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HOW DOES GREEN INTELLECTUAL CAPITAL INFLUENCE EMPLOYEE PRO-ENVIRONMENTAL BEHAVIOR? THE MEDIATING ROLE OF CORPORATE SOCIAL RESPONSIBILITY

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ABSTRACT

The issue of environmental protection in the twenty-first century has played a relatively critical role in business management. Companies developing green intellectual capital can increase their competitive advantage and may influence employees' attitudes and behavior regarding environmental protection. This research explored the mediating effects of corporate social responsibility (CSR) on the

relationship between green intellectual capital and employees' pro-environmental behavior. Data was obtained from surveys collected from 461 employees in the high-tech industries in Taiwan. The results revealed that green human capital and green relational capital were positively related to the perception of CSR. Moreover, the perception of CSR mediated the associations between green human capital, green relational capital and employees' pro-environmental behavior. Implications of the findings, including limitations and future research directions are discussed.

Keywords: Green intellectual capital, corporate social responsibility, pro-environmental behavior.

INTRODUCTION

The issue of environmental protection in the twenty-first century has played a relatively critical role in business management, corporate environmental management and green innovation which have become increasingly important (Chuang & Huang, 2018). Green intellectual capital (GIC) represents all types of intangible assets involving environmental protection or green innovation at the individual and organizational level within a company (Chen, 2008). This study postulates that GIC development is important because it generates more corporate competitive advantages and can affect employee attitudes and behavior toward environmental protection.

Prior studies have indicated that intellectual capital in environmental management and green innovation (such as green innovation performance) has a positive impact on the competitive advantage of enterprises (Chen et al., 2006). However, these studies have focused substantially on intellectual capital, while fewer studies have examined intellectual capital in relation to green innovation and environmental management (Chen, 2008), and the relationship between this type of intellectual capital and individual perception or behavior (Mehra, 2018). Therefore, the first motivation of this study was to address this research gap by examining this type of intellectual capital. We used the definition of GIC, as proposed by Chen (2008). We also adopted Chen's (2008) classification of GIC, categorized into green human capital (GHC), green structural capital (GSC), and green relational capital (GRC), to explore whether the three types of capital

have positive effects on employees' perception of corporate social responsibility (CSR) and their pro-environmental behaviors.

Moreover, a growing body of literature has indicated that companies involved in CSR efforts influence stakeholders' generalized reactions to an organization, such as employees, shareholders, and customers (Ng et al., 2019). Employees are highly salient stakeholders, to whom the company owes a perfect duty, meaning that they have power and legitimacy with which to influence the company (Parmar et al., 2019). However, most extant research on CSR investigate consumer perceptions (Jin & He, 2018; Kim & Park, 2009; Wei et al., 2018), but rarely on employee perceptions and their subsequent attitudes and behavioral responses (Mehra, 2018). Therefore, the second motivation of this paper was to fill this gap by examining employees' perceptions of CSR. We investigated the causes and consequences of employees' perceptions of CSR, including the relationship between GIC and CSR, as well as the relationship between CSR and pro-environmental behavior. Evaluating these relationships should support the notion that GIC is associated with greater perceived CSR activity in a company, and that employees' perceptions of CSR are associated with more pro-environmental behavior (Tian & Robertson, 2019).

This study has made several crucial contributions to the relevant literature on GIC and employee responses. First, it advances knowledge in the field, which focuses chiefly on a company's ethics policy and the interactional forms of CSR. By evaluating the impact of GIC on employees' perceptions of CSR, our study has extended current research by underscoring GIC as a critical source of organization-focused CSR. Second, by examining CSR as a mediating mechanism, we have integrated extant knowledge on GIC, CSR, and pro-environmental behavior and elucidated the process of how employees engage in pro-environmental behavior through the company to develop GIC.

LITERATURE REVIEW

Green Intellectual Capital

Intellectual capital refers to the total stock of knowledge, capabilities, and other intangible assets of firms that can generate value or

competitive advantage (Edvinsson & Malone, 1997), including collective knowledge, information, core techniques, intellectual property, experience, and customer relationships (Stewart, 1994). Previous studies have categorized intellectual capital: human capital, structural capital, and relational capital (Johnson, 1999). These three forms of capital collectively depict a company in motion as it transforms its skills and knowledge into competitiveness and wealth. Intellectual capital has been found to have a positive impact on the competitive advantage of a company (Anwar et al., 2018).

Although previous studies have focused considerably on intellectual capital, few had examined intellectual capital in relation to environmental management or green innovation until Chen (2008), who proposed a novel construct (i.e., GIC) for exploring intellectual capital in this area. Chen's (2008) research also found that GIC has a significant positive correlation with a company's competitive advantage. Companies that actively invest in GIC can minimize production waste and increase productivity, as well as improve their corporate image. Moreover, Huang and Kung (2011) revealed that GIC can help organizations meet environmental regulations, create value for the organization, and meet customer demands regarding environmental issues. Studies have confirmed that GIC can benefit the organization, including promoting business sustainability (Yusoff et al., 2019), increasing employees' organizational commitment, and reducing employees' turnover intention (Mehra, 2018).

Green Intellectual Capital and Corporate Social Responsibility

CSR is defined as conditions where a corporate excels in compliance and engages in "actions that appear to further some social good, beyond the interests of the company and that which is required by law" (McWilliams & Siegel, 2001). The fundamental concept of CSR is the belief that corporate have an obligation to meet the needs of their stakeholders and to improve social welfare (Waddock et al., 2002). To achieve the goal of sustainable development, companies should invest more resources and effort into increasing their GIC. Prior studies have posited that company ethics programs have a positive influence on employees' perceived CSR (Singhapakdi et al., 2019; Valentine & Fleischman, 2008). Similarly, we argue that the GIC of a company has a positive effect on employees' perception of CSR, as follows.

First, a natural extension of environmental protection or green innovation is engagement in CSR, which implies responding to stakeholder demands, with a focus on societal issues and challenges (Joyner & Payne, 2002). Companies that actively engage in environmental protection and green innovation can minimize production waste and increase productivity, as well as charge relatively high prices for their green products and improve their corporate image, thereby avoiding public condemnation and government penalties (Chen, 2008). Companies engaging in environmental management can find it helpful to create a green organizational culture and climate; simultaneously satisfying the needs of key stakeholders and even society, more effectively. Once these factors are fulfilled, employees will perceive the company's CSR more favorably. Second, developing GIC can facilitate improving companies' CSR resources and capabilities. Lee et al. (2013) found that the CSR capability of a company was positively related to employees' perceptions of CSR activities. Nejati et al. (2020) found that ethical leadership has a positive impact on employees' CSR engagement. Hence, when companies engage in environmental management, employees should have a higher perception of CSR activities in a company.

CSR is related to internal employees within an organization. On the other hand, GIC involves issues such as the accumulation of human capital, investment in employee health, and safety, and changes in management methods. Although the primary objective of a company is generating profit, in GSC, it can simultaneously contribute to social and environmental objectives by integrating CSR, as a strategic investment, into its core business strategy. Finally, in GRC, CSR extends beyond the company to the local community and involves a wide range of stakeholders as well as employees. Consequently, if people perceive an organization as developing human resources, building an internal structure or system, and maintaining friendly relations with stakeholders with a focus on environmental management or green innovation, then getting more attention for GIC should prompt a deeper understanding of the company's CSR. If employees find their organization engaging in the development of GIC, it heightens their perception of CSR activities in a company. Based on these assertions, we propose the following hypotheses:

Hypothesis 1a: GHC is positively related to the perception of CSR.
Hypothesis 1b: GSC is positively related to the perception of CSR.
Hypothesis 1c: GRC is positively related to the perception of CSR.

Green Intellectual Capital, Corporate Social Responsibility, and Pro-environmental Behavior

Pro-environmental behavior refers to behavior that does as little harm as possible to the environment, or even benefits it (Steg & Vlek, 2009). Examples include recycling, purchasing organic produce, and conserving energy.

Schwartz (1977) indicated that people have a moral imperative or a sense of obligation to engage in pro-environmental behavior. If employees could better perceive the total stock of all intangible assets – knowledge, capabilities, and relationships – of environmental protection or green innovation within a company, they may make decisions to benefit the environment and even happily take action to maintain it. Moreover, if companies decide to adopt proactive environmental management strategies, they could integrate environmental protection objectives with those of different departments to solve environmental problems by developing innovative technology (Yi et al., 2019). Therefore, companies that cultivate GIC can trigger employee environmental consciousness and promote their pro-environmental behavior.

According to cognitive theory, individual cognition can aid people in developing and changing their ethical behavior; that is, individual behavior can be affected by individual differences in cognition (Gick, 2003). Moreover, Stern et al. (1995) found that individuals' willingness to take pro-environmental action in response to newly emerging issues was influenced by their attitudes, values, and beliefs. Dietz et al. (1998) showed that an individual's norms, values, and attitudes are positively associated with a willingness to take pro-environmental action. Therefore, when the corporate climate is perceived as ethical, these perceptions influence the ethical decision-making and behavior of employees, as well as their attitudes toward tasks, and their sense of attachment toward the organization, i.e., responsible environmental behavior (Jaramillo et al., 2006). Accordingly, a company develops socially responsible strategies to satisfy employee needs more effectively (McWilliams & Siegel, 2001), thereby encouraging employees to display more responsible environmental behavior. Finally, previous studies have also identified a mediating role for

CSR between organizational activities and employee attitudes and behavior, showing that the perception of CSR promotes employees' sense of attachment (Lee et al., 2013) and raises their job satisfaction (Valentine & Fleischman, 2008). Based on these findings, we propose the following hypotheses.

Hypothesis 2a: The perception of CSR mediates a positive relationship between GHC and employees' pro-environmental behavior.

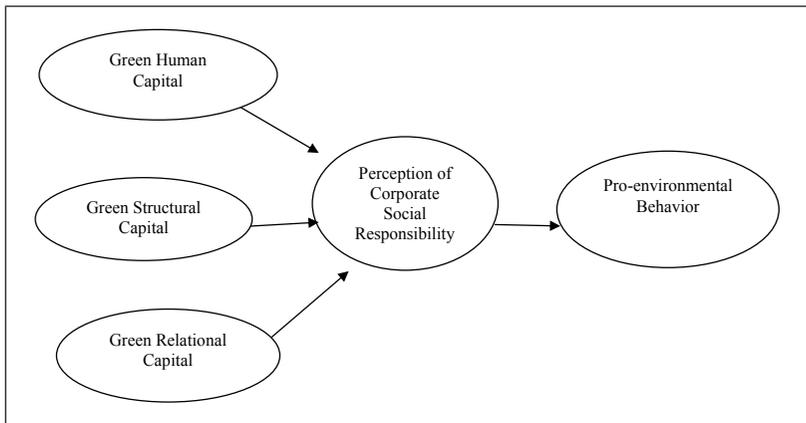
Hypothesis 2b: The perception of CSR mediates a positive relationship between GSC and employees' pro-environmental behavior.

Hypothesis 2c: The perception of CSR mediates a positive relationship between GRC and employees' pro-environmental behavior.

We propose that perception of CSR will mediate the relationship between GIC and employees' pro-environmental behavior. Figure 1 shows the hypothetical model.

Figure 1

Hypothetical Model



METHODOLOGY

Sample and Procedures

The study sample comprised full-time employees of several high-tech companies in Taiwan. We examined our hypotheses by using survey

data through a questionnaire, which was distributed with the assistance of the human resource department manager in each company. Questionnaires were sent to potential participants through the mail system of Chunghwa Post. Each questionnaire contained a simple list of instructions and cover letter from the researcher. The letter explained that participation in the study was strictly voluntary and that confidentiality would be maintained. Respondents were guaranteed anonymity and provided with a stamped pre-addressed envelope to the author. A total of 468 questionnaires from seven companies were rejected due to incomplete data. Among the 461 respondents, 51 percent were men, and 37.1 percent were aged between 26 and 30 years. In addition, 33.2 percent had been employed between one to three years, and 60.3 percent had a college degree or higher.

Measures

All items were measured on a Likert scale ranging from 1 (*very strongly disagree*) to 6 (*very strongly agree*), except for demographic variables.

Green Intellectual Capital

This was measured using the 19-item scale developed by Chen (2008). The scale included three dimensions: GHC, GSC, and GRC. Sample items included, “Whether the productivity and contribution of environmental protection of the employees in the firm is better than those of its major competitors,” “Whether the management system of environmental protection in the firm is superior to that of its major competitors,” and “Whether the firm designs its products or services in compliance with the environmentalism desires of its customers.” Cronbach’s alpha for GHC, GSC, and GRC was 0.93, 0.95, and 0.93, respectively.

Perception of CSR

Perception of CSR was measured using the 2-item scale developed by Valentine and Fleischman (2008). One sample item was “I work for a socially responsible organization that serves the greater community.” Cronbach’s alpha for this scale was 0.88.

Pro-environmental Behavior

Pro-environmental behavior was measured using the 10-item scale developed by Thøgersen (2004). One sample item was “I turn off the lights when I am the last one to leave a room.” Cronbach’s alpha for this scale was 0.75.

RESULTS

Descriptive Statistics and Correlations Analysis

Table 1 lists the means, standard deviations, and correlations among the variables. As expected, GHC, GSC, and GRC were significantly and positively correlated with employees’ perception of CSR ($r = 0.58, p < 0.01$; $r = 0.57, p < 0.01$; $r = 0.53, p < 0.01$, respectively). Moreover, employees’ perception of CSR were significantly and positively correlated with their pro-environmental behavior ($r = 0.26, p < 0.01$).

Table 1

Means, Standard Deviations, and Correlations

Variable	Mean	SD	1.	2.	3.	4.	5.
GHC	4.07	0.90	—				
GSC	3.87	0.90	0.84**	—			
GRC	4.13	0.82	0.70**	0.77**	—		
Perception of CSR	4.12	1.04	0.58**	0.57**	0.53**	—	
Pro-environmental behavior	4.45	0.63	0.18**	0.20**	0.25**	0.26**	—

Note: $n = 461$. ** $p < 0.01$.

Measurement Model Analysis

We adopted a two-step analytical process, conducted on LISREL 8.71, for hypothesis testing. Following Anderson and Gerbing’s (1988) recommendations concerning convergent and discriminant validities, we formed a five-factor model. The results of the five-factor model (Figure 2) revealed a good fit: $\chi^2(424) = 2236.84$; RMSEA = 0.09;

Table 2

Results of the Measurement Model Analysis

Model	χ^2	df	$\Delta\chi^2$	RMSEA	NFI	TLI	CFI	IFI
Five-factor model (baseline)	2236.84	424	—	0.09	0.95	0.96	0.96	0.96
Four-factor model 1 (combined GHC and GSC)	2738.01	425	501.17**	0.11	0.95	0.95	0.95	0.96
Four-factor model 2 (combined GHC and GRC)	3631.31	425	1394.47**	0.13	0.94	0.94	0.94	0.94
Four-factor model 3 (combined GSC and GRC)	3270.44	425	1033.60**	0.12	0.94	0.94	0.95	0.95
Four-factor model 4 (combined GHC and CSR)	2510.82	425	273.98**	0.10	0.95	0.95	0.96	0.96
Four-factor model 5 (combined GSC and CSR)	2509.97	425	273.17**	0.10	0.95	0.95	0.96	0.96
Four-factor model 6 (combined GRC and CSR)	2575.37	425	338.53**	0.10	0.94	0.95	0.95	0.95
Three-factor model (combined GHC, GSC, and GRC)	3792.95	427	1556.11**	0.13	0.93	0.93	0.94	0.94
Two-factor model (combined GHC, GSC, GRC, and CSR)	4057.71	430	1820.87**	0.14	0.92	0.93	0.93	0.93
One-factor model (combined all items)	4761.19	434	2524.35**	0.15	0.91	0.91	0.92	0.92

Note: n = 461. ** p < 0.01.

NFI = 0.95; TLI = 0.96; CFI = 0.96; and IFI = 0.96 (as shown in Table 2), suggesting that the model was acceptable (Hu & Bentler, 1999). Moreover, the change in significance for chi-square between each alternative model and the baseline revealed that the respondents could distinguish among the five constructs well. Hence, these results supported the discriminant and convergent validity of the measures used in this study.

Structural Model Analysis

The results of the fully mediated model (Figure 2) revealed a good fit: $\chi^2(427) = 2244.21$; RMSEA = 0.09; NFI = 0.95; TLI = 0.96; CFI = 0.96; and IFI = 0.96 (as shown in Table 3). To examine the mediating effects of the perception of CSR, we also constructed two alternative models. In Model 2, we added a direct path from the three types of GIC to pro-environmental behavior. Although the fit indices for the partially mediated model (Model 2) showed a similar fit ($\chi^2[424] = 2236.84$; RMSEA = 0.09; NFI = 0.95; TLI = 0.96; CFI = 0.96; and IFI = 0.96), adding direct paths from the three types of GIC to pro-environmental behavior did not reduce the chi-square value significantly ($\Delta\chi^2[3] = -7.37, ns$). Hence, the fully mediated model was accepted based on the principle of parsimony. For Model 3, we devised a reverse causal model in which the perception of CSR mediated the three types of GIC and pro-environmental behavior. As shown in the model-fit comparison in Table 3, the final model (Model 1) differed significantly from the alternative model (Model 3) and exhibited a fit superior to that of the alternative models ($\Delta\chi^2[1] = 239.82, p < 0.01$).

Table 3

Results of the Structural Model Analysis

Model	χ^2	df	$\Delta\chi^2$	RMSEA	NFI	TLI	CFI	IFI
Model 1 (baseline)	2244.21	427	—	0.09	0.95	0.96	0.96	0.96
Model 2	2236.84	424	-7.37	0.09	0.95	0.96	0.96	0.96
Model 3	2484.03	428	239.82**	0.10	0.95	0.95	0.96	0.96

Note: $n = 461$. Model 1 represents the final model (as shown in Figure 2). Model 2 contains a direct effect from the three types of GIC to pro-environmental behavior. Model 3 is a reverse causal model in which the perception of CSR mediates the three types of GIC and pro-environmental behavior.

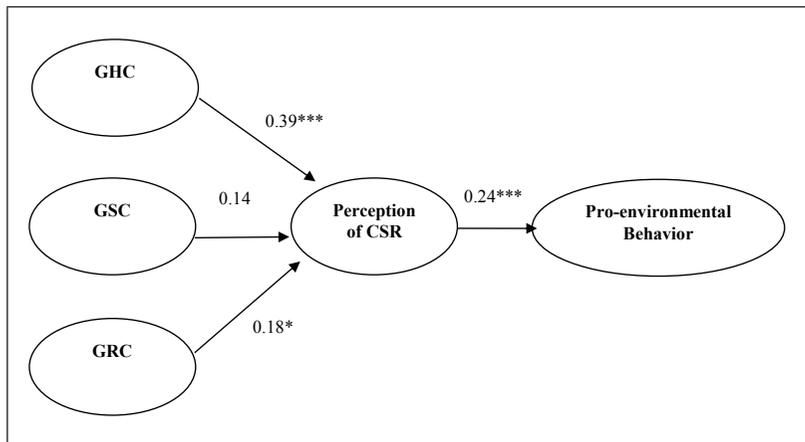
** $p < 0.01$.

Hypothesis Tests

As depicted in Figure 2, in addition to GSC, all the path coefficients estimated in the fully mediated model were found to be significant and in the predicted direction. GHC and GRC were found to be positively related to employees' perception of CSR ($\beta = 0.39, p < 0.001$; $\beta = 0.18, p < 0.05$, respectively); however, we did not find evidence of a similar relationship for GSC. In addition, employees' perceptions of CSR had a significantly positive relationship with pro-environmental behavior ($\beta = 0.24, p < 0.01$). Thus, overall only H1a and H1c were supported.

Figure 2

Results of the Hypotheses Tests



Note: $n = 461$. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Following that, we used Hayes's (2013) PROCESS macro for SPSS to test the statistical significance of these indirect effects. Based on our sample, we conducted the bootstrapping procedure with 2,000 random samples and a 95 percent confidence level (CI). After controlling for social desirability response and other types of GIC, the point estimate for the indirect effect of GHC on pro-environmental behavior through the perception of CSR was 0.04 (95% CI: 0.01, 0.11), whereas for GRC it was 0.03 (95% CI: 0.01, 0.09). Because the 95 percent CI of both indirect effects did not contain zero, which was significant, we concluded that the perception of CSR was a mediator between GHC

and GRC and employees' pro-environmental behavior. However, the point estimate for the indirect effect of GSC was 0.02 (95% CI: -0.01, 0.08), and the 95 percent CI of the indirect effect contained a zero, which was not significant. Therefore, only H2a and H2c were supported.

DISCUSSIONS

Although past research explored GIC – intellectual capital in relation to environmental management and green innovation (Chen, 2008), few studies have examined employees' pro-environmental behavior. The present study investigated how GIC influenced employees' pro-environmental behavior toward their organization and evaluated the role of CSR. Our results revealed that the perception of CSR was a mediator in the relationship between GHC as well as GRC and employees' pro-environmental behavior. However, we did not find evidence of a similar relationship for GSC. One possible explanation is that the employees who participated in the study could not perceive their company's development and investment in GSC (mean = 3.87, lowest; Table 1) because during working hours they may not be fully exposed to these types of capital (e.g. the management system or facilities related to environmental protection). Thus, the impact of GSC on employees' perception and behavior were relatively weak.

The other possibility is that GSC alone (without controlling for GHC and GRC) may have had a positive impact on the perception of CSR. We tested this possibility by excluding GHC and GRC from the model. As expected, the results revealed that when we did not control the other types of GIC, GSC had a significantly positive effect on the perception of CSR ($\beta = 0.63, p < 0.001$). Moreover, estimating for the indirect effect of GSC on pro-environmental behavior through the perception of CSR was 0.09 (95% CI: 0.03, 0.15), which was a similar result to that reported by Valentine and Fleischman (2008). Therefore, we still believe that GSC can engender employees' perception of CSR, which in turn promotes pro-environmental behavior. In short, the greater the investment in these three types of GIC, the stronger the employees' perception of CSR and the more personal and ingrained, their pro-environmental behaviors. This finding provides empirical support for the idea that perceiving corporate GIC can have a positive impact on

embracing CSR to initiate pro-environmental behavior. Therefore, the company's investment in GHC, GSC, and GRC has been helpful in improving their corporate image and gaining competitive advantage.

Theoretical Implications

These findings provide empirical support for the belief that perceiving corporate GIC can have a positive impact on embracing CSR to encourage employees' pro-environmental behavior. Our results have several implications for GIC and the related literature. First, in having to address the challenges of a changing business environment (specifically, the internal market) due to globalization, companies must maintain a competitive advantage as well as engage in environmentally protective behavior. A link between perceived CSR and attempts to develop GIC was identified, suggesting that investment in GIC may be effective in enhancing organizational approaches that emphasize CSR. Based on cognitive theory, our empirical results revealed that corporate development of GIC is a significant catalyst for employees' perception of CSR, which echoes Valentine and Fleischman's (2008) contention that a company's ethics program provides the foundations for CSR. Our findings have extended the knowledge of a company's ethics policy and the interactional forms of CSR. In addition, our results also showed that among the three dimensions of GIC, GHC has the greatest impact on employees' perception of CSR, followed by GRC, with GSC being the weakest. This indicates that investment in GHC may be more important. Human capital has two determinants: employees' capabilities and their commitments (Elias & Scarbrough, 2004). Therefore, human capital is embedded in employees and not organizations, and therefore can be lost with an employee's departure. A company can effectively promote employees' awareness of CSR by strengthening the knowledge, skills, attitude, and commitment of internal employees in environmental protection or green innovation.

Second, our findings underscore the importance of employees' perception of the CSR of the employing organization. Perceived CSR is a critical mechanism through which companies develop GIC, which translates into employees' pro-environmental behavior. Our results not only integrated extant knowledge on GIC, CSR, and pro-environmental behavior, but also elucidated the process of how employees engaged in pro-environmental behavior through a firm for the development of GIC. Based on social learning theory and

cognitive theory, it states that learning is a cognitive process that takes place in a social context and can occur purely through observation or direct instruction. When employees perceive that their company is actively investing in environmental protection or green innovation, they are likely to perceive more CSR in their organization, and hence, are more likely to engage in pro-environmental behavior in daily life.

Practical Implications

This study has several implications for managerial practice. First, in the past, many companies had dismissed environmental management as an unnecessary investment or were even misled that such an investment could hinder their growth and development. However, with the trend of strict international environmental regulations (e.g., Paris Agreement, Kyoto Protocol, and United Nations Framework Convention on Climate Change) and the emergence of consumer environmental awareness, corporate environmental management has begun playing a critical role (Chuang & Huang, 2018). This study revealed that GIC and GRC were positively correlated to employees' perception of CSR. In other words, GIC merits development because it can improve corporate competitive advantage and corporate image. Companies should increase the productivity of this resource through green innovation and design and develop green products that enable them to raise their price and improve their corporate image. Moreover, as employees perceive a richness of GIC in their company, it promotes their own behavior related to environmental protection or green innovation, which further improves the company's corporate image. Therefore, investment in GIC could protect companies from harsh penalties related to environmental regulations and enable them to expand through new market opportunities, increase their competitive advantage, and show evidence of social responsibility. In brief, investment in environmental management is beneficial for corporations, especially high-tech companies in Taiwan. For example, high-tech companies could invest in sewage treatment plants, air pollution control equipment and so on.

Second, our results also revealed that GIC engender employees' perception of CSR in their company, which in turn encourages them to engage in pro-environmental behavior. When employees perceive a richness of GIC in their company, they will improve their inner image

of the company (i.e. perceived CSR), thereby enhancing employees' awareness of environmental protection and prompting them to engage in more environmental protection behaviors. Therefore, investment in GIC is beneficial to companies in enhancing their competitive advantage, and encouraging their employees to become environmentally active. We also investigated two topics to enhance the understanding of CSR: (a) why companies should engage in environmental management, and (b) why and how companies' environmental conduct influences their employees' environmental conduct. Although the primary responsibility of a company is generating profits, companies can also contribute to social and environmental goals by integrating CSR as a strategic investment into their core business strategy, management tools, and practices. This study could serve as a reference for high-tech industries in Taiwan.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

This section looks at some limitations of the study and future research directions. First, we only assessed the perception of CSR at a specific point in time; thus, reverse causality cannot be excluded completely. Future research may retest our findings by collecting data at another point in time or by adopting a cross-lagged modeling design. Moreover, all data were collected from self-reported surveys filled out by employees; thus, common-method variance (CMV) bias may exist in our study. We used Harman's one-factor test and the results suggested that the data could not be fully explained by CMV bias as more than one factor emerged from the factor analysis, and the first factors explained 38.09 percent (<50%) of the item variance (refer Podsakoff et al., 2003). Nonetheless, we recommend that future studies use alternative methods for self-reporting. In addition, information on GIC can also be gathered from top-level managers or CEOs, rather than from employees alone, to avoid self-report bias (Chang & Chen, 2012).

Apart from this, although we used individual-level data to measure GIC in a manner similar to Chen (2008), GIC data level concerns remain. Future studies could investigate potential multilevel relationships among the study variables. Specifically, researchers could explore whether organization- or department-level GIC, and individual perceptions of GIC, influence individual-related outcomes

in varying degrees. Moreover, as mentioned, we tested the hypotheses by providing only cross-sectional data; thus, we could not observe the dynamic changes in GIC during the developmental process. Hence, future researchers could conduct a longitudinal study to identify the differences in GIC at different stages of development in high-tech or other industries.

Furthermore, we only collected data from high-tech industries in Taiwan, which may limit the generalizability of our findings. Chen (2008) found differences among the three types of GIC in different industries and enterprises of various sizes. Thus, future studies could explore whether the relationships we have identified also exist in other industrial and cultural contexts. Furthermore, this study employed the perspective of high-tech employees. Future research could extend this study to examine these relationships from different perspectives (e.g. corporation owners, consumers, shareholders, and government administrators).

CONCLUSION

Companies that invest considerable resources and efforts in GIC can gain competitive advantage and encourage their employees to engage in pro-environmental behavior. By addressing the question of how GIC affects employees' pro-environmental behavior, the findings of this study have advanced our understanding of the crucial role of GIC in fostering such behavior by generating the perception of CSR within their organization. It also highlights the importance of developing GIC to create CSR awareness at the workplace. Based on our findings, we hope to inspire further research in evaluating the impact of GIC on other individual-related outcomes, and encouraging further exploration into the potential mechanisms underlying these relationships. Finally, we hope that the research results will prove beneficial to enterprises, managers, and researchers.

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