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Green employee empowerment for environmental organization citizenship behavior: a moderated parallel mediation model

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Abstract

The paradigm shift in corporate environmentalism indicates the influx of dynamic, sophisticated, yet energy-efficient green production/management practices across global business firms. Even though there is radical growth in the studies encompassing employee green-behavior, a scarcity of work exists on how employee empowerment on environmental matters enables employees' environmental-organization citizenship behavior. Therefore, the current study initially analyzes how green employee empowerment, which is the autonomy at work for eco-related tasks, delegating accountability, and encouraging employee participation in environmental decision-making, independently enhances environmental-organization citizenship behavior (measured in terms of eco-initiatives, eco-civic engagement and eco-helping behavior) of 542 service-sector employees in India. Further, the mediation analysis reveals that employees' environmental commitment and green job satisfaction positively, parallelly and partially mediate the significant direct relationship of green empowerment on environmental-organization citizenship behavior, a newly tested phenomenon. Additionally, this work establishes the moderation effect of 'individual green values' of employees within technology-enabled service industries, wherein the indirect effects of green empowerment on the dependent variable through both mediators are more significant at higher levels of the moderator, supporting the moderated-mediation hypotheses. The model offers premium theoretical insights into self-determination theory, and supplies-values fit theory by contributing a new variable, "employee green empowerment" which has not been empirically established in green-behavior literature. Also, by integrating environmental management into the human resource management (employee empowerment) domain, the model practically encourages management/policy-makers to promote environmental autonomy for enhancing employees' green attitude and eco-behavior, thereby meeting organizational environmental sustainability goals.

Keywords Green employee empowerment · Pro-environmental behavior · Moderated mediation · Individual green values · Environmental commitment · Supplies-values fit

Highlights
- Green empowerment positively predicts environmental citizenship behavior.
- Environmental commitment and Job satisfaction are parallel mediators in the model.
- Age and experience are used as control variables.
- Individual green values significantly act as a moderator in the proposed model.
- Theoretical and practical implications of our moderated-mediation model projected.

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Introduction

Green human resource management (GHRM) is a trending topic that modern organizations actively promote to achieve corporate environmental sustainability. GHRM is the holistic application of sustainable workforce management practices across organizations, motivating employees to make the most efficient use of resources to minimize the harmful effects on the environment. Such sustainable organizational practices are essential to reinforce economic stability and maintain social relationships by integrating corporate goals and employee aspirations at the workplace (Wilkinson et al., 2001). GHRM practices like green training, recruitment, and performance management foster green behavior at work (Pham et al., 2019). Similarly, empowering employees for

green initiatives is a new trend in GHRM which practically benefits the tasks that pay to be green (Tariq et al., 2016). Employee empowerment involves autonomy at work, delegating accountability, and encouraging employee participation in managerial decision-making to reduce stress (Tuan et al., 2019).

Though 'employee greening' is trending across organizations, the empirical contributions of specific GHRM practices like green employee empowerment (GEE) in enhancing green behavior at work remain unknown (Tariq et al., 2016, Hameed et al., 2020). The impact of empowerment on organizational performance is uncertain since the concept is less understood and rarely applied in organizations, especially in developing countries (Tiong et al., 2017; Yin et al., 2019). However, organization psychology research argues that empowerment strengthens superior-subordinate relationships by sharing information, knowledge, and power (Daily et al., 2012), through which employees get internally inspired regarding sense, competence, and choices, developing self-efficacy, satisfaction, and organizational commitment. Employee empowerment is now sensing a green wave in the contemporary world of corporate environmentalism (Lee, 2009). Green employee empowerment stimulates competencies like decision-making ability through employee involvement in organizational eco-management (Tariq et al., 2016). GEE relates to "pursuing green tasks among employees, creating a sense of belongingness towards their respective organizations" (Tariq et al., 2016). It has been conceptualized to meet employees' daily task performance concerning eco-sustainability (Tiong et al., 2017; Hameed et al., 2020). Nevertheless, empowerment is a high-performance opportunity at work (Renwick et al., 2013), and it entails considerable academic attention due to the mixed performance outcomes (Taris & Feij, 2001). Therefore, in-depth research, in this regard, motivates organizations to provide a suitable green platform to employees with empowerment opportunities in eco-conservation to perform the best out of their environmental stewardship. Hence, the current study originally tested a moderated mediation model to identify how GEE affects employees' environmental-organization citizenship behavior (E-OCB) through increased environmental commitment and job satisfaction, conditioned by the interaction of individual green values.

The degree to which workers feel they have the autonomy to make decisions in diversified work contexts is a good indicator of empowerment. Ramus & Steger (2000) identified the concept of environmental empowerment as a precursor of employee eco-initiatives. For implementing environmental management systems, employee empowerment is regarded as an effective tool to facilitate the process (Daily & Huang 2001). Although it is accepted that employee empowerment would improve environmental performance (Daily et al., 2012), environmental HRM research has neglected to examine the worth of this variable (Hameed et al., 2020), forecasting employee green citizenship behavior.

This article focuses on employees' green empowerment and outcomes in the Information Technology (IT) sector. The Indian IT sector, combined with the IT-enabled services (ITES) and Business Process Management (BPM) units, contributes to the country's economy by managing more than four million talents across the national and international branches (Amrutha & Geetha, 2021). Today, organizations highly rely on their intellectual capital and are more involved in designing and developing their human resource management systems in ways that are better for the environment. For example, Indian IT companies currently engage in creating the best workforce management platforms to ensure efficient workflow by streamlining human resources with advanced robotic technologies (IBEF report, 2021) and work-from-home facilities.

However, intense technological transformations have some negative impacts that require due consideration. First, an 'engagement gap' (Ugargol & Patrick, 2018) arises due to differences in employee expectations and actual support from their organizations. For example, overtime duties and non-flexible work schedules in IT companies lead to work-life imbalance (especially for women employees) that restricts IT employees' voluntary involvement in green tasks. This would decrease dedication, lowering employee satisfaction, commitment, and trust, resulting in collective absenteeism and turnover, a key concern for IT employees. Hence, there is an increasing need to empower employees (Hameed et al., 2020) to experience better suppleness and improved self-efficacy in matters relating to environmental conservation. Employee-level studies on GHRM suggest activities like green recruitment and training effectively help reduce wastage, improving the environmental performance of industries (Gkorezis, 2015; Pham et al., 2019). Likewise, empowering employees, at least in environmental decision-making (Tariq et al., 2016), reduces work-related stress, increases green creativity, satisfaction, commitment, and trust, and develops eco-behavior, directly contributing to superior organizational performance. Though, in general, empowerment predicts organizational citizenship behavior (Lamm et al., 2015; Singh & Singh, 2018), green-behavior literature shows limited studies on GEE (Daily et al., 2012; Tiong et al., 2017) and is particularly devoid of research attention from India (Chaudhary, 2020).

Second, inefficient handling of intense technologies by human capital without appropriate knowledge of waste management results in a higher rate of environmental degradation. Though these companies do not directly pump waste into the air or water like manufacturing industries (Tiong et al., 2017), ignorance of such issues, over the years, may increase the wastage of natural resources and piling-up of e-waste (waste electrical/electronic equipment) that are not

easy to manage. A recent study shows India stands 5th in the world in terms of e-waste generation, producing approx.2 metric tonnes of e-waste a year, where a major portion of these come from IT and telecommunication industries spread over Maharashtra, Delhi, Karnataka, Tamilnadu, and Kerala (Garg, 2021). A timely intervention by the 'Ministry of Environment' in India calls for all organizations (including the IT sector) to balance their environmental performance with social well-being and economic prosperity, looking at the bright side of organizational sustainability (Garg, 2021). More research into areas like eco-conservation and human capital occupied with green values that positively contribute to environmental sustainability of IT organizations appears vital (Norton et al., 2014; Shah, 2019). Organizations need to redefine their recruitment policies to capture vibrant green talents (having green values) and ensure sufficient autonomy to employees in ecological conservation to uphold corporate environmentalism.

As such, this article addresses two central questions viz., (1) does green employee empowerment promote environmental-organization citizenship behavior, and if so, (2) what might be the influencing factors that enhance the independent positive effects of GEE on E-OCB, envisioning employee behavior in the long run, as an inevitable cause of the environmental performance of IT organizations. The proposed moderated mediation model analyses the effect of GEE on E-OCB, through environmental commitment (EC) and job satisfaction (JS), at different levels of individual green values (IGV), in the light of Self Determination Theory and Supplies-Values Fit theory.

The contributions of our study are: First, it extends the domain of environmental management into organizational human capital management, promoting sustainable development goals. This unique work devotes the attention of green-behavior researchers to the area of GEE and its effect on E-OCB, with environmental commitment and green job satisfaction as mediators using self-determination theory, a unique model that remains unexplored to date. While EC improves sustainable thinking, creating a sense of belongingness in the workplace, JS relates to the happiness employees tend to experience at work, equally contributing to E-OCB. Next, the study provides new empirical evidence for 'individual green values', and the interaction with GEE on EC and JS, unlocking diverse opportunities for academicians/practitioners to explore the supplies-values fit theory. Moreover, it forms the initial work in a developing country like India, where a significant portion of the workforce engages in IT, ITES, and BPM jobs.

The first section outlines the introduction and research background, followed by the detailed theoretical framework and research hypotheses. Methods are discussed in the third section, and the fourth section provides the analysis and results, which form the core of this study. Limitations of the study are stated in the fifth section, along with implications, future recommendations, and conclusions.

Theoretical background and hypotheses development

Theoretical framework

Much of the prior studies in the field emphasized the green outcomes of collaborative green HR practices instead of the independent impact of empowerment (a green HR dimension) on E-OCB, leaving a significant gap in the greening literature, which this work attempts to fulfill. According to Lamm et al. (2015), employees' psychological empowerment mediates the direct effects of organization support on environmental OCB among hotel employees in the western context, which is not tested so far in an IT context. Using Self Determination Theory (SDT), the current study aims to prove that GEE increases the environmental commitment and green satisfaction of employees, thereby reciprocating E-OCB (a significant predictor of organizational eco-sustainability).

Self-determination theory forms an experimentally derived explanation for employee motivation in organizational circumstances. The theory clearly distinguishes between autonomous and controlled motivation (Deci et al., 2017), focusing on the factors that stimulate employees towards sustainable development at work (wellness and well-being). According to SDT, when employees feel that their independent decisions are valued and supported by the organizations, they are more likely to experience self-efficacy and job satisfaction that subsequently enhances productivity (Zhao et al., 2022). As per Davis et al. (2020), self-determination theory is relevant to explaining the role of green human resource practices in enhancing employee green behavior. SDT categorizes that employee actions are typically driven by intrinsic and extrinsic motivation, wherein employees intrinsically engage in eco-friendly behavior at work based on pleasurable experience, joy or happiness. Extrinsic factors, such as complete autonomy and decision-making opportunity in matters relating to environmental issues, motivate employees to showcase satisfaction at work and remain loyal to the organization, which in turn will be reflected as environmental organization citizenship behavior. Therefore it can be argued that GHRM determines the behavioral motivations at work through extrinsic and intrinsic motivation, directing employees towards green workplace behaviors as per SDT (Zhu et al., 2021). In light of SDT, Zhao et al. (2022) have proved the effect of autonomous motivation (a form of psychological empowerment) in boosting employees' environmental consideration and developing eco-citizenship behavior. Currently, employee

empowerment is advancing as an essential GHRM practice (Tariq et al., 2016), yet the independent role of green empowerment in increasing satisfaction, trust and motivation through green autonomy and efficiency in handling numerous work situations, remains understudied to date in the theoretical lens of Self-determination theory, especially in the IT sector.

Apart from SDT, Edwards (1996) suggested the "Supplies-Values fit (S-V fit) theory" to explain fairness of organization supplies with individual values and beliefs. S-V fit is a complementary theory in that, when employees believe that their organization provides an environment parallel to their personal values, they feel more satisfied and committed at work. S-V fit links supplies and values directly to attitudes like satisfaction and commitment rather than employee behaviors (Choi, 2004). It is similar to "personal-environmental fit (P-E)," which demonstrates harmony of personal values with those supplied to employees by their work environment (Taris & Feij, 2001). S-V fit theory applied in green-behavior has examined the interaction of IGV between psychological-green-climate and employee-green-behavior (Dumont et al., 2017), stating that aligning personal values with psychological work climate enhances extra-role employee green behavior. Similarly, aligning personal values with opportunities like autonomy results in higher work satisfaction (Taris & Feij, 2001). Therefore, applying the "S-V fit", we use IGV as a moderator to explain the variances in EC and JS when personal environmental values interact with GEE.

Hypotheses development

Green employee empowerment (GEE) and environmental-OCB (E-OCB)

Empowering employees provides self-sufficiency to effectively use the rights and opportunities of employee participation in decision-making without compromising quality standards (Hayes 1994). It includes (a) sharing costs, profitability, and related performance data among employees in an organization, (b) autonomy and support regarding the conduct of daily tasks, and (c) shift of accountability from top-level to bottom-level of hierarchy (Yin et al., 2019). Environmental literature (Daily et al., 2012, p. 4) considers empowerment as having four dimensions, "competence, meaning, self-determination and impact" regarding ecological conservation issues, which forms an essential predictor of environmental performance. Employee empowerment enables a green organizational culture that fosters performance (Roscoe et al., 2019). Sharing organizations' environmental plans with employees help them perceive clear company goals, create meaningfulness, extrinsically develop competence and self-determination, which would positively contribute to the environment. According to Tariq et al. (2016), GEE involves employee involvement, participation, recognition, supervisor support, organization cultural support, eco-awareness, and resource sharing for green goal realization. However, it closely relates to employee involvement, which encompasses clarity (green vision), learning climate (eco-awareness), communication channels to spread green culture (information sharing and supervisor/organization support), and ensuring employee participation (Tang et al., 2018). Therefore, based on Tariq et al., (2016, p. 243), we define GEE as the "collective perception of employees regarding information sharing, supervisor support, and employee recognition, forming awareness and employee involvement in pursuance of green tasks."

Though motivation, commitment, job satisfaction (AlKahtani et al., 2021), and OCB (Newman et al., 2017) are the outcomes of empowerment (self-efficacy and determination), the application of empowerment in environmental problem-solving is limited. Employee empowerment in environmental management develops a green organizational culture (Roscoe et al., 2019), promoting better environmental performance (Daily et al., 2012). In contrast, using 'differentiation advantage' as a mediator in their model, Tiong et al. (2017) failed to show the effect of GEE on financial and environmental performance of hotel employees in Malaysia, stating that empowerment of each employee, regardless of capabilities might not be suitable to every aspect of organizational functioning. According to SDT, OCB is an essential outcome of employee motivation (Davis et al., 2020; Zhao et al., 2022). In general, OCBs are beyond formal guidelines that do not provide monetary benefits but, when made routine, would add to organizational sustainability. Paillé and Boiral (2013) adopted OCB in terms of corporate greening, stating that E-OCB includes "a set of discretionary behavior of employees at workplace directed towards environmental problem-solving." These are voluntary actions outside the formal environmental management policies but influence environmental performance (Boiral et al., 2015; Paillé et al., 2016; Pham et al., 2019). It has three dimensions: employee initiatives, employee helping behavior, and employee engagement towards eco-initiatives that express employee contribution towards corporate greening, supporting employee well-being, and environmental well-being (Boiral et al., 2015; Paillé & Boiral, 2013). EE's influence in improving E-OCB states that the collective impact of individual decision-making ability (empowerment) would positively contribute to discretionary behaviors that support environmental sustainability (Lamm et al., 2015). GHRM supports employee green-behavior through organizational identification among employees of automobile sector in India (Chaudhary, 2020), but the effects of green empowerment were not tested in their model. Therefore, considering empowerment as a vital predictor of OCB (Lamm et al.,

2015; Newman et al., 2017) in the Indian IT sector and using SDT (Deci et al., 2017), we propose that

H1: *Green employee empowerment significantly predicts environmental-organization citizenship behavior.*

Role of environmental commitment (EC) and job satisfaction (JS)

Commitment and satisfaction are separate constructs, though observed as attitudinal outcomes of organizational HR policies (AlKahtani et al., 2021). While commitment is defined as "a state of mind or psychological attachment of employees towards their organizations" (Aladwan et al., 2015), job satisfaction relates to "ones' emotional state of positive experiences at work as to their job entrusted roles and responsibilities" (Singh & Singh, 2018). When these two attitudes are considered in terms of environmental management, EC is "the rational or emotional obligation of employees towards their organizational environment" (Paillé & Valéau, 2021), while JS is "the degree of pleasure experienced from carrying out environmental tasks and responsibilities" (Kim et al., 2018). There is a direct relationship between empowerment and commitment (Aladwan et al., 2015) and satisfaction in general (AlKahtani et al., 2021; Singh & Singh, 2018). Employee competencies remain less fostered without proper support and motivation (autonomy) for task performance, consequently affecting commitment (Aladwan et al., 2015) and satisfaction (Singh & Singh, 2018). However, in greening, though researchers have stated the direct effect of green training and green support on organizational commitment (Temminck et al., 2015; Raineri & Paillé, 2016; Paillé & Valéau, 2021) and satisfaction (Paillé et al., 2016; Pinzone et al., 2019), the relation of GEE to EC and JS remains scarce and unclear. In the GHRM domain, we argue that the degree of autonomy, support, and employee participation in eco-initiatives also affect EC and JS (as in Fig. 1), forming GEE outcomes. Accordingly, we hypothesize that:

H2a: *Green Employee Empowerment is positively related to Employee Environmental Commitment.*
H2b: *Green Employee Empowerment is positively related to environmental task-related Job Satisfaction.*

Attitude-behavior relationships are highly valued in organizational contexts (Ajzen & Fishbein, 1977; Stern, 2000). Most common employee attitude like trust, commitment, and job satisfaction are directly proportional to employee behavior. Such attitude, when positive, will lead to positive behavior, and when negative or low, will result in negative behavior (Konovsky & Pugh, 1994). As an outcome of commitment and satisfaction, OCB has a long history in behavioral research (AlKahtani et al., 2021; Foote & Tang, 2008; Singh & Singh, 2018). Also, green attitude like commitment (Afsar & Umrani, 2019; Paillé et al., 2016) and JS (Kim et al., 2018) positively influence green behavior (Gholamzadehmir et al., 2019). Paillé et al. (2016) found that commitment predicts green behavior in Mexican firms,

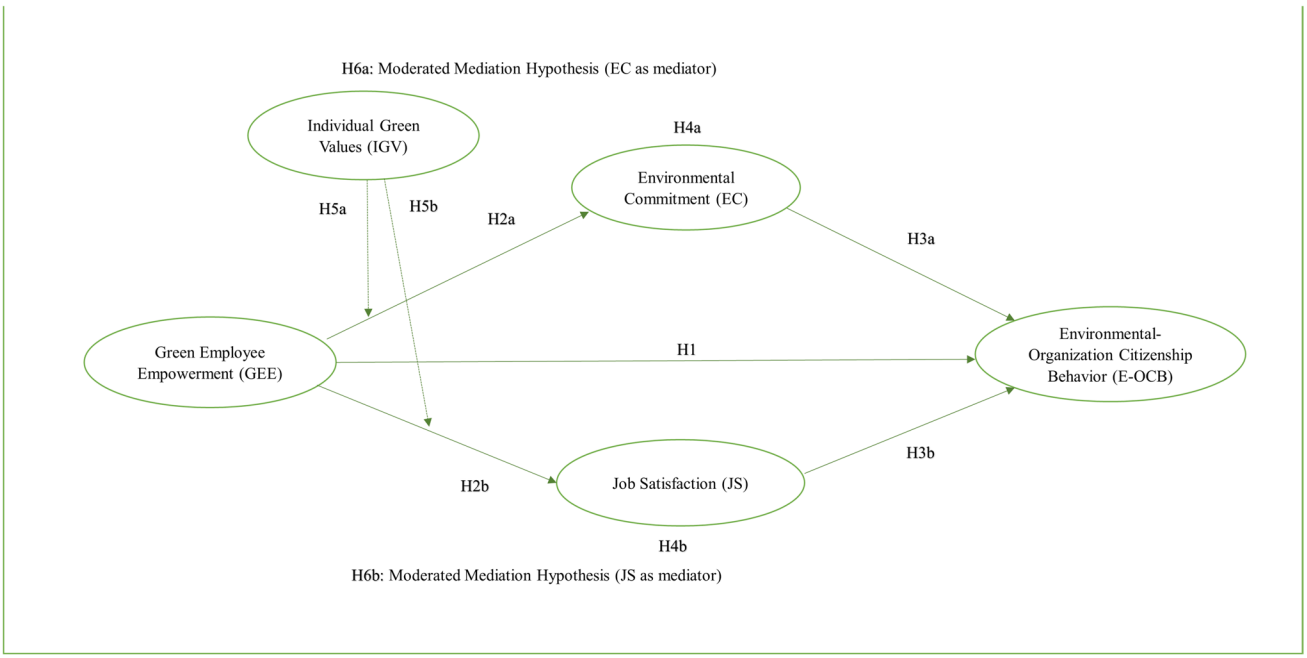

Fig. 1 Hypothesized moderated mediation model for E-OCB

while JS indirectly affects eco-helping (a dimension of E-OCB) behavior through commitment. However, a Korean study (Kim et al., 2018) explained JS as a direct determinant of employees' 'voluntary workplace green behavior.' Afsar and Umrani (2019) found support for corporate responsibility and employee behavior, mediated by commitment, but did not test the effect of satisfaction. Therefore, considering the increasing academic importance of employee attitude and eco-conservation behavior, we suggest that

H3a: *Employee Environmental Commitment significantly influences E-OCB.*
H3b: *Environmental task-related Job satisfaction positively predicts E-OCB.*

Given the direct relationship between empowerment and employee attitude (Aladwan et al., 2015; Singh & Singh, 2018) on employee behavior (AlKahtani et al., 2021; Foote & Tang, 2008), the literature shows employee attitude as an essential determinant of how employee management practices in an organization successfully predict workplace behavior (Aladwan et al., 2015; Norton et al., 2014). Such relation depends on employee awareness and perception regarding the practical implementation of organizational policies. SDT explains that individuals will express positive behavior, either directly or through trust, commitment, and satisfaction, in return for the extrinsic motivation (autonomy and support) experienced in their organizations. As evident in green literature, organizational supplies influence employee attitude and behavior (Kim et al., 2019; Paillé et al., 2016; Temminck et al., 2015). For example, organization support for environmental efforts indirectly affects the E-OCB of employees through 'affective organizational commitment' (Temminck et al., 2015). Commitment mediates: 'perceived colleague support' (PGS) to eco-helping behavior (Paillé et al., 2016); GHRM to eco-friendly behavior (Kim et al., 2019); and perceived corporate social responsibility to employee pro-environmental behavior (Afsar & Umrani, 2019). Organizational commitment (self-identification and involvement of employees in an organization) is a mediator of green human resource management (GHRM) and eco-friendly behavior, as per the Social Identity Theory (Kim et al., 2019). Likewise, PGS enhances job satisfaction, which indirectly supports eco-helping behavior through commitment (Paillé et al., 2016). Harmony of personal values and opportunities, like autonomy, fosters higher levels of job satisfaction (Taris & Feij, 2001). The enthusiasm a person has towards green initiatives at workplace determines the level of environmental commitment and green satisfaction, which the employees reciprocate as environmental-citizenship behavior in the long run. Employees' readiness to accept and perceive the environmental management policies as beneficial to employee well-being will improve their EC and JS, which volunteers them towards organizational environmental-goal realization (Afsar & Umrani, 2019; Paillé et al., 2016; Temminck et al., 2015). Luu (2018) proved that GHRM contributes to green recovery performance through affective organizational commitment as per attitude theory and attribution theory. However, the relationship, specifically GEE as a determinant of EC, JS, and E-OCB (Fig. 1), is devoid of research attention, and hence, we propose the mediational hypotheses

H4a: *Employee Environmental Commitment significantly mediates the positive relationship between Green Employee Empowerment and E-OCB.*
H4b: *Job Satisfaction significantly mediates the relationship between Green Employee Empowerment and E-OCB.*

Moderating role of individual green values (IGV)

Personal ideologies unique to each individual that motivate them to practice eco-friendly tasks in their daily lives are termed IGV. Green values may also represent 'personal environmental norms,' or ethical awareness of eco-conservational routines formulated based on worldwide environmental beliefs that are inclined towards sustainable behavior (Chou, 2014). When collectively viewed, it would create a group of people sharing similar experiences depending on the prevailing conditions of their job, neighborhood, or society; and will significantly impact the environment (Stern, 2000). IGV seemingly represents a new construct, but has solid theoretical support (Chou, 2014; Raineri & Paillé, 2016; Dumont et al., 2017; Chaudhary, 2020). The theory of Planned Behavior (TPB) presented by Ajzen and Fishbein (1977) explains attitudes and individual subjective norms as the fundamental determinants of employee intention to behave. Whitmarsh and O'Neill (2010) included pro-environmental self-identity in TPB variables and established its positive effect on pro-environmental behavior. Stern (2000) extended TPB using Value, Belief, Norms (VBN) Theory, in that "the '*Values*': biospheric, altruistic, egoistic; '*Beliefs*': ecological view, awareness of consequences, perceived ability to reduce threat; and '*Proenvironmental Personal Norms*': the sense of obligation to take action, directly determine OCB. Sabbir and Taufique (2021) empirically proved that TPB variables directly influence employees' task-related green behavior, and environmental attitude mediates green habits to the green-behavior relationship. However, all these prior theories were silent on the specific effects of attitude like commitment and satisfaction. We use Supplies-Values fit (Choi, 2004; Edwards, 1996), an integral theory linking our study variables. According to S-V fit, employees reciprocate a favorable attitude rather than immediate behavior when personal ecological values meet organizational environmental supplies. S-V fit theory originated from

Personal-Environmental fit (Choi, 2004) and is applied in green organization behavior research.

Green HRM policies contribute to employee behavior (Norton et al., 2014) through the psychological climate moderated by IGV (Dumont et al., 2017). Uddin et al. (2021) explored a direct positive association of biospheric values on environmental attitude, while Boiral et al. (2015) showed a significant positive effect of environmental values on managers' E-OCB. Raineri and Paillé (2016) found that green policies are directly related to environmental commitment, and personal environmental beliefs moderate this relationship. Paillé et al. (2016) explained the effect of employee perceptions on commitment, but did not test any moderators. Though S-V fit is used in greening research, these studies did not specifically test the interaction effect of IGV on GEE and EC. Similarly, JS is also an immediate outcome of organizational supplies like empowerment (Aladwan et al., 2015). Employees experience higher satisfaction at work when their expectations meet actual practices. As per S-V fit, IGV may also interact with GEE and JS, which have not been explored to date. Accordingly, we hypothesize that

H5a: *IGV moderates the direct relationship between Green Employee Empowerment and Environmental Commitment, such that the relationship is more significant at higher levels of the moderator.*
H5b: *IGV moderates the direct relationship between Green Employee Empowerment and Job Satisfaction, such that the relationship is more significant at higher levels of the moderator.*

Despite the direct interaction effects of IGV on commitment and satisfaction, it predicts workplace eco-behaviors also. For example, Chou (2014) tested psychological green climate (PSC) as a moderator and concluded that personal values have a stronger relationship with employees' behavior when PSC is weaker. Dumont et al. (2017) reversed this relationship by testing IGV as a moderator of PSC and employee green behavior (EGB) and revealed that IGV moderates PSC to Extra-role EGB and GHRM to Extra-role EGB relations. Likewise, biospheric values indirectly influence employee behavior through environmental attitude (Uddin et al., 2021). The model may be applied to other work settings, like the banking sector or the educational sector, motivating employees to practice greening on a voluntary basis to enhance their citizenship behavior through increased commitment and satisfaction at work.

Similarly, GHRM practices indirectly contribute to pro-environmental behavior through support and organizational identification, conditioned by the interaction of personal environmental values in the Indian automobile sector (Chaudhary, 2020). Apart from this, the literature does not provide solid evidence of how GEE indirectly affects E-OCB through attitudinal variables conditioned by the effect of IGV (Fig. 1). To bridge this gap, we propose that

H6a: *IGV moderates the indirect relationship of Green Employee Empowerment and E-OCB through Environmental Commitment, such that the relationship is more significant at higher levels of the moderator.*
H6b: *IGV moderates the indirect relationship of Green Employee Empowerment and E-OCB through Job Satisfaction, such that the relationship is more significant at higher levels of the moderator.*

Methodology

Sample and procedure

This study followed the component-wise descriptive design suggested by Sekaran and Bougie (2016) to examine the prevalence of green behavior among the chosen sample. The deductive approach mainly relates to identifying, observing, and measuring variables (Sahin & Mete, 2021) to determine answers to 'what, when, where, and how' green empowerment fosters green citizenship behaviors.

Research strategy The research strategy used was 'Survey'. It involved quantitative data collection through a structured questionnaire based on scales previously validated and a pilot study of 126 IT employees from the southern part of India. This survey strategy helps researchers gather data using open-ended and close-ended questionnaires arranged well-structured and distributed among the target group, for which voluntary participation, data anonymity and confidentiality of responses are assured. According to Sekaran and Bougie (2016), questionnaire surveys are widely used in social science research to describe and analyze the attitude and behavior of respondents in general and mostly form 'one-time surveys'.

Level of researcher interference As the study specifically targeted green companies, we collected contact details of ISO 140001-certified companies from the NASSCOM website and employed a two-stage non-probability sampling procedure among IT, ITES, and BPM firms in India. The questionnaire survey method adopted by this study was administered through online google forms, which the employees were requested to complete based on their willingness to participate. Hence, there was the least interference by the researchers, and higher participation was observed from the respondents, without affecting the normal flow of work or without manipulating the study settings.

Additionally, the Non-probability sampling used in this study enabled the researchers to focus on specific target groups rather than sampling the entire IT sector population. In the first stage, purposive sampling was used to choose green IT companies, which were contacted through emails and calls. Purposive sampling is usually employed when the researcher uses specific inclusion–exclusion criteria to select a population based on particular characteristic that suits the study. It is an appropriate method for environmental research, according to Etikan et al. (2016). As inclusion criteria, the unit of analysis included individuals working in IT organizations that employed environmental management practices to ensure that our target population is aware of eco-conservation. We excluded companies that did not practice a minimum level of greening; and those companies that initially hesitated to reveal their environmental practices.

After explaining the study purpose and enquiring about eco-conservation practices, seven companies in the southern region of India (Chennai) gave consent for data collection. Chennai is one of the major IT hubs in the southern region of India that undertakes huge efforts in creating and developing a green circular economy, following the 2030 Agenda of US sustainable development. Hence, shortlisting Chennai IT firms for the current green behavioral research was appropriate as they represented a major portion of the Indian IT sector. In the second stage, we chose convenience sampling (Etikan et al., 2016). The online questionnaire links created in Google forms were sent to our target group through emails forwarded by the concerned HR/training departments of these companies. Following the general ethics in social sciences research, the data were collected after obtaining informed consent from the employees, requesting them to voluntarily participate in the survey based on their convenience. Participants were encouraged to respond in their natural settings during their free time without disturbing the work atmosphere. Direct contact with the employees' was avoided to ensure anonymity of the survey and to reduce response bias. Confidentiality was assured to participants, and indirect request reminders were sent to fill in the questionnaire, which took approximately 10 min for each respondent.

G*Power selection criteria determined the minimum sample (154) required for our study at effect size-0.15, error probability- 0.05, and power 0.80 (Faul et al., 2009). However, based on Hair et al. (2019) criteria of 1:10, we fixed our minimum needed response as 350 (35*10) and maximum as 700 (35*20, i.e., double the required size). A total of 566 responses were received, of which 542 were found suitable for analysis (the remaining 24 contained missing data and were discarded). The questionnaire included 35 items under four heads: Section 1 had items of E-OCB; Section 2: GEE and moderator; section 3 measured EC and JS; and section 4, the demography. The highest reported percentage were: 283 males (52.2%), aged between 25–34 (38.2%), and experienced 5–7 years (32.1%). The characteristics of respondents are given in Table 1.

Study setting This descriptive study was carried out in a non-contrived setting where the eco-friendly engagement of employees at work was ensured naturally without any manipulations by the researchers at the workplace. The measurement items were taken from prior established scales for all other constructs except GEE. Limited works were found for GEE, depicting a lack of a validated scale to measure employee empowerment regarding workplace greening.

Accordingly, we adopted nine items from EE scale of Hayes (1994), employee green involvement scale of Tang et al. (2018), and Pham et al. (2019) to conduct a pilot study. Exploratory Factor Analysis carried out with 126 employee samples using maximum likelihood extraction for GEE resulted in KMO (0.937) and Bartlett's Test of Sphericity ($p < 0.001$) within limits (Hair et al., 2019). Communalities were above 0.6, as Hair et al. (2019) suggested, except for the item *"GEE8: Employees do not need to get management's approval before doing green activities at the workplace",* with 0.569. The standardized factor loadings were also higher than 0.7 (Hair et al., 2019), except for the above item loaded with 0.677. Subsequently, we removed this item from GEE to have a better fit, thereby validating the scale with eight items having good internal consistency (Cronbach's alpha- 0.94) and fit ($p < 0.001$), which was used in further analysis of the study. Later, our measurement model with eight-items confirmed the scale reliability of GEE for 542 employee samples, with Cronbach's alpha: 0.92 (> 0.7 suggested by Cronbach, 1951).

Table 1 Sample characteristics

Variables	Items	Frequency(N)	Percentage
Gender	Male	283	52.2
	Female	259	47.8
	Total	542	100.0
Age Group	< 25	141	26.0
	25–34	207	38.2
	35–44	147	27.1
	45–54	38	7.0
	> = 55	9	1.7
	Total	542	100.0
Experience with the firm (in years)	< 2	130	24.0
	2–4	165	30.4
	5–7	174	32.1
	8–10	62	11.4
	> 10	11	2.0
	Total	542	100.0

EC measured eight items developed by Raineri and Paillé (2016). Unlike the original six-point scale, we used a five-point Likert scale of strongly disagree to strongly agree (1–5). IGV comprised three items of personal environmental norms validated by Chou (2014), having values from 1 through 5 (completely disagree to completely agree). JS encompasses three items (Paillé et al., 2016), ranging from 1(strongly disagree) to 5 (strongly agree). E-OCB measured ten items (Paillé & Boiral, 2013) from 1(completely disagree) to 5 (completely agree). The internal consistency for the remaining scales: EC (0.91), JS (0.78), IGV (0.84), and E-OCB (0.91), evaluated using Cronbach's alpha (α), was also above the cut-off limits (0.7) suggested by Cronbach (1951), suggesting a good fit. Also, the calculated Variance Inflation Factor (VIF) values were also less than 0.3, confirming the scale reliability.

Demographic variables like gender and age affect an individual's behavior in any organizational setting (Dumont et al., 2017). Therefore, we controlled for age and gender in this study. Additionally, experience at the firm was also chosen as another control variable. Age and experience with the firm were related (0.532**), but both were not associated with gender.

Unit of analysis As the current work attempts to establish the effect of green empowerment of IT employees on their environmental-organization citizenship behavior, the unit of analysis is the individual. The data collected from each respondent was included in the data source used for hypotheses testing (except those responses, which were removed due to missing data). During data analysis, the scores for each indicator were aggregated, and the mean score was considered for all constructs to establish the relationship among the constructs chosen for the study.

Time horizon Data were collected from green IT companies already involved in various environmental management practices. Hence, a cross-sectional design was followed to gather data from employees to describe the independent effect of employee green-empowerment practices of these companies on their employees' environmental commitment, satisfaction and E-OCB. This further opens new pathways for the potential researchers to undertake a similar study in a non-green setting using an experimental design to assess the longitudinal (before providing green empowerment and after providing green empowerment) effect of GEE on E-OCB.

Data analysis and results

Exploratory factor analysis (EFA)

EFA was carried out for the study in two stages. First, EFA was employed to validate the appropriateness of GEE scale, using 126 samples collected from an IT organization, which was excluded during the later survey. The Maximum Likelihood Estimation proposed a good fit (CMIN/df – 2.15; $p < 0.001$) for the GEE scale. The item with communalities below 0.6 and factor loading below 0.7 was dropped to produce a better fit (Hair et al., 2019). Finally, a validated scale with eight-items of GEE was used for further hypothesis testing. Results of EFA for the GEE construct, along with the source, communalities, and standardized factor loadings, are presented in Table 2.

The second set of EFA was carried out for the entire sample of 542 IT employees considered for the study to assess the suitability of all the scales. Five factors were extracted with Eigen values > 1, explaining 65.32% of the total variance. The measure of sampling adequacy, KMO reported, was 0.93, and Bartlett's test of sphericity was also within the specified limits ($p < 0.001$). The communalities were above 0.6, and factor loadings were above 0.7 for all the items of each factor without cross-loadings, as Hair et al. (2019) suggested. Additionally, McDonald's Omega was determined in SPSS to establish the internal consistency of the scales used. The values above the cut-off limit of 0.7 (Dunn et al., 2014) for all the constructs: Emp – 0.92; GrnVal – 0.82; OCBE – 0.93; EGS – 0.78; and EEC—0.91 were indicative of good internal consistency. Hence, all the items were retained, and a five-factor model was used for further analysis.

Measurement model fit

Following EFA, Confirmatory Factor Analysis for the five extracted factors using 542 samples in AMOS 24 performed the validity (discriminant and convergent) and reliability (consistency) check of the constructs, ensuring the measurement model fit. Factor loadings, inter-correlations, Cronbach's alpha, Mcdonald's Omega, Average Variance Extracted (AVE), Maximum Shared Variance (MSV), Composite reliability (CR), and square roots of AVE were monitored in this regard. Check for discriminant validity done using two criteria depicted a good fit (Fornell & Larcker, 1981): first, the inter-correlation of variables < square root of AVE (bold diagonal values in Table 3); second, the MSV < AVE (shown in Table 4). The CR value of all constructs were above 0.7 (cut-off); AVE > 0.5; and AVE < CR values (refer Table 4), which confirmed the convergent validity of each construct. Factor loadings were also > 0.7 (Hair et al., 2019), and each measurement item was loaded to corresponding constructs without cross-loadings (Table 4).

Good measurement reliability was also confirmed, wherein CR values (given in Table), McDonald's Omega and Cronbach's alpha (reported earlier in Section 3) were greater than 0.7 (cut-off suggested by Cronbach, 1951; Hair et al., 2019). Overall, the CFA reported a good fit for our model with the values: CMIN/df:1.272; GFI:0.939;

Table 2 Exploratory factor analysis for GEE

Variable	Items	Std. Factor loadings	Communalities	Source
Green Employee Empowerment (GEE)	GEE1: company vision guiding employee's eco-initiatives	0.875***	0.765	Tang et al. (2018)
	GEE2: mutual learning green climate among employees	0.783***	0.613	
	GEE3: opportunities to participate in green suggestion schemes	0.821***	0.675	Pham et al. (2019)
	GEE4: decision-making aspects on eco-initiatives	0.823***	0.678	
	GEE5: employee involvement in problem-solving groups	0.858***	0.736	
	GEE6: communication channels to spread green culture	0.849***	0.720	Tang et al. (2018)
	GEE7: employee creativity allowed on ecological issues	0.788***	0.621	Hayes (1994)
	GEE8: need not wait for management approval in green tasks	0.677**	0.569	
	GEE9: encouragement to handle environmental issues	0.786***	0.618	

***$p < 0.01$; **$p < 0.05$

Table 3 Descriptive statistics, correlations, and discriminant validity

S. No.	Variables	Mean	SD	1	2	3	4	5
1	Green Employee Empowerment	3.72	0.84	**(0.773)**				
2	Individual Green Values	4.07	0.81	0.472**	**(0.795)**			
3	Environmental Commitment	3.91	0.75	0.630**	0.658**	**(0.756)**		
4	Job Satisfaction	3.88	0.79	0.613**	0.589**	0.615**	**(0.738)**	
5	Environmental-OCB	3.97	0.68	0.498**	0.597**	0.579**	0.475**	**(0.711)**

The bold diagonal values represent the square root of Averagre Varience Extracted (AVE)

**p <0.01

AGFI:0.929; NFI:0.946; RFI:0.940 (>0.90 Hair et al., 2019); CFI:0.988; IFI:0.988; TLI:0.987 (>0.95 Hair et al., 2019). The SRMR:0.027; and RMSEA:0.022 at a 90% confidence interval (Herzog & Boomsma, 2009) indicated that the error terms were also within limits (<0.08 Hair et al., 2019).

Common method bias (CMB)

CMB is taken care of in any environmental behavior research, as the chances of error through self-reported (individuals' mental assessment) surveys are high. We employed Harman's method and Common Latent Factor (CLF) method to test CMB (Podsakoff et al., 2003). Harman's one-factor method reported 40.29% of the variance extracted (single factor), which was below the standard limit of 50%, suggesting less possible CMB. We included a CLF in the model and further checked for CMB (Podsakoff et al., 2003). Results showed no issues of CMB since the difference between standardized factor loadings of our CLF-included model and without CLF model was below the limit of 0.2 (lowest being: 0.001 and highest value: 0.138). The fit indices for 'model-with-CLF' were CFI:0.990, NFI:0.950, SRMR:0.023, RMSEA:0.021 (90% CI), and that of the 'model-without-CLF' CFI:0.988, NFI:0.946, SRMR:0.027, RMSEA:0.022 (LO90/HI90). Thus, the overall fit indices showed that the proposed model does not contain CMB issues.

Hypotheses testing

After confirming the measurement model fit, hypotheses were tested in two stages using Process Macro with 5000 bootstrapped samples (Hayes, 2017). First, simple mediation in Process macro model 4 reported the unconditional direct (H1; H2a, b; H3a, b) and indirect (H4a, b) mediation effects. Subsequently, model 7 tested the interaction (H5a, b) and conditional indirect (H6a, b) effects of our hypothesized model. The results are as follows:

Mediation analysis (Process Macro model no.4)

Bootstrapped direct and indirect effects of the simple mediation model with EC and JS as mediators of GEE and E-OCB

Table 4 Standardized factor loadings, reliability, and convergent validity

Variables	Items	Std. Ld.	AVE	MSV	CR
Green Employee Empowerment (GEE)	GEE1:	0.772***			
	GEE2:	0.802***			
	GEE3:	0.759***	0.60		
	GEE4:	0.757***		0.52	
	GEE5:	0.802***			
	GEE6:	0.803***			0.92
	GEE7:	0.741***			
	GEE9:	0.748***			
Environmental Commitment (EC)	EC1:	0.760***			
	EC2:	0.748***	0.57		
	EC3:	0.761***		0.56	
	EC4:	0.749***			
	EC5:	0.748***			0.91
	EC6:	0.731***			
	EC7:	0.779***			
	EC8:	0.774***			
Job satisfaction (JS)	JS1:	0.744***	0.54		
	JS2:	0.747***		0.53	
	JS3:	0.722***			0.78
Individual Green Values (IGV)	IGV1:	0.799***	0.63		
	IGV2:	0.780***		0.56	
	IGV3:	0.806***			0.84
Environmental-Organization Citizenship Behavior (E-OCB)	EOCB1:	0.693***			
	EOCB2:	0.711***			
	EOCB3:	0.704***	0.51		
	EOCB4:	710***		0.47	
	EOCB5:	0.690***			
	EOCB6:	0.705***			0.91
	EOCB7:	0.710***			
	EOCB8:	0.738***			
	EOCB9:	0.752***			
	EOCB10:	0.700***			

***$p < 0.001$; *Std. Ld.* Standardized Factor Loadings; *AVE* Average Variance Extracted; *MSV* Maximum Shared Variance; *CR* Composite Reliability

are detailed in Table 5. Non-existence of a 'zero' value between the upper and lower bounds in a bootstrap sample shows the tested relation as significant (Hayes, 2017). Accordingly, in our model, the direct effect of GEE on E-OCB was positive and significant ($\beta = 0.1403$; $p < 0.001$), supporting H1. Similarly, GEE positively influenced EC ($\beta = 0.5640$; $p < 0.001$) and JS ($\beta = 0.5769$; $p < 0.001$), confirming H2a and H2b, respectively. Test of attitude-behavior relation, i.e., H3a ($\beta = 0.3537$; $p < 0.001$) and H3b ($\beta = 0.1110$; $p < 0.01$), was also supported as the direct effects were significant. Mediation hypothesis H4a showed the indirect effect of GEE on E-OCB through EC ($\beta = 0.1995$; $p < 0.001$) as positively significant. GEE's indirect effect on E-OCB through JS was also significant ($\beta = 0.0640$; $p < 0.01$), confirming H4b. This infers that, though the direct effect of GEE on JS is more than EC, the effect of EC on E-OCB and GEE on E-OCB through EC were more substantial, depicting EC to act as a better mediator than JS. Also, the significant direct and indirect effects of GEE on E-OCB demonstrate 'partial mediation' in both cases. The results reported total effect of GEE on E-OCB ($\beta = 0.4038$; $p < 0.001$), and R^2 (0.37). However, the control variables did not show significant effects on any of the focal predictors in our model and were excluded from further moderated mediation analysis.

Moderated mediation analysis (Process Macro model no.7)

Next, we performed moderated mediation using macro process model 7 (Hayes, 2017) to examine the interaction

Table 5 Unconditional direct, indirect, total effects; and conditional direct and interaction effects

Path	Unconditional effects / Simple mediation (Process Macro Model 4)				Conditional effects / Moderated mediation (Process Macro Model 7)			
	Effect (β)	SE	LLCI (95%)	ULCI (95%)	Effect (β)	SE	LLCI (95%)	ULCI (95%)
Direct Effects								
GEE→E-OCB (H1)	0.1403***	3.6589	0.0650	0.2156	0.1403***	3.6589	0.0650	0.2156
GEE→EC (H2a)	0.5640***	0.0299	0.5053	0.6227	0.3797***	0.0285	0.3238	0.4356
GEE→JS (H2b)	0.5769***	0.0320	0.5141	0.6397	0.4152***	0.0326	0.3511	0.4793
EC→E-OCB (H3a)	0.3537***	0.0429	0.2694	0.4381	0.3537***	0.0429	0.2694	0.4381
JS→E-OCB (H3b)	0.1110**	0.0322	0.0322	0.1898	0.1110**	0.0322	0.0322	0.1898
IGV→EC	–	–	–	–	0.4659***	0.0305	0.4060	0.5258
IGV→JS	–	–	–	–	0.4051***	0.0350	0.3365	0.4738
Indirect Effects (Unconditional)								
GEE→EC→E-OCB (H4a)	0.1995***	0.0306	0.1414	0.2609				
GEE→JS→E-OCB (H4b)	0.0640**	0.0261	0.0118	0.1158				
Interaction Effects (IGV as Moderator)								
GEE×IGV EC as Mediator (H5a)	–	–	–	–	0.1203***	0.0269	0.0674	0.1732
GEE×IGV JS as Mediator (H5b)	–	–	–	–	0.0988**	0.0309	0.0382	0.1594
Total Effects								
GEE→E-OCB	0.4038***	0.0302	0.3444	0.4632				

***$p < 0.001$; **$p < 0.01$; *SE* Standard Error; *LLCI* Bootstrapped Lower Limit Confidence Interval at 95%; *ULCI* Bootstrapped Upper Limit Confidence Interval at 95%; *GEE* Green Employee Empowerment; *EC* Environmental Commitment; *JS* Job Satisfaction; *IGV* Individual Green Values; *E-OCB* Environmental Organization Citizenship Behavior

effects of IGV in the mediation models tested above. The same criteria of a 'non-zero' value between the upper and lower bound of 95% confidence interval were considered significant (Hayes, 2017). The conditional interaction of IGV between GEE and EC (β = 0.120; p < 0.001) proposed using H5a was significant, as shown in Table 5, depicting substantial interaction effects. Similarly, the conditional effect of IGV on GEE and JS was also significant, supporting H5b. Conditional direct effects and interaction effects, along with bootstrapped intervals, are shown in Table 5.

Finally, we simultaneously observed the conditional indirect effects of both mediation models (EC and JS) in Process model.7, which are presented in Table 6. The significance of the conditional indirect relation of GEE and E-OCB through EC was assessed at three different levels of the moderator (IGV). Three conditions represent the lower, mean, and higher levels of the moderator at (-)1, 0, and (+)1 standard deviation, respectively (Hayes, 2017). Our analysis reported more significant (Table 6) conditional indirect effects at higher levels of IGV (effect 0.1689, CI-0.1201_0.2226). The index of moderated mediation with EC as mediator was also substantial (effect 0.0426) with a non-zero interval (CI—0.0212_0.0680). Therefore, both these results support the moderated mediation proposed using H6a (i.e., EC as mediator). Similarly, conditional indirect effects of GEE on E-OCB through JS, assessed at three levels of IGV (-1,0 and + 1 standard deviation), were more significant at higher levels (effect 0.0550; CI – 0.0103_0.0989) than at lower levels of IGV. The index of moderated mediation with JS as mediator was also significant (effect 0.0110; CI-0.0014_0.0240), supporting hypothesis H6b. However, the effect was lower for the model with JS as mediator than for the moderated mediation model with EC.

Discussion and implications

Though environmental sustainability has become a matter of concern, directives like adherence to ISO 14001 made realization of the '2030 sustainable development agenda' closer. Based on strong theoretical foundations, the authors have chosen EC and JS as the mediators in the proposed model to ensure that green autonomy at work reflects the nature of employee behavior through positive workplace experiences and enhanced loyalty towards the eco-initiatives of their company. Organizations following environmental sustainability practices try to refine their human resource management practices along production, marketing, and finance (Chaudhary, 2020), to engage and retain high-performance green-workforce that meets organizational environmental goals. Employee behavioral researchers also work to find new ways of upgrading environmental quality (Lee, 2009).

Table 6 Conditional indirect effects of GEE on E-OCB with IGV as moderator

Mediator	Conditions	Indirect effects (GEE→E-OCB)		Boot 95% CI	
		Effect	Boot SE	LLCI	ULCI
EC	Low (-1 SD)	0.0997	0.0195	0.0630	0.1386
	(0)	0.1343	0.0208	0.0955	0.1770
	High (+1 SD)	0.1689	0.0259	0.1201	0.2226
Mediator	Moderator	Index of Moderated Mediation			
		Effect	Boot SE	LLCI (95% CI)	ULCI (95% CI)
EC	IGV	0.0426	0.119	0.0212	0.0680
Mediator	Conditions	Indirect effects (GEE→E-OCB)		Boot 95% CI	
		Effect	Boot SE	LLCI	ULCI
JS	Low (-1 SD)	0.0372	0.0157	0.0068	0.0690
	(0)	0.0461	0.0187	0.0085	0.0831
	High (+1 SD)	0.0550	0.0224	0.0103	0.0989
Mediator	Moderator	Index of Moderated Mediation			
		Effect	Boot SE	LLCI (95% CI)	ULCI (95% CI)
JS	IGV	0.0110	0.0058	0.0014	0.0240

Boot *SE* Standard Error; *LLCI* Bootstrapped Lower Limit Confidence Interval at 95%; *ULCI* Bootstrapped Upper Limit Confidence Interval at 95%; *GEE* Green Employee Empowerment; *EC* Environmental Commitment; *JS* Job Satisfaction; *IGV* Individual Green Values; *E-OCB* Environmental Organization Citizenship Behavior

In this regard, we present this unique moderated mediation model that attempts to assess the effects of empowerment on employees' eco-friendly behavior at workplace.

This study considered the collective perception of IT and BPO employees in India as the basis of hypotheses testing, owing to the paucity of research in this sector. Our results are well connected with environmental well-being in a broader sense through enhanced EC, satisfaction, and E-OCB as the reciprocal effects of GEE, a rarely studied green practice. We accept our first hypothesis (H1) as the direct relation of independent variable 'GEE' and dependent variable 'E-OCB' is significant, thereby adding to the strong theoretical foundations (Singh & Singh, 2018) of the substantial positive influence of empowerment on citizenship behavior. Empowerment should be measured according to employee perceptions of the degree of freedom or authority they hold to act upon in different work situations. The results prove that aggregate perceptions of organization supplies (like empowerment) are highly valued by employees and result in their' eco-friendly behavior at work, extending the existing theoretical knowledge of SDT. The direct effect of GEE on commitment and satisfaction tested significant, accepting H2a and H2b, respectively, wherein GEE has stronger connection with satisfaction as the immediate outcome. Adequate autonomy and flexibility towards eco-initiatives make employees more satisfied at work, developing a sense of belongingness towards their company's eco-initiatives. This opens a new path where psychological empowerment directly influences JS, which in turn triggers organizational commitment, supporting serial mediation. These findings are closely related to Paillé et al. (2016), which tested the independent effects of 'perceived colleague support' and the serial intervention of satisfaction and commitment in enhancing employee behavior. The direct path of commitment to E-OCB and satisfaction with E-OCB was also positive, confirming H3a and H3b. We found that, unlike the direct relation of GEE to mediators, the role of commitment towards E-OCB was more substantial than satisfaction with E-OCB. It suggests that satisfaction encourages employees to engage in eco-friendly initiatives at workplace; however, if they feel more environmentally committed, it will create a higher impact on their subsequent behavior (Raineri & Paillé, 2016). Despite direct relations, our study also supported the indirect association of empowerment on E-OCB through commitment and satisfaction, accepting H4a and H4b, respectively. Our results support two intense positive attitudes that need to be encouraged among employees, through which organizations will be able to foster the eco-behavioral benefits of GEE. However, the mediation effect of commitment is much higher than that of satisfaction. Though prior studies (Paillé et al., 2016) have used commitment and satisfaction, the significant mediation effect of these variables between GEE and E-OCB has not been empirically explored to date, which is a vital contribution of this study to the SDT theory and the green-behavior literature.

Hypotheses H5a and H5b posit the moderation effect of IGV with GEE on the two mediators. First, H5a is accepted as the effect of IGV between GEE and Commitment is significant. As depicted in Fig. 2, the independent effect of GEE on Commitment is more significant at higher levels

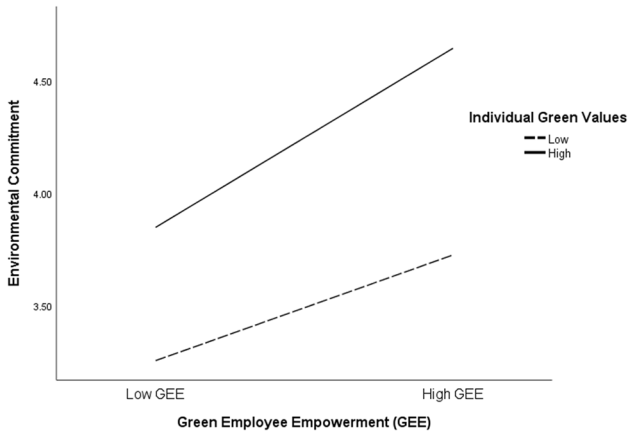

Fig. 2 Interaction effect of IGV and GEE on environmental commitment

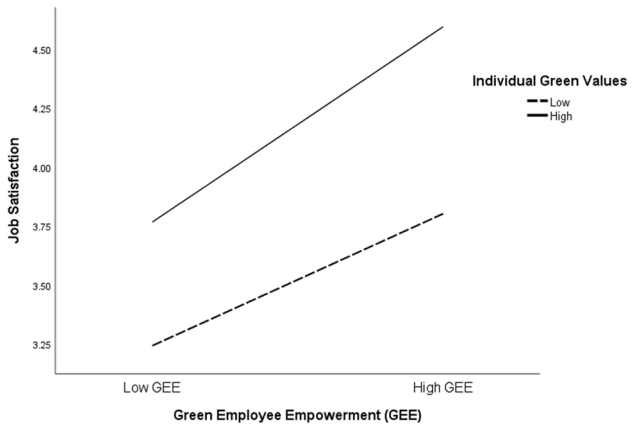

Fig. 3 Interaction effect of IGV and GEE on job satisfaction

of IGV than at lower levels, inferring that when employees with superior environmental values perceive high on environmental empowerment practices of their company, it would positively result in better ecological commitment. Next, we accept H5b, confirming the interaction of IGV on the direct relationship between GEE and job satisfaction. Figure 3 shows that people with high green values are highly satisfied at work when they perceive GEE as high. However, the positive effect was nominal at both levels, an essential finding of this study, revealing a substantial direct effect of GEE on JS towards eco-initiatives in workplace.

Finally, we accept hypotheses H6a and H6b. H6a shows the conditional indirect effect of GEE on E-OCB through commitment as significant at all levels of green values (Table 6). However, as hypothesized, we found the effects to be more significant at higher levels of IGV (0.1689), supporting H6a. This finding provides insights into how employee eco-behaviors highly depend on affective attitudes and personal values apart from their perceptions of green organizational practices (Paille et al., 2016). Based on this, we accepted H6b, stating that environmental behavior of employees depends on the conditional indirect effect of GEE through job satisfaction at various levels of green values. Our findings also conclude that moderated mediation with commitment as mediator is more influential than JS.

The findings of the current study empirically suggest that employees are the major change agents in any organization, and their perceptions of the existence of green employee empowerment (GEE) (freedom to practice green) will be reciprocated in the long run as environmental organization citizenship behaviors (E-OCB), facilitating the creation of a proactive organizational system that supports sustainable development (social, economic and environmental). The model may be applied to other work settings, like the banking sector or the educational sector, motivating employees to practice greening voluntarily to enhance their citizenship behavior through increased commitment and satisfaction at work. However, in the case of manufacturing firms, this model needs to be modified by testing the moderating effect of Corporate Social Responsibility (CSR), as adhering to the CSR requirements is mandatory rather than voluntary.

Thus the significant results of all the tested paths demonstrate that green opportunities to employees in terms of autonomy for ecological decision-making (i.e., GEE) at work would enhance job satisfaction and commitment towards organizational green initiatives of IT employees in an Indian context. Further, such behaviors are shown to be higher at higher levels of individual green values in terms of both job satisfaction and environmental commitment, leading to E-OCB.

Theoretical contributions

Our study on environmental empowerment and environmentally sustainable behavior provides new insights into SDT theory in green-behavior literature. First, it combines the perspectives of self-determination theory with supplies-values fit (Edwards, 1996) to connect organizational human resource domain with the ecological domain, adding to the green behavior research. Next, we divert academic attention to the scarce research on green empowerment as to how and when it fosters superior environmental performance of organizations. This is the initial study of green empowerment among IT employees in a developing country like India. The findings support our hypotheses, implying that academicians and researchers may consider the effects of attitude in the relation between green organizational practices and employee eco-behavior in the future. The empirical study also contributes a new moderator, 'individual green values,' to the empowerment-employee behavior relationship. A competent workforce with green values can

contribute to organizational goals if they experience sufficient autonomy to perform green tasks in their workplace.

Managerial implications

Organizations, managers/policy-makers also find this model a gateway to investing in green HR practices to foster organizational eco-sustainability. For example, the positive relation of empowerment to ecological behavior encourages them to include green empowerment in their upcoming policy implementation agenda, besides other GHRM practices, to develop and retain an eco-knowledgeable workforce. Second, they would find encouragement from our findings that autonomy, flexibility, and support, at least for green initiatives (Roscoe et al., 2019; Tariq et al., 2016), motivate employees, developing commitment and satisfaction at work, through which organizational environmental goals can be realized. Third, and most importantly, recruiting green employees and providing them with sufficient opportunities to participate in environmental campaigns, eco-conservation suggestion schemes and environmental decision-making help companies develop and implement better waste management facilities with employee support, thereby meeting environmental sustainability requirements.

Limitations and future research directions

There are certain limitations to the current study that could help future researchers continue the line of their academic research on GHRM. First, the current study applies to seven organizations adhering to eco-sustainability guidelines in the IT industrial hubs of the southern part of India. However, the present scenario demands every organization consider environmental protection to meet environmental sustainability requirements. Therefore, forthcoming studies may include a broader range of organizations in India and abroad, like manufacturing industries or the banking sector, to promote employees' eco-friendly initiatives and measure their impact on E-OCB. Next, the analysis focused on 542 samples that were quantitatively sufficient to prove the statistical assumptions raised in the current study. However, future research may use larger samples to boost the survey, to depict a much clearer picture of the need for green employee empowerment and its impact on organizations' environmental sustainability.

Third, though the study did not report any issues of method bias, the possibilities of CMB cannot be completely neglected in social sciences research that uses cross-sectional data. Hence, it is advised to check for CMB issues in future studies by including a marker variable. Further, this study analyzed the independent effect of GEE on E-OCB, considering gaps in green-behavior literature. Upcoming researchers may extend the model by examining the mediation effects of GEE among other GHRM practices and E-OCB or explore the effects of other mediators and moderators such as corporate social responsibility (CSR), environmental knowledge, or personality traits in GEE-EOCB relationship. Also, the serial mediation effects of green satisfaction and environmental commitment may be tested in the future, which this article did not examine. Further, considering the boundaries of our current work, we suggest academicians in the green-behavior realm may go for longitudinal studies using this model in the future.

Conclusion

Relationships analyzed in this study offer significant insights into the environmental management literature. Providing empowerment to employees regarding environmental aspects is highly recommended from our empirical findings for green organizations to uphold their environmental sustainability goals through increased commitment and eco-behaviors of knowledge capital. GEE is a better option for employee retention as well, since empowered employees are expected to be more satisfied at work and remain loyal to their organization. Additionally, this effect may be enhanced when individuals possess personal environmental values parallel to the environmental sustainability goals of their organization. Moreover, our findings strengthen prior green behavioral studies that establish the need for appropriate environmental management practices at the employee level to meet organization sustainability requirements.

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Author contribution Author 1 (V.N. Amrutha)—Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Software; Validation; Visualization; Roles/Writing—original draft; Writing—review & editing.

Author 2 (S.N.Geetha)—Conceptualization; Data curation; Funding acquisition; Project administration; Resources; Supervision; Validation; Visualization; Roles/Writing—review & editing.

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Data availability statement The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval statement This research involved a questionnaire survey of service sector employees in India. The questionnaire and methodology for this study were approved by the Research Ethics Doc-

toral Committee (ethical standards of Ph.D. regulations mentioned for 1825991111/Ph.D./AR10 of the University), constituted by the Centre for research, Anna University, Chennai, as per Clause 12.1 of Ph.D. Regulations. The authors declare that no clinical trials involving human subjects were undertaken for this study.

Informed consent statement Informed consent was obtained from all individual participants prior to the data collection through the questionnaire survey included in the study.

Declaration of potential conflict of interests statement The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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