

## **Exogenous Factors that Seem to Undermine Miners' Performance at a South African Platinum Mine**

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*The mining sector is viewed as the economic heartbeat of the Republic of South Africa. Mining houses acknowledge that human development is a powerful management instrument employed to encourage improvement in workers' prowess, yet they are unaware of the significant implications that exogenous variables – inadequacy of housing could have on employees' performance. This current paper was quantitative. Research instrument – A structured research questionnaire. The study surveyed 292 permanent underground miners' from 2 idiosyncratic reefs. Using SPSS version 24.0, the empirical findings suggested that miners' perceptions of exogenous factors were satisfactory even though their average production output was unsatisfactory.*

### **INTRODUCTION**

In a constantly changing world of business and economic environment, organizations need to strive for better competitive advantage through the implementation of dynamic business plans (Olayemi, 2012). Nations of the world are embracing free market system or capitalism. All businesses are profit driven, with the intent to make money. According to Agbeko (2015, p. 3), the term money is defined as a medium of exchange (buying and selling). Thus global business markets have become highly competitive (Ravi, 2015, p. 22). However, as a result of low-price or cost environment, the mining sector in South Africa had to adjust by cutting back on exploration and capital expenditure, and reduction of operational costs through retrenchments (Makhubedu, Nwobodo-Anyadiegwu, & Mbohwa, 2018). Mining houses had to contemplate job cuts within the sector due to loss of profit because of uncontrollable variables – weaker rand, fall in commodity prices and industrial labour protests.

Measuring performance effectively within a mining company is central to its success and to achieving long-term competitive advantage (Barr & Cook, 2009, p. 21). Performance requires the correct attitude (Ude & Coker, 2012, p. 32). It has to do with introducing innovative systems and acclimatizing to economic changes (Taggart, 2009, p. 13). The South African mining industry is central to the country's

economic growth, contributing in excess of R286 billion towards (GDP) (South African Chamber of mines, 2017). The industry plays a significant role in creating employment opportunities than any other sector in South Africa (Musungwini, Cruise & Phillips, 2013, p. 1). However, with all the wealth that the mineral exploration industry is generating, it seems like mineworkers' are not benefiting (Cairncross & Kisting, 2015). This was clear to see in the Marikana protests where inadequacy of housing was a burning issue. In August, 2012, Rustenburg, South Africa, as a result of mineworkers' going on an unsanctioned labour strike, it resulted in 34 miners losing their lives as they clashed with police officers (Makhubedu et al., 2017). Allegedly, the South African current president Mr Cyril Ramaphosa, directly or indirectly had a hand in the Marikana massacre witnessed, which he later apologised for how it unfolded.

South African mining companies have to comply with the Mining Charter, as it stipulates that mining houses improve the standard of housing, conversion of hostels to family units, upgrading of hostels, and most importantly, promoting home ownership options for mineworkers (Chamber of mines of South Africa, 2017). Nevertheless, the perception within mining communities' is that, the ruling party (African National Congress), mining companies, and stakeholders have failed in redressing disparities in miners' social and economic standing. It is not easy for mining houses to clearly communicate their shortcomings pertaining to social responsibility and development of mining communities. The challenge that the mining charter faces is that, mineworkers' come from all walks of life. Majority of them are from different parts of South Africa. Minority are mining immigrants. Most miners prefer to reside in informal settlements, as they do not stay with their families, preferring to pocket their housing allowance so that they can build their own houses and to have a place that they call home after retirement.

The mineral exploration sector in South Africa, is performance driven. However, this relentless drive for mineshaft workers' to perform under stringent conditions and time constraint (Makhubedu, et. al., 2017), hampers miners' ability to be productive (Masia & Pienaar, 2011, p. 1). Consequently, resulting in low employee motivation or morale, as mineshaft workers' are heavily dependent on motivationally-inclined incentive schemes such as, monthly performance based-bonuses, assuming that they have met their monthly production output target. Thus, the current study set out to evaluate how mineshaft workers' perceive some identified exogenous determinants which appear to negate miners' operational performance at a South African platinum mine.

## **LITERATURE REVIEW**

### **Mining Community**

According to Government Gazette (2016, p. 12), the term "mining community", is defined as a community, town or camp that mineworkers reside in. Mining exploration takes place in these mining communities and they serve as labour sending areas. These mining communities are in close proximity to mining houses.

### **Marikana Local Municipality**

Marikana is a mining town in Rustenburg's local municipality, Bojanala Platinum District Municipality in the North West province of South Africa ([https://en.wikipedia.org/wiki/Mining\\_community](https://en.wikipedia.org/wiki/Mining_community)). Impala Platinum mining lease area is situated 5 to 30 kms north of the city of Rustenburg.

FIGURE 1



Source: [www.implats.co.za/implats/Impala-platinum.asp](http://www.implats.co.za/implats/Impala-platinum.asp)

### The South African Mining Charter

According to the government gazette (2016), the term “*Mining Charter*” is defined as the broad-based black economic empowerment, abbreviated – BBEE. The acronym **BBEE** means a workable economic empowerment of all black citizens of the Republic of South Africans, prioritising women, disabled people, workers, people living in rural areas and the youth (Makhubedu et al., 2018). The South African Chamber of mines (2017) states that Mining Charter of South Africa requires mining organizations to provide adequate housing and better living conditions for miners’.

According to Raymond, Wheeler, and Brown (2011), inadequate housing “*is an occupied housing unit that has moderate or severe physical problems (e.g., deficiencies in plumbing, heating, electricity, hallways, and upkeep)*”. The Charter also further stipulates that they make available, *Social and Labour Plans (SLPs)* – detailing how mining houses plan to meet the terms that are stated in the Mining Charter, as a pre-requisite for granting mining rights. In order to insure compliance, mining houses have to submit progress reports to the Department of Mineral Resources on a yearly basis. In 2009/10, the South African mining Charter was then reviewed, specifying new set of objectives – converting or upgrading hostels into family units. Mining houses had to meet the stipulated objectives in the Charter by end of 2014. Some objectives were largely met by the mineral exploration industry (Chamber of mines of South Africa, 2017).

Homes that are healthy, are important for building mining communities. They play a significant role in meeting miners’ physical needs, also known as deficiency needs (e.g., air, water, food, and shelter), which are aligned to Abraham’s Maslow Needs Hierarchy Theory (1954) (Srivastava & Barmola, 2011, p. 90). These physical needs control how people behave until the point where they are satisfied (Makhubedu et al., 2017). Needs that are not satisfied can lead to psychological disorders –anxiety, stress, and depression) in the workplace (Srivastava & Barmola, 2011, p. 90).

### Managerial Tools That Impact Employee Performance

According to Ude and Coker (2012), business leaders must make it a priority to identify managerial tools – *motivationally inclined incentive schemes, job design, and work environment*. **Job Security** – Most workers need some sense of long-lasting commitment from companies about their job security. Employers who always speak about dispensable workers are likely to promote a lack of loyalty,

motivation, or commitment in the organization. This could have an adverse impact on company goals and objectives (Nyamubarwa, Mupani, & Chiduuro, 2013, p. 121). **Job Design** – Companies must use job design to promote motivation in the workplace and so improve employee productivity. This technique entails rotating job positions among employees – but only if it is possible (Stevenson, 2007, p. 312). In turn, workers will engage in the decision-making processes of the organization by acquiring more experience, greater responsibility for their work, training and learning opportunities (Srivastva & Barmola, 2011, p. 95). **Work Environment** – A working environment that is safe and non-threatening to its workers is necessary to maintain greater levels of employee motivation and performance (Chaudhary & Sharma, 2012, p. 31). A good and friendly working environment is another motivational tool that managers can use to increase employee performance, which in turn improves organizational productivity (Aarabi, Subramaniam, & Abu Baker Akeel, 2013, p. 24). A conducive working environment is essential, as it can contribute towards employee performance (Edrak, Ying-Fah, Gharleghi, & Seng, 2013, p. 97). Ude and Coker (2012, p. 35) suggest that we can divide incentive schemes into material ones – those that are used with specific people or group of workers to motivate them for a specific behaviour – and non-material ones – those that are directed at creating a moral motivation to look out for the interests and wellbeing of a community.

In the context of this study, the following specific incentive schemes are relevant.

- **Special benefits:** This form of incentive scheme encompasses additional paid leave to employees, commission, flawless attendance, and so forth.
- **Special opportunities:** These encompass flexible working hours, favoured assignments given to employees, employee mentorship, and so forth.
- **Profit-sharing:** Companies use this to share a predetermined profit with their employees through an incentive compensation design.
- **Gain-sharing:** Also referred to as the ‘productivity incentive plan’, this allows all employees to share in the company’s financial gains through increased organizational productivity.
- **Share ownership:** The share ownership plan entails providing employees with an opportunity to co-own the company (Ude and Coker, 2012, p. 35).

### **Process Theories of Motivation**

Process theories, also known as cognitive theories, tend to focus on a methodical way in which workers’ interpret and understand their workplace. For the purposes of this current study, the process theories below have been acknowledged and explored: McGregor’s theory *x* and theory *y*; Vroom’s expectancy theory; Skinner’s support or reinforcement theory; and motivation through goal-setting theory and task performance.

#### **McGregor’s *x* and *y* Theory**

Douglas McGregor investigated how senior management deal with their workforce, and concluded (1) that two assumptions influence managers’ views on human philosophy, and (2) that they would process their behaviour towards workers in relation to these assumptions. McGregor’s view in theory *x* and *y* was to improve the relationship between management and employees, changing the assumptions of how employees behaved in the workplace from a theory *x* perspective to a theory *y* perspective (Shani & Divyapriya, 2011, p. 4749).

#### **Vroom’s Expectancy Theory**

Vroom based his expectancy theory on four assumptions. Firstly, he assumed that people join companies with certain expectations (needs, motivations, and experiences). How people react in the workplace is influenced by these expectations. Secondly, mental processes about choices influence human behaviour. In other words, people are free to choose how to behave in relation to their own expectations. Thirdly, he assumes that peoples’ wants are not the same within an organization (salary/wage,

recognition, challenge, and so forth). Lastly, those people will select different alternatives that work for them personally to optimise outcomes (Lunenberg, 2011, p. 1).

### **Skinner's Support or Reinforcement Theory**

Skinner's reinforcement theory suggests that the behavioural characteristics of employees who contribute towards negative results will be repeated, and the repetition of those behavioural characteristics of employees who tend to lead towards poor results will not be allowed. It would be in the company's best interests for management directly to reinforce employees' behavioural characteristics that lead towards attaining positive results (Ondabu, 2014, p. 18).

### **Motivation through Goal Setting Theory and Task Performance**

Managers can use goal-setting theory as a motivational instrument in order to unlock and understand the mystery behind motivating employees in the workplace. A study by Srivastva and Barmola (2011, p. 91) explains why certain employees tend to work harder and even to out-perform other co-workers in an organization. Sometimes, even their level of commitment out-weighs that of the rest. The Srivastva and Barmola (2011) study highlights that goals are central to how people behave, and to the extent that they will be motivated. Before the theory of goal-setting can influence employee productivity, two fundamental conditions have to be satisfied. Firstly, Srivastva and Barmola (2011) explain, an individual has to be aware of the goal, and fully understand what must be achieved. Secondly, they must be willing to strive for that goal. Specific goals (measurable, observable, etc.) and goals that are difficult (challenging but realistic, and stimulate the mind) can lead to improved performance. A number of components (commitment, importance, self-efficacy, feedback, and task complexity) can increase the correlation between goal-setting and improved performance.

### **Measures of Performance**

Measuring performance effectively across an organization is central to its success and to achieving long-term competitive advantage. Internal stakeholders, external stakeholders, and the customer are three integral groups concerned with measuring organizational performance. The internal stakeholders are members of the workforce and management; the external stakeholders are members of the public who invest in an organization; and customers are those with a vested interest in procuring a company's commodity or service, depending on factors such as cost, quality, and delivery (Barr & Cook, 2009, p. 21). External stakeholders tend to focus primarily on return on investment, operational profit, and financial stock turnover. Internal stakeholders focus on just-in-time, quality costs, labour efficiency variance, lost time, injury frequency rate, and price performance ratio (Taggart, 2009, p. 3). In essence, organizations have to administer what they measure. Performance measures help organizations to determine how productive they are. Measures of multifactor productivity offer comprehensive and thorough information about the trade-offs among factors. However, measurement challenges (e.g., quality, external elements, and precise units of measure) might prevail (Heizer & Render, 2006, p. 15-16).

### **Dimensions of Operational Performance**

The dimensions of operational performance are cost performance, delivery/time based performance, flexibility, and quality. To some extent, every dimension is significant for all operations; and, based on competitive positioning, how important one is over the others depends on that (Hallgren, 2007, p. 10). **Flexibility** is an operations strategy in which companies seek to provide customer heterogeneity (Reid & Sanders, 2013, p. 16). An attribute that differentiates between flexibility and other dimensions of operational performance is that it is more of an operational means to provide modified products (Hallgren, 2007, p. 12). **Delivery or time-based performance** is an operations strategy focusing on developing new commodities and delivering them to customers as quickly as possible. Speed and reliability are two main features of delivery performance (Reid & Sanders, 2013, p. 16). Delivery reliability – sometimes referred to as 'on-time delivery' or 'dependability' – relates to the capability to meet a planned delivery schedule. Delivery speed relates to responsiveness to demand (Hallgren, 2007, p. 11). **Cost performance** is a

competitive strategy prioritising low product and delivery costs (Reid & Sanders, 2013, p. 35). The term ‘cost’ is absolute, and assesses the number of resources used to manufacture a product (Hallgren, 2007, p. 12). There is no single, universal description of the term ‘quality’, as it depends on the perspective of the individuals defining it (Reid & Sanders, 2010, p. 141). The term ‘*quality*’ is multidimensional, and can be seen from up to eight different viewpoints: aesthetics, conformance, durability, features, performance, perceived quality, and serviceability (Hallgren, 2007, p. 11). Today, the term ‘quality’ is referred to as ‘total quality management’ (TQM).

In relation to the above discussion, the following research questionnaire items were employed to measure how respondents perceived some of the recognised exogenous (external) factors that seem to negate underground miners’ performance, while further demystifying the growing perception that inadequacy of housing is what encourages miners’ to engage in labour protests within the South African labour industry.

C29: I have a house.

C30: I have electricity.

C31: I have clean water.

C32: I have a toilet.

C36: My company actively recruits (offers jobs) to people from the community.

C37: I benefit from the mine.

## RESEARCH METHODOLOGY

### Research Respondents

The current study targeted the South African mineral exploration sector. Population group (*N*): The study targeted underground miners’ – occupational mining category (conventional stoping).

### Sampling Technique

Sample group (*n*): A total of 290 participants took part in the current study, of which 279 (96.2%) were male, and 11 (3.8%) were females. They were conveniently sampled (Willemse & Nyelisani, 2015, p. 24). At the time, participants were based at a centralised training facility which made it convenient for the researcher (Convenient – non sampling technique). Secondary data of key grouping variables of performance (average centares produced, average face length, average stoping width, and absenteeism (with and without permission) were employed to analyse teams from two idiosyncratic reefs – the Upper Ground 2 (UG2) and the Merensky.

**Stoping or breast:** The “Stoping” or “Breast” mining method is used whereby rock is removed from the stope face (after being marked, drilled, charged up and blasted) by means of scrapers pulled by 37kW face winch, which deposits the ore into the advanced strike gully.

**Total number of panel(s):** In an underground mining area that has not been exhausted and is still mineable, panels are used as structural supports between the lower and upper surface of the stope, installed for a limited time to protect workers from local rock falls. They are used to maintain safety in the face area during the early stages of the mining cycle, including the installation of permanent supports.

**Average face length:** measured in metres, is the tunnel face advance length (going forward).

**Average panel length:** is the safe distance between supporting panel structures measured in centimetres (cm).

**Average stoping width,** measured in centimetres, is the distance between the footwall and hanging wall of a stope.

**Centare or ( $m^2$ ):** the quantity of essential minerals extracted or mined in square metres ( $m^2$ ).

### Research Instrument

This current study was quantitative. A structured questionnaire (i.e. *Strongly Agree – Disagree, Neutral and Strongly Agree – Agree*) was employed to collect primary data. Secondary data of key grouping variables of performance (average centares produced, average face length, average stoping

width, total number of panel(s), average panel length, total non-blasts, absenteeism (with and without permission) were used to measure teams from two specific reefs – the Upper Ground 2 (UG2) Reef, and the Merensky Reef – annual production stoping output report (2015 to 2016).

### **Statistical Data Analysis**

The collated data was subjected to Statistical Package for Social Science (SPSS version 23.0). Pearson's and the Spearman rank correlation analysis were employed to examine the nature of the relationship between identified variables and the impact they have on miners' operational performance. The study reported the Pearson correlation results, as they had a similar pattern to the non-parametric correlation analysis. According to Maree (2014, p. 238), the Pearson correlation coefficient, often referred to as bivariate or two-way correlation is a statistical tool that is used to ascertain if there is a relationship between two quantitative variables, one that is independent and the other dependent. It also measures the degree of strength ranging between (-1 to +1), of the linear relationship between the identified variables of the study. A positive relationship implies that, both variables will increase, while a negative correlation would imply that, as the dependent variable decreases, the independent variable would increase (Willemsse & Nyelisani, 2015:129-130). The Cronbach Alpha value was 0.825, indicating a reasonable reliability of the research questionnaire (Cohen, Manion & Morison, 2002, p. 119).

### **Results and Interpretation**

Research Item (C29): A probe was made to find out how respondents perceived their house (physical need) and the survey results indicated that 63.5% of the respondents were happy with their house, 28.3% were not happy, while 8.2% were neutral (**see Table 1 below**). Research Item (C30): A probe was made to find out if respondents had electricity (physical need) and overwhelmingly, 86.6% of the respondents had electricity, 10.4% had no electricity, while 2.9% of the respondents were neutral. From a sample of 279 respondents out of 292, 13 of the respondents failed to answer the question (**see Table 1 below**). Research Item (C31): A probe was made to find out if respondents had access to clean water (physical need) and overwhelmingly, 85.4% of the respondents had access to clean water, 11% of the respondents had no access to clean water, while of the respondents 3.7% were neutral (**see Table 1 below**). Research Item (C32): A probe was made to find out if respondents had access to proper toilets (basic human right) and the results show that 91.8% of the respondents had access to a toilet, 6.8% of the respondents had no access to proper toilets, while 1.4% of the respondents were neutral. From a sample of 279 respondents out of 292, 13 of the respondents failed to answer the question (**See Table 1 below**).

**TABLE 1**  
**STATISTICAL DESCRIPTIVE ANALYSIS – EXOGENOUS FACTORS**

Research Question Items	Strongly disagree – Disagree	Neutral	Strongly Agree – Agree
C29: I am happy with my house.	79 (28.3%)	23 (28.3%)	177 (63.5%)
C30: I have electricity.	29 (10.4%)	8 (2.9%)	242 (86.8%)
C31: I have clean water.	30 (11%)	10 (3.7%)	233 (85.5%)
C32: I have a toilet.	19 (6.8%)	4 (1.4%)	256 (91.8%)
C33: My children can read and write.	14 (5.1%)	24 (8.8%)	234 (86%)
C34: My children go to school every day.	11 (3.9%)	11 (3.9%)	261 (92.2%)
C35: My children have good teachers at school.	15 (5.4%)	49 (17.6%)	215 (77.1%)
C36: My company actively recruits (offers jobs) to people from the community	55 (20.1%)	55 (20.1%)	164 (59.9%)
C37: I benefit from the mine.	30 (10.6%)	30 (10.6%)	222 (78.7%)

Source: (Statistical calculation from SPSS analysis: 2016)

**TABLE 2**  
**PEARSON(S) CORRELATION ANALYSIS – UPPER GROUND 2 REEF**

UPPER GROUND 2 (UG2) REEF		Average centares – YTD	Total no. of panels – YTD	Ave panel length – YTD	Ave face advance YTD	Ave stopping width – YTD
Motivation	Pearson Correlation	-.081	.038	.004	-.085	<b>-0.261**</b>
	Sig. (2-tailed)	.338	.656	.958	.313	.002
	N	142	142	142	142	142
AWOP Total YTD	Pearson Correlation	<b>-0.666**</b>	<b>-0.519**</b>	.043	<b>-0.851**</b>	<b>-0.180*</b>
	Sig. (2-tailed)	.000	.000	.613	.000	.032
	N	142	142	142	142	142
AWP Total YTD	Pearson Correlation	<b>0.194*</b>	-.087	-.037	-.011	-.056
	Sig. (2-tailed)	.021	.303	.661	.897	.511
	N	142	142	142	142	142

Source: (Statistical data analysis: 2016)

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Table (2) above indicated that there was a negative association ( $r = - 0.227$ ,  $p < 0.01$ ) between employee motivation (independent) and average stopping width (dependent). The empirical results seem to suggest that, as employee morale increased, there was a significant decrease in average stopping width.



The results suggested that there was a negative association ( $r = - 0.666, p < 0.01$ ) between Absenteeism Without Permission (independent) when correlated with average centares produced ( $m^2$ ) (dependent). As far as maintaining production stopping output target, the results seem to suggest that, as more miners were **AWOP**, there was a significant decrease in average centares produced ( $m^2$ ).

The results also registered a negative association ( $r = - 0.519, p < 0.01$ ) between Absenteeism Without Permission (independent) when correlated with Total Number of Panels (dependent). The results suggest that, as more miners were **AWOP**, there was a significant decrease in Total Number of Panels.

There was a negative association ( $r = - 0.851, p < 0.01$ ) between Absenteeism Without Permission (independent) when correlated with average face advance (dependent). As more miners were **AWOP**, there was a significant decline in average face advance.

There was a negative association ( $r = - 0.180, p < 0.05$ ) between Absenteeism Without Permission (independent) when correlated with average stopping width (dependent). As more miners were **AWOP**, there was a significant decline in average stopping width.

There was a positive relationship ( $r = 0.194, p < 0.05$ ) between Absenteeism With Permission when correlated with average centered produced ( $m^2$ ). Results indicated that, as more miners' were **AWP**, there was a weak significant increase in average centares produced ( $m^2$ ).

**TABLE 3**  
**PEARSON CORRELATION ANALYSIS – MERENSKY REEF**

MERENSKY REEF		Ave. centares – YTD	Total no. of panels – YTD	Ave. panel length – YTD	Ave. face advance YTD	Ave. stopin width – YTD
<b>Motivation</b>	<b>Pearson Correlation</b>	-.131	.111	.035	<b>-0.177*</b>	<b>0.167*</b>
	<b>Sig. (2-tailed)</b>	.109	.176	.673	.030	.041
	<b>N</b>	150	150	150	150	150
<b>AWOP Total YTD</b>	<b>Pearson Correlation</b>	<b>-0.856**</b>	<b>-0.678**</b>	<b>-0.656**</b>	<b>-0.861**</b>	<b>-0.410**</b>
	<b>Sig. (2-tailed)</b>	.000	.000	.000	.000	.000
	<b>N</b>	150	150	150	150	150
<b>AWP Total YTD</b>	<b>Pearson Correlation</b>	<b>0.567**</b>	<b>0.565**</b>	<b>0.338**</b>	<b>0.447**</b>	<b>0.196*</b>
	<b>Sig. (2-tailed)</b>	.000	.000	.000	.000	.016
	<b>N</b>	150	150	150	150	150

Source : (Statistical data analysis: 2016)

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

**Table (3)** above indicated that there was a strong, but negative association ( $r = - 0.856, p < 0.01$ ) between Absenteeism Without Permission (independent) when correlated with average centares produced ( $m^2$ ) (dependent). As **AWOP** increased, there was a significant decline in average production stopping output.

There was a negative association ( $r = - 0.466, p < 0.01$ ) between Absenteeism Without Permission (independent) when correlated with the Total Number of Panels (dependent). The results show that, as more **AWOP** increased, there was a significant decline in the Total Number of Panels.

There was a good but negative association ( $r = - 0.656, p < 0.01$ ) between Absenteeism Without Permission (independent) when correlated with Average Panel Length (dependent). The empirical findings suggest that, **AWOP** increased, there was a significant decline in the average panel length.

There was a strong, but negative association ( $r = - 0.861, p < 0.01$ ) between Absenteeism Without Permission (independent) when correlated with Average Face Advance (dependent). The results indicate that, as **AWOP** increased, there was a significant decline in the average face advance.

There was a negative association ( $r = -0.410$ ,  $p < 0.01$ ) between Absenteeism Without Permission (independent) when correlated with Average Stopping Width (dependent). This means that, as **AWOP** increased, there was a significant decline in the average face advance.

There was a good positive association ( $r = 0.567$ ,  $p < 0.01$ ) between Absenteeism With Permission (independent) when correlated with Average Centares Produced (dependent). As **AWP** increased, there was a significant increase in the average face advance.

There was a good positive association ( $r = 0.338$ ,  $p < 0.01$ ) between Absenteeism With Permission (independent) when correlated with average panel length (dependent). The results show that, as **AWP** increased, there was a significant increase in the total number of panels. Equally, there was a weak positive association ( $r = 0.447$ ,  $p < 0.01$ ) between Absenteeism With Permission (independent) when correlated with average face advance (dependent). Suggesting that, as **AWP** increased, there was a significant increase in the average face advance.

There was a positive association ( $r = 0.196$ ,  $p < 0.05$ ) between Absenteeism With Permission (independent) when correlated with average stopping width (dependent). The results suggest that, as **AWP** increased, there was a significant increase in the average face advance. The correlation analysis had a similar pattern to the non-parametric correlation analysis.

The empirical findings in the UG2 Reef indicated that there was a significant negative relationship between ‘total non-blasts’ and ‘average centares produced’ (production stopping output), ‘average panel length’, ‘average face advance’, and ‘average stopping width’.

In the Merensky Reef, there was a significant negative relationship between ‘total non-blasts’ and ‘average centares produced’. The relationship was negative between ‘total non-blasts’ and ‘total number of panels’, ‘average panel length’, and ‘average face advance’.

Total non-blasts as a factor of performance had no significant positive impact on some of the grouping variables of performance in the UG2 and Merensky Reefs.

The empirical findings in the UG2 Reef indicated that even though the relationship between ‘absenteeism (without permission)’ and ‘all the grouping variables of performance, was good, and very strong with ‘average face advance’, it was still negative.

The empirical findings in the Merensky Reef, indicated a similar pattern. Absenteeism (without permission) had a significant negative impact on all the grouping variables in both mining reefs.

The empirical findings in the UG2 Reef indicated that ‘absenteeism (with permission)’ had a significant positive relationship with ‘average centares produced’, but a significantly negative relationship with ‘total number of panels’.

The empirical findings in the Merensky Reef were even better: ‘absenteeism (with permission)’ had a significant positive relationship with each of ‘all the grouping variables of performance’. Absenteeism (with permission) had a significant impact on employee performance.

## **LIMITATION(S) & FUTURE RESEARCH STUDY**

This study did not cover the entire South African mining spectrum. It was only limited to one mining company and one occupational mining category, hence it restricts the current study’s generalizability and ecological validity to other mining houses and industries in the Republic of South Africa. With that said, it is recommended that this study be extended to other sectors, focusing on other occupational categories, and further quantifying employees perceptions of exogenous variables that could negate workers operational performance.

## **CONCLUSION & PRACTICAL IMPLICATIONS**

The perception within the South African labour force is that inadequacy of housing drives mineshaft workers to engage in labour unrest. However, contrary to what was expected, the empirical findings of the current study suggest that miners are content with some of the exogenous factors that were identified even though their production output was unsatisfactory. Furthermore, the results demystifies this growing

perception within the South African labour sector, that exogenous factors, apart from remuneration (salary/wage), are what encourages miners' to engage in labour unrests. The South African Mining and Mineral Industry, mining houses, labour unions and stakeholders' should endorse home-ownership. It is also recommended that it becomes compulsory.

However, it is also important to note that the challenge pertaining to the South African mining charter – mineworkers' come from all walks of life. Majority of them, are from different parts of the Republic of South Africa. Most miners prefer to reside in informal settlements as they do not stay with their families, preferring instead to pocket their housing allowance so that they can build their own houses where they come from. This could be attributed to miners' not intending to spend their entire lives residing in these mining communities. All parties involved should find a common ground, where miners' social and economic standing can be improved.

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