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The readability of CEO and Board Chair statements of JSE-listed mining companies in South Africa: The role of Women Directors and the narrative tone

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Abstract

Demographic attributes (e.g., gender differences) and reporting style (e.g., narrative tone) have consequences on the CEO and board chair's statements in conveying the message to stakeholders. Other strands of the literature suggest significant differences in the effectiveness of statements written by women compared to those written by their male counterparts. These statements can be used to convey to stakeholders the entities' financial health and performance, growth prospects, sustainability efforts, and environmental factors. This paper examines the influence of the presence of women directors on the board and tone on the readability of CEO and Board Chair statements. The study analysed 136 firm-year reports from 17 JSE-listed mining companies covering the period 2014-2021, from which 272 board chair and CEO statements were extracted for textual analysis using Partial Least Squares structural equation modelling (PLS-SEM). The WD and the tone were found to be significantly and positively influencing the readability of the statements with respective coefficients of (β = .420, t-statistic = 5.316) and (β = .398, t-statistic = 6.926). The results imply that the presence of women on the boards improves transparency in reporting quality. Further, the tone in the statements can have consequences in that long and poorly written statements are less engaging, thus affecting their readability. The results align with the previous literature that argues in favour of gender-diverse boards and their association with tone and readability.

Keywords: Intent sentiment analysis, narrative tone, Partial Least Squares Structural Equation Modeling, readability, women directors

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1. Introduction

In recent years, the strategic narratives reported by chief executive officers (CEOs) and board chairs (CPs) in integrated annual reports (IARs), standalone sustainability reports, and other corporate communications material/medium have become increasingly influential in shaping perceptions of stakeholders, building investor confidence, and steering organisational direction (Loughran & McDonald, 2011). These statements often project narratives, which serve as a powerful tool for corporate leaders to convey their vision, strategy, and performance to a range of stakeholders, such as investors, industry practitioners, employees, analysts, and the public in general. Again, these textual artifacts offer insights into the financial and non-financial information and rationales underlying the strategic choices and actions of the organisation. On top of these functionalities, Mmako (2016) indicates that they can also proactively or reactively convey the company's key messages to stakeholders or counter environmental issues affecting the image and performance of the company.

Barkemeyer, Comyns, Figge, and Napolitano (2014), in a paper examining the background noise in CEO statements, liken this approach to impression management or accountability tactics. It appears that the CEO may strategically shape their statements to create a favourable image. This implies that managers have considerable autonomy in deciding what information to include in their statements, which can have implications for the accuracy, transparency, and overall effectiveness of the reporting process (Michelon, Trojanowski, & Sealy, 2022). Du and Yu (2022) report that the use of discretionary language and the descriptive nature of statements in firm performance reports raise concerns regarding the readability and potential use of narrative tone, particularly in the context of justifying unfavourable outcomes.

To restrict the effective use of managerial discretion and autonomy, Albitar, Abdoush, and Hussainey (2023) propose instituting internal corporate governance (CG) mechanisms that proactively monitor and regulate disclosures, which can lead to a more balanced tone in corporate disclosures. These mechanisms involve setting up processes and structures that oversee the disclosure of information, ensuring transparency, accuracy, accountability, and compliance with relevant regulations and standards (Ahmed, Jannat, & Ahmed, 2017), enhancing the company's credibility and legitimacy. According to Guluma (2021), these internal CG mechanisms comprise internal audits, internal controls (such as policies, procedures, and technical safeguards), and the board of directors (e.g., gender diversity, independence status, various committees). Previous studies have investigated the impact of various internal CG mechanisms on firm performance (Guluma, 2021), sustainability performance reporting (Ludwig & Sassen, 2022; Tjano, 2021), CSR disclosure (Fahad & Rahman, 2020), voluntary disclosure of reporting (Hamad et al., 2022), CSR narrative tone (Albitar et al., 2023), and non-financial reporting readability (Caldarelli, Allini, Salvatore, Zampella, & Meucci, 2022). However, relatively little attention has been paid to studies investigating the impact of internal CG mechanisms on CEOs' and CPs' statements.

In line with the current paper, Albitar et al. (2023) investigated the relationship between various CG measures, including gender diversity, board size, independent directors, and size of audit committee, and the disclosure of environmental, social, and governance information as well as the narrative tone of the corporate social responsibility (CSR) narrative within United Kingdom (UK) firms over the period of 10 years from 2008 to 2017. Similarly, Caldarelli et al. (2022) conducted a study in Italy investigating the impact of CG mechanisms, in particular, board independence, female directors, and the presence of a sustainability committee. However, these studies overlooked the inclusion of both the statements issued by CEOs and CPs in their investigations as well as the impact of various characteristics of women directors (WD) on corporate boards, e.g., the total number and proportion of WD on boards as well as the narrative tone.

In the South African context, Nel et al. (2022) investigated the association between optimism and future performance, specifically focusing on comparing the level of optimism between the letters from CEOs and CPs. Similarly, in their paper, Phesa and Sibanda (2023) investigated the use of impression management in the CPs' statements and audit committee's reports preceding the delisting of companies from 2016 to 2021. Despite recent scholarly (Caldarelli et al., 2022; Phesa & Sibanda, 2023; Dalwai, Mohammadi, Chugh, & Salehi, 2023) efforts to advocate for enhanced CG mechanisms within corporate boards, particularly in the context of corporate disclosure, along with the growing acknowledgement of diversity for enhancing CG, the specific roles and contributions of WD and the narrative tone in the mining industry remain inadequately explored and insufficiently understood. This paper delves deeper into assessing the impact of WD and narrative tone within the mining industry, particularly focusing on how the presence of WD and the narrative tone of CEOs and CPs influence the readability of statements issued by CEOs and CPs. This necessitates further investigation to enhance the understanding of the relationship between WD, the narrative tone, and the readability of CEOs' and CPs' statements. This study borrows from (Post & Byron, 2015) in operationalising WD as the number and presence of women on the board of directors.

In response to the identified gap in the literature, the paper sought to achieve the following objective:

- *To examine the influence of the presence of WD and the narrative tone on the readability of CEOs' and CPs' statements of JSE-listed mining companies*.

The paper makes notable contributions to the existing literature on sentiment analysis by going beyond the standard positive/negative classification of merely categorising the sentiment of the CEOs' and CPs' statements. Also, the application of NLP contributes significantly to enhancing the effectiveness of textual analysis in the statements issued by CEOs and CPs.

2. Literature Review

2.1 Corporate governance under pressure: Global trends, reforms, and South African Gaps

Amid rapid business transformation, good CG practices face disruptive forces emanating from various domains – investor priorities and expectations, technological advancements, global economic fluctuations, and societal demands. To remain relevant, CG frameworks need to adapt. Emerging trends are reshaping the future of CG, prompting a critical reassessment of the principles and practices governing corporate direction and control. CG has gained critical importance in the wake of a global string of high-profile corporate scandals that exposed significant weaknesses in oversight mechanisms. Major corporate failures include Enron, WorldCom, Steinhoff, VBS Mutual Bank, Tongaat Hulett, and alleged Gupta-related companies. These failures have raised concerns among stakeholders and shareholders about CG's effectiveness in upholding transparency, accountability, and sustainability of corporate reporting practices (Hossain, Hasan, & Hasan, 2024; Mabindla, 2018).

Governments worldwide responded to these challenges of CG by enacting laws and regulations emphasising disclosure as a medium for accountability. These include the U.S Sarbanes-Oxley Act (2002), Germany's CG Code (2002), South Africa's King Reports on CG (issued in 1994, 2002, 2009, & 2016), and New Zealand's Principles and Guidelines (2004). This implies that corporations are continuously compelled to reevaluate their governance structures to build stakeholder trust, enhance competitiveness, and contribute to global sustainable development. Reassessing the governance structures involves strengthening internal control mechanisms within the CG framework and applying agency theory to mitigate the potential manipulation of executives. For example, Bassyouny (2020) examined board independence, disclosure policies, board gender diversity, and audit committee independence, while Albitar et al. (2023) investigated ownership concentration, gender diversity, and board size. However, from the South African perspective, little attention has been paid to empirical investigations on the impact of WD and narrative tone on the readability of statements issued by CEOs and CPs in the mining industry.

2.2 The Role of CEOs and CPs' Narrative Reporting: Legitimacy and Upper Echelons Theoretical Perspectives

The primary narrative components of the IAR are encapsulated within the communications provided by the CEOs and CPs. These narrative disclosures in the CEOs' and CPs' statements are strategically crafted to legitimise the company's operations. According to the legitimacy theory (Dowling & Pfeffer, 1975), firms must continually validate that their operations comply with both legal requirements and societal norms and expectations in which they operate to ensure their survival (Hoque, 2018). Martens and Bui (2023) contend that companies should strive to communicate transparency about their social impact, as this informs and engages stakeholders while enhancing the company's perceived legitimacy through alignment with societal expectations. Giacomini et al. (2021) highlight that firms may invest in CSR to enhance their societal legitimacy. When a firm's legitimacy is threatened, it can either align its actions with social values or use CSR disclosures to obfuscate bad/negative news (Michelon, Pilonato, & Ricceri, 2015). The latter approach creates information asymmetry between the company and its stakeholders (Merkl-Davies & Brennan, 2007). Shin and You (2020) argue that transparent and comprehensive narrative disclosures by CEOs and CPs are crucial in reducing information asymmetry and mitigating agency conflicts.

Furthermore, Al Lawati, Hussainey, and Sagitova (2023) argue that these narratives offer a forward-looking perspective beyond traditional financial reporting. This argument resonates with the upper echelons theory (Hambrick & Mason, 1984), which posits that organisational outcomes, including strategic choices and performance levels, are partially predicted by top managers' characteristics. This perspective suggests that top managers' beliefs and attributes play a role in shaping the company's strategy and performance. A recent investigation conducted by Bassyouny, Abdelfattah, and Tao (2020) has extended the application of the theory to narrative disclosure tone, demonstrating that both observable CEO characteristics (age, gender, expertise) and psychological attributes (narcissism) significantly influence positive tone in corporate narratives, with these relationships being moderated by CG mechanisms such as board independence and audit committee composition.

2.3 Hypotheses Development

This section sheds light on the outcome of the review of the empirical and theoretical literature concerning the influence of internal CG mechanisms – women's presence on the board of directors and the narrative tone on the readability of statements issued by CEOs and CPs. The hypothesised conceptual model for this influence is illustrated in Figure 1 below.

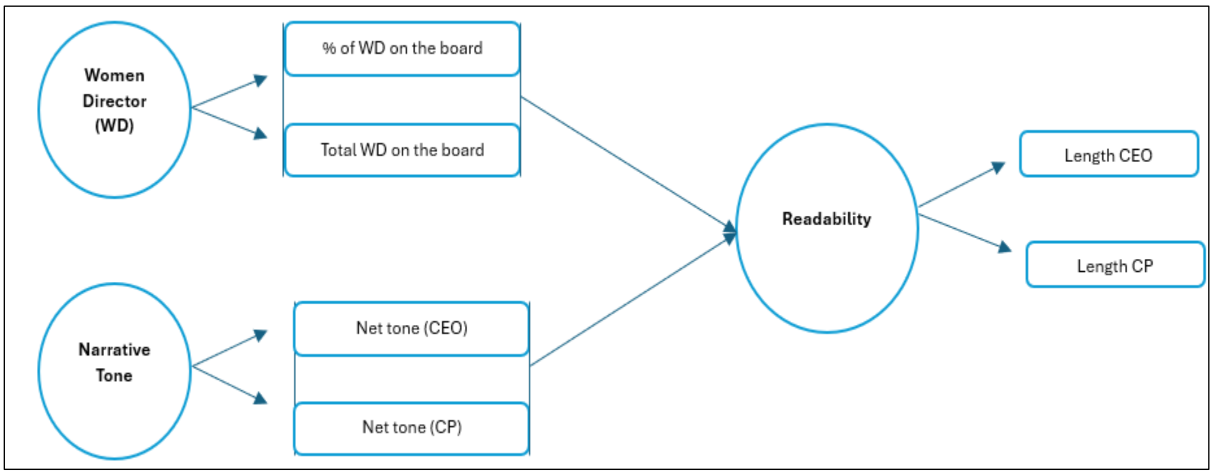

***Figure 1**: Hypothesised conceptual model between WD, narrative tone and readability*

Source: Own compilation

2.4 Women's presence on the board and readability of CEOs and CPs statements

Leveraging the stakeholder-agency theory, the study investigates the link between WD and the readability of CEOs' and CPs' statements in JSE-listed mining companies. The stakeholder-agency theory posits that the interests and actions of shareholders, suppliers, customers, society, the environment, and managers can influence corporate behaviour and communication (Freeman, 1984; Hill & Jones, 1992). Nadeem (2022) warns that self-interested actions by boards, such as withholding information or presenting it in a complex manner, may hinder transparency and misguide decision-making by key stakeholders.

Recent empirical research by Dalwai et al. (2023) highlights that CG mechanisms, specifically dispersed ownership and audit committee size, significantly contribute to the readability of annual reports. Similarly, Caldarelli et al. (2022) found that board size, social committees, gender diversity, and ESG scores significantly improve the readability of non-financial information among Italian-listed companies. While Metwally, Ei-Deeb, and Ahmed (2024) extended the research to the Egyptian banking sector, revealing that board meetings, gender diversity, and cultural diversity significantly impact annual report readability. Though these factors enhance transparency and accessibility of financial and non-financial information, their analysis has been limited to variables like board size, various committees, gender diversity, and ownership. Other potential factors such as female directorship that could influence readability have received insufficient empirical attention, especially in the South African mining industry. In alignment with this study, Beretta et al. (2023) found that both board size and the proportion of women on the board can serve as strategic levers to enhance completeness and transparency of non-financial disclosures in the Italian banking sector. However, these studies were conducted in markets outside of the South African economy, limiting generalisability, especially in the mining industry. Building upon the context outlined earlier and considering Rahi's (2024) insights on women's participation on corporate boards and the impact on corporate sustainability performance, the current study hypothesises the following relationship:

- **Hypothesis 1:** Women's presence on the board significantly and positively influences the readability of CEOs' and CPs' statements of JSE-listed mining companies.

2.5 The narrative tone and readability of statements issued by CEOs and CPs

The narrative tone used in the CEOs' and CPs' statements can significantly affect conciseness and clarity, leading to readability issues. Fisher, Van Staden, and Richards (2020) demonstrate that tone dimensions vary significantly across different narrative types within corporate reports, with tone serving as a significant determinant of readability. Complementing this, Hassan, Abu-Abbas, and Kamel (2022) find that a positive tone is associated with easier-to-read annual reports of Gulf Cooperation Council (GCC) banks, while negative tone and higher financial risk are associated with reduced readability. Similarly, Eslin, du Toit, and Puane (2023) show that a more positive and optimistic tone, characterised by language that endorses persons and groups and highlights their positive aspects, can enhance the readability of the statements. Beyond tone, the disclosure length of the statements also emerges as a role player, with longer disclosures generally being less readable. Synthesising these insights, García-Sánchez et al. (2019) emphasise that the CEOs and CPs should strive to utilise a clear, concise, and accessible tone in their statements to effectively communicate with stakeholders. Building on this foundation, the following relationship is hypothesised

- **Hypothesis 2:** The tone significantly and positively influences the readability of CEOs' and CPs' statements of JSE-listed mining companies.

3. Research design and methodological approaches

3.1 Data sources and sample selection

This study was conducted within the confines of the positivist paradigm (Bryman, 2016) and used secondary data extracted from IARs of 17 JSE-listed mining companies between 2014 and 2021. A total of 136 (17 mining companies x 8 years) IARs were retrieved from the identified mining companies' websites. From these reports, 272 CEOs' and CPs' statements were manually extracted from Portable Document Format (PDF) files and converted to MS Word documents to prepare them for Machine Learning (ML) readability processing. This study employs the wordlists developed by Loughran and McDonald (2011) to operationalise measures of positive and negative tone in CEOs' and CPs' statements. Following the removal of tables, pictures, infographics, and punctuation signs, the identification of positive and negative words in the CEOs' and CPs' statements was computed using the Google Colaboratory Program (Theron, 2020), which facilitated the computation of the sentiment scores of positive and negative words in each statement across the dataset. This program boosts the comprehensive power of Python libraries for leveraging ML and deep learning experiences (Carneiro et al., 2018). The Loughran and McDonald wordlists were used because this wordlist was developed specifically for accounting reports and business purposes (Huang, Teoh, & Zhang, 2014). The Loughran and McDonald wordlist comprises 354 positive and 2337 negative words.

The composition of the sentiment index follows a detailed formula yielding values that range from +1 (maximum positive) to -1 (maximum negative) (Muslu et al., 2019). To account for variation in the length of CEOs' and CPs statements and ensure conciseness and clarity, the study employs the natural logarithm (log) of the total word count in CEOs' and CPs' statements as a proxy for document length. To enhance the reliability and validity of the Google Colaboratory Program process for computing positive and negative narrative tones, a subsample of 35 statements issued by CEOs and CPs was randomly selected. Through the intent sentiment analysis, the net sentiment score was calculated by subtracting the negative sentiment score from the positive sentiment score, providing the overall measure of the narrative tone expressed in each CEO's and CP's statement.

The selection of 2014 as a starting point for examination is strategically two-fold. First, the period is aligned with significant regulatory milestones impacting JSE-listed mining companies. Secondly, the period marks when the 2010 BBBEE Mining Charter was enforced, requiring JSE-listed mining companies to conform to 26% female representation on their boards by the year-end (Moraka, 2015). The study builds from the previous literature (Barkemeyer et al., 2014; García-Sánchez et al., 2019; Mankayi et al., 2023; Phesa & Sibanda, 2023; Sahar, Oradi, & Nazari, 2022; Varachia & Yasseen, 2020) by conducting intent sentiment and textual analysis of content in the statements issued by CEOs and CPs of South African mining companies.

3.2 Variable selection and measurement

Drawing from the hypothetical model as depicted in Figure 1, the independent variables include WD and the narrative tone. The WD was proxied through % of women on the board and the total number of WDs on the board. The dependent variable was the readability of both the CEOs' and CPs' statements and was proxied through the length of the CEO (CEO _Len) and CP (CP_Len) statements. The tone is quantified using an index that captures the positive and negative words. The net tone is calculated as the difference between the percentage of positive words and the percentage of negative words. Table 1 illustrates how variables were operationalised.

Table 1: Operationalisation of variables

Category	Variable definition	Variable Symbol
Dependent Variable		
Readability	Log of the number of words in CEO and Board Chair statements (Li, 2008; Muslu et al., 2019; Al-Shaer et al., 2022)	LEN_CEO LEN_CP
Independent Variables		
Tone	Difference between the percentage of positive words and the percentage of negative words (DeBoskey, Luo, & Zhou, 2019; Elshandidy & Kamel, 2024).	NET_CEO NET_CP
Total number of WD	Number of WD on boards (Al-Shaer & Zaman, 2016)	NB_WD
Proportion of WD	(Total number of WD/Board Size) x 100 (Hussain, Rigoni, & Orij, 2018)	%WD

Source**:** Researchers' own compilation

3.3 Empirical Model Specification and Data Analysis

To test the hypothesised association between WD, tone, and readability, the following models were estimated following the hypothetical conceptual model presented in Figure 1. SmartPLS was used as data analysis software through which Partial least squares structural equation modelling (PLS-SEM) was performed as an analysis technique (Ringle, 2024). PLS-SEM is suitable for exploratory studies with smaller sample sizes and theory development (Hair et al., 2019). An additional strength of PLS-SEM lies in its ability to deal with complex models with multiple predictor and outcome variables (Sarstedt et al., 2017). PLS-SEM is thus appropriate for the conceptual framework of this paper as we were able to simultaneously assess the measurement and construct models through assessing the measurement properties of the constructs and testing the hypothesized structural relationships.

Model 1 was envisaged to test H1, the influence of WD on the readability of the length of CEOs' and CPs' statements, and this is illustrated through the following equation 1:

$$Read_{it} = \beta_0 + \beta_1 NB\_WD_{i,t} + \beta_2 \%WD_{i,t} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textbf{(1)}$$

Where the dependent variable is represented using $Read_{it}$ = readability of the length of CEOs' and CPs' statements, i = firm, t = year; and β_0 = constant. The independent variables NB_{it}= total number of women directors on boards, $\%WD_{i,t}$= proportion of WD on boards, and ε_{it}= the standard error term.

Model 2 was designed to empirically test H2, which proposes the influence of the narrative tone on the readability of the length of CEOs' and CPs' statements, and this is illustrated through the following equation 2:

$$Read_{it} = \beta_0 + \beta_1 NET\_CEO_{i,t} + \beta_2 NET\_CP + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textbf{(2)}$$

Where the dependent variable is represented by $Read_{it}$ = readability of the length of the CEOs' and CPs' statements, i = firm, t = year; and β_0 = constant, NET_CEO_{it}= net narrative tone for CEOs, $NET\_CP_{i,t}$= net narrative tone for board chair, and ε_{it}= the standard error term.

The error for both models signifies the possibility of variance between the expected outcome and the actual outcome, representing the unexplained portion not accounted for by the model.

4. Results and Discussion

4.1 Measurement model evaluation (Reliability and validity tests)

Reliability and validity tests were performed to assess the measurement properties of the constructs of the hypothesised model. These tests included internal consistency, convergent validity, and discriminant validity, which are discussed next:

4.2 Internal consistency

Cronbach's Alpha (CA) coefficient and Composite Reliability (CR) were utilised to assess the reliability of the constructs and their dimensions. The results are illustrated in Table 2.

Table 2: Internal consistency

Construct	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)	Collinearity statistics (VIF)
Readability	.610	.833	.715	1.239
Tone	.738	.877	.782	1.518
WD	.947	.974	.949	5.191

***Source*:** SmartPLS output

The *WD* construct exhibited high internal consistency, with respective CA and CR coefficients of $\beta = .947$ and $\beta = .974$. Both coefficients exceeded the recommended threshold of 0.60 (Duad et al., 2018; Fakir, 2020), thus suggesting that items used to measure WD are highly reliable and consistently capture the underlying construct. Similarly, the tone and readability constructs showed higher and moderate consistencies, respectively. The tone construct demonstrated satisfactory internal consistency, with a CA coefficient recorded at $\beta = .738$ and a CR coefficient at $\beta = .877$. At the same time, the readability construct showed a CA coefficient at $\beta = .610$ and a CR at $\beta = .833$. These exhibit good internal consistency coefficients, implying items used to measure the tone and readability of CEOs' and CPs' statements are reliable, well-aligned with the overall constructs, and coherent in representing the underlying constructs. This view is based on the less stringent criterion measure of a 0.60 threshold (Duad et al., 2018; Fakir, 2020). Conservative higher threshold literature recommends a 0.70 cutoff or higher (Hair et al., 2019). If we were to consider the latter, the readability of CEOs' and CPs' statements may not be as reliable or coherent in representing the underlying construct. Notwithstanding the moderately reliable coefficients for readability, the overall measurement model appears to be satisfactory, with the WD and tone constructs exhibiting strong internal consistency. This aligns well with the study of Mankayi et al.

(2023) that analysed the readability of board statements of 40 JSE-listed entities. Looking at collinearity statistics, the variance inflation factor (VIF) loadings are less than 10, thus suggesting no presence of multicollinearity, consistent with Hair et al. (2019).

4.3 Convergent validity

To assess the reliability and validity of the hypothesised model, convergent validity was evaluated by computing Average Variance Extracted (AVE) values. This approach further supports the validity of the constructs. According to Table 2, the produced AVE outputs for constructs were as follows: WD recorded at $\beta = .949$, tone at $\beta = .782$, and readability at $\beta = .715$. Depending on Hair et al. (2019), the extracted values surpass the recommended 0.50 threshold. This therefore suggests that the three constructs can account for (explain) more than 50% of the variance in their respective measurement items. The high AVE coefficient loadings, in particular the WD construct, imply the efficacy of measurement items capturing a significant portion of the underlying construct's variance. All in all, these AVE loadings provide evidence of convergent validity, similar to other literature (e.g., Bhuyan, Baid, Baid, & Mishra, 2023; Sahar et al., 2022).

4.4 Discriminant validity and correlations

To assess the reliability and validity of the measurement model, the Fornell-Larcker Criterion (FLC), Heterotrait-Monotrait (HTMT) Ratio, and Cross-Loadings were considered to test if the model demonstrates adequate discriminant validity. The intention is to ensure that the proposed model constructs are possibly distinct and capture various aspects of the underlying phenomena (i.e., the influence of WD and tone on readability), as this is crucial for the validity and explainability of the structural model relationships. The FLC assesses discriminant validity by comparing the square root of the AVE value for each construct with the correlations to all other constructs. Discriminant validity is established if the square root of the AVE for a construct exceeds its highest correlation with any other construct (Ringle, Wende, & Becker, 2024).

The results of HTMT are presented in Table 3. Discriminant validity is evident when the HTMT ratio is less than the threshold $\beta = .90$ and $\beta = .85$ if we were to consider a more conservative criterion.

Table 3: Heterotrait-Monotrait (HTMT) outputs

Direction of the influence	Coefficients
Tone <-> Readability	.576
Women Director <-> Readability	.514

Women Director <-> Tone	.131

Source**:** SmartPLS output

Compared to the Fornell-Larcker criterion, HTMT is a more reliable indicator of discriminant validity, and drawing on the data in Table 3, the HTMT ratios for all the constructs recorded at $\beta = .576$, $\beta = .514$, and $\beta = .131$, which are found to be compliant with the recommended threshold. This suggests that the correlation ratios of indicators across all the constructs compared to correlation ratios within the same construct demonstrate discriminant validity.

The final test to establish discriminant validity was to closely examine factor loadings. Following the criterion set out by Hair et al. (2019) adopted in this study, loadings of every measurement item in each construct are supposed to be at $\beta = .70$ or higher to be acceptable for establishing indicator reliability. In addition, each measurement item is expected to exhibit a higher loading on its construct than on other constructs. The results in Table 4 illustrate that all outer factor loadings were above the recommended threshold, ranging from 0.789 to 0.977, providing evidence of satisfactory indicator reliability. Furthermore, each item loaded more strongly on its assigned construct than on the other constructs. For example, *Len_CEO* loaded at 0.789 on readability, while *Net Tone_CEO* loaded at 0.943 on tone. Similarly, the two *WD* indicators, proportion of WD and the total number of WD, recorded outer loadings of 0.972 and 0.977, respectively, which exceeded their corresponding cross-loading criterion.

It is worthwhile to note that factor loading is considered a weaker assessment of discriminant validity; hence, the assessment was further supported by the FLC and HTMT ratio. Nonetheless, the combined assessment of these criteria provides a solid base evaluation of whether readability, tone, and women director constructs are empirically distinct. The results of the FLC and HTMT assessments are considered alongside the cross-loading results in determining the adequacy of the measurement model for the subsequent structural model assessment, the results of which are discussed in the following section.

Table 4: Model evaluation

Construct	Outer loadings	Readability	Tone	WD
Len_CEO <- Readability	0.789	0.489		
Len_CP <- Readability	0.898	0.684		
Net Tone_CEO <- Tone	0.943		0.703	
Net Tone_CP <- Tone	0.821		0.411	
Proportion_of_all_WD <- Women Director	0.972			0.488

Total_Number_of_WD <- Women Director	0.977			0.538

Source**:** SmartPLS output

4.5 Structural model evaluation

In this section, the significance and relevance of path coefficients accounting for the hypothesised influence of WD and narrative tone on the readability of CEOs' and CPs' statements are discussed. The relevant statistical measures and thresholds used to evaluate the model are illustrated in Table 4. Drawing from the above discussion, the structural model is depicted in Figure 2 below. Path coefficients and significance values were used to explain the hypothesised influence of WD and tone on readability. All other factors remain constant, and the path coefficient of the influence of the first explanatory variable indicates a positive association between WD and readability (*β = .420*, *t-statistic = 5.316*).

This result implies that a single unit increase in WD is responsible for a 0.42-unit improvement in the readability of CEOs' and CPs' statements. This indicates that WD exerts a strong and positive influence, making it a significant predictor of how accessible South African mining industry CEOs' and CPs' statements are. The path coefficient of the influence of the second explanatory variable, tone, on readability was *β = .398,* with a *t-statistic* = *6.926*. This suggests that a one-unit increase in narrative tone is associated with a 0.39 improvement in the readability of CEOs' and CPs' statements. Tone emerges as a salient determinant, although with a slightly lower effect than WD while demonstrating greater statistical robustness.

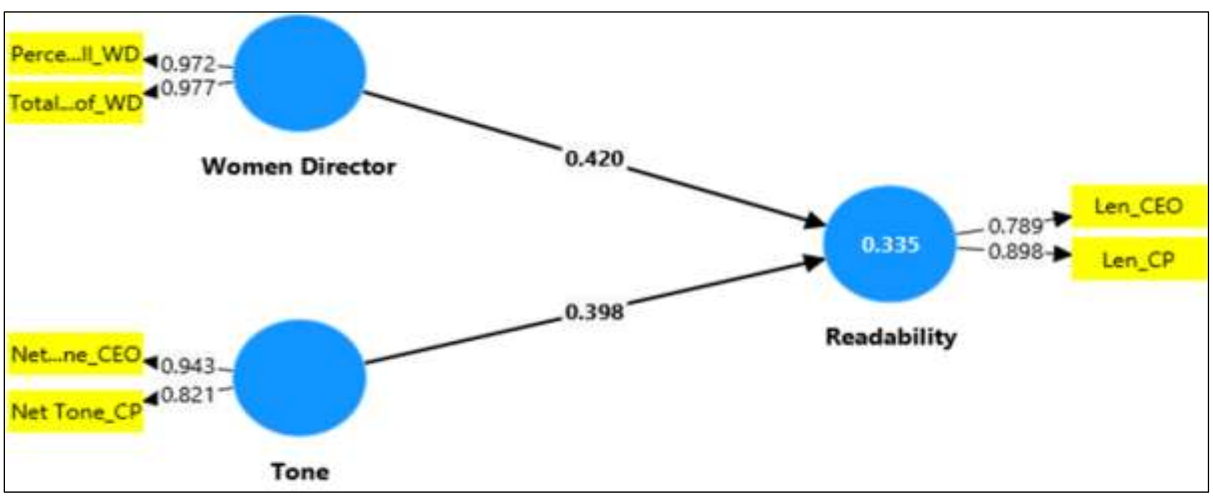

Figure 2: *The structural model*

Source: SmartPLS output

Examining the factor loadings, WD exhibited high indicator loadings (both >.90), therefore implying that the WD construct is well-represented by these two measurement items. Along the same lines, tone and readability also posted higher factor loadings, which were still higher than 0.60 (Duad et al., 2018; Fakir, 2020). Therefore, both tone and readability were both well-captured by their respective measurement items.

4.6 Model fit

The bootstrapping technique was incorporated into PLS-SEM analysis to provide for robust statistical significance of path coefficients and strengthen the validity of the structural model. This technique is suitable for analysing non-normally distributed data and enhances the overall assessment of the model by improving its predictive capabilities (Sarstedt et al., 2017). The R-squared for the readability construct was ($\beta = .335$), indicating that the model explains 33.5% of the variance in readability. The adjusted R-squared of ($\beta = .325$) suggests that the model's explanatory power remains legitimately high after accounting for the number of predictor variables. The Bayesian Information Criterion (BIC) value was -41.733, indicative of a good model fit, as lower BIC values suggest a better fit. The F-squared values for the influence of tone on the readability of CEOs' and CPs' statements ($\beta = .238$) and the influence of WD on the readability of CEOs' and CPs' statements ($\beta = .265$) suggest medium-to-large effect sizes, indicating the relative importance of the hypothesised influences in the model. The model fit summary statistics are shown in Table 5 below.

Table 5: The model fit summary statistics

Dimension measure	Saturated model	Estimated model
SRMR	.109	.109
d_ULS	.248	.248
d_G	.155	.155
Chi-square	137.367	137.367
NFI	.646	.646

Source: *SmartPLS output*

SRMR = Standardised root mean square residual, d_ULS = the squared Euclidean distance, d_G = the geodesic distance.

The results show that the saturated model and the estimated model have the same values for SRMR ($\beta = .109$), d_ULS ($\beta = .248$), d_G ($\beta = .155$), and Chi-square (137.367). The Normed Fit Index (NFI) of ($\beta = .646$) implies a moderate fit between the estimated and saturated model.

Figure 2 demonstrates how PLS-SEM was used to test hypotheses (H1 - *WD influence* on *readability of CEOs' and CPs' statements*) and H2 (*tone* influence on *readability of CEO and CP statements*). The WD significantly and positively influences the readability ($\beta = .420$, *t-statistic value* $= 5.316$). This therefore confirms H1 and leads to its acceptance. Concerning H2, the tone was found to positively influence the readability of CEOs' and CPs' statements of JSE-listed mining companies ($\beta = .398$, *t-statistic value* $= 6.926$). The results are in line with findings from previous literature, which suggest that women's presence on corporate boards is linked with improved readability, thus improving disclosure and transparency governance practices (Sahar et al., 2022). A recent study by Mankayi et al. (2023) that examined the readability of annual reports of 40 JSE-listed companies established that the reports were difficult to read (measured by the Fog index of certain CP statements). Despite these revelations, and further to the results of the current paper, there is literature in favour of gender-diverse boards which argues that women directors tend to promote and improve transparency and disclosure practices by positively shaping readability and tone (Ben-Amar et al., 2024). Likewise, boards with a higher proportion of women are more likely to produce readable annual reports and, by extension, CEOs' and CPs' statements (Ginesti et al., 2018). Maux and Smaili (2024) established that women CEOs are associated with more readable CEO letters, while Buchholz et al. (2018) argued that male CEOs tend to be more narcissistic.

5. Conclusion

In the main, the results of this paper highlight the importance of appreciating gender-diverse boards in the context of breaking the glass ceiling, which tends to undermine the significant role women can play in transforming the performance of the board, both in improving disclosure and advancing transparency governance practices. Furthermore, the positive influence of women's presence on the board on the clarity and accessibility of key corporate communications such as CEOs' and CPs' statements is noteworthy, as this can be beneficial to investors and other stakeholders to understand the message being conveyed. This paper contributes to a relevantly developing area of corporate governance research in South Africa compared to other parts of the world such as China, India, Europe, and America. The hypothesised structural model and model fit statistics imply a reasonable fit, however, there is room for improvement in the model's performance, especially the influence of other WD characteristics such as their expertise, skills, and educational background on the tone. The model does exhibit a moderate explanatory power, with about one-third of the variance in readability being explained by the predictor variables. Nonetheless, the paper provides insights into the factors contributing to the readability of corporate communications, which can add value for companies in a journey to enhance the accessibility and clarity of their disclosures.

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