EXPERIENCES OF WOMEN IN THE PLATINUM MINING INDUSTRY

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REMARKS

The reader is reminded of the following:

- The references and the editorial style prescribed by the *Publication Manual (5 th edition)* of the American Psychological Association (APA) were followed in this mini-dissertation. This practice is in line with the policy of the Programme in Industrial Psychology of the North-West University (Potchefstroom Campus) use APA style in all scientific documents as from January 1999.

- The mini-dissertation is submitted in the form of one research article. The name of the promoter appears on the research article as it will be submitted for publication in a national journal.

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SUMMARY

Topic: Experiences of women in the platinum mining industry

Keywords: South African Mining, risk work, legislation, discrimination, maternity leave, sexual harassment, health of women

The South African mining industry has been a male dominated environment for a very long time. With changes in government policy and legislation, discriminatory laws forbidding women to work underground have been repealed and the mining industry have since been trying to accommodate women. Unfortunately there is an imbalance to this general trend of increase shown by the consistently low numbers of female employees within the mining industry. It was far-fetched for management to perceive that women can ever play a role in the underground mining industry. Unfortunately the perceptions of management is having an enormous impact on the attitudes of the rest of the employees in this industry. This leads to discrimination in the mining industry that will make it difficult for the women seeking financial stability. The whole mining industry should learn to adapt to this idea of women in mining. Employing women in the mine is a challenge of the mindset of viewing mining as a men's world.

The objective of this research was to determine the experience of women in the platinum mining industry in South Africa as well as the impact that women entering the mining industry could have on the mines in terms of the working conditions, harassment, physiological aspects, ergonomics, physical strength, discrimination etc.

The research method for this article consists of a brief literature review and an empirical study. A qualitative design has been used on an availability sample ($N = 14$) females in the platinum mining industry. The qualitative research makes it possible to determine the subjective experience of women working in the platinum mining industry. The literature focused on previous research on the experience of women entering the mining industry as an employee.

The outcome of this research was that the male worker attitude and discrimination have an enormous impact on women that are entering the mining industry. One of the more difficult hurdles to overcome is the harassment that women need to deal with. The women are also facing a huge challenge in terms of their physical strength not being adequate in order to perform up to a minimum of eight hours per day in the harsh working conditions including the ergonomics of the mining industry. Most of the women are entering the mining industry for financial reasons in order to survive in the South African Economic environment of today. After a hard day performing these physical activities they need to face their responsibilities at home in order to manage a work-home life balance. Management need to start seeking solutions to make the mining industry a more women free environment for example focussing on facilities for women. The fact that women were appointed into the mining environment covering traditionally male sectors, also speaks to a commitment to changing the face of the mining industry.

Recommendations for future research were made.

OPSOMMING

Onderwerp: Ervaring van vrouens in die platinum mynbou industrie.

Sleutelwoorde: Suid-Afrikaanse mynwese, risiko werk, wetgewing, diskriminasie, kraamverlof, seksuele teistering, gesondheid van vroue

Die Suid-Afrikaanse mynindustrie is al te lank deur mans gedomineer. Met die veranderinge in die regering se beleid en wette, is diskriminasiewette wat die vrou verhoed om ondergrond te werk laat vaar. Ongelukkig is daar 'n wanbalans bewys deur die konstante lae syfers van vroulike werknemers in die mynindustrie. Dit was onmoontlik vir bestuur om te dink dat 'n vrou ooit 'n rol in die ondergrondse myne kan speel – bestuur speel 'n groot rol in die produksie proses waar die res van die werknemers deelneem en dit is moeilik om die idee van vroue in die mynindustrie te aanvaar. Ongelukkig het die bestuur se persepsies 'n enorme impak op die houding van die res van die werknemers in die industrie. Dit kan lei tot diskriminasie in die mynindustrie wat dit moeilik maak vir die vroue wat streef na finansiële stabiliteit. Die hele mynindustrie moet leer om aan te pas rakende die idee van vrouens in die myn. Indiensneming van vrouens in die myn is 'n groot uitdaging weens die illusie van die mynindustrie as 'n manswêreld.

Die doel van die navorsing was om die ervaring van vrouens in die Suid-Afrikaanse platinum mynindustrie te bepaal sowel as die impak wat vrouens op die myn het deur rolle in die platinum mynindustrie te begin vul.

Die navorsingsmetode vir die artikel beskik oor verskeidenheid literatuuroorsig en 'n empiriese studie. 'n Kwalitatiewe ontwerp is gebruik deur gebruik te maak van 'n beskikbaarheidsteekproef van (N = 14) vrouens in die platinum mynindustrie. Die kwalitatiewe navorsing maak dit moontlik om die subjektiewe ervaring van vrouens wat in die platinum mynindustrie werk te bepaal. Die literatuur het gefokus op vorige navorsing rakende die ervaring van vrouens wat die mynindustrie as 'n werknemer binnegaan.

Die uitkoms van die navorsing is dat die houding van manlike werkers asook diskriminasie 'n enorme impak het op vrouens wat die mynindustrie binnegaan. Nog 'n moeilike hekkie wat oorkom moet word is die teistering waarmee vrouens moet deel. Vrouens staar ook 'n groot uitdaging in terme van hul fisiese krag wat nie genoeg is om 'n minimum van agt ure in die haaglike werksomstandighede (insluitend die ergonomika van die mynindustrie) uit te oefen nie. Die meerderheid van die vrouens betree die mynindustrie vir finansiële redes om sodoende te kan oorleef in die Suid-Afrikaanse ekonomiese omgewing van vandag. Na 'n harde dag waar fisiese aktiwiteite uitgeoefen word, moet die vroue verantwoording doen by die huis om sodoende 'n werk-huis lewensbalans te handhaaf. Bestuur sal moet begin om oplossings te identifiseer om sodoende die mynindustrie 'n meer vrou vrye omgewing te maak byvoorbeeld om te fokus op fasiliteite wat dit gemakliker maak vir vrouens. Die feit dat vrouens in die mynindustrie in diens geneem is en manssektore gevul het, is 'n bewys van toegewydheid om die gesig van die mynindustrie te verander.

CHAPTER 1

INTRODUCTION

This mini-dissertation focuses on the experience of women working in the platinum mining industry in South Africa.

Chapter 1 contains the problem statement, research objectives and research methodology employed. In addition, the division of chapters in this mini-dissertation is presented.

1.1 PROBLEM STATEMENT

For many decades, the mining industry has been perceived as a male dominated environment, i.e. mining is men's work (Robinson, 1998). The hard labour associated with mining along with the heavy machinery characteristics symbolises male rather than female forms of endeavour (McCulloch, 2003). With the amounts of physical strength required in the mining environment, it feels far-fetched even for one to perceive that women can play an active role in mining, despite them being involved in the industry in South Africa in the pro-apartheid era (Singer, 2002).

In the annual report of 1954 of the Department of Mines and Industries, it was indicated that 274 women were at that stage employed in the South African mining environment (McCulloch, 2003), and in 1963 almost 594 women were employed in different mineral mines. The invisibility of certain kinds of work particularly performed by women in the mining industry, has been a preoccupation of historians for more than three decades (McCulloch, 2003). However, during apartheid, women also felt the sting of discrimination (Singer, 2002), by being barred, for instance, from jobs in the nation's vast underground mining industries.

Changes in legislation in South Africa along with a new constitution adopted in 1997, swept away apartheid and with it many restrictions on South African women (Singer, 2002). With

changes in the Minerals Act (South Africa, 1991), Mine Health and Safety Act (South Africa, 1996), Employment Equity Act (South Africa, 1998) and the Labour Relations Act (South Africa, 1995), the re-entrance of women in the mining environment were stipulated, along with enormous pressure on the mining industry to ensure the safety of women. As a result of the mentioned legislations, mining organisations have to ensure that they comply with their equity targets, by employing women in dominantly male positions. They are also obliged to make a clear diagnosis of the working environment and conditions within the mining industry.

Underground mining presents a very unique working environment. Working conditions can sometimes be difficult and hazardous (Anon, 2000) and the work is gruelling (Singer, 2002). Mine workers spend most of their day performing physical tasks. They work with explosives, placing pencil sticks in stopes, test geological formations operate load-haul-dump (LHD) machines, scraper winches and heavy duty-machines and maintain mining machinery in conventional mines. They may also be required to install air and water pipes, scale loose rocks and construct timber supports and cribbing (Anon, 2000). The equipment and techniques used are varied and complex, with many areas requiring significant safety and skills training.

Workers may also be required to work in dark and damp conditions with varying temperatures (Anon, 2000; Singer, 2002), sometimes deep underground. They may work alone, in small areas, and with little supervision or communication. The unavailability of physical facilities makes these conditions even harsher for women. The toilet is most of the time a shed equipped with a bucket (Singer, 2002), and the harrowing trip in a rickety elevator along with riding chairlifts, takes sometimes more than five minutes. This along with the high degree of gender-related occupational segregation indicates that the mining industry provides overall a relatively inhospitable climate for women (Graham & Hotchkiss, 2003).

Despite the harsh conditions, can the exposure to different gasses result in females having teratogenic and other harmful consequences, especially during her reproductive age and

pregnancy (Forastieri, 2000). Wide-ranging studies conducted in the early thirties in the Soviet-Union, indicated that underground mining can have harmful effects of even short-term employment in arduous tasks and heavy industries on women's reproductive functions (Ilic, 1996). Health hazards of women mine workers have traditionally been underestimated due to the fact that occupational safety and health standards and exposure limits to hazardous substances are based on male populations and laboratory tests (Forastieri, 2000). As a result this creates a risk for the organisation in employing females.

With more than one hundred miners killed every year in South Africa (McGwin, Valent, Taylor, Howard, Davis, Brissie, & Rue III, 2002), the mining industry has proven to have the highest rates of fatal occupational injuries. The wear of protective clothing is one way to enhance safety, along with different safety training sessions. The protective equipment and tools used in the mining industry is however, designed based on the male population (Forastieri, 2000). As a result women may not be properly equipped for their own protection, enhancing the proneness of accidents.

Still, despite the danger of working in a mining environment, most women employees are viewed as a dedicated group (Wilkinson, 1985). It appears that the presence of women has the potential to make the work environment safer. Singer (2002) indicated that women seem to be more careful. It also appears that women do not hesitate to speak up when conditions are unsafe, while men in contrast often do not report violations for fear of being thought weak or cowardly (Wilkinson, 1985).

Also, with 30% South African adults being jobless, mining, although dangerous and despite the harsh conditions, is often the best job available (Singer, 2002), especially for women. Most of the women working underground in the mining industry are usually single mothers with little schooling, earning two thirds more than they earned as maids or farm labourers (Singer, 2002). This alone, makes the mining industry attractive to women.

Female miners are not given any privileges. They have to pass the same rigorous employment test that men have to pass (Singer, 2002), especially if they work underground.

This test requires them to climb up and down a set of steps for half an hour in a room heated to an adequate temperature, equal to the temperature underground. Those who keep moving, don't faint and pass a physical examination, will qualify for a position (Singer, 2002).

With mining seen as so 'naturally' masculine, it is clear from the above discussion that few people consider it's effect on women (Robinson, 1998). While women are entering occupations previously closed to them, the labour force is still highly segregated on the basis of gender (Forastieri, 2000). Requirements of rapid economic expansion placed unprecedented demands on the labour force which necessitated the employment of women in a whole range of tasks, many of which had previously been reserved for men (Ilic, 1996). Debates focused on the physical capabilities of female labour and the fact that while the enactment of protective labour laws was perceived to be in women's interests, such legislative practice discriminated against women because it prevented them from working in jobs which they themselves wanted to do (Ilic, 1996).

There are certain work tasks that females generally find more difficult to complete, due to physiological differences to males, like hauling as much rock as their male co-workers (Singer, 2002). Of course this depends on the individual's strength and fitness. Where women use to be employed in either administrative or menial positions (like sweepers, cleaners or attendants), these days they are mining supervisors, geologists, underground locomotive drivers, etc. (Singer, 2002).

Considering all the above mentioned, it can be gleaned that many different and often opposing views and opinions exist regarding women entering the world of mining, and specifically taking up the high-risk occupation of underground mining. One opinion glaringly absent from those discussed in the literature is that of the women actually being employed in the mining industry, and specifically in the platinum mining industry. A first research problem therefore will be that little information exists on the experience of women working in the platinum mining industry. A second research problem is to determine the impact that women entering the workforce have on the mine according to literature and to make recommendations on possible solutions.

This research will make the following contributions to the subject Industrial Psychology and the practice thereof in mining organisations:

- It will result in gauging the experience of women working in a male-dominated environment, i.e. the mining industry.
- It will results in a clearer understanding of the unique obstacles females entering the mining workforce encounter – information which could be used successfully by mining organisations, policy-makers and underground female miners themselves.
- Recommendations could be made on possible solutions regarding problems surrounding women working in the mining industry.

1.2 RESEARCH OBJECTIVES

The research objectives are divided into a general objective and specific objectives.

1.2.1 General Objective

With reference to the above formulation of the problem, the general objective of this research is to determine the experience of women working in the platinum mining industry in South Africa.

1.2.2 Specific Objectives

The specific research objectives are as follows:

- To gauge women's experience of working in the platinum mining industry
- To determine the impact that women entering the mining industry could have on the mine according to the literature.
- To make recommendations on possible solutions regarding problems surrounding women working in the mining industry

1.3 RESEARCH METHOD

The research method consists of a literature study and is followed by an empirical investigation. Because separate chapters were not targeted for a literature review, this paragraph focuses on aspects relevant to the empirical studies that are conducted. The reader should note that a literature study is conducted for the purposes of an article.

1.3.1 Literature review

The literature will focus on previous research on the experience of women entering the mining industry as an employee. An indication of the impact of female mine workers on the mining industry, and the response of the mining industry to the phenomenon, will also be reviewed in the literature.

1.3.2 Research design

For the purpose of this research, a qualitative design was used. Qualitative research makes it possible to determine the subjective experience of women working in the platinum mining industry (McMurty, 1988). Despite the negativity surrounding the use of qualitative research, Woods and Catanzaro (1988) indicated that the validity of qualitative research is one of it's biggest advantages.

1.3.3 Study population

The study population consisted of an availability sample of women working in a Platinum Mining organisation ($N = 14$). The sample consisted mainly of black females (64,29%) aged between 31 and 35 years (42,86%), with a Grade 12 certificate (35,71%) in a semi-skilled position (57,14%). A total of 35,71% females had at least two children.

1.3.4 Data collection

An interview based on the phenomenological method, was used as a method for gathering the data (Moustakas, 1994). The researcher had put all the participants at ease by ensuring that they all clearly understood what were expected from them. The interviews were non-directive for example: "How do you experience the mining industry?" The questions were asked consequently and were well explained to everyone.

The interviews took place in a venue with enough ventilation, lightning and comfortable chairs. A tape recorder was used with permission from the participants, to ensure that no information were omitted (Omery, 1983). The candidates were put at ease before the start of the interviews. The researcher introduced herself during the beginning of each interview and also explained the context of the interview. Non-directive dialogue techniques like attentive body language, reflection, clarification, minimal encouragement and silence were used to assist the participant to share her experience (Meulenberg-Buskens, 1994).

The tape record of the interview was verbatim transcribed by the researcher in order to analyse the information. Content analysis (Giorgi, 1985) were used to analyse and interpret the research data in a systematic, objective and quantative way. Content analysis consists of the following steps (Giorgi, 1985; Kerlinger, 1986):

- The first step is to universalise the context that needs to be analysed (for example all the verbal answers of the participants), to be defined and to be categorised.
- The second step is to determine the subunits of the analysis, namely words and themes. The researcher reads the responded notes in order to get the whole picture. Afterwards she reads through it again in order to determine the themes. The words which were used by the participant, is the smallest analysis that can be made. A subtheme is usually a sentence and is more difficult but also more useful to analyse. Subthemes can be combined in order to determine the themes. The analysis of the information goes on until repeated themes have been identified.
- The third step is to get rid of the unnecessary information and to determine the meaning

of the rest of the subunits by linking it to the whole picture.

- The fourth step consists of the conversion of the concrete language that's been used by the participants, to scientific language and concepts. The precise words of the participants are used in support. An integration and synthesis is then done based on received insights.

The amount of objects per category were counted and placed in order of preference. The trustworthiness of the content analysis is promoted by the coding that took place by the researcher and the independent psychologist with a thorough background based on facilitation. A literature-control has been done to investigate relevant research in order to determine the comparativeness and uniqueness of the current research (Krefting, 1991).

The researcher strives to promote the validity by spending enough time with every participant in order to establish a report. Social-desirable responses were minimised by making use of dialogue techniques. Rephrasing and repetition of questions have been used in order to gain credibility of information. The researcher made use of a diary to highlight the ideas and feelings of the respondents during the research process. These notes consist of information about the problems and frustrations that have been experienced (Krefting, 1991).

1.4 DIVISION OF CHAPTERS

The chapters are presented as follows in this mini-dissertation:

Chapter 1: Introduction
Chapter 2: The experience of women in the platinum mining industry
Chapter 3: Conclusions, limitations and recommendations

1.5 CHAPTER SUMMARY

Chapter 1 focused on the problem statement, objectives and research method in this study. This was followed by a division of the chapters that follow.

Chapter 2 will focus on the experience of women in the platinum mining industry in South Africa.

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CHAPTER 2

RESEARCH ARTICLE

THE EXPERIENCE OF WOMEN IN THE PLATINUM MINING INDUSTRY

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ABSTRACT

The South African mining industry has been for too long a male dominated environment. With changes in government policy and legislation, discriminatory laws forbidding women to work in the mining industry, underground and in the plants, have been repealed and the mining industry have since been trying to accommodate women. Interviews based on the phenomenological method were conducted with fourteen (N=14) women working in different sections and different positions in a platinum mining organisation to determine their experience working in the mining industry. The results indicate that male worker attitude, discrimination, harassment, ergonomics and the shortage of facilities had an enormous impact on women entering the mining industry. Women also need to manage work-life balance issues. Furthermore management should support and be committed to the transition of women in the mining industry.

OPSOMMING

Die Suid-Afrikaanse mynindustrie is al te lank deur mans gedomineer. Met veranderinge in die regering se beleid en wetgewing, is diskriminerende wetgewing wat vrouens verbied het om in die mynindustrie ondergrond en in die aanleg, te werk laat vaar en het die mynindustrie sedertien pogings aangewend om vrouens in die mynindustrie te akkommodeer. Onderhoude gebaseer op die fenomenologiese metode is met veertien (N=14) vrouens wat werksaam is in verskillende afdelings en verskillende poste in 'n platinum myn organisasie gevoer om hul belewing om in die mynindustrie werksaam te wees te bepaal. Die resultate het getoon dat die houding van manlike werkers, diskriminasie, teistering, ergonomika en die tekort aan fasiliteite 'n enorme impak op vrouens het wat die mynindustrie betree. Vrouens moet ook werk-lewe balans kwessies bestuur. Verder moet bestuur die transisie van vrouens in die mynindustrie ondersteun en toegewyd daartoe wees.

Modern mining has been a quintessentially masculine occupation (McCulloch, 2003) with its association with hard labour and heavy machinery characteristics. For many decades, this masculinity has been emphasised in the mining industry (Robinson, 1998), as the mining industry traditionally symbolised male rather than female forms of endeavour (McCulloch, 2003). With the amounts of physical strength required in the mining environment, it feels far-fetched even for one to perceive that women can play an active role in mining, despite them becoming more actively involved in the industry in South Africa in the pro-apartheid era (Singer, 2002).

Annual reports of the Department of Mines and Industries indicated that 274 women were employed in the South African mining environment in 1954 (McCulloch, 2003), and in 1963 almost 594 women were employed in different mineral mines. However, during apartheid, women also felt the sting of discrimination (Singer, 2002), by being barred, for instance, from jobs in the nation's vast underground mining industries. Changes in legislation in South Africa along with a new constitution adopted in 1997, swept away apartheid and with it many restrictions on South African women (Singer, 2002). It is especially the Employment Equity Act (South Africa, 1998) that forced organisations to comply with their equity targets, by employing women in male dominant positions.

Still, despite the changes in legislation, the South African mining industry remains a male-dominated industry. Compared with other industries, the integration and participation of women in the mining industry has been slow (Ranchod, 2001). This can be due to the shaping of the mining industry according to imperatives of apartheid and, in particular, the policy of segregating mine sites by gender (McCulloch, 2003). This implied that women were forced out of the labour force and family work units that had been the basis of the industry from its inception, were broken. The high degree of gender-related occupational segregation indicates that the mining industry provides overall a relatively inhospitable climate for women (Graham & Hotchkiss, 2003).

The mining industry is also an industry characterised by a long history of well-established beliefs and practices (Keegan, Knievel, & Shugg, 2001). This has resulted in an industry

reluctant to let go of entrenched practices, especially in terms of the employment of females in male dominant positions. In order to remain in line with society's current practices and future aims, effective reform needs to take place. This reform must impact on changing the culture of the industry whilst ensuring that safety remains the number one priority (Keegan, et al., 2001).

The actual employment of women in the mining industry creates various problems. Women workers are often discriminated against because they are believed to contaminate work processes (Lazcano, 2002). Some male mine workers even promulgated stereotypical beliefs to legitimize women's exclusion by believing that women can not possibly do the work as they are mentally and physically weak (Whittock, 2002). It is clear that assumptions are still made about the roles, behaviour, abilities and needs of women, prompting organisations to prioritise the issue of sex stereotyping (Whittock, 2002). Furthermore, it appears that harassment also plays a vital role. Frey (1997) indicated that women endure physical and verbal abuse that included sexually harassing comments, physical contact, and initiation rites.

Harassment is one of the most concerning issues when focusing on women entering a male dominated environment like the mining industry. Sexual harassment, although occurring in every occupation, is more frequent when women enter traditionally male dominated fields (Coburn, 1997). The unacceptable language that male employees use make female employees uncomfortable and may as a result lead to verbal harassment. Studies suggest that harassment may extend to threats, demands and even bodily contact (Whittock, 2002).

In addition to structural gender divisions within the South African mining industry, racial divisions persist in terms of where women are located. It appears that mining organisations tend to employ white women in professional and elite positions, while unskilled women in mining are likely to be black (Ranchod, 2001). The racial issue is dominant in different industries. Price (2002) found for instance, in a study among employees in the highway construction field, that white women and men tend to work in the higher status and less physical trades, while black women and men tend to work in the more manual trades. This opens the organisation up to different forms of discrimination. It appears that race should be

reflected in the design and measurement of the impacts of employment programs for women as well as for men in any industry (Price, 2002).

Mining presents a very unique working environment, especially for women. Workers may be required to work in dark and damp conditions with varying temperatures (Anon, 2000; Singer, 2002), sometimes deep underground. They may also work alone, in small areas, and with little supervision or communication.

The working conditions can be difficult and hazardous (Anon, 2000) and the work is gruelling (Singer, 2002). Mine workers spend most of their day performing physical tasks. They work with explosives, placing pencil sticks in stopes, test geological formations, operating load-haul-dump (LHD) machines, scraper winches and heavy duty-machines and maintain mining machinery in conventional mines. They may also be required to install air and water pipes, scale loose rocks and construct timber supports and cribbing (Anon, 2000). To achieve independence and credibility in the eyes of co-workers, along with the ability to complete the everyday tasks, a female employee needs a sound level of overall fitness in the task required (Wynn, 2001). This includes the ability to carry heavy objects and work both outside, underground and in confined spaces often in hot conditions for extended periods of time.

The availability of physical facilities makes it difficult for women to participate in the production process. The toilet is most of the time a shed equipped with a bucket (Singer, 2002), and the harrowing trip in a rickety elevator along with riding chairlifts, takes sometimes more than five minutes. It is clear that when women are employed to work underground, that the organisation needs to make a number of practical changes. For one, ablution facilities and changing rooms need to be created for women (Ranchod, 2001).

For those working in physical environments (i.e. processing plants and underground), assumed routine tasks such as taking samples and carrying them through the processing plant, using high-pressure hoses, carrying bags, opening ventilation doors, etc., require some

degree of physical fitness and strength (Wynn, 2001). The equipment and techniques used are varied and complex, with many areas requiring significant safety and skills training.

With more than one hundred miners killed every year in the South African mining industry (McGwin, Valent, Taylor, Howard, Davis, Brissie, & Rue III, 2002), the mining industry has proven to have the highest rates of fatal occupational injuries (McGwin, et al., 2002). As such, when integrating women in the mining industry, specific occupational health and safety requirements need to be considered (Ranchod, 2001). Mental alertness is for instance of the utmost importance as the wrong decision can result in accidents and safety risks. Relevant safety training and the wear of protective clothing is seen as a way to alert employees in terms of hazardous situations. However, protective equipment and tools used in the mining industry is designed based on the male population (Forastieri, 2000). As a result women may not be properly equipped for their own protection, enhancing the proneness of accidents.

Wide-ranging studies conducted in the early thirties in the Soviet-Union, indicated that underground mining can have harmful effects of even short-term employment in hazardous tasks and heavy industries on women's reproductive functions (Ilic, 1996). The health and safety problems vary from one mineral to the other, from the technology used, type of mining (open cast to underground) and the size of operations. The most common diseases suffered by people due to the dust from the coal mines, for instance, are tuberculosis, cough and cold, malaria, skin diseases, diarrhoea, staining of teeth, joints pain, arthritis, lethargy, etc. (Anon., 2003). The majority of the health problems in mining regions are caused due to unchecked pollution and high levels of toxicity, mine tailings and mine disasters (Anon., 2003). The physical hard labour can result in lower back pain and it has been found that the effects of lumbar curvature on low back pain risk factors during repetitive postural upper extremity musculoskeletal disorders in the neck and the upper limb are common among industrial workers, and most pronounced among women (Arvidsson, Akesson & Hansson, 2003). The change in legislation in South Africa, stipulating the re-entrance of women in the underground mining environment (South Africa, 1991), place therefore enormous pressure on the mining industry to ensure the safety of women.

Despite the mentioned danger, female mine workers are mostly viewed as a dedicated group although critics violently oppose their choice to work in the nation's most dangerous occupation (Wilkinson, 1985). It appears that the presence of women has the potential to make the work environment safer. Singer (2002) indicated that women seem to be more careful. They do not hesitate to speak up when conditions are unsafe, while men in contrast often do not report violations for fear of being thought weak or cowardly (Wilkinson, 1985).

With 30% South African adults being jobless, mining, although dangerous and despite the harsh conditions, is often the best job available (Singer, 2002), especially for women. Women enter small scale mining primarily as a means of survival (Ranchod, 2001). Poverty, education, the economy, power and decision-making, health, violence, armed conflict, institutional mechanisms for the advancement of women, human rights, media and the environment are critical areas of concern identified as barriers to women's empowerment (Ranchod, 2001). Many of these critical areas of concern have direct relevance to the mining industry. If the mining industry wishes to contribute to sustainable development in the region, they have to increase women's participation in the economy, reducing women's poverty, increasing access to educational opportunities and enhancing women's access to power and decision-making (Ranchod, 2001). This will have direct bearing on the way the industry currently operates, and points to areas where there is scope to support women's advancement through a proactive recruitment, promotion and skills building policy.

The wide variety of disciplines from which the work/non-work interface has been studied is reflected in a wide range of topics that have been addressed (e.g. time schedule conflicts, household and care-giving responsibilities, marital conflict, children's development problems, and even community involvement) (Geurts & Demerouti, 2003). Most of the women working underground in the mining industry are usually single mothers with little schooling, and they are generally earning two thirds more that they earned as maids or farm labourers (Singer, 2002). Many women suffer from excessively long hours of work and they usually have to do the predominant share of the housework as well (Forastieri, 2000). Special health problems such as stress, chronic fatigue, premature ageing and other psycho-social and health effects, can arise from this situation (Forastieri, 2000). A women's economic

dependency encouraged their participation in collective action to protest or advance the male wage-earners' position (Dawson, 1990).

Despite all the above arguments, female miners are not given any privileges. They have to pass the same rigorous employment test that men have to pass (Singer, 2002), if they work underground. This test requires them to climb up and down a set of steps for half an hour in a room heated to an adequate temperature, equal to the temperature underground. Those who keep moving, don't faint and pass a physical examination, will qualify for a position (Singer, 2002). Initial attempts to screen female mineworkers for heat tolerance suggested that they had difficulty in passing the standard heat tolerance test employed in the South African mining industry (Schutte, Kielblock, De Villiers, & Dias, 2002). The consequences of high environmental heat loads can be expressed in terms of impaired work capacity, errors of judgement, and the occurrence of heat disorders, especially heat stroke which is often associated with severe and irreversible tissue damage and high mortality rates. The female body is considerably less adaptable to warm surroundings, especially during her pre-menstrual-stress cycle (Schutte, et al., 2002). It is generally believed that, under conditions of high ambient temperature and low humidity, thermoregulation in women is 'less efficient' than in men (Schutte, et al., 2002).

With mining seen as so 'naturally' masculine, few people consider its real effect on women (Robinson, 1998). In western history, mining and the hard labour that goes with it, were always as mentioned, closely associated with masculinity (McCulloch, 2003). There are work tasks that females generally find more difficult to complete, due to physiological differences to males. They acknowledge for instance, that they can't haul as much rock as most of their male co-workers (Singer, 2002). Women differ from men both physically and physiologically, and a workplace or work system, including technology, designed for men in some respects would be, on the one hand, unsuitable for women (Ranchod, 2001). On the other hand, the requirements of rapid economic expansion placed unprecedented demands on the labour force which necessitated the employment of women in a whole range of tasks, many of which had previously been reserved for men (Ilic, 1996).

With the pressure placed on mining organisations to meet their equity targets, reports reveal evidence of the increasing numbers of women employed in a range of tasks in the mining industry, including in underground work (Ilic, 1996). It emphasizes also the improvements in the overall technological level of the industry, which, it could be argued, facilitated the employment of women in greater numbers and in a broader range of jobs (Ilic, 1996).

Considering all the above mentioned, it can be gleaned that many different and often opposing views and opinions exist regarding women entering the world of mining, and specifically taking up the high-risk occupation of underground mining. One opinion glaringly absent from those discussed in the literature is that of the women actually being employed in the mining industry, and specifically in the platinum mining industry. A first research problem is that little information exists on the experience of women working in the platinum mining industry. A second research problem is to determine the impact that women entering the workforce have on the mine according to literature and to make recommendations on possible solutions.

This research will make the following contributions to the subject Industrial Psychology and the practice thereof in mining organisations:

- It will result in gauging the experience of women working in a male-dominated environment, i.e. the mining industry.
- It will results in a clearer understanding of the unique obstacles females entering the mining workforce encounter – information which could be used successfully by mining organisations, policy-makers and underground female miners themselves.

METHOD

Research Design

For the purpose of this research, a qualitative design was used. Qualitative research makes it possible to determine the subjective experience of women working in the platinum mining

industry (McMurty, 1988). Despite the negativity surrounding the use of qualitative research, Woods and Catanzaro (1988) indicated that the validity of qualitative research is one of its biggest advantages.

Study population

The study population consisted of an availability sample of women working in a Platinum Mining organisation (N = 14). It is clear from Woods and Catanzaro (1988) that small samples can deliver reliable research data and is therefore acceptable for phenomenology studies. Descriptive information of the sample is given in Table 1.

Table 1

Characteristics of the Participants

Item	Category	Frequency (Percentage)
Age	< 25 years	2 (14,29%)
	25 – 30 years	4 (28,57%)
	31 – 35 years	6 (42,86%)
	> 35 years	2 (14,29%)
Home Language	Afrikaans	2 (14,29%)
	English	3 (21,43%)
	Northern Sotho	1 (7,14%)
	Tswana	7 (50,00%)
	Zulu	1 (7,14%)
Race	White	5 (35,71%)
	Black	9 (64,29%)
Educational Level	Standard 8 / Grade 10	2 (14,29%)
	Standard 10 / Grade 12	5 (35,71%)
	National Certificate (N1 / N2)	3 (21,43%)
	Mine Overseer Certificate	1 (7,14%)
	Diploma / B Tech	2 (14,29%)
	Degree in Mining	1 (7,14%)
Organisational level and role	Semi-skilled labour	8 (57,14%)
	Lower Management	2 (14,29%)
	Middle Management	3 (21,43%)
	Senior Management	1 (7,14%)
Number of Children	0	6 (42,86%)
	1	1 (7,14%)
	2	5 (35,71%)
	3	2 (14,29%)

The sample consisted mainly of black females (64,29%) aged between 31 to 35 years (42,86%), with a Grade 12 certificate (35,71%) in a semi-skilled position (57,14%). A total of 35,71% females had two children.

Data collection

An interview based on the phenomenological method, were used as a method for gathering the data (Moustakas, 1994). The researcher had put all the participants at ease by ensuring that they all clearly understood what were expected from them. The interviews were non-directive for example: "How do you experience the mining industry?" The questions were asked consequently and well explained to everyone.

The interviews took place in a venue with enough ventilation, lightning and comfortable chairs. A tape recorder was used with permission from the participants, to ensure that no information got lost (Omery, 1983). The candidates were put at ease before the start of the interviews. The researcher introduced herself during the beginning of each interview and also explained the context of the interview. Non-directive dialogue techniques like attentive body language, reflection, clarification, minimal encouragement and silence were used to assist the participant to share her experience (Meulenberg-Buskens, 1994).

The tape record of the interview were verbatim transcribed by the researcher in order to analyse the information. Content analysis (Giorgi, 1985) were used to analyse and interpret the research data in a systematic, objective and quantative way. Content analysis consists of the following steps (Giorgi, 1985; Kerlinger, 1986):

- The first step is to universalise the context that needs to be analysed (for example all the verbal answers of the participants), to be defined and to be categorised.
- The second step is to determine the subunits of the analysis, namely words and themes. The researcher reads the responded notes in order to get the whole picture. Afterwards she reads through it again in order to determine the themes. The words that are used by the participant, is the smallest analysis that can be made. A subtheme is usually a sentence and is more difficult but also more useful to analyse. Subthemes can be combined in order to determine the themes. The analysis of the information goes on until repeated themes have been identified.
- The third step is to get rid of the unnecessary information and to determine the meaning

of the rest of the subunits by linking it to the whole picture.

- The fourth step consists of the conversion of the concrete language that has been used by the participants, to scientific language and concepts. The precise words of the participants are used in support. An integration and synthesis is then done based on received insights.

The amount of objects per category were counted and placed in order of preference. The trustworthiness of the content analysis is promoted by the coding that took place by the researcher and the independent psychologist with a thorough background based on facilitation. A literature-control has been done to investigate relevant research in order to determine the comparativeness and uniqueness of the current research (Krefting, 1991).

The researcher strives to promote the validity by spending enough time with the participant in order to establish a report. Social-desirable responses were minimised by making use of dialogue techniques. Rephrasing and repetition of questions have been used in order to gain credibility of information. The researcher made use of a diary to highlight the ideas and feelings of the respondents during the research process. These notes consist of information about the problems and frustrations that have been experienced (Krefting, 1991).

RESULTS

The experience of women working in the platinum mining industry is reported in Table 2 according to certain themes, the total participants and the ranking order.

Table 2

The experience of women working in the platinum mining industry

Theme	Total Participants	Ranking
1. Male Worker Attitude	13	1
2. Working Conditions	7	7.5
3. Work-Life Balance	7	7.5
4. Harassment	10	3
5. Physiological Aspects	4	11
6. Language Barrier	8	5
7. Ergonomics	11	2
8. South African Economic Conditions	5	10
9. Physical Strength	8	5
10. Management	6	9
11. Discrimination	8	5
12. Facilities	2	12

The following assumptions can be made, based on Table 2:

- **Theme 1: Male Worker Attitude (Ranking = 1)**

This theme was indicated by 13 participants. Feminine work is traditionally considered to be simple, repetitive, and a manual activity (Lazcano, 2002). As a result, the majority women feel that they not only had to prove themselves to their fellow employees, but that the men on the job held a deep-seated attitude that women do not belong in the mining industry. It appears from the interviews that the hardest part of working in the mine industry is not the related tasks, but rather the dealing with and handling of prevailing attitudes of men about women not belonging in the mining industry. Some of the responses in this regard, was: "the men can handle us with a little more respect...they behave like children...they are really mean to us...they are so afraid that we will take their jobs" and "men make it so hard for the women in the mining industry. They don't give us a chance to develop and they are the dominant people underground".

Interestingly, it was also found that some of the participants experience problems with males from different culture groups than their own. The perception is that the males of the Shangaan and Xhosa culture groups usually play the dominant role over the female in any situation. This dominance was prominent in some of the responses, like: "Xhosa and Shangaan culture think that women must obey them and I am a Tswana. Overall the men think that they are in charge and that they can do what they want with the women...it is really so difficult with the different cultures underground" and "The male employees are much too dominant and try to push the women employees to the ground".

The perception of the respondents also indicated that the men don't want to help the women because they try to prove to the woman that they do not belong in the industry. The female employees are trying to prove themselves in order to gain respect from their fellow male employees. A woman said: "I was in charge over a group of men and I needed to prove to them that I could work with the heavy machines...otherwise they wouldn't have had respect for me". Some women mentioned that the black male employees tried to assist the white female employees and that the white male employees would just laugh when they were asked for assistance. These attitudes are having a negative impact on the development of women in the mining industry and can result in lower production.

- **Theme 7: Ergonomics (Ranking = 2)**

This theme was identified by 11 participants. The duties of an underground worker in conventional mines involve physical tasks and working in dark and damp conditions with varying temperatures (Anon, 2000). Women employed in underground positions are either complaining about the extreme heat or cold of the working place. Some of the responses include: "I am a miner and I am working in the stopes – it is a very hot working environment", " The heat at the declines makes me sometimes want to sleep because the ventilation isn't up to standard" and " The place where the belt feed attendants work is very cold...they are complaining a lot...most of them are usually sick with flue".

When female mineworkers are employed in occupations and environments conducive to the development of heat stroke, they may be required to undergo heat tolerance screening (Schutte, et al., 2002), which they do not always pass. One woman mentioned: ""I must admit that I didn't pass the Heat Tolerance Testing".

The underground conditions are overall not suitable for women if one look at the small spaces, gasses, dust, and noise etc. (Ranchod, 2001). A woman working underground stated that: "the stoping area...it is so difficult for women to work there. The conditions are not suitable for a woman...it is very hot and there is minimal space to move in". Another underground woman employee stated that: "I must say that I am afraid of the different gasses, dust and poison in the air...I am afraid that I might get infected because a lot of our people are struggling with TB". One woman argued that she is struggling with the dust and the noise. This all can have an enormous impact on the health and safety of a woman.

The cages (equipment use to transport employees from surface to underground and from underground back to surface) are a big concern for the women. Some of the responses include: "When I enter the cage in order to go underground or to surface, the men are playing around...I am always afraid that they can perhaps injure me" and "The cage can take 60 people...now imagine 59 men and 1 woman in a cage. They are pushing and squeezing...they don't worry about me at all".

- **Theme 4: Harassment (Ranking = 3)**

This theme was identified by 10 participants. Harassment is one of the most concerning issues when focusing on women entering a male dominated environment like the mining industry. Although it occurs in every occupation, it appears that sexual harassment along with verbal harassment is more frequent when women enter traditionally male fields (Coburn, 1997). Since the entrance of women in the mining industry, they have endured physical and verbal abuse that included sexually harassing comments, physical contact, and initiation rites (Frey, 1997).

The working conditions in the mining industry are very difficult (Anon., 2000). The handling of machinery, moving around in the stopes (small areas), etc. demand physical strength. This is a new industry for women and they are still struggling and need to practice to get into this routine. In some of the cases the workload is too much and it is then when the men are taking advantage of the women. As was mentioned by one participant: "they asked the men to help them with the hard work in return for a sexual favour".

The fear of being sexually harassed was clear among the participants in the research. Some of them mentioned: "It is difficult to go underground in the cages because men are pushing and touching me. I think it is going to lead to Sexual Harassment" and "I also think that it is not safe for the women to work alone between the men, it is not safe. It is dark underground and the men will definitely take their chances with women".

Verbal harassment is however also playing a role in the experience of women working in the mining industry. Men are laughing at women trying to do their work in an underground setting, causing them to feel humiliated and having a negative impact on the overall production. Some of the participants mentioned that: "The men used bad language" and "The men call me names and it makes me feel uncomfortable". Studies suggest that harassment may extend to threats, demands and even bodily contact (Whittock, 2002).

- **Theme 6: Language Barrier (Ranking = 5)**

This theme was mentioned by 8 participants. Language is one big barrier in the production process of the mining industry. For many years the mines made use of the language Fannagalo Fannagalo is a communication medium that has been used within the mining industry over decades. No literature regarding the origin of Fannagalo could be found.

It consists of a variety of Arican languages namely Xhosa, Sotho, Tswana, Zulu, Afrikaans and English. In fact, previously no employee was allowed to go underground without passing the Fannagalo language test. Today most mining industries are trying to get rid of the language by replacing it with English. The new employees entering the mining industry don't

have to write the Fannagalo test as long as they can speak English. With the women entering the mining industry as new employees they are struggling with the language because some employees speak English, others Afrikaans or Tswana and some employees working for years in the mining industry still speak Fannagalo. As a result they can't understand when some employees are talking. Some of the participants mentioned: "I want to defend myself. It is so difficult because I can't speak Fannagalo" and "I am worried about the language that the people are using...it is only Afrikaans and sometimes I don't understand the people but they still don't worry". As mentioned by one participant: "This can have a negative impact on the production process and can lead to accidents by misunderstanding each other".

- **Theme 9: Physical Strength (Ranking = 5)**

This theme was mentioned by 8 participants. There are work tasks that females generally find more difficult to complete, due to physiological differences to males (Singer, 2002). Some of the responses include: "I think that women can't do every type of work...we are physically not capable to do all the work" and "It is a fact that men are stronger than us but if we put in a little more effort than them we will perform the same". There is however some women who find other ways to cope with heavy work, for instance, by dragging something instead of lifting it (Whittock, 2002).

It may be necessary to identify certain job categories for women in the mining industry, due to the physical strength required in some positions. Some of the responses regarding this included: "I think it is safe for a women to work underground but the mine needs to focus on certain job categories for women...some job categories aren't good for women to work in if you look at a women's health" and "I think we can do many kinds of jobs underground but they must still keep in mind that we are women...we are not as strong as the men but we can still do certain tasks".

- **Theme 11: Discrimination (Ranking = 5)**

This theme was mentioned by 8 participants. In some mining communities discrimination takes place in the employment of women (Anon, 2003). One female employee stated: "They are still trying to motivate us that women can't do the different jobs in the mining industry...they don't want to accept us. Discrimination does definitely exist". Male miners held preconceived notions that women were physically weaker, less intelligent, and promiscuous (Lazcano, 2002; Whittock, 2002). They may be ogled, treated like a novelty, or not taken seriously by male subordinates, peers, or management, similar to what working women encounter in any male-dominated setting. A male worker is viewed as a person with high reception of sexual signals, dirty, not very meticulous, and not pathogenic. The female worker however is seen as a sexual object, cleanly, meticulous and pathogenic. Women workers are often discriminated against because they are believed to contaminate work processes (Lazcano, 2002). It is clear that the gender issue has not yet been resolved as one participant mentioned: "The male-female issue will always be a problem".

There is an imbalance to this general trend of increase shown by the consistently low numbers of female employees with the mining industry, particularly at mine sites. Female participation within the Minerals Industry is comparatively low with two to twenty percent employed in the professional technical division and only eight to fourteen percent female employees comprising the overall workforce (Wynn, 2001).

Another discriminating issue that needs to be taken into consideration is the racial issue surrounding the employment of women. A female employee stated: "They treat white women differently than black women. If I am pregnant the people won't worry about a light duty job for me but if it is a white women, they will from day one put her on light duty...it doesn't work this way...it is unfair" and " the mine is focusing only on the white women's needs...they don't worry about the black women...it sounds strange but it is the truth".

Ranchod (2001) indicated that it seems that the professional women in mining are likely to be white, while unskilled women in mining are likely to be black. This level of

discrimination was also identified by the participants as one mentioned: "I must admit that I am afraid that the black men will get a 'grudge' against me because of the different treatment I get in comparison to the black women".

- **Theme 2: Working conditions (Ranking = 7,5)**

This theme was mentioned by 7 participants. A typical shift underground may vary from eight to twelve hours depending on the worker's position and the location of the work. During the interviews one woman mentioned: "We had specific working hours on the shaft but I started earlier (4 o'clock) in the mornings and went home 6 o'clock when everybody already left". Another woman said: "I am working long hours...usually 8 hours but if the work is not finish I have to finish it on my own". Jobs have become denser; more tasks have to be performed in the same job, resulting in a larger amount of time allocated to work (Mientjes & Norman, 2003).

One of the set working conditions includes the month's maternity leave allowed. The working environment can get harsh for women when they become pregnant (Whittock, 2002). Pregnant and nursing employees are not allowed to perform work underground and any other work where hazards are present that pose a risk. This could entail an absence of up to fifteen months from such workplaces for pregnant employees (nine months pregnancy plus six months after the birth of the child) according to the Basic Conditions of Employment Act (South Africa, 1997). During the interviews one woman mentioned: "I also feel that it is my right to have a longer period for maternity leave...it is too short...it is only three months and then one month unpaid".

The participants also perceived the mining environment as overall focusing on men only. One woman stated: "the mine is catering for men only...for instance the overall, gumboots, etc....everything is designed for men". The distance to the working place is also very far. One woman mentioned: "I am walking very far to my workplace and it is very cold there. It is even worse when I need to work night shift...I would rather prefer working in the day".

- **Theme 3: Work-Life Balance (Ranking = 7,5)**

This theme was mentioned by 7 participants. The wide variety of disciplines from which the work/non-work interface has been studied is reflected in a wide range of topics that have been addressed (e.g. time schedule conflicts, household and care-giving responsibilities, marital conflict, children's development problems, and even community involvement) (Geurts & Demerouti, 2003). Many women suffer from excessively long hours of work and they usually have to do the predominant share of the housework as well (Forastieri, 2000). In most cases they are actually supporting their children as a single guardian. As a result problems such as stress, chronic fatigue, premature ageing and other psycho-social and health effects can arise (Forastieri, 2000). Some of the responses included: "I am so tired when I knock off at work...I need to wait then for a Taxi to take me home. When I get home I just eat and go to bed because I need to stand up 03:00 the next morning in order to catch a Taxi to take me to work", "I never saw my husband and two children. Because of my responsibilities and the fact that I worked harder in order to prove myself is the reason why my husband and me divorced" and "I must admit that I am very tired when going home and then my responsibilities at home start. I need to check my child's homework and prepare everything for him for school. I also need to prepare supper...it is difficult because I am a single parent".

Working long hours put an unsustainable strain on all staff whether they have caring responsibilities or not. A women's economic dependency encouraged their participation in collective action to protest or advance the male wage-earners' position (Dawson, 1990). As one participant indicated: "After work I go straight home to look after my children...I must say it is difficult to work and to work when going home...I don't have a husband to support me. The mining industry needs to take this into consideration when appointing woman in shift cycle positions".

- **Theme 10: Management (Ranking = 9)**

This theme was mentioned by 6 participants. From the interviews it appeared that employees felt that there is a lot of mismanagement in the mining industry especially relating to women in mining. Management can be defined as a process where people are appointed in positions of authority by using human and other resources as effective as possible to produce certain products and to provide services in order to fulfill certain needs so that the organisation in turn reach set objectives (Van Rensburg, 1997). One female employee stated: "Management doesn't play a big role in developing women in the mining industry...they need to put the women through the same development as they did with the men".

Management needs to drive the whole process of women entering the mining industry. They should prove to women that they will support them the whole way. The support female employees currently receive from management can be summarized in the following statements: "I don't think they are to keen about us working in their environment, meaning the male environment" and "The mine needs to take into account that we are women...we are new in the industry...they must try to support us wherever they can".

- **Theme 8: The South African Economic Environment (Ranking = 10)**

This theme was mentioned by 5 participants. With 30% South African adults being jobless, mining, although dangerous and despite the harsh conditions, is often the best job available (Singer, 2002). Women have no choice but to expose themselves to severe health risks for economic reasons. Some of the participants mentioned that: "The main reason why I am doing this job is because I need to help my husband financially...he is financially not that strong", "I am doing this work for an income and not because I am interested in the mining industry" and "I don't have a husband to support me".

If one looks at the unemployment rate of South Africa, it is clear that the current economic condition plays a vital role in the experience of women in the mining industry, as one

mentioned: "I am working underground because there is not work in South Africa and I need to look after myself".

- **Theme 5: Physiological aspects (Ranking = 11)**

This theme was mentioned by 4 participants. The working conditions, as was mentioned, can be harsh and difficult. Workers may be required to work in dark and damp conditions with varying temperatures (Anon, 2000; Singer, 2002), sometimes deep underground. They may also work alone, in small areas, and with little supervision or communication, which makes it even harsher on women. Some of them mentioned: "The stoping area...it is so difficult for women to work there. The conditions are not suitable for women...it is very hot and there is minimal space to move in...It can't be of any good for a women's health. The development area is also difficult...there is more space but the equipment like the drilling machines is very heavy". Although certain tasks within the industry are being automated, the industry will essentially remain labour orientated as there will always be manual tasks, such as those described (Wynn, 2001).

It was also proven that the female's body is considerably less adaptable to warm surroundings, especially during her pre-menstrual-stress cycle (Schutte, et al., 2002). It is generally believed that, under conditions of high ambient temperature and low humidity, thermoregulation in women is 'less efficient' than in men (Schutte, et al., 2002). Some participants mentioned: "Me and the women that worked in my crew struggled when we had menstrual periods...some of us lied for the whole day because of the pain. There were times that my back and stomach were aching of the hard work" and "it feels as if my 'nipples' get sensitive when I work in the hot places – I don't think that is good for a woman". Apart from the hot environment there are some places that are very cold especially at the belts where the ore is transported from underground to the surface. The ventilation pressure is very high at the belts. One woman complained about the cold environment she is working in especially during night shift. Another woman mentioned: "the place where the belt feed attendants work is very cold...they are complaining a lot...most of them are usually sick with flue".

- **Theme 12: Facilities (Ranking = 12)**

This theme was mentioned by 2 participants. The availability of physical facilities makes it difficult for women to participate in the production process. The toilet is most of the time a shed equipped with a bucket (Singer, 2002), and the harrowing trip in a rickety elevator along with riding chairlifts, takes sometimes more than five minutes. The mining sector needs to take drastic action steps by start focussing on facilities for women in order to contribute to the development and empowerment of women in the mining industry. Change houses, underground toilets, etc need to be looked at.

DISCUSSION

Throughout the last few decades, the meaning of equal opportunity and the remedies or the lack thereof, have been debated and shaped by courts, legislatures, the media, and recently, the ballot box (Price, 2002). The lack of women in the mine environment, created a living and working environment that is heavily male-dominated. The gender imbalance in the mine industry makes it difficult to develop a genuine 'mining community', and has wide range social consequences that are negative for both men and women (Ranchod, 2001). The South African mining industry is a male domain. In 2000, women made up only 2,3 % of the workforce in the mining industry. This is a part explained by a legacy of the legislation, which prohibited women from working in a mine (Ranchod, 2001). The organisation should work towards a collective struggle in order to advocate for a gender sensitive mining policy for the country. The policy should be promoted equally. The Conditions of Employment need to be standardised in order to deal with medical contributions during maternity leave.

The negative attitudes to women in mining are an important constraint to women's effective integration in the industry. There is a great deal of male scepticism that needs to be tackled. There are fears and perceptions that women may distract men if they work side by side with them. Some perceptions are that a women's place is at home, not in the mine, and that the largely migrant workforce living in single sex accommodation could be a deterrent to women in the mines (Ranchod, 2001).

South Africa's Employment Equity Act (South Africa, 1998) aims at implementing positive measures to redress the disadvantages in employment experienced by black people, women and people with disabilities, in order to ensure their equitable representation in all occupational categories and levels in the workforce. However, it would be unfortunate if the industry only employed women to comply with labour legislation. Attitudes of male co-workers, ergonomics, harassment (sexually and verbally), physical strength, discrimination, language barrier, working conditions, work-life balance, role of management in the integration of women in the mining industry, South African economic conditions, physiological aspects and facilities were identified as themes playing a vital role in the experience of women working in the mining industry.

Working in the mining industry especially in the underground environment is very difficult. Women differ from men both physically and physiologically, and a workplace or work system, including technology, designed for men in some respects would be unsuitable for women (Ranchod, 2001). The company need to identify positions (surface and underground) in which women would be productive and promote the employment of women into these positions. In order to reach the previous objective, they should develop a suitable profile for the women recruited as well as focussing on career development paths for women in the mining industry. The organisation also needs to identify the physiological as well as the physical strain experienced by women working underground. Measures must be taken to ensure that special needs of women in relation to pregnancy, breastfeeding and reproductive health are considered through minimizing the exposure to hazards.

Many women suffer from excessively long hours of work and they usually have to do the predominant share of the housework as well. Women are entering small scale mining primarily as a means of survival in this changing global economy (Ranchod, 2001). The mine needs to focus on the women's needs especially because it is a new environment – if the mining industry is unable to accommodate women's sanitary needs, it is unlikely that it will be able to accommodate the greater needs of women in the workforce – primarily the need to balance work and family.

Employing women in the mine is a challenge of the mindset of viewing mining as a men's world. With the commitment of the society the entering of women in the mining industry will be definitely a positive challenge to face. The fact that women were appointed into the mining environment covering traditionally male sectors, also speaks to a commitment to changing the face of the mining industry.

RECOMMENDATIONS

The first step relating to women in the mining industry should be to start creating a women friendly environment in this industry. The organisation should start working towards a collective struggle in order to advocate for a gender sensitive mining policy for the country. It is necessary that the Mining Organisation ensures higher levels of exclusivity and advancement of women. The organisation also needs to understand the status of women in the mining environment and understand how they are affected by mining.

Production is the number one priority in the mining industry and it is therefore important that the organisation should start to focus on types of production teams underground by asking whether females should work together or be mixed with male employees. Management should start implementing new ideas such as mentoring programmes for women, and skills development programmes in order to contribute to a more productive organisation. It is also necessary to identify the physiological as well as the physical strain experienced by women working underground. Measures must be taken to ensure that special needs of women in relation to pregnancy, breastfeeding and reproductive health through minimizing the exposure to hazards. A suite of measures need to be introduced and addressed in order for women to have a balance between work and family. The organisation needs to create a workforce that is more flexible in its work practices and attitudes towards women.

The organisation should start setting the parameters of this challenge by ensuring that they have a workforce that works for women. The women in mining chapter are not a challenge

that can be addressed alone. There is a need for commitment from employers, all employees and all of society to make the workforce work for women

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CHAPTER 3

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

The purpose of this chapter is to provide conclusions regarding the results of the empirical studies of the research article. Conclusions are drawn with regard to the research objectives. Furthermore, limitations of the study are discussed. Finally, recommendations for the organisation are made and research opportunities that emanate from this research are presented.

3.1 CONCLUSIONS

The general objective of this research is to determine the experience of women working in the platinum mining industry in South Africa. The following conclusions can be made from this study:

The experience of women working in the platinum mining industry is seen as a huge challenge. The majority participants felt that they not only had to prove themselves to their fellow male employees, but that the men on the job held a deep-seated attitude that women do not belong in the mining industry. To achieve independence and credibility in the eyes of co-workers, and have the ability to complete everyday work, a female employee needs a sound level of overall fitness in the task required. This includes the ability to carry heavy objects and work both outside, underground and in confined spaces often in hot conditions for extended periods of time.

The underground conditions are overall not suitable for women if one look at the small spaces, gasses, dust, and noise etc. (Anon, 2000; Singer, 2002; Ranchod, 2001).Working in the mining industry especially in the underground environment is very difficult. Women differ from men both physically and physiologically, and a workplace or work system, including technology, designed for men in some respects would be unsuitable for women (Ranchod, 2001). Many women suffer from excessively long hours of work and they usually

have to do the predominant share of the housework as well. The availability of physical facilities makes it more difficult for women to participate in the production process. The majority of women, particularly unskilled women, enter the mining industry as a means of survival.

The actual employment of women results in various cases of discrimination because they are believed to contaminate work processes (Lazcano, 2002). Some male mine workers even promulgated stereotypical beliefs to legitimize women's exclusion by believing that women can not possibly do the work as they are mentally and physically weak (Whittock, 2002). It is clear that assumptions are still made about the roles, behaviour, abilities and needs of women, prompting organisations to prioritise the issue of sex stereotyping (Whittock, 2002). Furthermore it appears that harassment also plays a vital role.

Although it occurs in every occupation, it appears that sexual harassment along with verbal harassment is more frequent when women enter traditionally male fields (Coburn, 1997). The fear of being sexually harassed was clear among the participants in this research. Since the entrance of women in the mining industry, they have endured physical and verbal abuse that included sexually harassing comments, physical contact, and initiation rites (Frey, 1997). In some of the cases the workload is too much and it is then when the men are taking advantage of the women. This is a new industry for women and they are still struggling and need to practice to get into this routine. With the assistance of the men, it would be much easier to adapt.

Another discriminating issue that needs to be taken into consideration is the fact that white women are treated with more respect than black women. Male miners held preconceived notions that women were physically weaker, less intelligent, and promiscuous (Lazcano, 2002, Whittock, 2002) and their treatment in terms of white and black female employees were perceived by the participants as being different. The perception is that white females get more privileges than their black female counterparts.

From the interviews it appeared that employees felt that there is a lot of mismanagement in the mining industry especially relating to women in mining. One needs to understand the vital importance of production in the mining industry. It is after all the number one priority in order to show profit at the end of the month. Women entering the mining industry especially underground will definitely have an impact on the production process that will lead to frustrating co-workers as well as management. One needs to understand that every employee started with this slow process and therefore should give a female employee the chance also to develop. There are a lot of challenges relating to women entering the mining industry but each challenge needs to be tackled one at a time in order to contribute to the development of women.

The need to understand the challenges for women working in this environment continues to be important, especially as more women seek financial security in a changing global economy. The culture in the mining industry has also stagnated and it will be difficult to change but the mining industry needs to adapt to the idea of women entering the mining industry.

3.2 LIMITATIONS

The first limitation of this study was that the respondents felt uncomfortable when the interviews were recorded. Despite the fact that the researcher ensured them of the confidentiality of this research, some of the respondents still did not totally trust the confidentiality statement. This could have influenced some of the results.

Secondly, as data was collected from different business units within a platinum mining organisation, unique organisational characteristics and/or historical events may have affected the findings. Also, because of the array of language and culture groups included in the study, the interpretation of the questions asked during the interview could have differed vastly among participants.

Thirdly, the fact that the women were interviewed on the same day and the same place could have resulted in them speaking to one another. This could have influenced the results of the interviews.

Fourthly, the use of an availability sample could result in the researcher losing vital information from women who experience the mining industry differently as well as similar to the participants. Future studies could benefit from using a stratified random-sample design, which would ensure sufficient representation of the different groups in the total population and will enable generalisation of findings to the total study population.

English being the only language used for the interviews represents the fifth limitation. The possibility exists that the level of English language skills or respondents speaking English as their second, third, fourth or even lower language could have influenced the results.

3.3 RECOMMENDATIONS

Recommendations pertaining to the specific organisation used in this study, as well as recommendations for future research, are made in this section.

3.3.1 Recommendations to the organisation

It is necessary that the Mining Organisation ensures higher levels of exclusivity and advancement of women. The organisation should start by creating a women friendly atmosphere in the mining industry. They need to understand the status of women in the mining environment and understand how they are affected by mining. The organisation should understand the health problems and hazards of women in mining areas and address these problems. The organisation also needs to identify the physiological as well as the physical strain experienced by women working underground. Measures must be taken to ensure that special needs of women in relation to pregnancy, breastfeeding and reproductive health are considered through minimizing the exposure to hazards. The organisation need to work together to ensure that a suite of measures are introduced to adequately address the

need to balance work and family for example longer paid maternity leave. The organisation needs to create a workforce that is more flexible in its work practices and attitudes towards women.

Production is the number one priority in the mining industry and therefore they should start to focus on types of production teams underground – should females work together in one team or should the team be mixed with male and female employees? The company need also to identify positions (surface and underground) in which women would be productive and promote the employment of women into these positions. In order to reach the previous objective, they should develop a suitable profile for the women recruited as well as focussing on career development paths for women in the mining industry. This will definitely contribute to a successful financial plan that will cater for women in mining. Facilities for women need to be the next focus point like underground toilets, change rooms, housing, etc.

The organisation also needs to ask the question whether race has a stronger influence on who works in the mining industry than gender. The relationship between race, skilled and unskilled work needs to be further explored form a gender perspective. Are black women able to move up the ranks of the industry? Are black women likely to be employed in professional positions? Are white women likely to be employed underground (Ranchod, 2001)? The company need to focus not only on the figures of women in mining in general but also focus on the percentage of white- and black female employees on different levels. The perception is that the white females are currently fulfilling the "elite jobs" and the black females are occupying the harsh underground occupations. The government will definitely start asking questions about these inconsistent figures in the organisation.

The organisation should work towards a collective struggle in order to advocate for a gender sensitive mining policy for the country. The policy should be promoted equally. The Conditions of Employment need to be standardised in order to deal with medical contributions during maternity leave. Pregnancy testing should also be made compulsory due to the Basic Conditions of Employment Act (South Africa, 1997) which states that women can not work in a hazardous environment. The pregnancy policy should be communicated to

all female employees by including it in the induction programme. The organisation should also focus on an agenda to provide safety to all working women against sexual harassment and to protect their respect and dignity. In order to keep the respect and dignity of women, the organisation should identify women who already succeeded in the industry and they should act as mentors for the rest of the female employees who find it difficult to adapt in this new industry.

The organisation should start considering a campaign in order to protect the human rights of women displaced by, or working in mining areas. Career advisors also need to be educated on the opportunities for women in the mining industry and establishing effective promotional frameworks to challenge the stereotypes.

Highlighting the workplace disadvantage faced by women today does not need to be a frustrating experience. Rather it can be seen as setting the parameters of the challenge – ensuring that the organisation have a workforce that works for women. The women in mining chapter are not a challenge that can be addressed alone. There is a need for commitment from employers, all employees and all of society to make the workforce work for women.

3.3.2 Recommendations for future research

Despite the limitations of this study, the present findings may have important implications for future research and practices. Future research should still focus on the experience of women in the mining industry without focussing only on the platinum mining industry.

With regard to intervention research in South Africa, the following aspects need to be considered in future research:

- Address the health problems and hazards of women in mining areas.
- Physiological as well as the physical strain experienced by women working underground.

- Special needs of women in relation to pregnancy, breastfeeding and reproductive health through minimizing the exposure to hazards.
- Positions (surface and underground) in which women would be productive and promote the employment of women into these positions.
- Suitable profile for the women recruited as well as focussing on career development paths for women in the mining industry.
- Facilities for women need to be the next focus point like underground toilets, change rooms, housing, etc.
- Figures of women in mining in general as well as the percentage of white- and coloured female employees on different levels.
- Comparative studies need to be done between different mine industries in terms of female workers.
- Factors influencing their work wellness, e.g. personality characteristics, etc.
- Comparative studies need to be done between different mine industries in terms of female workers.

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