward existing health and safety culture to improve diversity and inclusion awareness.

In addition to communication strategies, companies also need to have policies and programs to create accountability within their workforce. To ensure supports of gender equity strategies my recommendations are for companies to:

- Ensure that all employees are made aware of their roles and responsibilities in gender equity strategies and policies from their first orientation;
- Ensure that supervisors are held accountable to facilitate two-way dialogue with employees regarding risks and benefits of gender equity;

- Ensure training programs for all employees to understand processes, roles, responsibilities, and to recognize and report discrimination and harassment incidents; and
- Ensure that supervisors and leaders are held accountable to facilitate support for resolution of discrimination and harassment incidents.

Next, companies should consider ways in which they can monitor their progress and incorporate continuous improvement methods. To ensure that diversity efforts can being realized, my suggestions are to:

- Find ways to learn from those who have left the industry and those who are farther along in the journey toward gender equity;
- If targeting recruitment of those that have left the industry, address how the industry may have changed, specifically in regard to strategies or improvements to inclusion and diversity;
- Consider ways to use metrics to measure leading indicators of gender equity or inclusion within your workforce; and
- Examine the feasibility of using existing health and safety systems to track discrimination and harassment incidents that would allow for privacy to be maintained and also encourage the collection of data on the rate and types of occurrences of exclusionary behaviour in their workforce; through tracking data in a consistent and transparent manner, employees can be held accountable.

Lastly, individuals have a major part to play in creating inclusive workplaces which will lead to gender equitable workplaces. Inclusivity is a mindset and practice that be incorporated into daily interactions. My recommendations are for individuals to:

- Recognize inclusive and exclusive behaviour in the workplace, including in your own interactions.
- Support men and women to become aware of how their behaviours are inclusive or exclusive.
- Encourage empathy through sharing personal stories and supporting others to share their experiences with inclusive and exclusive behaviour.

5.4 Conclusions

Equity within the mining industry can be realized when a diverse group of people are welcomed into a corporation. Employees who feel included in a company, who work in supportive environment which is free from harassment and discrimination, and who are eligible for positions and advancement according to the same standards as everyone else, will ultimately be productive employees. Once these terms of condition and work are known within the wider community, corporations in the mining industry should have no difficulty in attracting and keeping employees. Therefore, as highlighted in other studies, inclusion is a necessary precursor to realizing the ultimate goal of a gender equitable workforce (Nadya et al., 2017; Roberson, 2006).

For the past thirty years, with varying degrees of success, there has been a push both within the mining industry, and more generally, across industries and occupations to employ more women. The mining industry has been slow to act, but there are some signs that many individual Canadian mining companies understand that gender equity within the workplace is necessary and desirable. As the results of this study demonstrate, leaders in the mining industry are aware of the importance of gender equity and have started to develop strategies to achieve this goal. Through this same time period, the mining industry has been very successful in changing the corporate culture around health and safety issues. Strategies used to improve health and safety can be adapted to encourage companies to become more inclusive and diverse. Similar to improvements in health and safety, companies need to ensure that the complex nature of shifting individuals' beliefs are considered in their messaging, communication methods, and ultimately are reflected in the accountability and behaviours of their leaders.

The results of this work could be applied to other male-dominated industries that also are trying to close gender gaps in their organizations. Lastly, closing gender gaps will not alleviate all forms of marginalization that may occur in work environments; however, creating an environment that welcomes and supports inclusion of all genders also may create space for strategies and improvements for other marginalized groups.

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Appendix A Top-Down Sample Design

Table A-1: Canadian mining companies considered in the top-down approach[7]

Company (# of Employees Globally)	Head Office Location	Primary Commodities	Canadian Operations (# of Employees in Canada)	World Wide Operations[8]
Barrick (15,000)	Toronto, ON	Gold, Copper	N. Ontario (650)	Argentina, Chile, Dominican Republic, Peru, US, Zambia (Australia, Saudi Arabia)
BHP (26,000)	City name, Australia	Iron Ore, Coal, Copper, Petroleum, Potash (project)[9]	S. Saskatchewan[9], formerly NWT (~200)	Australia, US, UK, Chile, Trinidad, China, Japan, Malaysia, Singapore (Brazil, Peru, Algeria)
Cameco (3,200)	Saskatoon, SK	Uranium	N. Saskatchewan, Ontario (~2,000)	Australia, US, Switzerland, Kazakhstan
Glencore (146,000)	Baar, Switzerland	Copper, Cobalt, Nickel, Zinc and Lead, Iron Ore, Gold and Silver, Coal, Petroleum, Agriculture	BC, Alberta, Manitoba, Ontario, Quebec, New Brunswick (7,450)	50+ countries around the world
Goldcorp (9,700)	Vancouver, BC	Gold, silver, copper, lead and zinc	N. Ontario (3,300)	US, Mexico, Argentina, Guatemala (Chile, Dominican Republic)
Mosaic (8,300)	Minneapolis, USA	Potash, Phosphates	S. Saskatchewan (2,100)	US, Brazil, India, China, Australia, Paraguay
Nutrien (21,800)	Saskatoon, SK / Calgary, AB	Potash, Nitrogen, Phosphates	S. Saskatchewan, BC, Alberta, New Brunswick	US, Argentina, Chile, Europe,

[7] Information is sourced from (Agrium, 2017; Barrick, 2018b; BHP, 2018a; Cameco, 2018b; Glencore, 2018a; Goldcorp, 2018b; Mosaic, 2018b; Nutrien, 2018; PotashCorp, 2017; Rio Tinto, 2018; Teck, 2018b; Vale, 2018a).

[8] Operations which are operated by a joint venture partner and not by the company listed are shown in brackets.

[9] The Jansen Potash project is not yet approved for operation.

Company (# of Employees Globally)	Head Office Location	Primary Commodities	Canadian Operations (# of Employees in Canada)	World Wide Operations[8]
			(~3,000)	Egypt, Australia Trinidad (Chile, Israel, Jordan, China)
Rio Tinto (47,000)	Melbourne, Australia	Aluminum, Copper, Diamonds, Coal, Petroleum, Iron Ore	BC, NWT, Quebec, Newfoundland & Labrador (15,000)	40+ Countries around the world
Teck (9,800)	Vancouver, BC	Coal, Copper, Lead/ Zinc, Petroleum	Elk Valley, Southern BC, Trail, Fort McMurray (7,500)	Chile, US (Peru)
Vale (140,000)	Rio de Janeiro, Brazil	Iron ore, Nickel, Copper, Fertilizer, Coal, Manganese	Manitoba, Sudbury, Newfoundland & Labrador (5,100)	26 Countries around the world

Appendix B Top Down Analysis

Cluster Criticism Key Words

Table B-1: Word cluster examination of *People* pages

God = 1, Devil = -1	Key Words	Barrick	BHP	Cameco	Glencore	Goldcorp	Mosaic	Nutrien	Rio Tinto	Teck	Vale	Total
1	Diversity/ diverse	x			x	x		x	x	x		6
0.98	Inclusion/ inclusive				x	x		x	x	x		5
0.94	Equal opportunity	x				x						2
0.92	integrity								x			1
0.91	Equity											0
0.9	Respect(ful)	x			x			x	x			4
0.9	Flexible				x							1
0.9	Empower				x		x					2
0.88	Gender equality	x			x	x						3
0.85	Gender balance	x										1
0.8	Engaged/ engagement	x			x	x	x	x	x	x		7
0.8	Develop(ment)	x			x	x	x	x	x	x		7
0.75	Collaborative							x				1
0.7	Attractive/ attract	x			x				x	x		4
0.7	Motivated											0
0.7	Energetic											0
0.65	Reflect communities	x			x					x		3
0.65	Representative workforce								x			1
0.6	Potential	x			x	x		x	x			5
0.6	Grow						x					1
0.5	Gender	x			x	x						3
0.5	Ethical	x										1
0.5	Positive				x			x				2
0.4	Women	x			x	x			x	x		5
0.4	Indigenous				x		x		x	x		4
0.4	Aboriginal											0
0.4	Co-operation											0
0.1	Female	x			x	x						3
0.1	Merit/ performance based	x			x							2
0.1	Fair	x				x						2
-0.1	Gender bias	x										1
-0.2	Male-dominated	x										1
-0.2	Issues	x										1

God = 1, Devil = -1	Key Words	Barrick	BHP	Cameco	Glencore	Goldcorp	Mosaic	Nutrien	Rio Tinto	Teck	Vale	Total
-0.3	Barriers							x				1
-0.5	Bias	x						x				2
-0.6	Dignity	x										1
-0.65	Tolerant	x			x			x				3
-0.8	Discrimination	x			x			x				3
-0.8	Retaliation	x										1
-0.8	Harassment	x			x							2
-0.85	Sexual harassment	x										1
-0.9	Non(anti)-discrimination	x						x				2
-1	Gender-Based Violence	x										1
	Total	28	0	0	20	11	5	13	11	8	0	

Table B-2: Word cluster examination of *Career* pages

God = 1, Devil = -1	Key Words	Barrick	BHP	Cameco	Glencore	Goldcorp	Mosaic	Nutrien	Rio Tinto	Teck	Vale	Total
1	Diversity/ diverse	x	x	x	x		x	x	x	x	x	8
0.98	Inclusion/ inclusive		x	x			x	x	x			5
0.94	Equal opportunity						x					1
0.92	integrity	x		x					x			3
0.91	Equity			x								1
0.9	Respect(ful)	x		x	x			x	x			5
0.9	Flexible		x	x					x			3
0.9	Empower	x							x			2
0.88	Gender equality						x					1
0.85	Gender balance		x									1
0.8	Engaged/ engagement			x			x	x		x		4
0.8	Develop(ment)	x	x	x	x	x	x	x	x	x	x	9
0.75	Collaborative											0
0.7	Attractive/ attract	x	x				x					3
0.7	Motivated	x	x							x	x	3
0.7	Energetic	x										1
0.65	Reflect communities	x	x	x								3
0.65	Representative workforce			x								1
0.6	Potential	x	x		x					x	x	4

God = 1, Devil = -1	Key Words	Barrick	BHP	Cameco	Glencore	Goldcorp	Mosaic	Nutrien	Rio Tinto	Teck	Vale	Total
0.6	Grow	x		x		x	x		x	x	x	6
0.5	Gender		x				x					2
0.5	Ethical											0
0.5	Positive	x	x			x		x				4
0.4	Women			x		x	x					3
0.4	Indigenous									x		1
0.4	Aboriginal			x		x						2
0.4	Co-operation			x								1
0.1	Female											0
0.1	Merit/ performance based	x	x	x				x			x	4
0.1	Fair			x								1
-0.1	Gender bias		x									1
-0.2	Male-dominated											0
-0.2	Issues			x					x			2
-0.3	Barriers			x								1
-0.5	Bias		x									1
-0.6	Dignity	x										1
-0.65	Tolerant							x				1
-0.8	Discrimination	x		x				x				3
-0.8	Retaliation											0
-0.8	Harassment	x		x								2
-0.85	Sexual harassment											0
-0.9	Non(anti)-discrimination											0
-1	Gender-Based Violence											0
	Total	16	14	20	4	5	10	9	9	7	6	

Cluster Criticism Word Trees

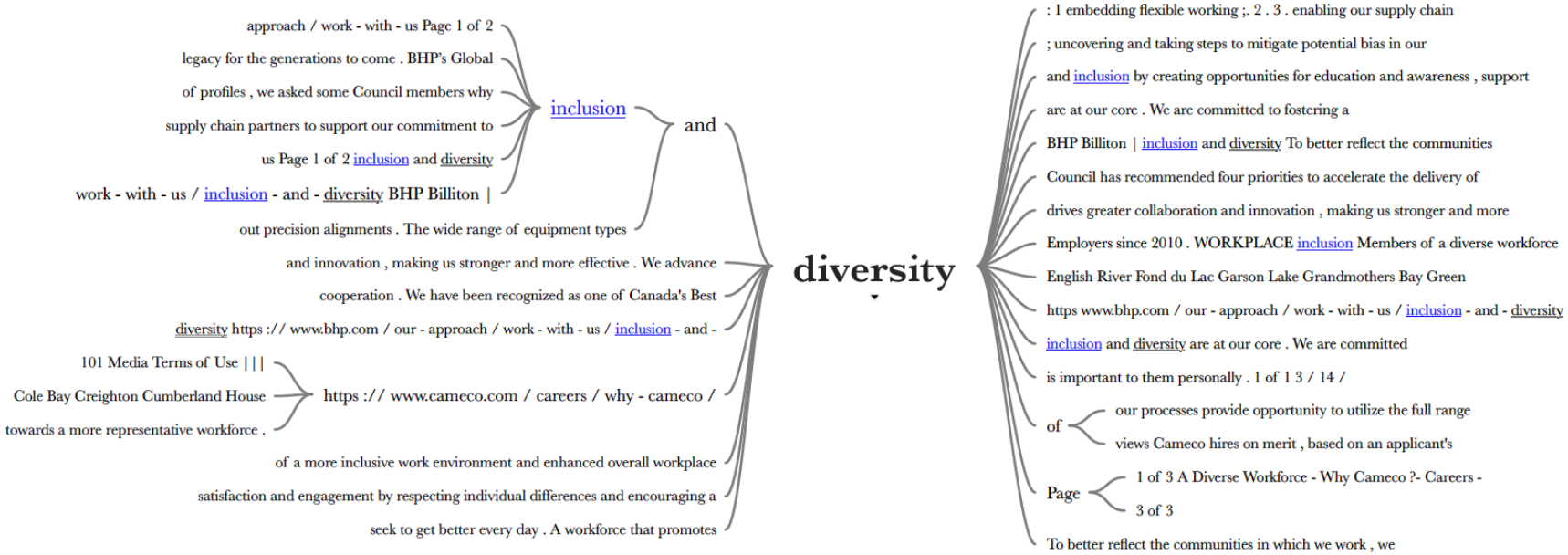

Figure B-1: Inclusion and diversity word tree from *Career* pages

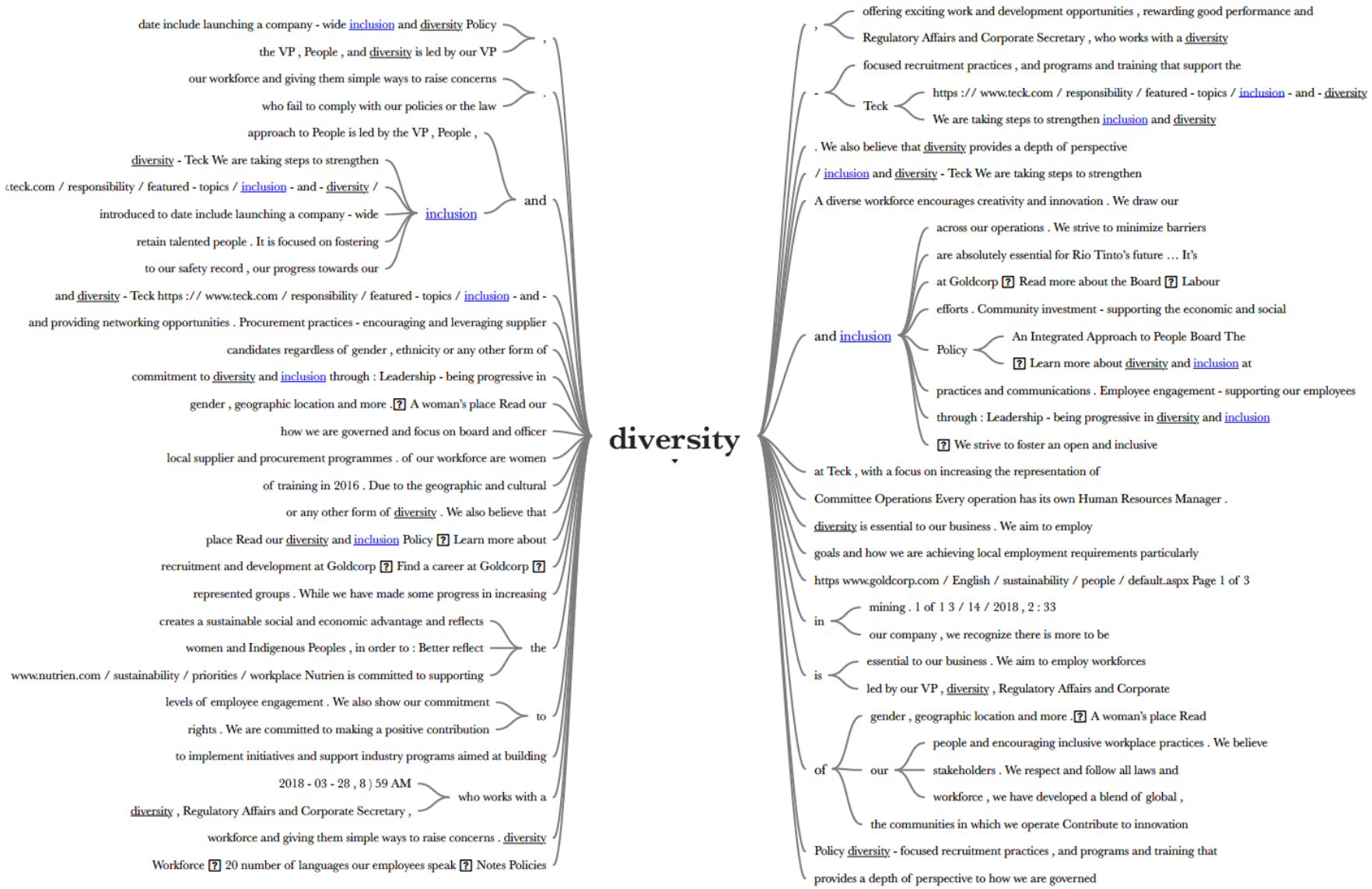

Figure B-2: Inclusion and diversity from *People* pages

Figure B-3: Discrimination word Tree from *Career* pages

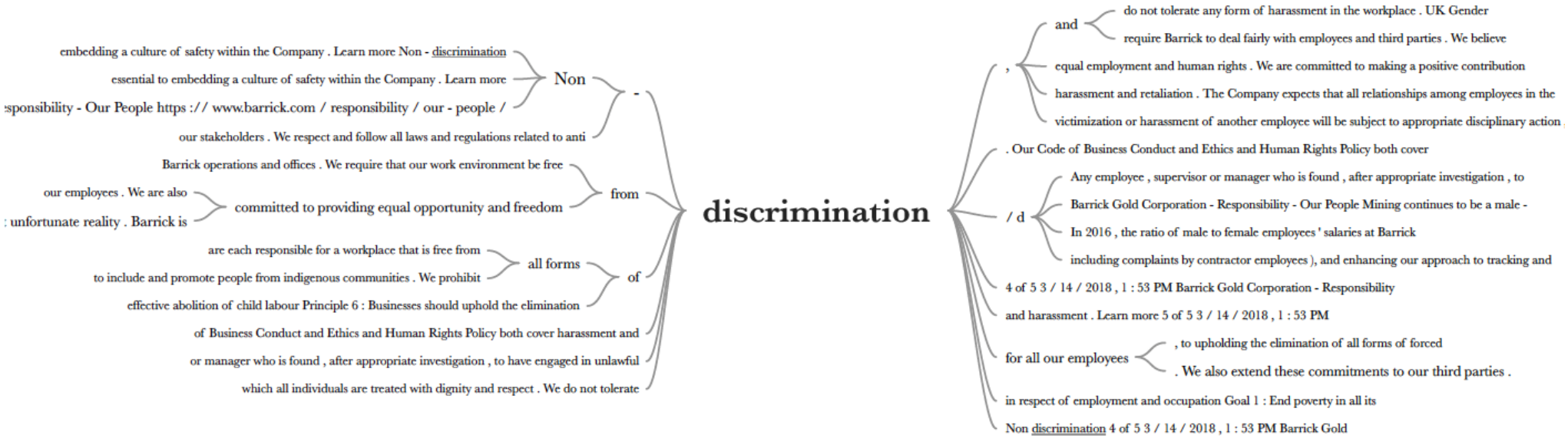

Figure B-4: Discrimination word tree from *People* pages

Appendix C Survey Design

Survey Outline and Logic

The survey was accessed through a link directing participants to Survey Monkey. The preliminary screen displayed the consent statement and subsequent sections included the survey questions.

1. First section confirms present or past mining industry employment.

   Logic: If participant is currently working in the Canadian mining industry, they proceed to section 2. If participant has not worked in Canadian mining industry survey ends. If participant has previously worked in Canadian mining industry but is not currently, proceed to section 3.

2. Second section collects demographic information outlined in classification for those currently working in the Canadian mining industry.

   Logic: If current employer has or may have a diversity and inclusion strategy proceed to section 4.

3. Third section collects demographic information, information related to leaving mining industry, and perceptions of mining industry from those who are no longer working in mining.

   Logic: If participant may have experienced or witnessed discrimination or harassment in the mining industry, proceed to section 7, otherwise proceed to section 8.

4. Forth section explores company strategies for diversity inclusion.

   Logic: Only accessible if participant indicates on the first page. After completing this section, proceed onto section 5.

5. Fifth section asks questions around perceptions on health and safety in the workplace.

   Logic: Only accessible for current employees in the mining industry. After completing this section, proceed to section 6.

6. Sixth page asks questions around perceptions on diversity and inclusion in the workplace.

   Logic: Only accessible for current employees in the mining industry. If participant may have experienced or witnessed discrimination or harassment in the mining industry, proceed to section 7, otherwise proceed to section 8.

7. Seventh page asks open ended questions around discrimination or harassment incidents experienced or witnessed.

Logic: Only accessible if participant indicates they have experienced or witnessed an incident. After completing this section, proceed to section 8.

8. Eighth section thanks participants for completing survey and will display contact information for researcher again.

Case Classifications

The following table outlines case classifications that will be collected to distinguish participants.

Table C-1: Case classifications

	Participant #1	Participant #2	Participant #3… etc
Survey respondent identification number			
Currently working in mining?			
Gender			
Age range			
Education Level			
Profession			
Province of employment			
Employer			
Current role level			
Years of work experience			
Years of experience in mining			

Professional and Industry Association Communications

Hello [insert name here],

I am professional mechanical engineer with 13 years of experience working in the Canadian mining industry. I am currently working on a Master of Science degree at the University of Saskatchewan with research focusing on communication strategies related to gender diversity and inclusion initiatives in the Canadian mining industry. The final stage in my research involves a survey which will gather perceptions of professionals, both men and women, who have worked or are working in the mining industry. The outcome of my research will be structured into a toolkit that seeks to educate and empower leaders in the mining industry to support greater diversity and inclusion in their workplaces and work to closing the gender gap in mining.

At this point I am reaching out to industry and professional associations who value diversity and inclusion with the request to send out my survey directly to their members. The survey would be sent out in October. At this stage I anticipate associations would need to send out an initial survey request and a reminder to participants. If you would like more information or are interested in supporting this work, please let me know. Thank you.

Jocelyn Peltier-Huntley, P. Eng.
Graduate Student, University of Saskatchewan
Jop803@mail.usask.ca
306-250-3450

Table C-2: Associations who aided in survey mobolization

Industry or Association Name	Expected Mobilization Date
Engineers and Geoscientists British Columbia	08-Oct
Canadian Institute of Mining (CIM) National	24-Oct
CIM Sudbury Geoscience	09-Oct
CIM Saskatchewan	09-Oct
CIM Vancouver	09-Oct
Saskatchewan Mining Association	09-Oct
Saskatchewan Industrial and Mining Suppliers Association	11-Oct
Women in Mining (WIM) Northern Ontario	17-Oct
Women in Mining and Women in Nuclear Saskatchewan Inc.	03-Oct
Engineers Canada	03-Oct
Regina Engineering Society	05-Oct
Saskatoon Engineering Society	18-Oct

Survey Participant Communication

I am professional mechanical engineer with 13 years of experience working in the Canadian mining industry. I am currently working on a Master of Science degree at the University of Saskatchewan with research focusing on communication strategies related to gender diversity and inclusion initiatives in the Canadian mining industry. The final stage in my research involves a survey which aims to gather perceptions of professionals, both men and women, who have worked or are working in the mining industry. The outcome of my research will be structured into a toolkit that seeks to educate and empower leaders in the mining industry to support greater diversity and inclusion in their workplaces and work to closing the gender gap in mining.

You are invited to share your perceptions on topics such as: health and safety, and gender diversity and inclusion through the following survey: [Inserted link for survey]. The survey may take up to 15 mins to complete. Thank you for taking the time contribute to original Canadian research which aims to make the mining industry a welcoming environment for all.

Jocelyn Peltier-Huntley, P. Eng.
Graduate Student, University of Saskatchewan
Jop803@mail.usask.ca

Survey Codebook and Variable Types

Table C-3: Survey codebook

Variable Labels			Variable Values													
	Label	Data Type	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Respondent ID	Scale														
2	Connection to Mining Industry	Nominal	Working directly for miner	Working in support of mining	Formerly worked in mining											
3	Age Range	Ordinal	18 to 24	25 to 34	35 to 44	45 to 54	55 - 64	>=65								
4	Gender	Nominal	Female	Male	Other											
5	Education Level	Ordinal	High School	CEGEP	Some post-secondary	Diploma	Bachelors degree	Graduate degree								
6	Profession	Nominal	Accountant	Admin	Eng/Geo/Sci	HS&E	HR	IT	Comm	Ops	Supply	Tech	Trades			
7	Mining Industry Employer	Nominal	Other	BHP	Hatch	Mosaic	Teck	Cameco	Rio Tinto	Vale	Orano	Nutrien	Goldcorp	Glencore	Barrick	Did not report
8	Mining Industry Employer - Confirmed	Nominal	Other	BHP	Hatch	Mosaic	Teck	Cameco	Rio Tinto	Vale	Orano	Nutrien	Goldcorp	Glencore	Barrick	Did not report
9	Province of Mining Employment	Nominal	AB	BC	MAN	NF	NWT	NS	NUN	ON	QU	SK	YU			
10	Role Responsibility Level	Ordinal	Non-supervisory	Front line supervisor	Superintendent	Manager	Senior Manager	Executive								
11	Overall Work Experience	Ordinal	< 1 Year	1 to 3 years	3 to 5 years	5 to 10 years	10 to 15 years	15 to 20 years	20 to 25 years	> 25 years						
12	Mining Work Experience	Ordinal	< 1 Year	1 to 3 years	3 to 5 years	5 to 10 years	10 to 15 years	15 to 20 years	20 to 25 years	> 25 years						
13	What industry did you switch to after leaving the mining industry?	String														
14	What industry did you switch to after leaving the mining industry?	Nominal	Teaching	Return to school	None	Retired	Oil	Stay at home parent	Consult.	Manufacturing/ Construction	Gov./ Health Care	Tech.	Other			
15	What role did you switch to after leaving the mining industry?	String														
16	Would you work in mining again?	Nominal	Yes	No	Unsure											
17	Please explain what would entice you to come back to mining.	String														
18	Importance of gender D & I in mining industry to you	Ordinal	Not at all important	Not so important	Somewhat important	Very important	Extremely important	Unsure								
19	Support of improving mining culture to welcome D & I	Ordinal	Not support	Somewhat support	Neither support nor not support	Support	Strongly support									
20	Based on your experience in mining, which is most important?	Nominal	Physical well-being is more important	Physical well-being is slightly more important than mental well-being	Mental and physical well-being are equally important	Mental well-being is slightly more important than physical well-being	Mental well-being is more important									
21	Did you witness or experience D & H in mining?	Nominal	Yes	No	Unsure	Did not answer										
22	Comfortable sharing more info on the D & H incident?	Nominal	Yes	No	Unsure	Did not answer										
23	How long ago did incident occur?	Ordinal	< 1 Year	1 to 3 years	3 to 5 years	> 5 years										
24	Was the incident reported formally or unformally?	Nominal	Yes	No	Unsure	Did not answer										
25	Please describe the incident that you witnessed or experienced and how it was dealt with.	String														
26	Does your company have a D & I strategy?	Nominal	Yes	No	Unsure	Did not answer										
27	Gender	Nominal	Yes	No	Unsure	Did not answer										
28	Sexual orientation	Nominal	Yes	No	Unsure	Did not answer										
29	Ethnicity	Nominal	Yes	No	Unsure	Did not answer										
30	Across the company	Nominal	Yes	No	Unsure	Did not answer										
31	At board level	Nominal	Yes	No	Unsure	Did not answer										
32	At Sr management level	Nominal	Yes	No	Unsure	Did not answer										
33	At management	Nominal	Yes	No	Unsure	Did not answer										
34	At technical roles	Nominal	Yes	No	Unsure	Did not answer										
35	At trades or ops	Nominal	Yes	No	Unsure	Did not answer										
36	Email	Nominal	Yes	No	Unsure	Did not answer										

Variable Labels			Variable Values													
	Label	Data Type	1	2	3	4	5	6	7	8	9	10	11	12	13	14
37	Supervisor	Nominal	Yes	No	Unsure	Did not answer										
38	Management	Nominal	Yes	No	Unsure	Did not answer										
39	Training	Nominal	Yes	No	Unsure	Did not answer										
40	Newsletter	Nominal	Yes	No	Unsure	Did not answer										
41	Internal website	Nominal	Yes	No	Unsure	Did not answer										
42	External website	Nominal	Yes	No	Unsure	Did not answer										
43	Anti-harassment and anti-discrimination policies	Nominal	Available in my company	Leaders actively promote	Is actively occurring/ in use within the company	Is actively occurring/ in use within my depart.	I have personally benefited from this	N/A								
44	Advancement of diverse leaders	Nominal	Available in my company	Leaders actively promote	Is actively occurring/ in use within the company	Is actively occurring/ in use within my depart.	I have personally benefited from this	N/A								
45	Flexible work hours	Nominal	Available in my company	Leaders actively promote	Is actively occurring/ in use within the company	Is actively occurring/ in use within my depart.	I have personally benefited from this	N/A								
46	Parental leave over and above gov't benefits	Nominal	Available in my company	Leaders actively promote	Is actively occurring/ in use within the company	Is actively occurring/ in use within my depart.	I have personally benefited from this	N/A								
47	Sr leaders accountability to meet targets	Nominal	Available in my company	Leaders actively promote	Is actively occurring/ in use within the company	Is actively occurring/ in use within my depart.	I have personally benefited from this	N/A								
48	Unconscious bias training	Nominal	Available in my company	Leaders actively promote	Is actively occurring/ in use within the company	Is actively occurring/ in use within my depart.	I have personally benefited from this	N/A								
49	Leadership training for women	Nominal	Available in my company	Leaders actively promote	Is actively occurring/ in use within the company	Is actively occurring/ in use within my depart.	I have personally benefited from this	N/A								
50	Audits to check for biases in hiring and promotion	Nominal	Available in my company	Leaders actively promote	Is actively occurring/ in use within the company	Is actively occurring/ in use within my depart.	I have personally benefited from this	N/A								
51	Comments on the potential benefits you see resulting from your organization's initiatives towards diversity and inclusion.	String														
52	Risk of job loss to meet diversity targets	Ordinal	Highest risk	High risk	Medium risk	Lower risk	Lowest risk									
53	Risk that quotas undermine credibility of diverse leaders	Ordinal	Highest risk	High risk	Medium risk	Lower risk	Lowest risk									
54	Risk that all leaders do not support diversity and inclusion	Ordinal	Highest risk	High risk	Medium risk	Lower risk	Lowest risk									
55	Risk that there are not enough qualified diverse people to meet the targets	Ordinal	Highest risk	High risk	Medium risk	Lower risk	Lowest risk									
56	Risk that D & I policies are not actually being used	Ordinal	Highest risk	High risk	Medium risk	Lower risk	Lowest risk									
57	Risk that subtle sexism is not being addressed	Ordinal	Highest risk	High risk	Medium risk	Lower risk	Lowest risk									
58	Risk that harassment and discrimination complaint processes are not clear or effective	Ordinal	Highest risk	High risk	Medium risk	Lower risk	Lowest risk									
59	What are other risks you see as a result of your organization's initiatives towards diversity and inclusion?	String														
60	What opportunities or support have you personally experienced as a result of your organization's initiatives towards diversity and inclusion?	String														
61	Have you experienced or observed barriers, discrimination, or exclusion within your organization as a result of diversity and inclusion?	Nominal	Yes	No	Unsure	Did not answer										

Variable Labels			Variable Values													
	Label	Data Type	1	2	3	4	5	6	7	8	9	10	11	12	13	14
62	What barriers, discrimination or exclusion have you experienced based on your organization's diversity and inclusion initiatives?	String														
63	How would you rate the overall diversity and inclusion practices within your company?	Ordinal	Poor	Fair	Good	Very Good	Excellent									
64	Will the initiatives your company is pursuing have a lasting and positive impact on diversity and inclusion?	Ordinal	Very Unlikely	Unlikely	Neither likely nor unlikely	Likely	Very Likely									
65	How would you rate the H & S practices within your workplace?	Ordinal	Poor	Fair	Good	Very Good	Excellent									
66	How confident are you discussing H & S issues?	Ordinal	Not at all confident	Not so confident	Somewhat confident	Very confident	Extremely confident									
67	Understand process for reporting a health and safety issue in your workplace	Nominal	Yes	No	Unsure	Did not answer										
68	How often do you discuss health and safety	Nominal	Never	Less than once a month	A few times a month	About once a week	A few times a week	Every day								
69	Have you reported a health and safety issue in your workplace?	Nominal	Yes	No	Unsure	Did not answer										
70	Importance of health and safety within your workplace	Ordinal	Not at all important	Not so important	Somewhat important	Very important	Extremely important									
71	What is your view of workplace gender divserity and inclusion programs?	Ordinal	Not at all important	Not so important	Somewhat important	Very important	Extremely important									
72	Importance of diversity and inclusion to your supervisor	Ordinal	Not at all important	Not so important	Somewhat important	Very important	Extremely important	Unsure								
73	Importance of diversity and inclusion to sr management	Ordinal	Not at all important	Not so important	Somewhat important	Very important	Extremely important	Unsure								
74	Condfidence in discussing diversity and inclusion issues	Ordinal	Not at all confident	Not so confident	Somewhat confident	Very confident	Extremely confident									
75	How often you discuss diversity and inclusion	Nominal	Never	Less than once a month	A few times a month	About once a week	A few times a week	Every day								
76	Informally raising a concern if you were the victim	Ordinal	Very Unlikely	Unlikely	Neither likely nor unlikely	Likely	Very Likely									
77	Informally raising a concern if you were the witness	Ordinal	Very Unlikely	Unlikely	Neither likely nor unlikely	Likely	Very Likely									
78	Informally raising a concern if a co-worker confided in you	Ordinal	Very Unlikely	Unlikely	Neither likely nor unlikely	Likely	Very Likely									
79	Do you know the process for formally reporting a discrimination and harassment concern?	Nominal	Yes	No	Unsure	Did not answer										
80	Formally raising a concern if you were the victim	Ordinal	Very Unlikely	Unlikely	Neither likely nor unlikely	Likely	Very Likely									
81	Formally raising a concern if you were the witness	Ordinal	Very Unlikely	Unlikely	Neither likely nor unlikely	Likely	Very Likely									
82	Formally raising a concern if you were the witness	Ordinal	Very Unlikely	Unlikely	Neither likely nor unlikely	Likely	Very Likely									

Appendix D Statistics Description

Theory of Independent Sample t-tests

The null hypothesis (H_0) for an independent sample t-test assumes that there is no difference between the means (M) of men's (m) and women's (f) responses, while the alternative hypothesis (H_1) assumes that there is a difference (Witte & Witte, 2007). Therefore, the null and alternative hypothesis can be written as:

$$H_0 = M_f - M_m \leq 0$$

$$H_1 = M_f - M_m \neq 0$$

The decision of whether to reject H_0 at the level of significance (α), shown in Table D-1, if $t \geq t_{critical}$, given the degrees of freedom, df. For this study an $\alpha < 0.05$ was used. We can calculate df based on the following formula:

$$df = n_f + n_m - 2$$

Table D-1: Critical t[10]

	Level of Significance, α		
	0.05	0.01	0.001
$t_{critical}$	1.960	2.576	3.291
Level of confidence	95%	99%	N/A

The p-value will be used to show "the degree of rarity of that result, given that the null hypothesis is true. Smaller p-values tend to discredit the null hypothesis and to support the [alternative] hypothesis" (Witte & Witte, 2007, p. 293).

Lastly, Cohen's d will be used to report the standardized effect size by the following formula (Witte & Witte, 2007):

[10] Table is an excerpt from Table B (Witte & Witte, 2007), where df > 120.

$$d = \frac{|Mf - Mm|}{SD}$$

The size effect of Cohen's d is small when $d \leq 0.20$, medium when $0.2 \geq d \leq 0.50$, and large when $d \geq 0.80$ (Witte & Witte, 2007, p. 300). Results from independent t-test are reported in paragraphs in the form [$t(df) = X_1$, $p < X_2$, $d = X_3$].

Theory of Chi-squared Test of Independence

Data which is not normally distributed or is categorical can be analyzed with a Chi-squared (χ^2) test of independence. A Chi-squared (χ^2) tests looks for correlation between two variables where data is not necessarily normally distributed (Witte & Witte, 2007). The null hypothesis can therefore be written as:

H_0: Variable 1 and Variable 2 are independent,

where Variable 1 will be gender, and Variable 2 will be the question being analyzed. The alternative hypothesis is then:

H_1: H_0 is false

The decision of whether to reject H_0 is at the level of significance (α) shown in Table D-2 for $\chi^2 \geq \chi^2_{Critical}$, given the degrees of freedom, df. For this study an $\alpha < 0.05$ was used.

Table D-2: Critical values of Chi-squared [11]

	Level of Significance (α)			
df	0.1	0.05	0.01	0.001
1	2.71	3.84	6.64	10.83
2	4.6	5.99	9.21	13.82
3	6.25	7.81	11.34	16.27
4	7.78	9.49	13.25	18.47
5	9.24	11.07	15.09	20.52

The effect size for a Chi-squared test is measured by squared Cramer's Phi Coefficient (Φ^2_C), which "estimates the proportion of explained variance (or predictability) between two

[11] Table is an excerpt from Table D (Witte & Witte, 2007), for values of df equal to 1 through 5.

qualitative variables" (Witte & Witte, 2007, p. 429). A small effect size is considered to be less than or equal to 0.01, a medium effect size is between 0.01 and 0.09, and a large effect size is equal to or greater than 0.25 (Witte & Witte, 2007, p. 430). Results from Chi-squared tests of independence are reported in paragraphs in the form [χ^2 (df, N = X_1) = X_2, p < X_3], where df and all X's were calculated in SPSS.

Appendix E Bottom Up Analysis

Demographics Information

Table E-1: Connection to mining industry demographics

		Frequency	Percent	Valid Percent	Cumulative Percent
	Working directly for miner	267	49.4	49.4	49.4
	Working in support of mining	192	35.6	35.6	85.0
	Formerly worked in mining	81	15.0	15.0	100.0
	Total	540	100.0	100.0	

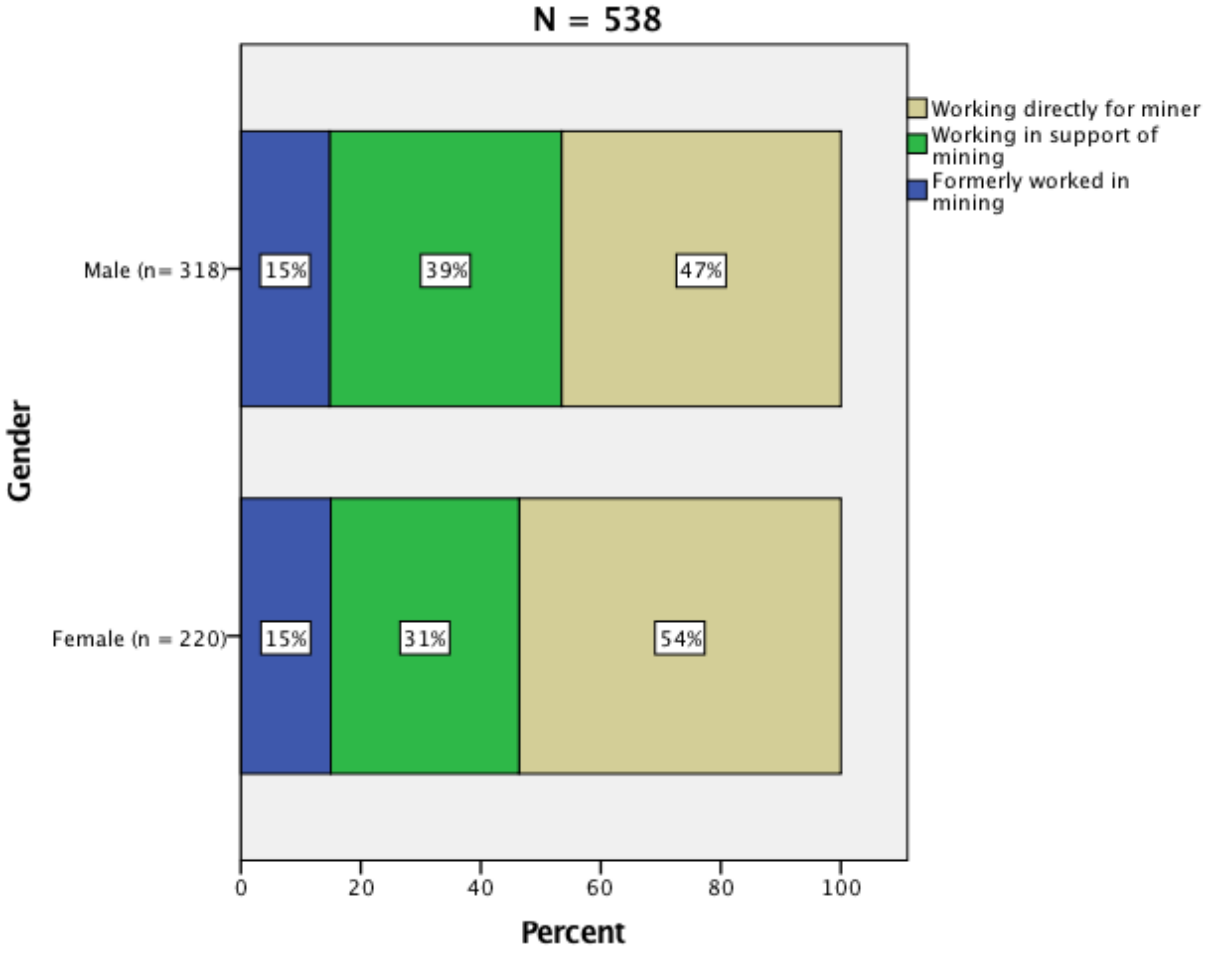

Figure E-1: Gender and mining connection demographics

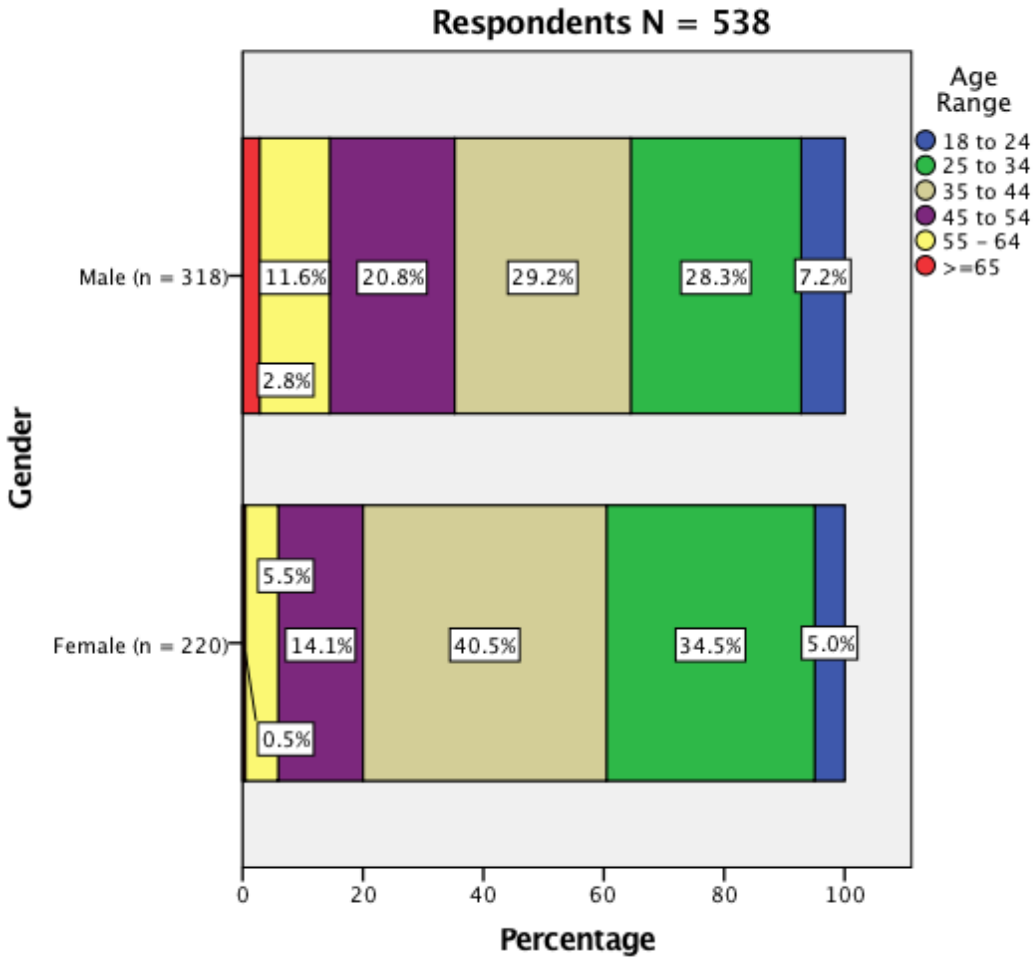

Figure E-2: Gender and age demographics

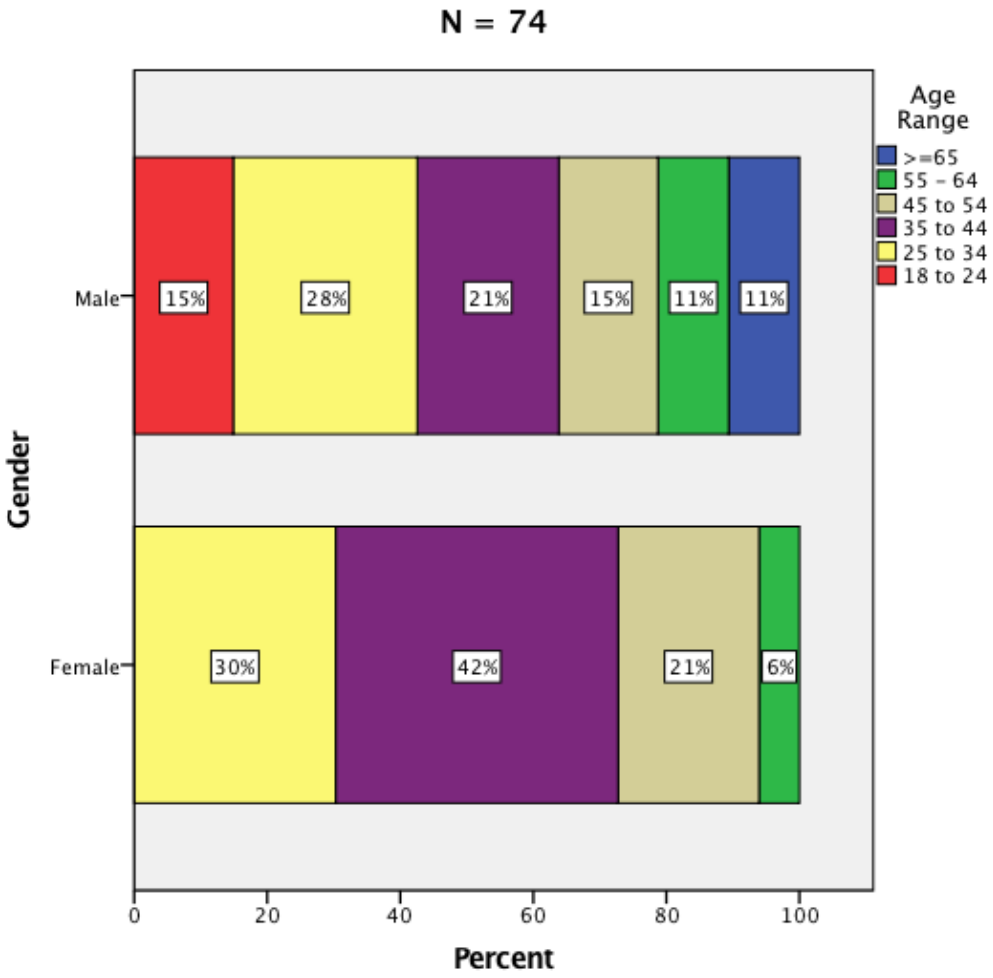

Figure E-3: Former mining employees gender and age demographics

Table E-2: Education level demographics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High School	18	3.3	3.5	3.5
	CEGEP	5	.9	1.0	4.5
	Some post-secondary	25	4.6	4.9	9.4
	Diploma	77	14.3	15.2	24.6
	Bachelors degree	360	66.7	70.9	95.5
	Graduate degree	23	4.3	4.5	100.0
	Total	508	94.1	100.0	
Missing	System	32	5.9		
Total		540	100.0		

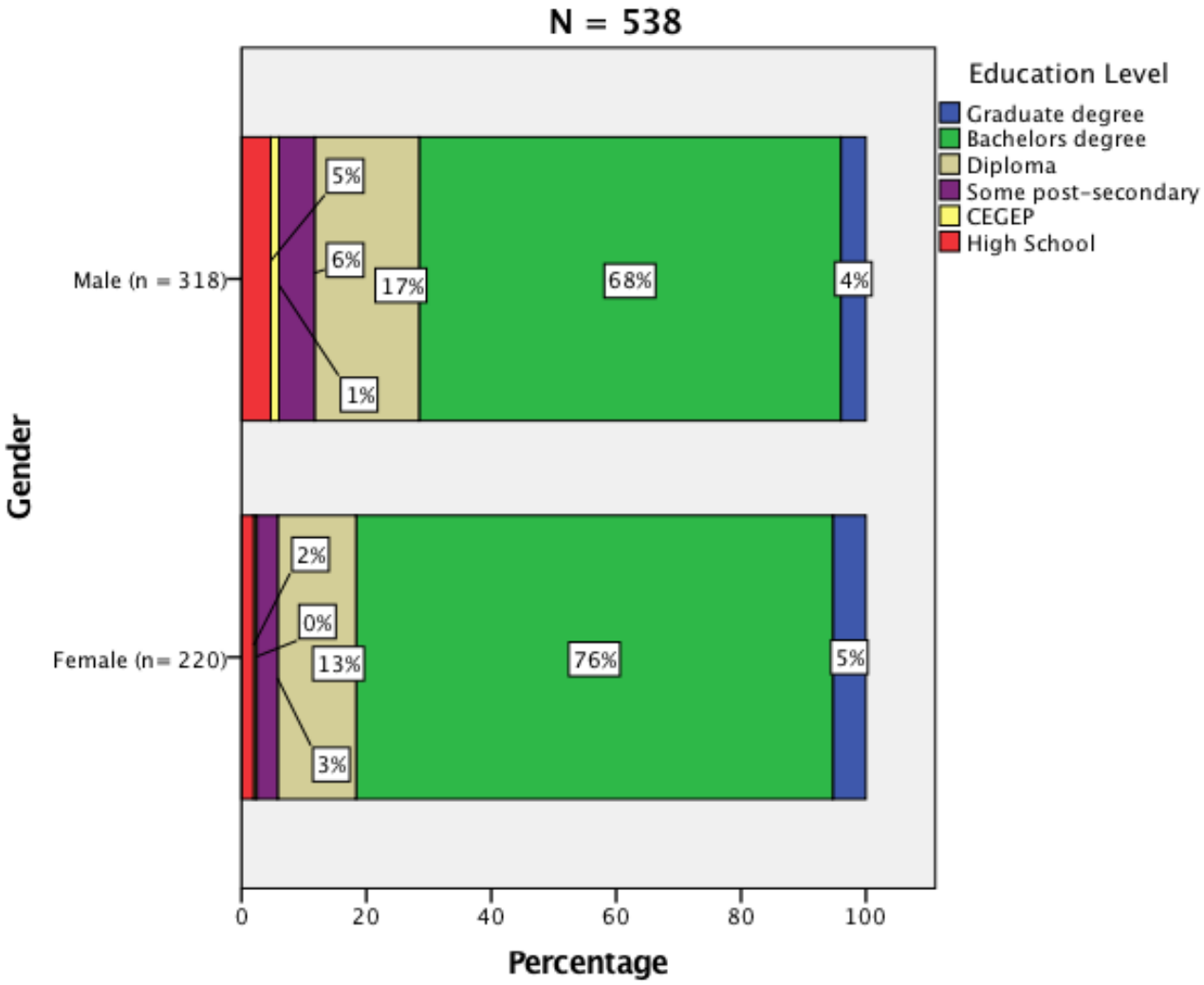

Figure E-4: Gender and education level demographics

Table E-3: Role responsibility level demographics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Non-supervisory	276	51.1	51.1	51.1
	Front line supervisor	79	14.6	14.6	65.7
	Superintendent	27	5.0	5.0	70.7
	Manager	93	17.2	17.2	88.0
	Senior Manager	38	7.0	7.0	95.0
	Executive	27	5.0	5.0	100.0
	Total	540	100.0	100.0	

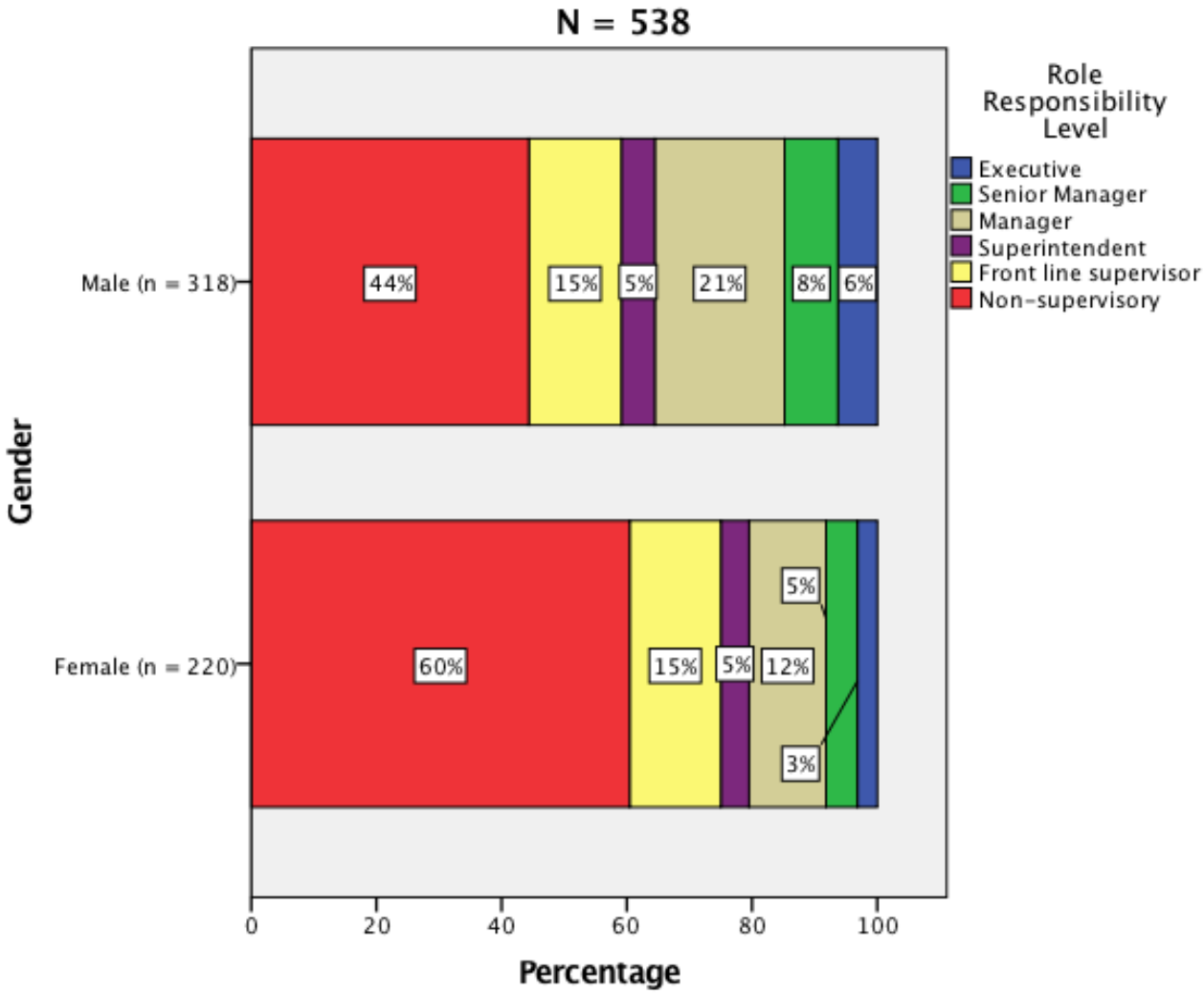

Figure E-5: Gender and role level demographics

Table E-4: Province of mining employment demographics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Alberta	25	4.6	4.7	4.7
	British Columbia	94	17.4	17.6	22.3
	Manitoba	13	2.4	2.4	24.8
	Newfoundland	7	1.3	1.3	26.1
	North West Territories	6	1.1	1.1	27.2
	Nova Scotia	5	.9	.9	28.1
	Nunavut	2	.4	.4	28.5
	Ontario	113	20.9	21.2	49.7
	Quebec	36	6.7	6.8	56.5
	Saskatchewan	228	42.2	42.8	99.2
	Yukon	4	.7	.8	100.0
	Total	533	98.7	100.0	
Missing	System	7	1.3		
Total		540	100.0		

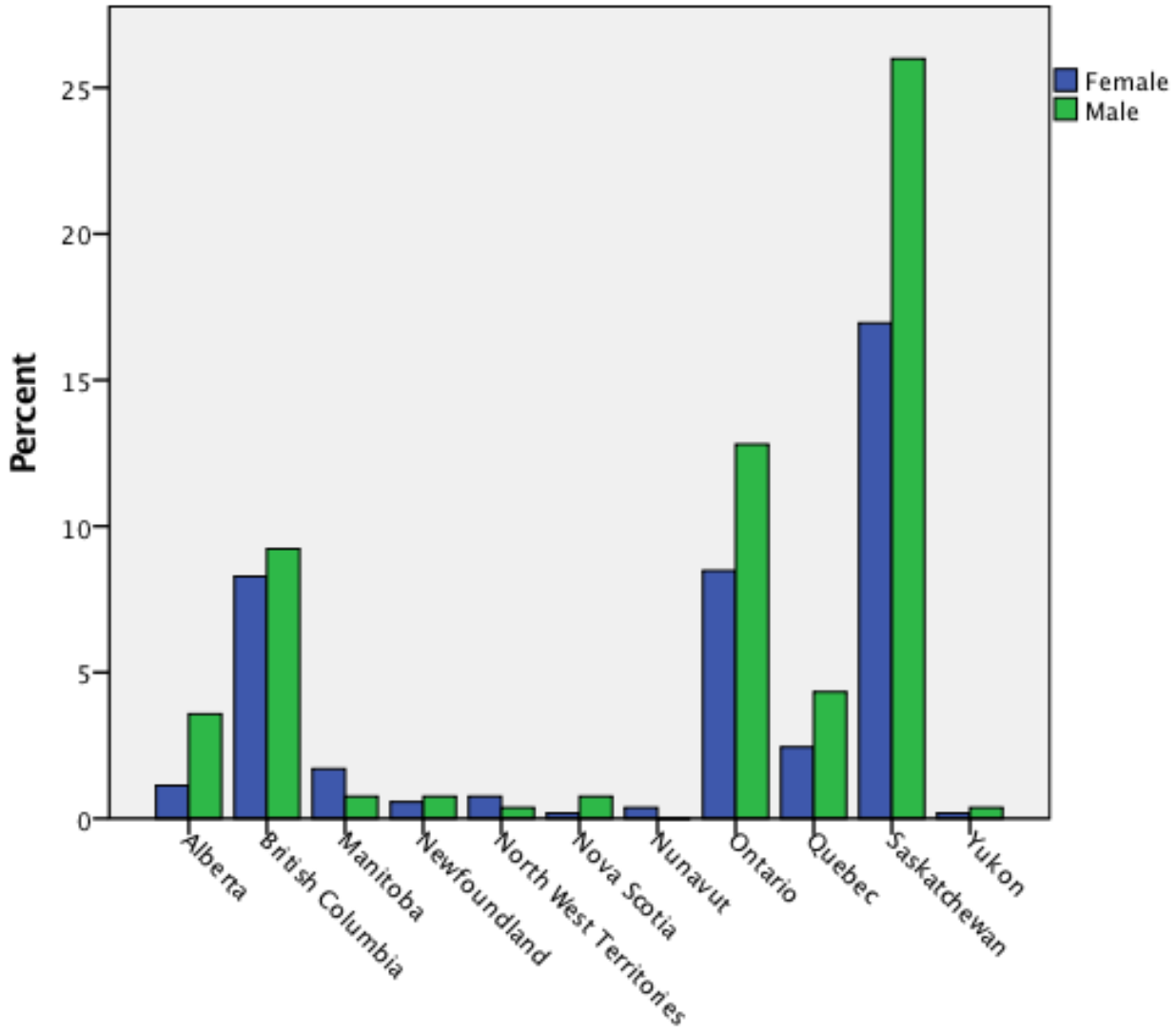

Figure E-6: Gender and province of mining employment demographics

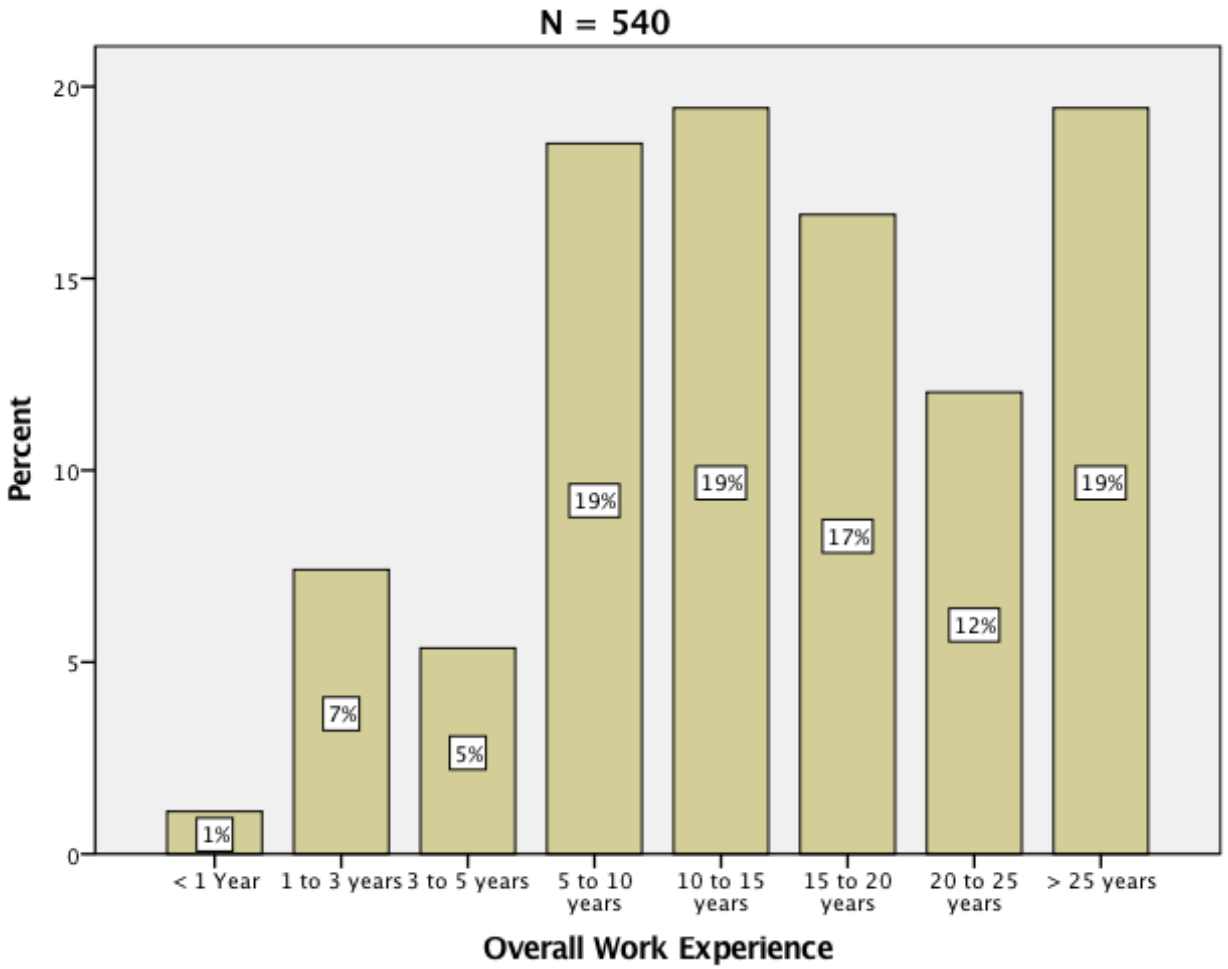

Figure E-7: Overall work experience demographics

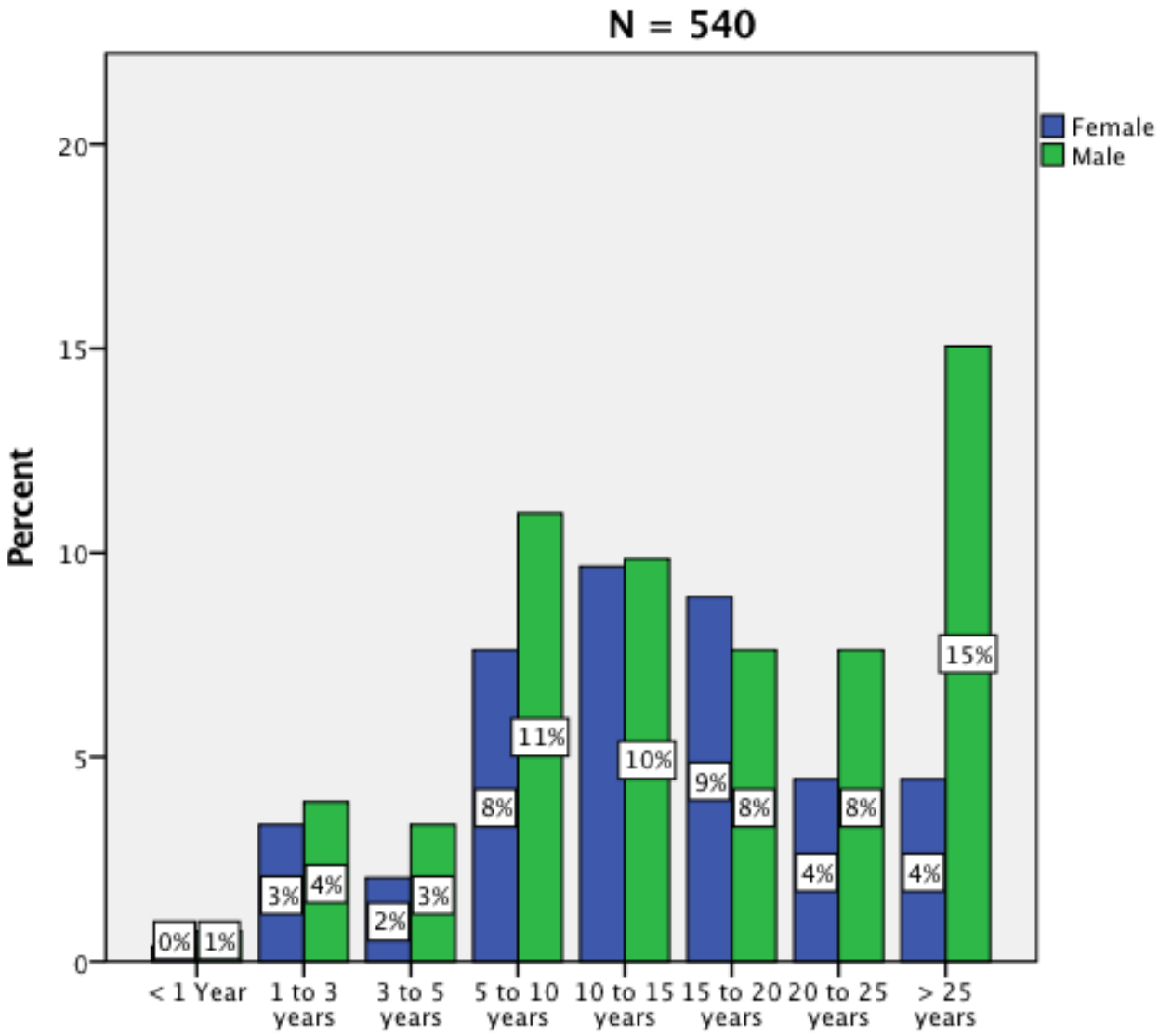

Figure E-8: Gender and overall work experience demographics

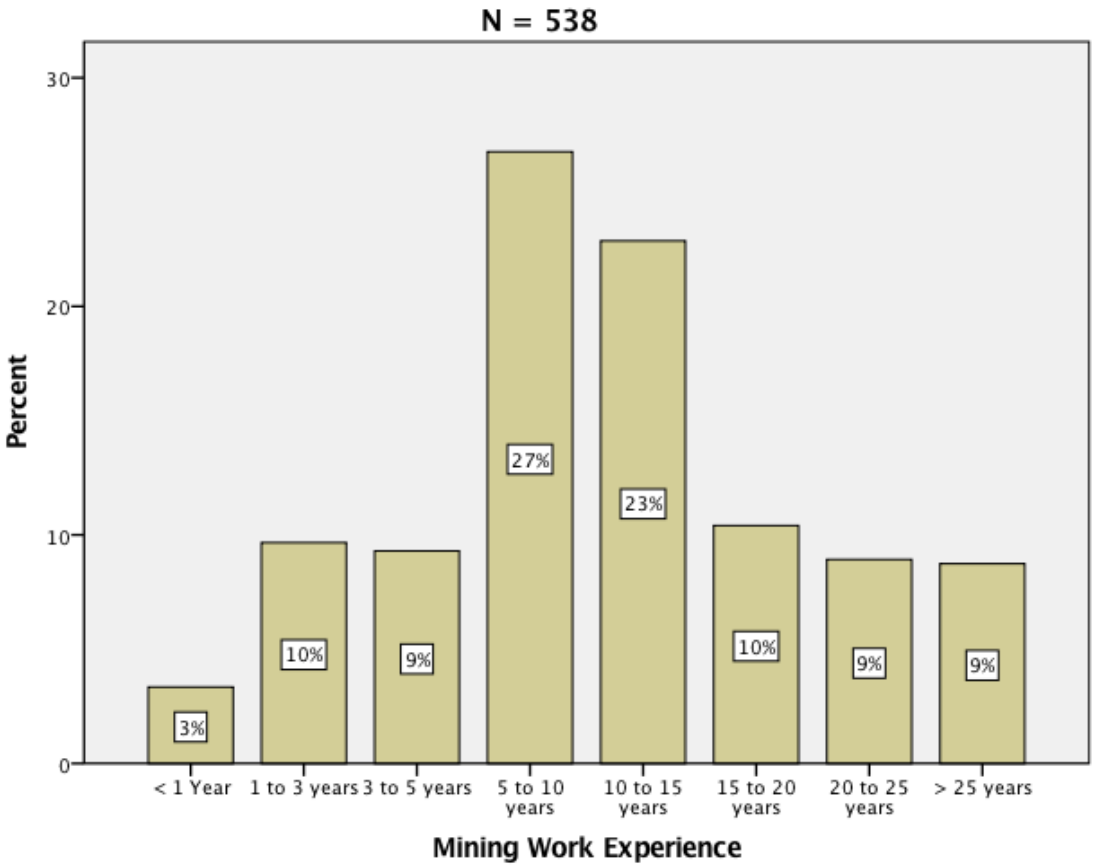

Figure E-9: Mining work experience demographics

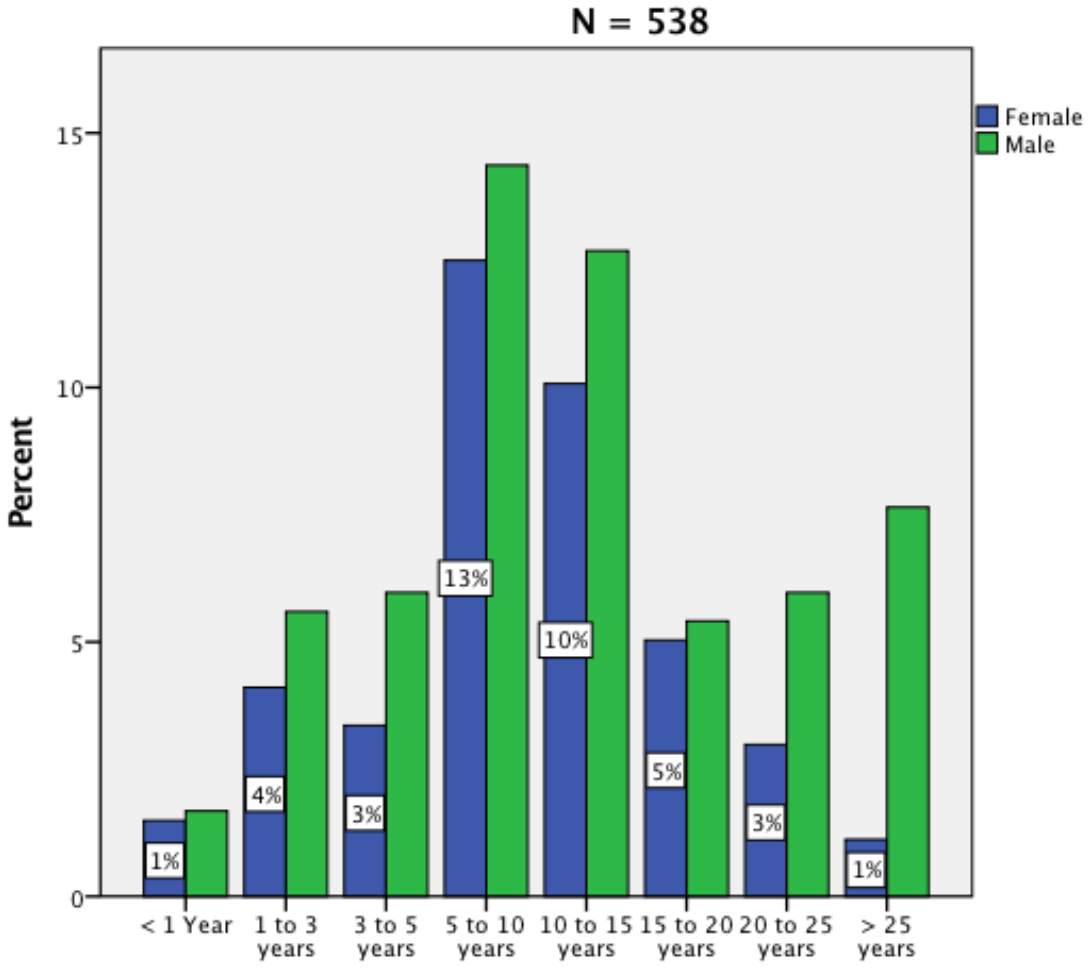

Figure E-10: Gender and mining work experience demographics

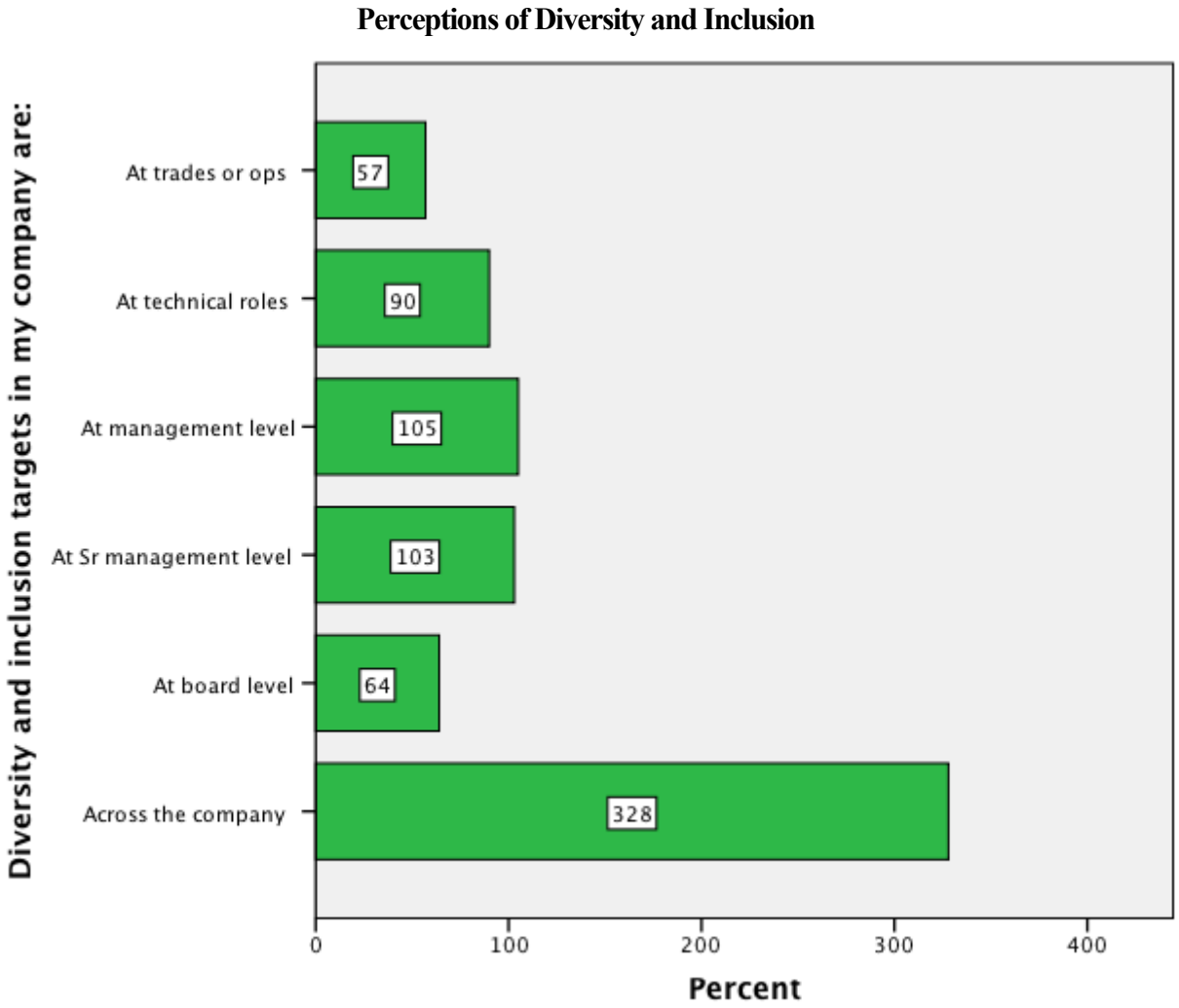

Figure E-11: Diversity and inclusion targeted levels

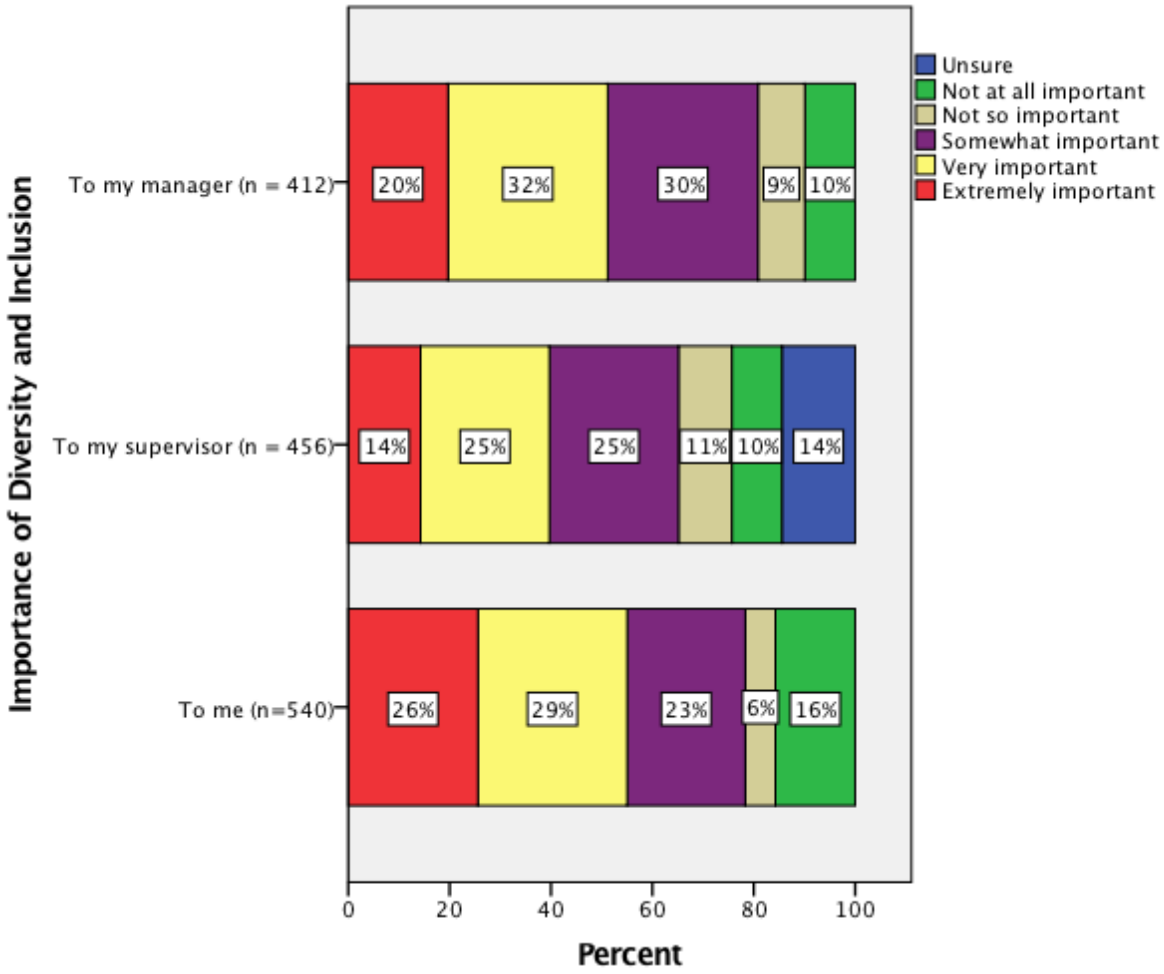

Figure E-12: Importance of diversity and inclusion

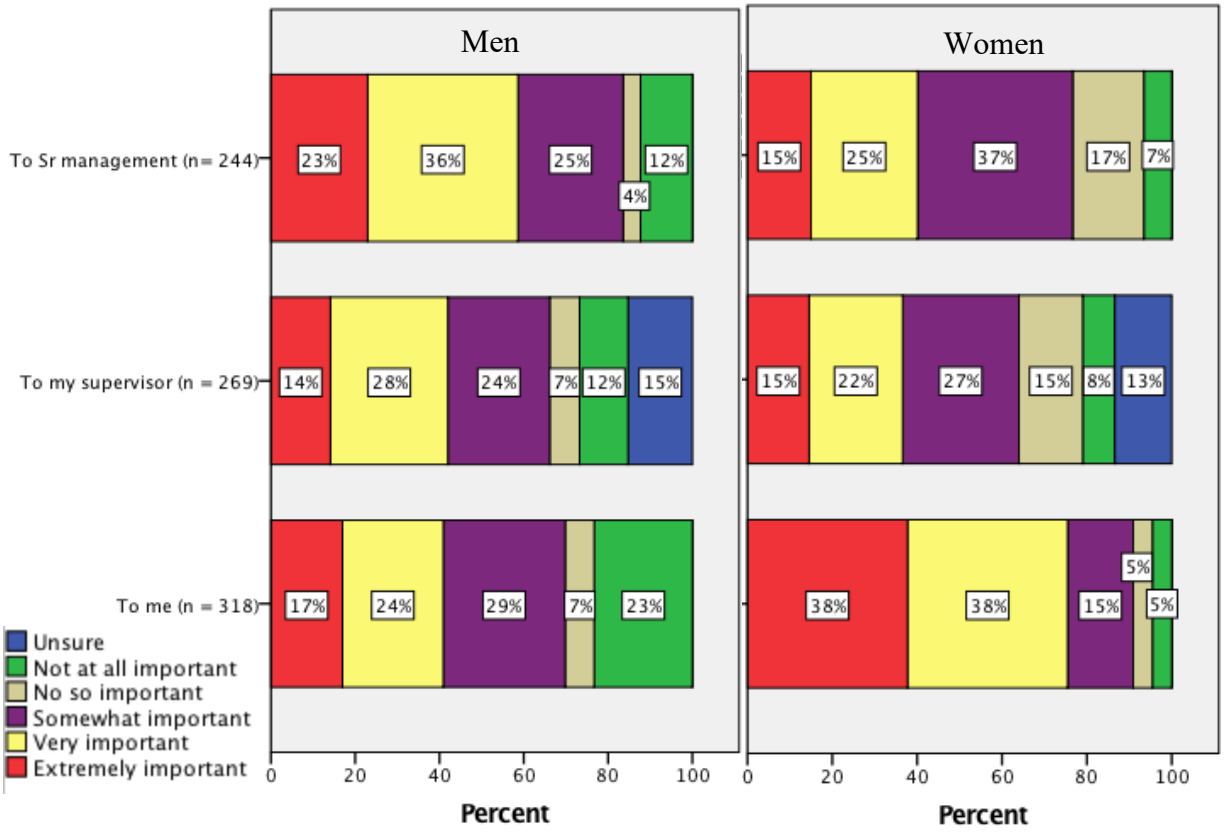

Figure E-13: Importance of diversity and inclusion by gender

Table E-5: Independent sample T-test differences based on gender

Question	Overall			Female			Men			Independent Sample T-Test Results						
	N	M	SD	n	M	SD	n	M	SD	t	df	p	Mean Difference	Cohen's D	Lower Confidence Interval	Upper Confidence Interval
Support of improving mining culture to welcome diversity and inclusion.	540	4.0	1.21	220	4.4	0.89	318	3.7	1.32	6.5	536	0.001	0.67	0.6	0.47	0.87
Rating of the overall diversity and inclusion practices within your company.	388	3.0	1.16	161	2.7	1.14	226	3.2	1.11	-4.9	385	0.001	-0.57	0.5	-0.80	-0.34
Your company's initiatives will have a lasting and positive impact on diversity and inclusion.	387	3.7	1.06	159	3.5	1.05	227	3.8	1.04	-3.1	384	0.002	-0.33	0.3	-0.55	-0.12
Physical well-being is more important (1) ranging through to mental wellbeing is more important (5).	536	3.0	0.90	217	3.0	0.78	317	3.0	0.97	0.6	532	0.526	0.05	0.1	-0.10	0.20
Importance of workplace gender diversity and inclusion programs.	456	3.6	1.27	186	4.0	0.99	269	3.3	1.36	6.0	453	0.001	0.69	0.5	0.47	0.92
Importance to you of gender diversity and inclusion in mining.	540	3.4	1.35	220	4.0	1.06	318	3.0	1.39	8.6	536	0.001	0.95	0.7	0.73	1.17
Importance to your supervisor of gender diversity and inclusion in mining.	456	3.7	1.48	186	3.6	1.45	269	3.7	1.50	-0.7	453	0.458	-0.10	0.1	-0.38	0.17
Importance to senior management of gender diversity and inclusion in mining.	412	3.4	1.19	167	3.3	1.11	244	3.5	1.24	-2.3	409	0.021	-0.28	0.2	-0.51	-0.04

Question	Overall			Female			Men			Independent Sample T-Test Results						
	N	M	SD	n	M	SD	n	M	SD	t	df	p	Mean Difference	Cohen's D	Lower Confidence Interval	Upper Confidence Interval
Confidence in discussing diversity and inclusion issues.	456	3.5	1.22	187	3.2	1.21	268	3.8	1.18	-5.1	453	0.001	-0.58	0.5	-0.81	-0.36
Likelihood of informally raising a discrimination and harassment concern if you were the victim.	427	3.8	1.29	170	3.8	1.27	256	3.9	1.31	-1.1	424	0.262	-0.14	0.1	-0.39	0.11
Likelihood of informally raising a discrimination and harassment concern if you witnessed.	428	4.0	1.13	171	3.9	1.14	256	4.1	1.13	-1.9	425	0.062	-0.21	0.2	-0.43	0.01
Likelihood of informally raising a discrimination and harassment concern if a co-worker confided in you.	427	3.7	1.26	170	3.5	1.29	256	3.8	1.23	-3.1	424	0.002	-0.38	0.3	-0.63	-0.14
Likelihood of formally raising a discrimination and harassment concern if you were the victim.	427	3.6	1.35	171	3.4	1.34	255	3.7	1.34	-2.4	424	0.017	-0.32	0.2	-0.58	-0.06
Likelihood of formally raising a discrimination and harassment concern if you witnessed.	261	3.7	1.51	107	3.3	1.45	154	3.9	1.49	-3.6	259	0.001	-0.68	0.4	-1.04	-0.31
Likelihood of formally raising a discrimination and harassment concern if a co-worker confided in you.	425	3.5	1.26	169	3.2	1.23	255	3.7	1.25	-4.0	422	0.001	-0.49	0.4	-0.73	-0.25
Rating the overall health and safety practices within your company.	456	4.3	0.90	186	4.1	0.92	269	4.4	0.86	-3.8	453	0.001	-0.32	0.4	-0.49	-0.16

Question	Overall			Female			Men			Independent Sample T-Test Results						
	N	M	SD	n	M	SD	n	M	SD	t	df	p	Mean Difference	Cohen's D	Lower Confidence Interval	Upper Confidence Interval
Importance to you of health and safety within the workplace.	453	4.6	0.66	184	4.6	0.58	268	4.6	0.71	-0.3	450	0.753	-0.02	0.0	-0.14	0.10
Confidence in discussing health and safety issues.	456	4.4	0.78	186	4.3	0.77	269	4.5	0.78	-3.0	453	0.003	-0.22	0.3	-0.36	-0.07

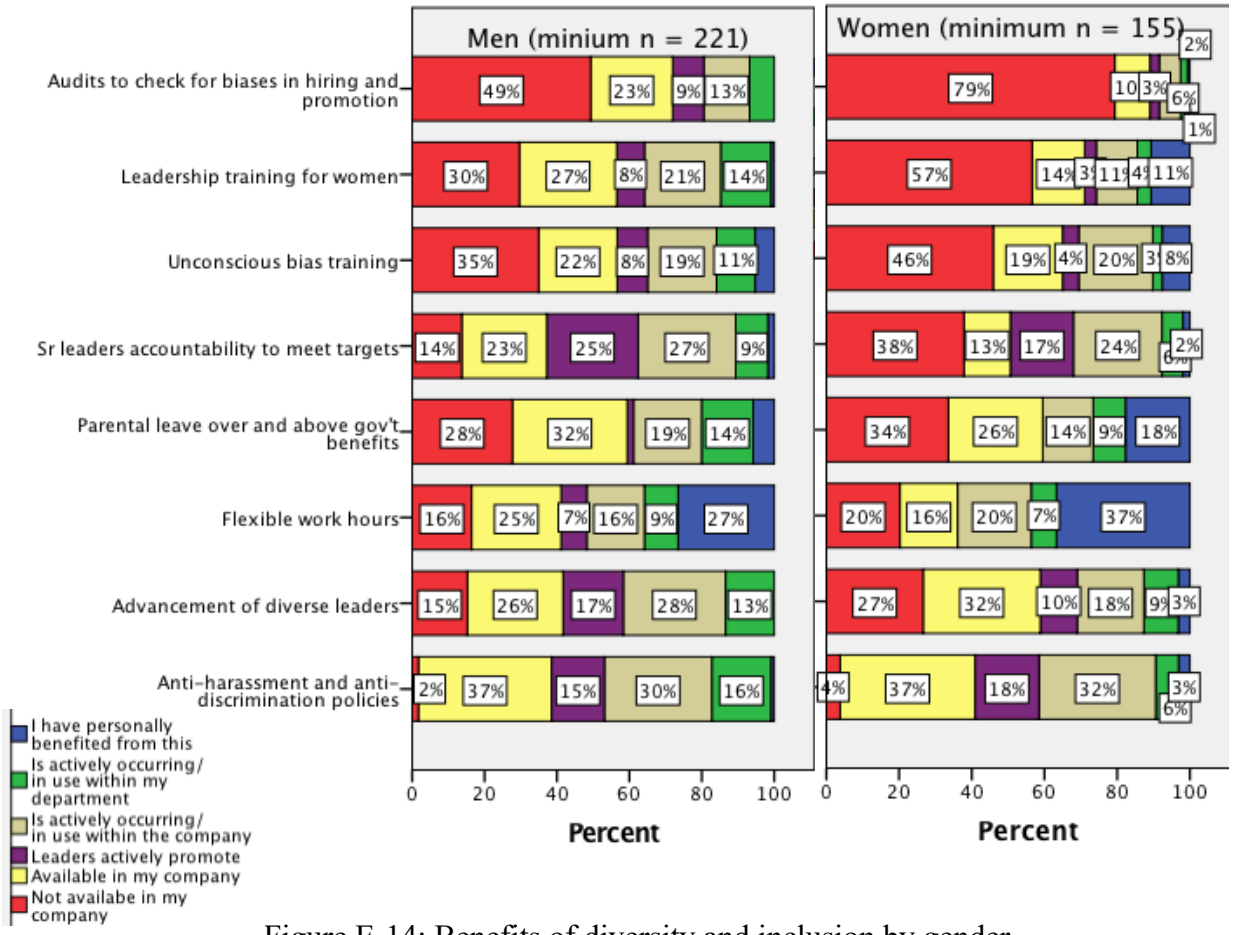

Figure E-14: Benefits of diversity and inclusion by gender

Table E-6: Chi-squared test gender and benefits of diversity and inclusion

		Chi-Squared Test of Independence (Gender)				
Question	N	X^2	df	Squared Cramer's V	p	H0 Rejected?
Anti-harassment and anti-discrimination policies	386					No
Advancement of diverse leaders	382	21.86	5	0.058	<0.001	Yes
Flexible work hours	385	20.21	5	0.052	<0.001	Yes
Parental leave over and above gov't benefits	383	20.74	5	0.054	<0.001	Yes
Sr leader's accountability to meet targets	383	32.26	5	0.085	<0.001	Yes
Unconscious bias training	384	14.37	5	0.038	0.013	Yes
Leadership training for women	383	59.35	5	0.155	<0.001	Yes
Audits to check for biases in hiring and promotion	377	37.81	5	0.100	<0.001	Yes

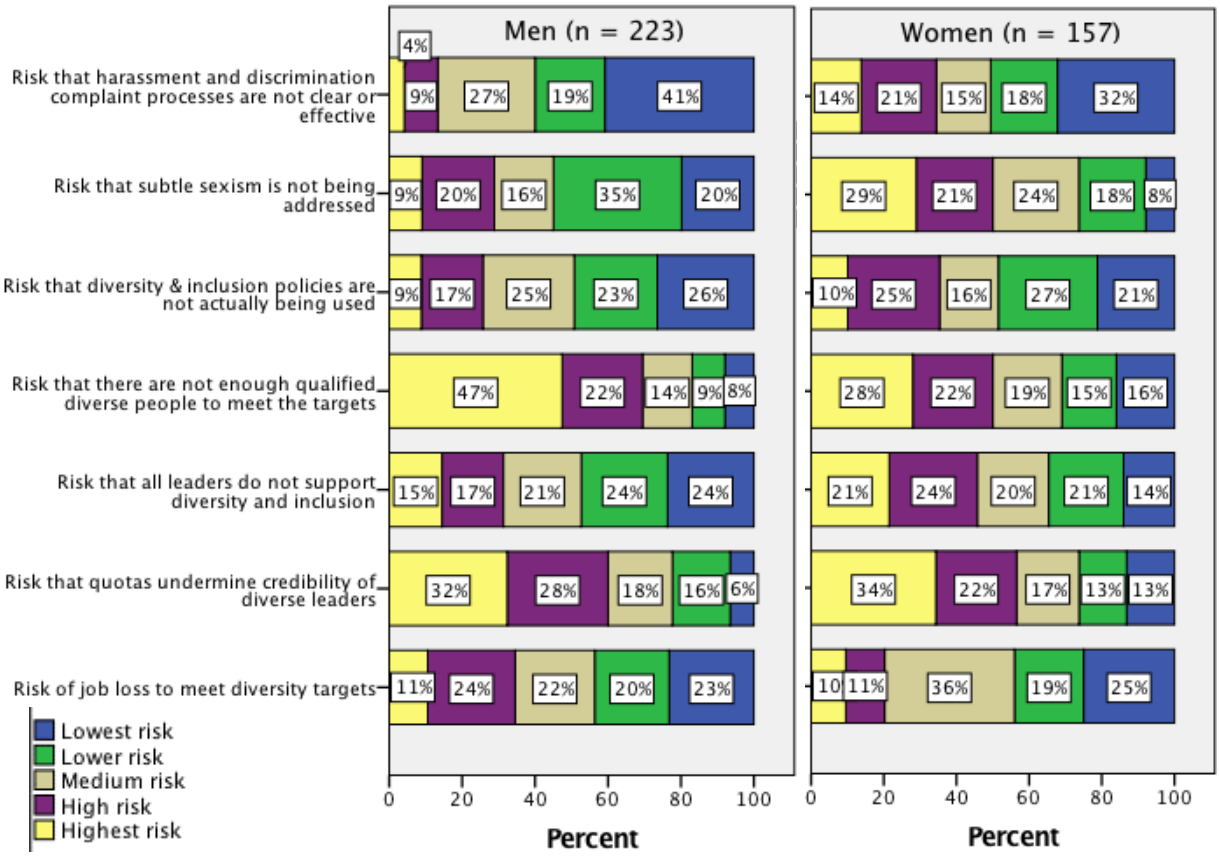

Figure E-15: Risks to or of diversity and inclusion by gender

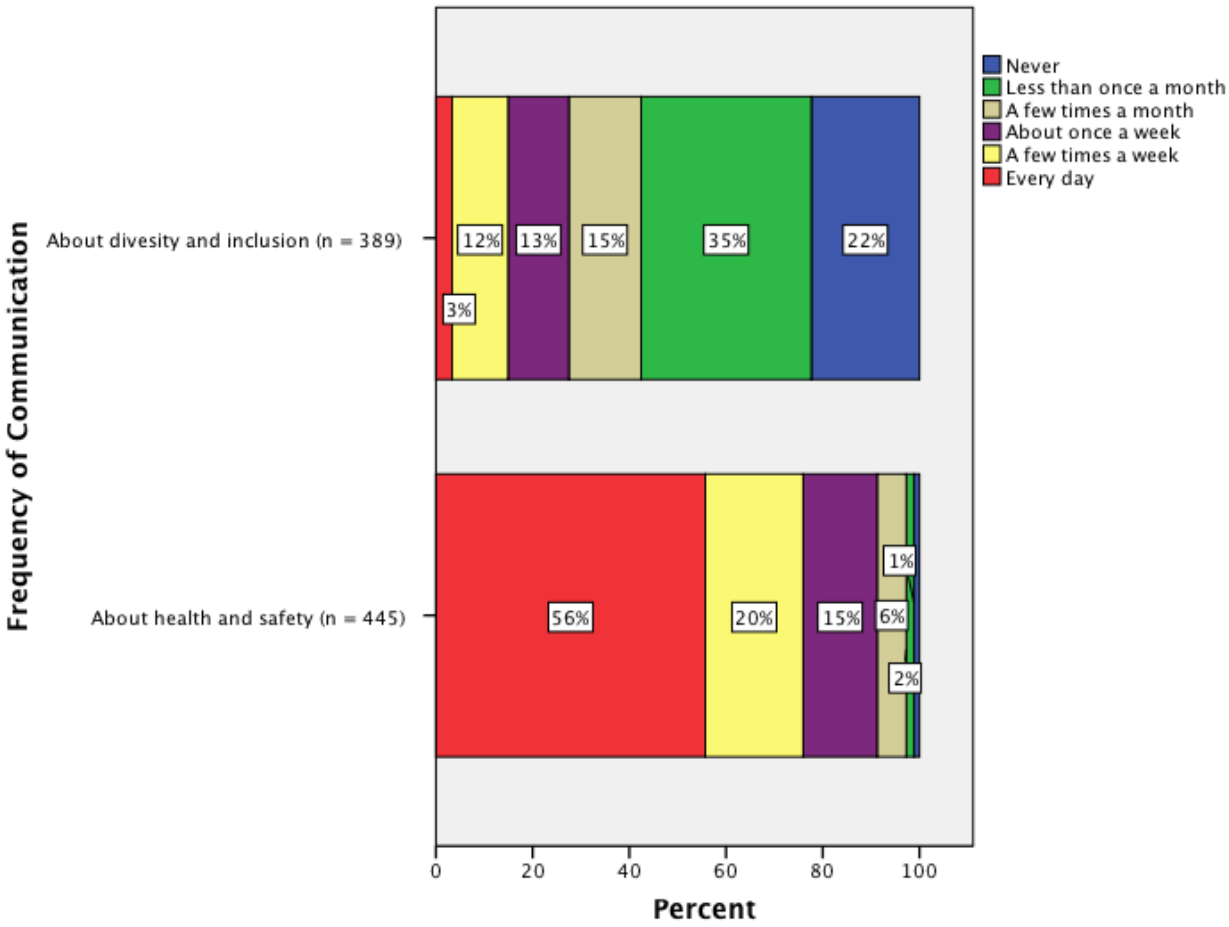

Figure E-16: Frequency of communication on diversity and inclusion and health and safety

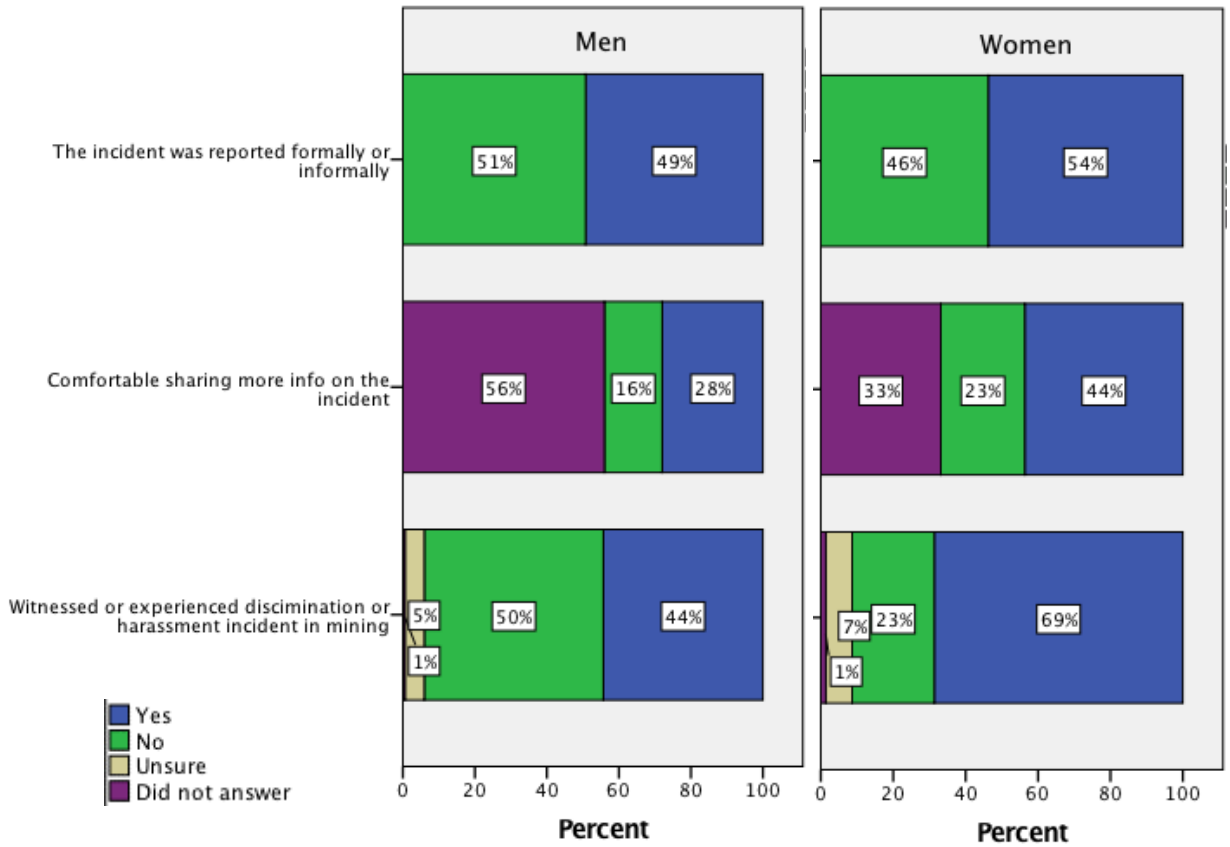

Figure E-17: Exposure to discrimination and harassment in mining by gender

Perceptions of the Canadian Mining Industry

Participant Consent

You are invited to participate in a research study entitled: Perceptions of Miners of the Canadian Mining Industry

Researcher: Jocelyn Peltier-Huntley, P. Eng., Graduate Student, Interdisciplinary Studies, University of Saskatchewan, jop803@mail.usask.ca

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Purpose and Objective of the Research:
The Canadian mining industry is projecting a labour shortage in many critical roles. Many mining companies have recently embarked on journeys to increase gender diversity and inclusion within their organizations in order to attract the next generation of miners. Given the need and desire to shift the industry's image, this proposed research will fill a gap in the literature on the perceptions of Canadian mining employees on the industry.

Procedures:
If you are currently or have previously worked in the Canadian mining industry you are invited to complete this anonymous survey. This survey will allow for anonymous feedback which will help to shape a practical training tool intended to increase individual's awareness and educated them on how their behaviors can impact gender diversity and inclusion in their organization.

Potential Risks:
Participants may re-live emotions while considering their responses to the survey questions. If you require additional emotional support due to re-telling your experiences, please call your company's family support hotline, a local crisis centre listed at https://suicideprevention.ca/need-help/, or the First Nations and Inuit Hope for Wellness Help Line 1-855-242-3310.

Potential Benefits:
Participants who complete this survey may become more aware of how their perceptions and behaviors can improve the well-being and work environment for themselves and their fellow co-workers.

Confidentiality:
Responses and response data will be collected anonymously so that confidentiality may be maintained. Resulting data will be combined so as to prevent identification of any individual person's responses.

Right to Withdraw:

Your participation is voluntary, and you may withdraw from the research project for any reason, at any time without explanation or penalty of any sort. You do not need to answer all survey questions, andshould you be unwilling to answer any of the mandatory questions, you may exit the survey and withdraw at any time. Your right to withdraw data from the study will apply until the survey has been complete. After this, it is may not be possible to identify your responses and it may not be possible to withdraw your data.

Follow up, Questions or Concerns:

To obtain results from the study and for any questions or concerns, please contact Jocelyn Peltier-Huntley. Contact information will be shown again following completion of the survey.

This research project has been approved on ethical grounds by the University of Saskatchewan Research Ethics Board. Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office ethics.office@usask.ca (306) 966-2975. Out of town participants may call toll free (888) 966-2975.

By completing and submitting the questionnaire, **YOUR FREE AND INFORMED CONSENT IS IMPLIED** and indicates that you understand the above conditions of participation in this study.

Working in Canadian Mining

1. Are you currently working in the Canadian mining industry?

- ◯ Yes, I am currently working directly for a mining or exploration company.
- ◯ Yes, I am currently working for a mining consulting firm or supplier.
- ◯ No, but I have worked for a mining or exploration company, consulting firm, or supplier in the past.
- ◯ No, I have not worked in the Canadian mining industry.

Demographics Information For Current Mining Employees

We would like to know a little bit about you.

2. What is your age?

- ◯ 18 to 24
- ◯ 25 to 34
- ◯ 35 to 44
- ◯ 45 to 54
- ◯ 55 to 64
- ◯ 65 to 74
- ◯ 75 or older

3. What is your gender?

- ◯ Female
- ◯ Male
- ◯ Other (specify)

4. What is the highest level of school you have completed or the highest degree you have received?

- ◯ Less than high school diploma
- ◯ High school diploma or equivalent (e.g., GED)
- ◯ Some post-secondary but no degree or diploma
- ◯ Post-secondary diploma
- ◯ CEGEP
- ◯ Bachelor degree
- ◯ Graduate degree (MA, MEd., MSc., PhD)

5. What is your profession?

- ◯ Engineer, Geologist, Scientist
- ◯ Human Resources
- ◯ Accounting
- ◯ Safety
- ◯ Trades
- ◯ Technologist or Technician
- ◯ Other (please specify)

6. What company do you work for in the mining industry? Please keep this company in mind when answering the survey.

7. In what province do you work?

8. Which of the following best describes your current role level in the mining industry?

- ◯ Non-supervisory Role, includes Specialist
- ◯ Front Line Supervisor (Supervise at least one person)
- ◯ Superintendent
- ◯ Manager
- ◯ Senior Management
- ◯ Executive/ Director
- ◯ Other (please specify)

9. About how many years of overall work experience do you have?

- ◯ Less than 1 year
- ◯ At least 1 year but less than 3 years
- ◯ At least 3 years but less than 5 years
- ◯ At least 5 years but less than 10 years
- ◯ At least 10 years but less than 15 years
- ◯ At least 15 years but less than 20 years
- ◯ At least 20 years but less than 25 years
- ◯ More than 25 years

10. About how many years of overall work experience do you have in the mining industry?

- ◯ Less than 1 year
- ◯ At least 1 year but less than 3 years
- ◯ At least 3 years but less than 5 years
- ◯ At least 5 years but less than 10 years
- ◯ At least 10 years but less than 15 years
- ◯ At least 15 years but less than 20 years
- ◯ At least 20 years but less than 25 years
- ◯ More than 25 years

11. Does your organization have a strategy or target related to diversity and inclusion?

- ◯ Yes
- ◯ No
- ◯ Unsure

Demographics & Perceptions For People With Mining Experience

We would like to know a little bit about you and your perceptions of gender diversity and inclusion in the mining industry. Diversity strategies or initiatives in the mining industry are often related to increasing representation of certain underrepresented groups such as women or Indigenous peoples. For example: the Canadian mining industry currently employs only 17% women, despite women making up half of the population and nearly half of the Canadian workforce. Inclusion is often paired with diversity and is related to how integrated and welcomed underrepresented groups are in the workplace.

12. What is your age?

- ◯ 18 to 24
- ◯ 25 to 34
- ◯ 35 to 44
- ◯ 45 to 54
- ◯ 55 to 64
- ◯ 65 to 74
- ◯ 75 or older

13. What is your gender?

- ◯ Female
- ◯ Male
- ◯ Other (specify)

14. What is the highest level of school you have completed or the highest degree you have received?

- ◯ Less than high school diploma
- ◯ High school diploma or equivalent (e.g., GED)
- ◯ Some post-secondary but no degree or diploma
- ◯ Post-secondary diploma
- ◯ CEGEP
- ◯ Bachelor degree
- ◯ Graduate degree (MA, MEd., MSc., PhD)

15. What was your profession in the mining industry?

- ◯ Engineer, Geologist, Scientist
- ◯ Human Resources
- ◯ Accounting
- ◯ Safety
- ◯ Trades
- ◯ Technologist or Technician
- ◯ Other (please specify)

16. What was the last company you worked for in the mining industry? Please keep this company in mind when answering the survey.

17. In what province did you work in your last mining role?

18. Which of the following best describes your last role level in the mining industry?

- ◯ Non-supervisory Role, includes Specialist
- ◯ Front Line Supervisor (Supervise at least one person)
- ◯ Superintendent
- ◯ Manager
- ◯ Senior Management
- ◯ Executive/ Director
- ◯ Other (please specify)

19. About how many years of overall work experience do you have?

- ◯ Less than 1 year
- ◯ At least 1 year but less than 3 years
- ◯ At least 3 years but less than 5 years
- ◯ At least 5 years but less than 10 years
- ◯ At least 10 years but less than 15 years
- ◯ At least 15 years but less than 20 years
- ◯ At least 20 years but less than 25 years
- ◯ More than 25 years

20. About how many years of overall work experience do you have in the mining industry?

- ◯ Less than 1 year
- ◯ At least 1 year but less than 3 years
- ◯ At least 3 years but less than 5 years
- ◯ At least 5 years but less than 10 years
- ◯ At least 10 years but less than 15 years
- ◯ At least 15 years but less than 20 years
- ◯ At least 20 years but less than 25 years
- ◯ More than 25 years

21. What industry did you switch to after leaving the mining industry?

22. What role did you switch to after leaving the mining industry?

23. Why did you leave the mining industry?

24. Would you consider working in the mining industry in the future?

- ◯ Yes
- ◯ No
- ◯ Unsure

Please explain what would entice you to come back to mining.

25. How important is gender diversity and inclusion in the mining industry to you?

- ◯ Extremely important
- ◯ Very important
- ◯ Somewhat important
- ◯ Not so important
- ◯ Not at all important

26. To what extent do you support improving the culture within the mining industry to welcome gender diversity and inclusion?

- ◯ Strongly support
- ◯ Support
- ◯ Neither support nor not support
- ◯ Support
- ◯ Strongly support

27. From your experience in the mining industry do you believe the mental health or well-being of an individual is as important as safety or physical well-being in your workplace?

- ◯ Mental well-being is more important
- ◯ Mental well-being is slightly more important than physical well-being
- ◯ Mental and physical well-being are equally important
- ◯ Physical well-being is slightly more important than mental well-being
- ◯ Physical well-being is more important

28. Did you ever witness or experience discrimination or harassment in the mining industry?

- ◯ Yes
- ◯ No
- ◯ Unsure

Mining Company Strategies for Diversity and Inclusion

We want to find out more about your company's strategy or initiatives towards diversity and inclusion. These strategies or initiatives in mining are often related to increasing representation of certain underrepresented groups such as women or Indigenous peoples. For example: the Canadian mining industry currently employs only 17% women, despite women making up half of the population and nearly half of the Canadian workforce. Inclusion is often paired with diversity and is related to how integrated and welcomed underrepresented groups are in the workplace.

29. Please confirm the name of the mining industry company where you currently work. This should be the organization which you are keeping in mind when answering the following questions around diversity and inclusion initiatives.

30. Are the diversity and inclusion initiatives in your organization related to gender, sexual orientation, and/or ethnicity? Please check all that apply.

- [ ] Gender (example: increasing number of women in the organization)
- [ ] Sexual orientation (example: creating culture welcoming of LGBTQ)
- [ ] Ethnicity (example: increasing number of Indigenous peoples in the organization)
- [ ] Unsure

31. Based on your understanding, what are the goals of diversity and inclusion initiatives within your company? Please check all that apply.

- [ ] Overall diversity increases across the company
- [ ] Targeted diversity increases at board level
- [ ] Targeted diversity increases at senior management level
- [ ] Targeted diversity increases in management
- [ ] Targeted diversity increases in technical roles
- [ ] Targeted diversity increases in trades or operations
- [ ] Other (please specify)

32. How are your organization's initiatives on diversity and inclusion communicated to you? Please check all that apply.

- [ ] Email
- [ ] Conversation with supervisor
- [ ] Meeting with management
- [ ] Training
- [ ] Newsletter
- [ ] Internal website
- [ ] External website
- [ ] Other (please specify)

33. How do you rate the potential benefits you see resulting from your organization's initiatives towards diversity and inclusion?

	Available in my company	Leaders actively promote	Is actively occurring/ in use within the company	Is actively occurring/ in use within my department	I have personally benefited from this	N/A
Anti-harassment and anti-discrimination policies	○	○	○	○	○	○
Greater opportunities for diverse leaders to advance	○	○	○	○	○	○
Flexible work hours	○	○	○	○	○	○
Parental leave benefits over and above government benefits	○	○	○	○	○	○
Senior leadership is driving accountability towards meeting targets	○	○	○	○	○	○
Unconscious bias awareness training	○	○	○	○	○	○
Leadership training for women	○	○	○	○	○	○
Audits to check for biases in hiring and promoting	○	○	○	○	○	○

Other (please specify)

34. What are the top 5 risks you see as a result of your organizations's initiatives towards diversity and inclusion? #1 is the top or highest risk.

	#1	#2	#3	#4	#5
Current employees feel threatened that they might lose their jobs to meet diversity targets	○	○	○	○	○
Quotas undermine credibility of diverse leaders	○	○	○	○	○
All leaders do not support diversity and inclusion	○	○	○	○	○
There are not enough qualified diverse people to meet the targets	○	○	○	○	○
Policies designed to improve diversity and inclusion, such as flexible work policies, are not actually being used	○	○	○	○	○
Subtle sexism is not being addressed	○	○	○	○	○
Harassment and discrimination complaint processes are not clear or effective	○	○	○	○	○

Other (please specify)

35. What opportunities or support have you personally experienced as a result of your organization's initiatives towards diversity and inclusion?

36. Have you experienced or observed barriers, discrimination, or exclusion within your organization as a result of your organizations's initiatives towards diversity and inclusion?

- ○ Yes
- ○ No
- ○ If you answered yes, please explain.

37. How would you rate the overall diversity and inclusion practices within your company?

- ◯ Excellent
- ◯ Very good
- ◯ Good
- ◯ Fair
- ◯ Poor

38. In your opinion, will the initiatives your company is pursuing have a lasting and positive impact on diversity and inclusion within your organization?

- ◯ Very likely
- ◯ Likely
- ◯ Neither likely nor unlikely
- ◯ Unlikely
- ◯ Very unlikely

Mining Employees' Perceptions of Health and Safety

Next we want to find out more about your perceptions on your company's initiatives towards health and safety. Results from this part of the survey will aid in developing diversity and inclusion awareness training material.

39. How would you rate the overall health and safety practices within your workplace?

- ◯ Excellent
- ◯ Very good
- ◯ Good
- ◯ Fair
- ◯ Poor

40. How confident are you discussing health and safety issues in your workplace?

- ◯ Extremely confident
- ◯ Very confident
- ◯ Somewhat confident
- ◯ Not so confident
- ◯ Not at all confident

41. Do you know the process for reporting a health and safety issue in your workplace?

- ◯ Yes
- ◯ No
- ◯ Unsure

42. How often do you discuss health and safety in your workplace?

- ◯ Every day
- ◯ A few times a week
- ◯ About once a week
- ◯ A few times a month
- ◯ Once a month
- ◯ Less than once a month
- ◯ Never

43. Have you reported a health and safety issue in your workplace?

- ◯ Yes
- ◯ No

44. How important to you is the issue of health and safety within the workplace?

- ◯ Extremely important
- ◯ Very important
- ◯ Somewhat important
- ◯ Not so important
- ◯ Not at all important

45. Do you believe the mental health or well-being of an individual is as important as safety or physical well-being in your workplace?

- ◯ Mental well-being is more important
- ◯ Mental well-being is slightly more important than physical well-being
- ◯ Mental and physical well-being are equally important
- ◯ Physical well-being is slightly more important than mental well-being
- ◯ Physical well-being is more important

Mining Employees' Perceptions on Diversity and Inclusion

We want to find out more about your perceptions on diversity and inclusion. Diversity discussion in mining is often related to increasing representation of a certain underrepresented groups such as women or Indigenous peoples. For example: the Canadian mining industry currently employs only 17% women, despite women making up half of the population and nearly half of the Canadian workforce. Inclusion is often paired with diversity and is related to how integrated and welcomed underrepresented groups are in the workplace.

46. How important is gender diversity and inclusion in your workplace to you?

- ◯ Extremely important
- ◯ Very important
- ◯ Somewhat important
- ◯ Not so important
- ◯ Not at all important

47. To what extent do you support improving gender diversity and inclusion within your workplace?

- ◯ Strongly support
- ◯ Support
- ◯ Neutral, neither support nor not support
- ◯ Somewhat Support
- ◯ Not support

48. Regardless of whether your organization has one – what is your view of workplace gender diversity and inclusion programs?

- ◯ Extremely important
- ◯ Very important
- ◯ Somewhat important
- ◯ Not so important
- ◯ Not at all important
- ◯ Unsure

49. How important is gender diversity and inclusion to your direct supervisor?

- Extremely important
- Very important
- Somewhat important
- Not so important
- Not at all important
- Unsure

50. How important is gender diversity and inclusion to senior management in your organization?

- Extremely important
- Very important
- Somewhat important
- Not so important
- Not at all important
- Unsure

51. How confident are you discussing gender diversity and inclusion issues, such as discrimination and harassment, in your workplace?

- Extremely confident
- Very confident
- Somewhat confident
- Not so confident
- Not at all confident

52. How often do you discuss gender diversity and inclusion in your workplace?

- Every day
- A few times a week
- About once a week
- A few times a month
- Once a month
- Less than once a month
- Never

53. What is the likelihood that you would informally raise a discrimination or harassment concern in your workplace?

	Very likely	Likely	Neither likely nor unlikely	Unlikely	Very unlikely
If you were the victim	☐	☐	☐	☐	☐
If you witnessed the incident	☐	☐	☐	☐	☐
If a co-worker confided in you about their incident(s)	☐	☐	☐	☐	☐

54. Do you know the process for formally reporting a discrimination or harassment concern in your workplace?

- ◯ Yes
- ◯ No
- ◯ Unsure

55. What is the likelihood that you would formally raise a discrimination or harassment concern in your workplace?

	Very likely	Likely	Neither likely nor unlikely	Unlikely	Very unlikely
If you were the victim	☐	☐	☐	☐	☐
If you witnessed the incident	☐	☐	☐	☐	☐
If a co-worker confided in you about their incident(s)	☐	☐	☐	☐	☐

56. Have you ever witnessed or experienced discrimination or harassment in the mining industry?

- ◯ Yes
- ◯ No
- ◯ Unsure

Discrimination or Harassment Incident in Mining

Please tell us a bit more about the incident that you witnessed or experienced in the mining industry.

57. Do you feel comfortable providing more details about the harassment or discrimination incident that you witnessed or experienced?

- ◯ Yes
- ◯ No

58. About how long ago did this incident occur?

- ◯ Less than 1 year
- ◯ At least 1 year but less than 3 years
- ◯ At least 3 years but less than 5 years
- ◯ More than 5 years ago

59. Was the discrimination or harassment issue(s) in your workplace reported, either formally or informally?

- ◯ Yes
- ◯ No

60. Please describe the incident that you witnessed or experienced and how it was dealt with.

Thank you for completing this survey.

Thank you for taking the time to respond to our survey. The results of this study will be structured into a toolkit that will be used to educate and empower those working in the mining industry on what behaviours they can change in order to support greater gender diversity and inclusion in their workplaces. Results of this research will also be documented in a thesis required for the completion of an interdisciplinary Master of Science program at the University of Saskatchewan.

For more information please contact:
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