Exploring the effects of power distance orientation on unethical pro-organisational behaviour from the perspective of management

Purpose: This study verifies whether the personal psychological factor of power distance disposition is perceived as conformity or obedience to the parties, triggers unethical pro-organisational behaviour (UPB) and is reinforced by hierarchy and market cultures.

Design/methodology/approach: Structural equation model analysis was used to test the hypotheses, and Process macro was used to test the moderating effect rigorously. A survey was conducted from 15 August 2018 to 20 September 2018, and 565 questionnaires were collected for analysis.

Findings/results: The effect of power distance orientation (PDO) on UPB was determined by deriving the regression coefficient with the control variable input in the relationship between the independent and dependent variables. Power distance orientation had a significant positive effect on UPB, even after controlling the influence of demographic variables. Pro-organisational members do not refrain from unethical actions when carrying out the tasks assigned by the company. This causal relationship is strengthened when hierarchy and market cultures are reinforced.

Practical implications: To instil ethical behaviour in employees, a company must continuously manage the organisational culture and atmosphere, as well as educate and train employees on the company’s code of ethics.

Originality/value: This study contributes to the limited body of knowledge examining both PDO (i.e. individual psychological factor) and organisational culture (i.e. work environment factor) as factors inducing UPB.

Keywords: Sustainable management; power distance orientation; unethical pro-organisational behaviour; hierarchy culture; market culture; decision-making; social cognitive theory; social identity theory.

Introduction

Corporate ethical virtues are essential to sustainable management. As corporate management activities and cultural influence on each agent increase, the social demand for ethical corporate management and managerial roles increases as well. Sustainable corporate management aims to achieve harmony between the present and future generations by not wasting the economic, environmental and social resources used by future generations or deteriorating the conditions to meet the needs of the present generation. The ultimate corporate goal of ensuring survival, growth, profit and performance is achieved when companies make high profits from business performance and their stock prices rise (Kelebek & Alniacik, 2022).

According to Carroll and Shabana (2010), sustainable management pertains to building equitable relationships with stakeholders through ethical practices and philanthropic obligations of an organisation. Therefore, companies systematise ethical management in the pursuit of sustainable management activities and actively promote ethics, transparency and reputation as core elements directly related to corporate performance (Miles & Covin, 2000). By contrast, unethical management activities may include collusion between politicians and businesspeople, bribery, lack of managerial transparency, slush fundraising, distorted governance structures and expedient succession of management rights. Gurcihiek emphasised that 30% of organisational members...
engage in unethical behaviour, of which 19% intentionally deceive customers, suppliers and public agencies (Gurchiek, 2006). This trend can be confirmed through news coverage or social media exposure of various incidents and corporate scandals, predominantly attributed to the collaborative involvement of management and employees in unethical behaviour for the benefit of the company or organisation (Chen et al., 2016; Umphress et al., 2010).

Umphress et al. (2010) defined this phenomenon as the result of the voluntary act of personal deviation of organisational members in conducting unethical pro-organisational behaviour (UPB) to support the organisation or colleagues without any instruction from the leader or regulatory recourse. Umphress and Bingham (2011) also explained that members routinely engage in UPB to enhance organisational performance or protect their leaders. Recently, because of a growing interest in employees’ deviant behaviour (Bligh et al., 2007; Umphress & Bingham, 2011), researchers have focused on the effect of leadership on employees’ deviant behaviour in explaining its cause (Effelsberg & Solga, 2015). In recent years, however, a growing number of studies have investigated the effects of individual psychological factors such as the power distance orientation (PDO) of members on deviant behaviour (Ji et al., 2015; Richard et al., 2020; Taras et al., 2010; Tian & Peterson, 2016). Power distance orientation focuses on the differences in individual perceptions of unequal distribution of power, higher-ups and preferred leadership (Mulki et al., 2015). For example, leadership exercised over members with a high PDO induces them to engage in deviant behaviour for the organisation rather than follow their will, because they are more strongly motivated by in-group favouritism and collectivism (Bligh et al., 2007; Effelsberg & Solga, 2015; Tian & Peterson, 2016).

Farh et al. (2007) noted that members with a low PDO prefer to participate in decision-making within the same social system. By contrast, those with a high PDO strongly tend to obey because they choose silence over voicing their opinions. Since then, many studies have demonstrated that the degree of PDO does not linearly affect organisations and members in a negative or positive direction but can have advantages and disadvantages depending on the organisation and work environment (Clugston et al., 2000; Farh et al., 2003; Mulki et al., 2015). Tian and Peterson (2016) stated that the PDO reinforces individuals’ submissive tendencies, thus intensifying their organisational commitment and UPB. Meanwhile, individual psychological factors, such as organisational identification, ownership awareness and organisational commitment, have been investigated as antecedents for UPB (Matherne & Litchfield, 2012; Moore et al., 2012; Xu & Lv, 2018) and leadership. Leader–member exchange (LMX) and social exchange relations have been investigated as work environment requirements (Ilie, 2012; Miao et al., 2013; Wang et al., 2019).

Although, as an individual psychological factor, PDO can be a necessary condition along with work environment requirements to engage in UPB, it is far from sufficient. Intentionality, organisational orientation and goal outcome consistency of members are some of the other characteristics that are required (Umphress & Bingham, 2011). As assumed by social cognitive theory, once the interactions between behaviour, environment and the individual are activated and perceived, employees simply follow the instructions of their bosses, responding to a given stimulus, or, when faced with a task and work process beyond their capacity in quantity and complexity, they carry out the task without ethical considerations, driven by the environmental requirements (Chen et al., 2016).

Hierarchical culture is a maladaptive or bureaucratic culture characterised by command, regulation, control, efficiency and stability under the premise that members will comply with formal rules. Market culture refers to a cohesive culture that attaches great importance to planning, goal achievement, performance maximisation, result orientation and work efficiency (Quinn & McGrath, 1985; Zheng et al., 2010). From this perspective, hierarchy culture and market culture, examined in this study, will certainly act as key moderators in the relationship between PDO and UPB, because individuals with high PDO tend to conform to their organisational culture (Wang et al., 2019). Furthermore, individuals exposed to hierarchy culture and market culture can double their PDO, equipped with conformity and obedience mandated by the culture, which in turn strengthens their psychological factors such as conformity and obedience for the benefit of the organisation or senior staff in the work process. Unethical pro-organisational behaviour presupposes an individual’s intention to help the organisation in the provided work environment. Regarding this intentionality, Linnenluecke and Griffiths (2010) explained that members have no choice but to opt for obedience and conformity because their survival depends on whether they display the behaviour required by the organisational culture.

However, to our knowledge, only a limited number of studies have examined both PDO (i.e. individual psychological factor) and organisational culture (i.e. work environment requirement) as preconditions for inducing UPB. In particular, given the growing interest in corporate ethical management in recent years, it may be significant to examine the role of organisational culture thus far, which has been investigated only within a limited scope. This study is significant in that it examines the moderating effect of hierarchy and market culture, which are two of the four representative organisational cultures.

This study verifies whether the individual psychological factor, PDO, is perceived as conformity or obedience by those concerned; whether PDO induces UPB; and whether PDO is reinforced by hierarchical culture and market culture. This purpose is pursued through three concrete objectives: (1) to examine whether PDO has a significant effect on UPB; (2) to
explore whether the moderator variable market culture reinforces the effect of PDO on UPB; and (3) to explore whether the moderator variable hierarchy culture reinforces the effect of PDO on UPB. The remainder of this article is organised as follows. The ‘Theoretical background and hypothesis formulation’ section presents the theoretical background and the hypothesis formulation. The ‘Methodology’ section presents the data, descriptive statistics and measurement tools, as well as the methodology, while the ‘Results’ section presents the analysis of the results. Finally, the ‘Discussion’ section discusses the results and the ‘Conclusion’ section concludes the study.

Theoretical background and hypothesis formulation

Relationship between power distance orientation and unethical pro-organisational behaviour

Power distance is defined as the extent to which people perceive power disparities among individuals within the same social system and accept the unequal distribution of power (Hofstede, 1980; Mulder, 1977). According to Hofstede (1980), although the extent to which people endorse power disparities and unequal distribution of power is presented by measuring power distance as a variable at the level of group culture, group-level power distance does not necessarily coincide with individual-level power distance, which has been measured as an individual-level variable in many previous studies, because power distance can vary depending on the values pursued by individuals in the same group (Auh et al., 2016; Chen et al., 2014; Clugston et al., 2000; Clugston et al., 2000; Farh et al., 2003; Khatri, 2009; Mulki et al., 2015).

Clugston et al. (2000) defined individual-level power distance as the extent to which an individual endorses an unequal distribution of power within a group and organisation. Kirkman et al. (2009) proposed that PDO refers to an individual-level power distance to differentiate it from a group-level power distance. Therefore, the concept of PDO is based on that of power distance, as proposed by Hofstede (1980, 2001), focusing on the differences in individual perceptions of the PDO-dependent unequal distribution of power towards bosses, preferred leadership and participation in the decision-making process. In addition, several studies have verified that even in the same organisation and work environment, PDO-dependent differences exist in the effect of power distance on the organisation and its members. This characteristic of PDO can be found primarily in the perceptions towards senior staff and organisational communication patterns. Tian and Peterson (2016) explained that the higher the PDO of an employee, the higher their level of submissive orientation and the more consistent and normative their commitment to the organisation; they more readily engage in pro-organisational behaviour, even if it is an unethical act.

From the perspective of social cognitive theory, the results of PDO can vary depending on individual-level perceptions of power distance during the intermediate stage. While burnout-like negative perceptions of power distance can lead to turnover intention or stress, positive perceptions can strengthen employees’ psychological factors, expressed as intrinsic motivation towards work. Human motivations are formed by the stimulus–response relationship principle, and PDO-dependent differences have direct and indirect effects on members’ motivation and behaviour, including cognitive processes (Ormrod, 2016). This process reflects the effects of PDO on UPB that can vary depending on the perception of the work environment (Chen et al., 2016; Kirkman et al., 2016).

Researchers have also found that the higher the level of PDO, the higher the degree of employee compliance and obedience and the higher their job enthusiasm. Members with a high PDO are more willing to put up with the burnout caused by their bosses, which further encourages them to participate in UPB (Auh et al., 2016; Chen et al., 2016; Tian & Peterson, 2016).

In summary, as employees with high PDO are more dependent on and committed to the organisation and their superiors (Clugshot, 2000; Farh et al., 2007), they are less likely to have a conflict. Once a close communicative relationship is formed with the boss, they are more devoted to the organisation and willing to engage in UPB for the organisation (Tian & Peterson, 2016; Zheng et al., 2019). Based on the aforementioned studies, Hypothesis 1 was developed, focusing on the possibility that PDO increases submissive orientation, thereby inducing UPB:

H1: PDO positively affects UPB.

Moderating effect of hierarchy culture

Not only does PDO have a direct effect on UPB, but it may also influence UPB through a moderating effect, depending on the perceptions of organisational culture (Chen et al., 2016; Miao et al., 2013). Organisational culture motivates organisational members to take action, provides guidelines for establishing and complying with regulations within the company and plays a role in coping with unexpected or difficult situations (Sørensen, 2002). Organisational culture contributes not only to management activities but also to the sustainable management activities of a firm. Sustainable management refers to management activities aimed at reducing negative social and environmental impacts and contributing to sustainable development (Schaltegger & Hörisch, 2017).

This study examines whether and how members’ perceptions of organisational culture have a moderating effect. A moderator variable can increase the explanatory power of a variable of interest by explaining the causal relationship and interaction between the aforementioned variables (Miao et al., 2013). A literature review on the development of
research on UPB and PDO revealed that PDO not only has an overall positive or negative effect on the organisation and members depending on its level, but it can also have advantages and disadvantages depending on the environment (Farh et al., 2007; Mulki et al., 2015). Moreover, members with a higher power distance tend to be more dependent on and submissive to the organisation and their superiors, making them more willing to engage in UPB (Bolino, 1999; Chen et al., 2016; Tian & Peterson, 2016). A theory can be developed and refined by setting and explaining the situation using a moderating variable to identify the concrete causes of the relationship between PDO (independent variable) and UPB (dependent variable).

Social cognitive theory attributes an individual’s motivation and behaviour to the extent to which they want to respond to perceived stimuli. As organisational culture helps members recognise the performance and values desired by the organisation in carrying out their duties, the clearer the organisational culture, the lower the ambiguity of roles and the higher the commitment to work, job satisfaction and pro-organisational behaviour (Chen et al., 2016; Quinn & McGrath, 1985; Zheng et al., 2010). In other words, as the perception of organisational culture acts as an important situational factor in determining attitudes and behaviours towards the organisation, individuals show different levels of UPB depending on the level of interaction between PDO and organisational culture (Chen et al., 2016).

This mechanism is anchored in the social cognition theory based on the stimulus–response principle. Various previous studies have presented organisational culture as contributing to enhancing pro-organisational behaviour by reinforcing positive cognition about the organisation and reducing the opposite tendency of turnover intention (Chen et al., 2014; Teh et al., 2012; Wang et al., 2019).

Robbins (1989) argued that hierarchy culture reinforces hierarchical order, enhances internal stability and provides members with a sense of group identity and identification simultaneously. There exists an exclusivity that puts the interests of the organisation first, with collectivism overriding individualism. Therefore, members with higher perceptions of hierarchical culture in the current organisation have a high PDO, are more dependent upon and are more willing to conform to the organisation and their superiors. This strengthens their collectivism and induces them to engage in UPB to protect the interests of the organisation and their superiors (Chen et al., 2016; Hofstede, 1980; Moore et al., 2012). By contrast, members with little or no perceptions of hierarchy culture find it difficult to have a sense of group identity and identification. Their low PDO makes them less dependent upon and less willing to conform to the organisation and their superiors. This strengthens their individualism, which deters them from engaging in UPB to protect the interests of the organisation and their superiors (Hofstede, 1980; Lee et al., 2000; Moore et al., 2012).

Furthermore, the moderating role of hierarchy culture between PDO and UPB can be predicted by the social identity theory proposed by Moore et al. (2012), according to which members’ perceptions, emotions and behaviours can change dramatically when they are conscious of their social identity and depending on which group they belong to. The identity provided by the organisation promotes hierarchical culture, which increases members’ identification with the organisation in relation to subordination and conformity to their superiors (Chen et al., 2016). Hierarchy culture, by which an individual’s collectivism, obedience and conformity can be reinforced, becomes a major situational requirement for motivating members with PDO to participate in UPB (Bolino, 1999). Unethical pro-organisational behaviour is predicted to increase with the perception of a high hierarchy culture within the organisation and among senior management and to decrease with the perception of a low hierarchy culture:

H2: Hierarchical culture moderates the relationship between PDO and UPB. Specifically, the higher the level of hierarchy culture, the greater the positive effect of PDO on UPB.

**Moderating effect of market culture**

A shift in management paradigm results from a change in perspectives on a company’s role and raison d’être (Coombs & Gilley, 2005; Parmar et al., 2010), which induces many companies to increase their activities in the fields of social responsibility and ethical management. The expansion of the scope of activities is one of the goals of sustainable management. A well-managed market culture fosters an environment conducive to increasing levels of goal achievement plans, efficiency, performance-reward expectations, competitiveness and productivity, as well as laying the groundwork for improved performance and motivation in carrying out the activities assigned by the organisation (Cameron & Quinn, 2006; Effelsberg et al., 2014; Moore et al., 2012; Tian & Peterson, 2016; Tsui et al., 2007). To strengthen organisational commitment and improve performance, it is necessary to consider both the environmental aspects of hierarchical culture and those associated with a dynamic market culture when investigating the relationship between PDO and UPB.

When an organisation fosters an excessive market culture, its members can strengthen their commitment to task performance. Still, conflicts can arise in their relationships with regard to performance improvement and task completion (Cameron et al., 2006). According to social identity theory, members who believe that their identity matches the organisational identity engage in UPB, even going against social norms, to improve organisational performance and complete the assigned tasks. Those who do not share that belief enter into conflicts with other members and leave the organisation as a result of increased turnover intention (Moore et al., 2015).

The outcomes required by market culture can only be achieved by investing much effort and time (Mesdaghnin...
et al., 2019). However, market culture emphasises performance improvement, while ignoring the interests of other stakeholders (Bonner et al., 2017; Tsui et al., 2007), promoting a competitive environment and causing conflicts among members (Cameron et al., 2006). Resultantly, members become more willing to engage in unethical behaviour, ignore ethical issues and sacrifice other stakeholders to achieve and conform to organisational goals and objectives (Chen et al., 2016).

Social exchange theory explains that employees’ actions are triggered by a sense of duty to repay the organisation or superiors for the offered goodwill and rewards, thereby committing themselves to the entire organisation, if not to specific individuals. It also explains that as market culture provides organisational members with the foundation for strengthening the goal achievement plan, efficiency, competitiveness, productivity, obedience, conformity and identification necessary to achieve the goal, the higher the level of market culture provided, the higher the extent to which organisational members are willing to engage in UPB to repay and protect the organisation (Bandura, 2002; Holtbrügge et al., 2015; Moore et al., 2012). In other words, the presence or absence of market culture itself is an important situational factor in determining the attitudes and behaviours of organisational members with PDO towards the organisation, which in turn determines the level of their UPB depending on the level of interaction between PDO and UPB (Callahan, 2005; Moore et al., 2012; Wang et al., 2019).

Market culture may play a moderating role in the relationship between PDO and UPB, which has been the focus of previous studies on market culture, drawing on social identity theory, social cognitive theory and social exchange theory. Positive emotions, attitudes and behavioural patterns towards the organisation are induced when members expect to receive identity, positive recognition, reciprocity or rewards (Blau, 1964); the stronger the market culture perceived by members, the stronger the intention to repay and protect the organisation and senior staff through UPB that violates social norms during task completion (Chen et al., 2016; Tian & Peterson, 2016). In this context, members who fear social exclusion are more willing to engage in UPB to mitigate the risk of exclusion by demonstrating their ability to contribute to the organisation and conform to market culture (Thau et al., 2015).

Market culture, which can change an individual’s perceived identity, stimulus response and reciprocity, is a major situational factor that motivates members with PDO to engage in UPB. Therefore, it follows that the stronger the market culture perceived by an employee through their current job and organisation, the higher the level of UPB, and the weaker the perceived market, the lower the level of UPB (Figure 1):

H3: Market culture moderates the relationship between PDO and UPB. Specifically, the higher the level of market culture, the greater the positive effect of PDO on UPB.

Methodology
Descriptive statistics

This study aimed to verify the relationship between variables by conducting an empirical analysis of the moderating effects of hierarchy and market culture on the relationship between PDO and UPB. To this end, an individual-level survey was conducted with a small group of company employees sampled by dividing the population into clusters representative of the population using the cluster sampling method. A random sample was extracted from the selected group. The prestatistical verification power analysis by G*Power 3 (Heinrich Heine University Düsseldorf, Düsseldorf, Germany) indicated that for four measurement variables, the minimum number of observations collected should be at least 194; this study has high statistical verification power, because 565 observations were used for the final analysis (Faul et al., 2007).

For this self-reported survey, questionnaires were distributed from 12 September to 06 November 2018 to employees of 30 small, medium-sized and large domestic companies, including service and manufacturing industries. Of the 820 questionnaires distributed, 680 (82.9%) were collected, and after removing 115 questionnaires (14%) with incomplete or insincere replies, 565 valid questionnaires (68.9%) were used for data analysis. The specifics are shown in Table 1.

A correlation analysis between the constructs of the latent variables revealed a significant correlation between all constructs of PDO, UPB, hierarchy culture and market culture, as presented in Table 2. Specifically, PDO was found to be closely correlated with UPB ($r = 0.322$), market culture ($r = 0.238$) and hierarchy culture ($r = 0.134$) and UPB with market culture ($r = 0.159$) and hierarchy culture ($r = 0.128$). Market culture and hierarchical culture were also closely correlated ($r = 0.723$).

Following Fornell and Larcker (1981), discriminant validity was tested by comparing the average variances extracted (AVEs) of the latent variables and the squared correlation.
coefficients between the constructs of the latent variables. Discriminant validity among the latent variables was considered established when the former outweighed the latter (Fornell & Larcker, 1981). As presented in Table 2, the largest correlation coefficient was found between market and hierarchy cultures (0.723). Its coefficient of determination (its squared value), 0.522 (0.723 × 0.723), was outweighed by the AVE of the smallest latent variable, 0.909, and the discriminant validity of latent variables was considered established (Fornell & Larcker, 1981), as shown in Table 2.

The questionnaire, which was based on previous studies’ operational definitions of variables and measurement tools, was designed as a scale for measuring five variables, four of which (PDO, hierarchy culture, market culture and UPB) were evaluated on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

All constructs were measured using multi-item scales with acceptable reliability coefficients. Managers and employees rated the scale items using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

Unethical pro-organisational behaviour was measured using the seven-item scale developed by Umphress and Bingham (2011). Of the seven UPB-related items, six with verified validity were selected. The internal reliability of each item in the original scale presented by Umphress and Bingham (2011) exceeded 0.7. The six items selected for the analysis were translated and adapted for this study. The UPB-related items include ‘If it would help my organisation, I would misrepresent the truth to make my organisation look good’ and ‘If it would benefit my organisation, I would withhold negative information about my company or its products from customers and clients’. The internal reliability of each item of the modified scale exceeded 0.7.

The PDO of each respondent was measured using the six-item scale developed by Farh et al. (2007), which had internal reliability of 0.7 or greater. Power distance orientation–related items include ‘Managers should make most decisions without consulting subordinates’ and ‘It is frequently necessary for a manager to use authority and power when dealing with subordinates’.

The Organizational Culture Assessment Instrument (OCAI) developed by Cameron and Quinn (2011) was used to measure organisational culture. The OCAI consists of a six-item scale for hierarchical culture and a six-item scale for market culture. The former includes the items ‘Our company is result-oriented, emphasises completion of tasks, and is performance-oriented’ and ‘The glue that holds our company together is formal rules and policies’. The latter includes the items ‘Our company is result-oriented, emphasises completion of tasks, and is performance-oriented’ and ‘High level of competitiveness, expectations, and goal achievement are our corporate management style’. Both the OCAI scales showed internal reliability of 0.7 or greater.

As all variables for the study sample were surveyed from a single source, Harman’s single-factor test was conducted post hoc to check for common method bias. An exploratory factor analysis conducted with a factor value of 1 revealed that...
26.02% of the overall variance was explained. It was also found in a confirmatory factor analysis that the fit of model, with all observed variables set as a single potential factor, was significantly lowered ($\chi^2 = 4195.477, df = 252$, minimum discrepancy function by degrees of freedom divided $[\text{CMIN/DF}] = 16.649$, goodness-of-fit index $[\text{GFI}] = 0.498$, adjusted goodness-of-fit index $[\text{AGFI}] = 0.403$, comparative fit index $[\text{CFI}] = 0.421$, normed fit index $[\text{NFI}] = 0.408$, incremental fit index $[\text{IFI}] = 0.423$, Tucker–Lewis index $[\text{TLI}] = 0.366$, root mean square error of approximation $[\text{RMSEA}] = 0.167$, root mean square residual $[\text{RMR}] P = 0.186$). Consequently, the common method bias for the data in this study was not considered serious enough to affect the study results (Podsakoff & Organ, 1986).

**Data analysis procedure**

This study was based on empirical research, with analyses performed in the following order using the Statistical Package for the Social Sciences (SPSS) 26.0 and Amos 27.0 (both by IBM Corporation, Armonk, New York, United States) and PROCESS Macro (Nos. 1 and 2) developed by Darlington, & Hayes (2016) to verify the measurement, structural, and moderated mediation models, all of which are widely used in the social sciences, to validate the research hypotheses: (1) frequency analysis was performed after receiving the responses to the questions regarding personal information to understand the demographic characteristics of the sample, that is, gender, age, education, marital status, position, job tenure and duration of working with the current boss; (2) reliability analysis and confirmatory factor analysis were performed to ensure internal reliability and content validity, respectively, based on the operational definitions of variables and the psychometric instruments proposed in previous studies; and (3) structural equation model analysis and PROCESS Macro analysis were performed to analyse correlation and discriminant validity to verify the research hypotheses.

**Ethical considerations**

This study was approved by the Institutional Review Board (IRB) of the National Bioethics Policy Committee to secure ethical and scientific validity and reliability. This study was approved by the Korea National Institute for Bioethics Policy (ref. no. P01-202204-01-026), and the research was conducted in accordance with research ethics.

**Results**

**Reliability analysis**

Convergent validity analysis was performed to determine whether the observed items used in this study constituted the latent variables. The standardised coefficients of all PDO,

<table>
<thead>
<tr>
<th>Variables</th>
<th>Estimate</th>
<th>SE</th>
<th>CR</th>
<th>P</th>
<th>B</th>
<th>AVE</th>
<th>CR</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDO</td>
<td>0.864</td>
<td>0.053</td>
<td>16.290</td>
<td>***</td>
<td>0.716</td>
<td>0.909</td>
<td>0.984</td>
</tr>
<tr>
<td>PDO2</td>
<td>0.888</td>
<td>0.058</td>
<td>15.290</td>
<td>***</td>
<td>0.673</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PDO3</td>
<td>0.756</td>
<td>0.055</td>
<td>13.714</td>
<td>***</td>
<td>0.607</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PDO4</td>
<td>0.887</td>
<td>0.061</td>
<td>14.435</td>
<td>***</td>
<td>0.637</td>
<td>-</td>
<td>-</td>
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<tr>
<td>PDO5</td>
<td>1.000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.773</td>
<td>-</td>
<td>-</td>
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<tr>
<td>PDO6</td>
<td>0.897</td>
<td>0.056</td>
<td>16.015</td>
<td>***</td>
<td>0.704</td>
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<td>-</td>
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<tr>
<td>UPB</td>
<td></td>
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<tr>
<td>UPB1</td>
<td>0.877</td>
<td>0.045</td>
<td>19.694</td>
<td>***</td>
<td>0.761</td>
<td>0.928</td>
<td>0.987</td>
</tr>
<tr>
<td>UPB2</td>
<td>1.000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.840</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>UPB3</td>
<td>0.981</td>
<td>0.045</td>
<td>21.856</td>
<td>***</td>
<td>0.830</td>
<td>-</td>
<td>-</td>
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<tr>
<td>UPB4</td>
<td>0.669</td>
<td>0.048</td>
<td>14.020</td>
<td>***</td>
<td>0.578</td>
<td>-</td>
<td>-</td>
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<tr>
<td>UPB5</td>
<td>0.692</td>
<td>0.049</td>
<td>13.990</td>
<td>***</td>
<td>0.579</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>UPB6</td>
<td>0.826</td>
<td>0.051</td>
<td>16.102</td>
<td>***</td>
<td>0.649</td>
<td>-</td>
<td>-</td>
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<tr>
<td>MC</td>
<td></td>
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<tr>
<td>OC7</td>
<td>0.768</td>
<td>0.049</td>
<td>15.816</td>
<td>***</td>
<td>0.654</td>
<td>0.931</td>
<td>0.988</td>
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<tr>
<td>OC8</td>
<td>0.808</td>
<td>0.046</td>
<td>17.748</td>
<td>***</td>
<td>0.718</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OC9</td>
<td>1.000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.816</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OC10</td>
<td>0.921</td>
<td>0.047</td>
<td>19.498</td>
<td>***</td>
<td>0.774</td>
<td>-</td>
<td>-</td>
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<td>OC11</td>
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<td>0.052</td>
<td>18.399</td>
<td>***</td>
<td>0.744</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OC12</td>
<td>1.013</td>
<td>0.054</td>
<td>18.630</td>
<td>***</td>
<td>0.751</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>HC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OC13</td>
<td>1.000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.736</td>
<td>0.923</td>
<td>0.986</td>
</tr>
<tr>
<td>OC14</td>
<td>0.969</td>
<td>0.055</td>
<td>17.530</td>
<td>***</td>
<td>0.761</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OC15</td>
<td>1.002</td>
<td>0.056</td>
<td>17.801</td>
<td>***</td>
<td>0.772</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OC16</td>
<td>0.972</td>
<td>0.055</td>
<td>17.751</td>
<td>***</td>
<td>0.770</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OC17</td>
<td>0.999</td>
<td>0.054</td>
<td>18.426</td>
<td>***</td>
<td>0.799</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OC18</td>
<td>0.851</td>
<td>0.058</td>
<td>14.583</td>
<td>***</td>
<td>0.637</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

SE, standard error; AVE, average variance extracted; CR, composite reliability; PDO, power distance orientation; UPB, unethical pro-organisational behaviour; MC, market culture; HC, hierarchy culture.

$\chi^2 = 683.434, df = 242, \text{CMIN/DF} = 2.824, \text{GFI} = 0.906, \text{AGFI} = 0.883, \text{CFI} = 0.935, \text{NFI} = 0.904, \text{IFI} = 0.936, \text{TLI} = 0.926, \text{RMSEA} = 0.057, \text{RMR} = 0.048$.

***$p<0.001$.  

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UPB, hierarchical culture and market culture items were found to exceed 0.500. The AVE and composite reliability (CR) proposed by Fornell and Larcker (1981) were used for the reliability test. The AVE is obtained by dividing the sum of the squared values of the standardised factor loadings by the sum of the squared standardised factor loadings and the sum of the error variances of the observed items (Fornell & Larcker, 1981). The construct reliability or CR of latent variables can be obtained by dividing the square of the sum of the standardised factor loadings of the observed items by the sum of the standardised factor loadings and the sum of error variance. If the AVE and CR of the latent variables exceed 0.500 and 0.700, respectively, reliability conditions can be considered met (Fornell & Larcker, 1981). As shown in Table 3, the AVE and CR of the research variables used in this study exceeded 0.500 and 0.800, respectively, thus satisfying the two conditions for the construct reliability of the latent variables. Therefore, with internal consistency reliability, CR, convergent validity and discriminant validity all satisfied, the validity of the measurement model used in this study was established.

Therefore, the construct validity, content validity and convergent validity for each observed item were ensured (Fornell & Larcker, 1981). Convergent validity was also satisfied, with the standardised coefficient of the observed questionnaire items exceeding 0.500. Then, the internal consistency reliability, CR, AVE, convergent validity and discriminant validity of all applied constructs were tested. The convergent validity and reliability of each observed variable constituting each latent variable were statistically significant, with its standardised factor loading, AVE and CR exceeding 0.5, 0.5 and 0.7, respectively. In addition, most of the indices showed good values, meeting the cut-off of the model suitability index, as shown in Table 3.

The measurement model and structural model fit indices are divided into the absolute fit index, incremental fit index and simple fit index. Firstly, the absolute fit index (a smaller fit is considered good), comprising CMIN/DF (if chi-square divided by df is 4.0 or less, the fit is high), RMR (if less than 0.050, the fit is high), GFI (greater than 0.900 for a good fit), AGFI (greater than 0.900 is considered good) and RMSEA (less than 0.010 is normal, less than 0.080 is good and less than 0.050 is good), shows how well the research model fits the covariance matrix of the data collected by the researcher and the covariance matrix of the research model based on the theory fit. Secondly, the incremental fit index, which forms a family of measures of fit, including the NFI (greater than 0.900 is considered a good fit), TLI (greater than 0.900 is good), CFI (greater than 0.900 is considered a good fit) and the non-normed fit index (NNFI), indicates how well the research model fits in comparison to the null model. Thirdly, parsimonious GFI (PGFI; a lower value is considered better), parsimonious NFI (PNFI; a lower value is considered better), Akaike information criterion (AIC; a lower value is considered better) and simple fit index (parsimonious fit index) measure the complexity of the model. It is an index that provides information on the best model in the state of consideration among competing models. This model fit evaluation index is used to determine whether a research model should be accepted or rejected (Hu & Bentler, 1999). Therefore, it was found that the fit of the structural model in which the power distance disposition influences UPB meets the criteria ($\chi^2 = 7629.694$, df = 500, CMIN/DF = 3.814, CFI = 0.869, TLI = 0.858, RMSEA = 0.060, RMR = 0.061). However, because the input of the control variable limited the model fit index of this study, it appeared close to 0.900, which can be considered incomplete (Hu & Bentler, 1999).

Regression analysis was performed to test the hypotheses and PROCESS Macro was used to test the moderating effect rigorously. Table 4 outlines the results of the regression analysis. Firstly, the effect of PDO on UPB was determined by deriving the regression coefficient with the control variable input in the relationship between the independent and dependent variables.

Secondly, Power distance orientation had a significant positive effect ($\beta = 0.328$, $T = 7.293$, $p < 0.000$) on UPB, even after controlling for the influence of demographic variables.

### TABLE 4: Structural equation model results for power distance orientation.

<table>
<thead>
<tr>
<th>Variables</th>
<th>$\beta$</th>
<th>SE</th>
<th>T</th>
<th>LL 95% CI to UL 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0.118</td>
<td>0.045</td>
<td>2.609</td>
<td>0.029 to 0.207</td>
</tr>
<tr>
<td>Age</td>
<td>0.027</td>
<td>0.068</td>
<td>0.397</td>
<td>-0.106 to 0.160</td>
</tr>
<tr>
<td>Education</td>
<td>-0.067</td>
<td>0.044</td>
<td>-1.519</td>
<td>-0.153 to 0.019</td>
</tr>
<tr>
<td>Position</td>
<td>-0.064</td>
<td>0.058</td>
<td>-1.099</td>
<td>-0.178 to 0.050</td>
</tr>
<tr>
<td>Job tenure</td>
<td>0.015</td>
<td>0.062</td>
<td>0.240</td>
<td>-0.106 to 0.136</td>
</tr>
<tr>
<td>Duration of working with the boss</td>
<td>-0.004</td>
<td>0.070</td>
<td>-0.063</td>
<td>-0.141 to 0.132</td>
</tr>
<tr>
<td>Job function</td>
<td>0.083</td>
<td>0.052</td>
<td>1.609</td>
<td>-0.018 to 0.185</td>
</tr>
<tr>
<td>Industry</td>
<td>-0.005</td>
<td>0.045</td>
<td>-0.101</td>
<td>0.092 to 0.083</td>
</tr>
<tr>
<td>PDO</td>
<td>0.328</td>
<td>0.045</td>
<td>7.293</td>
<td>0.240 to 0.416</td>
</tr>
</tbody>
</table>

Note: For the effect to be statistically significant, 0 should not be present between the lower limit confidence interval (LLCI) and upper limit confidence interval (ULCI) of the 95% confidence interval

$\chi^2 = 7629.694$, df = 500, CMIN/DF = 3.814, CFI = 0.869, TLI = 0.858, RMSEA = 0.060, RMR = 0.061.

$\alpha = 565$ employees.
(sex, age, education and position, among others). Therefore, organisational members with higher PDO engage more actively in UPB, as shown in Table 4 and Figure 2.

The analysis using Model 1 of Hayes’ (2018) PROCESS Macro, performed to test the moderating effect of hierarchical culture, revealed that the interaction between PDO and hierarchical culture ($t = 3.2862, p < 0.000$) had a significant positive effect on UPB. Hence, a hierarchical culture reinforces the effect of PDO on UPB. In a hierarchy-oriented organisation, members with a high PDO actively engage in UPB for the benefit of the organisation because they attach the greatest importance to obedience or conformity and hierarchical order.

Therefore, unlike the existing analysis methods, PROCESS Macro can verify a model that validates multiple variables at once, reflects the measurement error of the research model and performs statistical verification of individual effects (Hayes, 2018). When compared to structural equations, regression analysis has a tendency to bias effect estimation due to random measurement errors (Darlington & Hayes, 2016). However, Hayes et al. (2017) found no difference in estimated coefficient values when using the ordinary least squares (OLS) regression equation and the SEM programme in a comparative study. Although there was a difference in the standard error, this was to be expected because the sample variance estimation of the OLS method and the Maximum likelihood (ML) method are based on different statistical assumptions; thus, it was not a problem. Rather than assessing the overall structural suitability of the research model, the primary purpose of this study was to explore the moderating effect of market culture and hierarchical culture in the relationship between members’ power distance disposition and UPB.

Specifically, in the case of low hierarchy culture (95% confidence interval [CI]: 0.0301–0.2876), the independent variable PDO stood at $\beta = 0.1589$, which increased to $\beta = 0.2805$ as the hierarchy culture increased to the midrange (95% CI: 0.1911–0.3699) and $\beta = 0.4022$ as the hierarchy culture peaked (95% CI: 0.3022–0.5022). Consequently, H2 was supported. Meanwhile, with no zero values found between the lower level of the confidence interval (LLCI) and the upper level of the confidence interval (ULCI) at a 95% CI in the low-, mid- and high-range groups, the moderating effect of hierarchical culture was found to be significant, as shown in Table 5 and Figure 3.

Finally, the analysis using Model 1 of Hayes’ (2018) PROCESS Macro, performed to test the moderating effect of market culture, revealed that the interaction between PDO and market culture ($t = 3.0722, p < 0.000$) had a significant positive effect on UPB. Therefore, market culture reinforces the effect of PDO on UPB. In a result-oriented organisation, members with a high PDO actively engage in UPB for the benefit of the organisation because they attach the greatest importance to performance.

Historically, leadership has been focused on members’ UPB (Effelsberg & Solga, 2015). However, recently, studies have

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**TABLE 5:** Regression results for moderation effect on the relationship between power distance orientation and unethical pro-organisational behaviour.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Standardised coefficients</th>
<th>$t$</th>
<th>Boot LLCI</th>
<th>Boot ULCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome variable: UPB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>2.9802</td>
<td>2.5</td>
<td>1.9904</td>
<td>3.9901</td>
</tr>
<tr>
<td>Gender</td>
<td>0.1914</td>
<td>0.13</td>
<td>0.0455</td>
<td>0.3372</td>
</tr>
<tr>
<td>Age</td>
<td>-0.0019</td>
<td>-0.84</td>
<td>-0.1046</td>
<td>0.1009</td>
</tr>
<tr>
<td>Education</td>
<td>-0.0660</td>
<td>-0.91</td>
<td>-0.1469</td>
<td>0.0149</td>
</tr>
<tr>
<td>Position</td>
<td>-0.0013</td>
<td>-0.82</td>
<td>-0.0659</td>
<td>0.0633</td>
</tr>
<tr>
<td>Job tenure</td>
<td>-0.0137</td>
<td>-0.83</td>
<td>-0.0785</td>
<td>0.0510</td>
</tr>
<tr>
<td>Duration working</td>
<td>0.0725</td>
<td>0.13</td>
<td>0.0071</td>
<td>0.1379</td>
</tr>
<tr>
<td>Job function</td>
<td>-0.0069</td>
<td>-0.80</td>
<td>-0.0542</td>
<td>0.0403</td>
</tr>
<tr>
<td>Industry</td>
<td>-0.0136</td>
<td>-0.83</td>
<td>-0.0485</td>
<td>0.0213</td>
</tr>
<tr>
<td>PDO</td>
<td>-0.3049</td>
<td>-0.83</td>
<td>-0.6874</td>
<td>0.0775</td>
</tr>
<tr>
<td>HC</td>
<td>-0.3197</td>
<td>-0.83</td>
<td>-0.5739</td>
<td>-0.0656</td>
</tr>
<tr>
<td>PDO × HC</td>
<td>0.1699</td>
<td>0.11</td>
<td>0.0684</td>
<td>0.2715</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hierarchy culture</th>
<th>Low</th>
<th>Middle</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable:</td>
<td>0.1589</td>
<td>0.2805</td>
<td>0.4022</td>
</tr>
<tr>
<td>outcome variable:</td>
<td>0.0655</td>
<td>0.0455</td>
<td>0.0509</td>
</tr>
</tbody>
</table>

PDO, power distance orientation; UPB, unethical pro-organisational behaviour; HC, hierarchy culture.

Specifically, in the case of low market culture (95% CI: 0.0383–0.2993), the independent variable PDO stood at $\beta = 0.1688$, which increased to $\beta = 0.2805$ in the midrange market culture (95% CI: 0.3055–0.3761) and $\beta = 0.4022$ as the hierarchy culture peaked (95% CI: 0.3055–0.5073). Consequently, H3 was supported. Meanwhile, with no zero values found between LLCI and ULCI at the 95% CI in the low-, mid- and high-range groups, the moderating effect of market culture was significant, as shown in Table 6 and Figure 4.

**FIGURE 3:** Regression results for moderation effect on the relationship between power distance orientation and unethical pro-organisational behaviour.

**FIGURE 4:** Regression results for moderation effect on the relationship between power distance orientation and unethical pro-organisational behaviour.

**Discussion**

This study sheds light on the mechanism by which PDO affects UPB and examines whether the effect of PDO on UPB is reinforced by hierarchical culture and market culture.

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suggested that personal psychological factors that influence deviant behaviour are increasing (Tian & Peterson, 2016). This study confirmed whether power distance disposition, a personal psychological factor suggested by Farh et al. (2007), is perceived by parties as conformity or submissiveness and triggers UPB. This is because differences in the power distance propensity directly or indirectly affect the motivation and behaviour of members (Ormrod, 2016).

In addition, it has been demonstrated that power distance propensity does not uniformly affect the organisation and members according to high and low power distance propensities, but it can have advantages and disadvantages depending on the organisation and work environment (Farh et al., 2007; Mulki et al., 2015). As company life cycles are getting shorter because of rapid changes in the business environment, ethical virtue has become an essential element for sustainable management.

This study shows that hierarchy and market cultures regulate the relationship between power distance disposition and UPB. As the perception of organisational culture acts as an important situational factor in determining attitudes and behaviours towards the organisation, the higher the level of power distance disposition, the higher the level of UPB. However, the intensity varies (Chen et al., 2016). In other words, as the perception that there is a high hierarchy culture in the organisation increases, the likelihood of members with a power distance tendency to participate in UPB increases (Bolino, 1999). By contrast, recognising that the hierarchy culture is small may decrease the likelihood of unethical behaviour.

Market culture can promote an excessively competitive environment and cause conflict among members (Cameron et al., 2006). It is more likely to ignore the issue of human resources or sacrifice other stakeholders (Chen et al., 2016). Consequently, market culture becomes a major situational factor that motivates members with a power distance disposition to demonstrate UPB. When market culture is perceived as weak, UPB may decrease with an increase in pro-organisational behaviour.

The results suggest that power distance disposition affects UPB, and this influence is reinforced by hierarchy culture and market culture. A study was conducted in which the organisation promotes a hierarchy culture that increases employee identification with the organisation and conformity to their superiors (Chen et al., 2016). The context of the study and the results were the same: the more the market culture is perceived as strong, the more it seeks to protect or reward the organisation and superiors through UPB that violates social norms when completing tasks (Chen et al., 2016; Tian & Peterson, 2016).

The theoretical implications of this study are as follows. Firstly, it presented an empirical case for PDO being the cause of UPB. This allows for the assumption that PDO may act excessively or negatively, despite the clear need to increase it in an organisation in terms of job efficiency and member effectiveness. It was emphasised that this could lead to a decrease in obedience, compliance and innovativeness, impeding sustainable management.

Secondly, from the perspective of social cognitive theory, the empirically derived mechanism by which hierarchical culture and market culture moderate the effect of PDO on UPB has theoretical implications. This effect can be explained by the fact that when organisational members’ PDO increases, they become more willing to engage in unethical behaviour, in order to improve organisational efficiency and performance. This suggests that the high hierarchy and market culture
perceived by organisational members are likely to induce them to engage in unethical actions.

Thus, this study makes a theoretical contribution to explaining the effect of PDO on UPB from the perspective of social cognitive theory, reinforced by perceived hierarchy culture and market culture. Furthermore, from the perspective of social identity theory, the mechanism behind the role of hierarchical culture and market culture in mediating the effect of PDO on UPB could be empirically elucidated. This has theoretical implications because it reveals that organisational members with higher PDO are more willing to accept organisational identity as well as obedience and conformity and to engage in unethical activities for the benefit of the organisation; the effect of PDO is strengthened when organisational members perceive a high hierarchy culture and market culture.

Therefore, organisational identification allows individuals to compromise their moral standards in order to support or protect unethical organisational behaviour, and explaining this only in terms of social identity has limitations. As confirmed by Matherne and Litchfield (2012), Lee et al. (2017), Wang et al. (2018), and Xu and Lv (2018), organisational commitment influences UPB, which can be influenced by other environmental factors such as colleagues and leaders. Furthermore, solutions should be found in the organisation using the mechanisms of social cognition theory and social identity theory to maintain a balance between market culture and hierarchical culture and not promote these cultures excessively. This should be encouraged to improve the mutual relationship between individuals and organisations and to facilitate ethical considerations in pro-organisational behaviour.

Conclusion

The practical implications of this study are fourfold: firstly, to strengthen employees’ ethical behaviour, it is necessary for a company to continuously manage the organisational culture and atmosphere regarding the dos and don’ts and provide them with education and training on the organisation’s code of ethics for their ethical behaviour to be internalised. To this end, the company should explain how it understands the meaning of ethical behaviour and provide specific guidelines for acceptable behaviours. For the success of corporate ethical management, the CEO’s conviction and the establishment of a code of ethics are important, but it is also important for employees to properly understand and implement corporate ethics so that sustainable ethics can take root rather than being carried out as a one-time campaign.

Secondly, it is necessary to improve the decision-making process towards both horizontal and bidirectional decision-making. Employees with a high PDO perceive their bosses as superior and are more willing to accept their decisions by taking them for granted (Loi et al., 2012), which may undermine their ability to identify right from wrong. By contrast, employees with a low PDO prefer formal information to informal information and attach importance to constructive dialogue and collaboration, which can be reinforced by horizontal decision-making in a participatory atmosphere rather than unilateral decision-making by the leader.

Thirdly, it is necessary to diversify the management. Given the diversity of organisational members in terms of race, personality, age and career paths, they may interpret and understand the pursuit of corporate ethics differently. Therefore, to clearly deliver a consistent message to various members, it is recommended that the executive manager appoint an ethics officer, formally expressing their will to implement the organisational ethics programme.

Finally, employees should be generously praised and rewarded for excellent ethical behaviour. If only punishment is imposed for behaviours violating the code of ethics, it may hamper progress towards the intended goal of enhancing employee loyalty and customer satisfaction. Therefore, rewards for excellent ethical behaviour must be properly balanced with punishments for noncompliant behaviour.

This study has two limitations. Firstly, there was a risk of common method bias because a self-report questionnaire was used to measure the variables. Although Harman’s single-factor test was performed to address this problem, a method using different response sources for independent and dependent variables must be sought to increase the objectivity of the research. Secondly, this study used cross-sectional data for analysis; therefore, future research must use a longitudinal study design to determine causal relationships.

As a direction for future research, this study may be extended to studies that consider the characteristics specific to each generation. This is all the more important as Generation MZ (millennials and Generation Z) accounts for over 50% of the global labour market. Their characteristics are very different from those of previous generations, particularly in terms of disposition, lifestyle, way of thinking, organisational behaviour and valuation of work. In this respect, follow-up research that considers the characteristics of each generation would be meaningful.

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Competing interests

The authors have declared that no competing interest exists.

Authors’ contributions

The study was conceptualised by Y.L. and S.H.; M.S. was responsible for the methodology; J.J. was responsible for the software; validation was carried out by J.J., S.H. and M.S.;
formal analysis, investigation, resources and data curation were undertaken by Y.L.; J.P. prepared the original draft preparation, reviewed and edited the manuscript and was responsible for visualisation, supervision, project administration and funding acquisition. All authors have read and agreed to the published version of the manuscript.

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Data availability
The data that support the findings of this study are available on request from the corresponding author.

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References

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