

Operationalization of green behavior at workplace: Analyzing three major constructs

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Abstract

Pro-environmental behavior is a broad construct of individual activity that minimizes harm to or benefits the environment. Different researches have given different terminology for different aspect of those environment oriented behavior. Present research compares between the three different constructs of pro-environmental behavior at workplace which has been extensively researched upon in the last decade- employee green behavior, voluntary workplace green behavior and organizational citizenship behavior towards environment. Theoretical comparisons of the three variables were done. Comparisons among the three variables were also done by collecting data using measures of three variables. Data was collected from 234 employees from chemical manufacturing firm. Factor analysis was done to find out factors. Result of factor analysis showed similarities among the variables. The items of three scales loaded into three factors – daily pro-environmental activities, lesser consumption of resources and alternative pro-environmental steps. The similarities among the variables along with theoretical contribution are discussed. Comparison among three major initiatives have been done.. A comprehensive tool which has been suggested can be used by future researchers to measure environmental behavior at workplace.

Keywords: employee green behavior, voluntary workplace green behavior, organizational citizenship behavior towards environment, factor analysis, pro-environmental behavior.

Pro-environmental behavior is a broad construct of individual activity that minimizes harm to or benefits the environment (Steg & Vlek, 2009). Studies on pro-environmental behavior with individualistic approach (Sia & Jose, 2019) and collective approach (Sia, 2019) in various contexts have been extensively researched upon, but in context of workplace have got researchers attention only in very recent past (Anderson, Jackson & Russell, 2013; Ones & Dilchert, 2012b). The pro-environmental behavior done in daily life is different from the behavior one does inside organization because of the contextual differences of the location and amount of control one has over their behavior (Norton, Zacher, Parker, & Ashkanasy, 2017; Dalal, Bhawe & Fiset, 2014).

Several researches have been done on behavior of employee which they do for the environment. The interest of researchers in pro-environmental behavior at workplace has made it conducive for the researcher to take up construct and come up with different terms.

Different researches have given different terminology for different aspect of those environment oriented behavior (e.g., Ones & Dilchert, 2012a). Need of operationalization in theory is very crucial in explanation of the constructs and measurement of it. The present research reviews and explains the three different type of constructs which measure pro-environmental at workplace by first reviewing the literature related to it and then using measures each of the constructs and comparing it. Previous review research done have concentrated more on operationalization of construct and measurement scales and their items (eg., Francoeur, Paillé, Yuriev, & Boiral, 2019). Previous research have concentrated more on organizational and individual determinants of pro-environmental behavior and on antecedents and outcomes of it (eg., Lo, Peters & Kok, 2012; Inoue & Alfaro- Barrentanes, 2015). Present research compares between the three different constructs of pro-environmental behavior at workplace which has been extensively researched upon in the

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30/ Operationalization of green behavior at workplace...

last decade- employee green behavior, voluntary workplace green behavior and organizational citizenship behavior towards environment. The paper is structured as follows. First the literature of each constructs is discussed. Second, comparisons among the constructs are explained. It is then followed by the methodology of empirical study and then the result of the study is presented. Lastly the theoretical contribution and limits of the paper are discussed in the conclusion.

Organizational citizenship behavior towards environment (OCB-E)

The emerging literature on OCB-E has mainly focused on the issues of definition and scope, theoretical models of its antecedents and outcomes (Daily, Bishop, & Govindarajulu, 2009), different measures and empirical exploration of OCB-E and other variables. OCB-E can most comprehensively be defined as the “environmental efforts that are discretionary acts, within the organizational setting, not rewarded or required by the environment” (Daily et al., 2009 p.243). Most researches point out that organization citizenship behavior towards environment are driven by supervisory support, social norms, personal disposition and self-efficacy (e.g., Ramus & Killmer, 2007, Daily et al., 2009). Research on difference between OCB-E and organization citizenship behavior highlight that OCB-E are not directed at the organization but it focuses on behavior which are for betterment of environment where the organization operates (eg., Tosti-Kharas, Lamm & Thomas, 2017; Lamm, Tosti-kharas, & Williams, 2013). OCB-E construct is comprised with three categories- eco-initiatives, eco-civic management and eco-helping. Eco-initiative are those behaviors which are been started by the employee themselves. Eco-civic management include taking part in environmental events organized by organization and eco-helping are those actions taken by one employee to make other colleagues more environmental concerned (Lamm, Tosti-kharas, & Williams, 2013; Boiral & Paille, 2012). Boiral (2009) has explained OCB-E as the application of organizational citizenship behavior as per the model given by Organ et al (2006). The dimensional approach proposed by Organ (1988) divides OCB into five dimensions: altruism, conscientiousness, sportsmanship, civic virtue and courtesy. The dimensions mentioned in OCB-E are same as the OCB but the behaviors are directed towards environment: helping (collaborating and encouraging other workers to consider environmental issues), sportsmanship (positive attitude

towards inconvenience associated with environmental practices), organizational loyalty(following policies of organization for sustainability), organizational compliance (compliance with environmental policies), initiative (environmental initiative) and self-development (attainment of environmental knowledge) (Boiral, 2009; Boiral, Talbot, & Paillé, 2015).

Previous literature on OCB-E show that it has a significant impact on the corporate greening and employees’ OCB-E behavior contribute to the environmental leadership but it is highly mediated by managers’ value and priorities (e.g., Boiral, Raineri & Talbot, 2018; Bowler et al. 2010). Research by Lufs and Hans (2013) show a more complex model that distinguish between the distal predictors and more direct motivational components. The distal predictors can be organizational context, awareness of need and social norms to name a few. The motivational determinants can be perceived behavioral control, personal moral norm. This model also explains that habitual process can act as moderator intentions and behavioral act (Boiral, Talbot, et al., 2015). Studies have shown that CSR initiatives taken by the company also has significant positive effect on OCB-E (e.g., Tuan, 2018; Brammer, He & Mellahi, 2015) and research also show that perception of CSR has positive effect on OCB-E mediated by organizational identity and environmental fit (Cheema, Afsar & Javed, 2019). There has been extensive research to propose a comprehensive measurement scale for OCB-E (e.g., Boiral & Paille, 2012; Boiral, Talbot, & Paillé, 2015). Boiral and Paille have at first tried to find out comprehensive measurement scale based on three dimensions of OCB-E. A 12 itemed scale was constructed by Lamm, Tosti- Kharas and William (2013) and is one-dimensional in nature and is measured on 7 point Likert scale. Another scale for OCB-E measurement in managers have been constructed by Boiral, Talbot and Paillé, (2015). The scale consists of three items and is measured on 5 point Likert scale.

Employee Green Behavior (EGB)

The emerging literature on EGB have focused mainly on the definitions, scopes, theoretical models (Boiral, Paille, & Raineri, 2015), taxonomy of behaviors which should be included (Ones & Dilchert, 2012). Employee green behavior can be defined as “scalable actions and behaviors that employee engage in that are linked with and contribute to detract from environmental sustainability” (Ones & Dilchert, 2012 p.87). Employee green behavior can be divided into

two types- required EGB and voluntary EGB. Required EGB is the one in which contributes to core business goal and one which is performed within the employee's required job duties. It may require choosing some sustainable alternative and creating something sustainable product. The concept of voluntary EGB involves personal initiative that is beyond the organizational roles. The concept of voluntary EGB is closely associated with contextual performance and organizational citizenship behavior. Recent research on EGB show that employees not only differ from one another in terms of EGB (between-persons variation) but there is changes in EGB over the time also (with-in person variation). Research on within person variation EGB showed that green psychological climate moderates the relationship between green behavioral intention and EGB that is acted out in the organization (Norton, Zacher, Parker, & Ashkanasy, 2017; Bissing-Olson, Iyer, Fielding, & Zacher, 2013).

Research also shows that positive psychological climate helps to strength green behavioral intention and leading to more EGBs (Smith- Corwe, Burke & Landis, 2003). Researches also show that if the employees are aware of company's corporate environmental strategies then the knowledge acts as moderating factor for EGB (Norton, Zacher, Parker, & Ashkanasy, 2017). Studies show that when employees made to engage in the CSR initiatives which lead to higher employee well-being which in turn lead to more positive behavior like green behaviors, helping others (e.g., Su & Swanson, 2019; Ahmed, Zehou, Raza, Quershi & Yousufi, 2020). There are different set of factors which contribute to EGB at different level of the organization. At the institutional level there was found to be significant positive relationship between employee engagement in required behavior (Del Brio, Fernandez & Junquera, 2007). At the organizational level, there are enormous numbers of factors that contribute to EGB. The factors include attitude of organization towards the environment (Cantor, Marlow & Montabon, 2012). Policies for environmental sustainability are also important factor in influencing both voluntary and required EGB (Ramus & Stager, 2000). The effect of EGB on organization can be clearly seen in cost saving. Result on this research line show mixed result (Paille, Chen, Boiral & Jin, 2014). A measurement tool for EGB was developed by Norton et al (2014). The measurement tool consisted of 6 items half of which measured required EGB and 3 items measured voluntary EGB. The scale used five point

Likert scale. The scale is extensively used for measurement of EGB.

Voluntary Workplace Green behavior

Researches on voluntary workplace green behavior have mostly focused on finding out its definition, scope, its relation with other organizational constructs and measurement scale. Voluntary workplace green behavior (VWGB) is type of "prosocial or citizenship behavior that can occur in workplace" (Kim, Kim, Han, Jackson, & Ployhart, 2017 p.1337). VWGB is not specified in job description for most of the employees working in an organization (Ramus & Killer, 2007). The theoretical model of VWGB is based on functional approach to organizational citizenship behavior (Lavalle, 2010) and CSR engagement (Aguilera et al., 2007). VWGB exhibited by the employee help organization directly by conserving resources and energy reduction and also by preserving natural environment for sustainability. Research on dispositional factor influencing VWGB show that conscientiousness acts as a distal dispositional factor and moral reflection as proximal determinants as conscientiousness would stimulate VWGB thorough morality (Feinberg & Willer, 2013; Kim, Kim, Han, Jackson, & Ployhart, 2017).

Research on leadership and VWGB show that when employees work in small work groups, leader's behavioral cues and work group's green advocacy have an amplifying on individual's VWGB (Kim, Kim, Han, Jackson, & Ployhart, 2017). Research on relation between job satisfaction and VWGB show that positive relation between the two. The research show that positive relationship between direct behavior of VWGB and job satisfaction (e.g., Biga et al., 2012; Kim, Kim & Han, 2019). Researches on corporate environmental strategy show that it doesn't have direct positive effect on voluntary workplace green behavior but it may have an effect on green psychological climate (Das, Biswas, Jilani & Uddin, 2019). Research done on new generation employee also shows that green display rules acts as a deciding factor for an employee to exhibit VWGB (Wu, Wu & Yuan, 2019). Kim and his colleagues first devised a scale for measurement of VWGB. The scale consists of six items measured on six point Likert scale (Kim, Kim, Han, Jackson, & Ployhart, 2017). Several researches done on VWGB have mostly used this scale for measurement.

Similarities among the three constructs

The three constructs of pro-environmental behavior at work which have been discussed in this paper are similar in nature. Previous researches on each one of

32/ Operationalization of green behavior at workplace...

them show that the constructs are similar in the context of their definition. All three of constructs talks about green behavior which are voluntary. EGB though has divided itself into required and voluntary EGB, mostly measures and talks about behavior which are voluntary in nature. Previous researches on three constructs also show that they are very close to organizational citizenship behavior (OCB) (e.g., Lavalley, 2010; Paille & Boiral, 2013). The construct OCB-E have been section of OCB, voluntary EGB being a part of OCB and VWGB have been thought as functional approach to OCB. The three constructs are also very similar to corporate social responsibility or the perception of it. As mentioned earlier, research on the relationship between corporate social responsibilities (CSR) with each of the variable show a positive impact on each. VWGB is seen as functional approach to CSR; companies' CSR have a positive impact on OCB-E and engagement in CSR initiative has an effect on EGB. Studies also show that all three constructs have significant positive relationship with green display rules. Similarities among the three variables can also be found with its relationship between managers' role in allowing to carrying out in this types of behavior. The three variables not show their similarities in context of organizational variables but they are also comparable in its relation with dispositional factors like personal and social norms. So, it can be observed that three constructs are similar to each other in its conceptual framework and it is also akin in aspects with its relationship with other prominent organizational variables like OCB, CSR engagement and corporate greening and dispositional characteristics determining the variables.

Need of the study

It is very essential for researcher to know different perspective of any construct. If a researcher goes through the three different constructs then they would be able to better judge which initiative should be used for their research. The present research focuses on comparing three major initiatives that have been taken by the researchers to study pro-environmental behavior at workplace. The present research also finds out the similarities among the construct and to propose a comprehensive variable which can be used by future researchers to measure pro-environmental behavior at workplace. Very few previous researches have been done to explore the difference and similarities between pro-environmental behaviors at workplace. The present research opens up the possibilities of a

comprehensive variable for measurement of the pro-environmental behavior at workplace. If required, with proper deliberation and analysis the researcher can do further analysis for a comprehensive operationalization of measure.

Present research

Extensive researches have been done in this three constructs and has been extremely useful for measuring the pro-environmental behavior at work. The research on each constructs strikes several similarities among the constructs. In the present researcher it has been tried to find out if there is any similarities among the constructs that measure pro-environmental behavior at work. In the present research other than doing extensive review of literature; three measurement scales of each construct have been used. Factor analysis had been done on three measurement scale and then comparison had been done. The factor analysis have been done to find out the similarities among the items of each scale and look for a comprehensive measure to measure pro-environmental behavior at workplace.

Method

Participants: The total numbers of participants are 234 with mean age of 28.56 years (SD of 3.9) with age range of 21 years to 40 years. The numbers of male participants were 182 and numbers of female participants were 49 and numbers of transgender participants were 3. 565 of the population were married and rest was unmarried. All the participants were working in chemical manufacturing companies and were posted at managerial position. The data was collected from an online survey distribution to 410 employees working in Indian chemical manufacturing company in city of Kolkata.

Design and Procedure: The data was collected from an online survey distribution to 410 employees working in Indian chemical manufacturing company. The survey was conducted with help of Human Resource Department of the companies. The chemical manufacturing companies of the city was shortlisted and human resource department was contacted. Permission of Human Resource Development of the company was taken and employees were sent link of the survey. Only those employees who were at managerial position were shortlisted and sent the link. The questionnaire containing three scales were mailed. After a week of time only 300 questionnaires came back. Out of which 234 questionnaires was found to be complete and could be used for analysis. The

response rate was 57%. Proper analysis was done for completed questionnaires. The questionnaire consisted of demographic questions like age, gender and educational qualification.

Measure used for OCB-E- The scale consists of three items. The response of the scale is measured in five point Likert scale (totally disagree to totally agree). The scale was developed by Boiral and Paille, 2012. The composite reliability was found to be 0.96 (Boiral et al., 2015). The example one of the item is "In my daily activities, I weigh the environmental impact of my personal actions".

Measure for VWGB- The scale consists of six items. The response of the scale is measured in six point Likert scale (never to always). The scale was developed by Kim et al. (2017). The Cronbach alpha for the scale was reported to be 0.79. An example of an item from the scale is "I avoid doing unnecessary printing to save papers".

Measures for EGB- The scale consists of three items. The response of the scale was measured in five point Likert scale (never to always). The scale was developed by Norton et al (2014). The Cronbach alpha of the scale was reported to be 0.97. The scale consists of two subscales- required EGB and voluntary EGB. The present study used only the voluntary EGB subscale. The items in the scale were modified. An example of an item from the scale is "I took a chance to get actively involved in environmental protection at work".

Results

Factor analysis was done on the three scales. Oblique rotation was used to analyze the data. The result showed no significant correlation among the factor components. The data was then further analyzed using varimax rotation. The Bartlett test of sphericity and Kaiser-Meyer-Olkin were both found to appropriate. The value of KMO test was .731 and Bartlett test of sphericity was found to be significant. The result of the analysis is given in table 1. The scree plot of the analysis is shown in Figure 1.

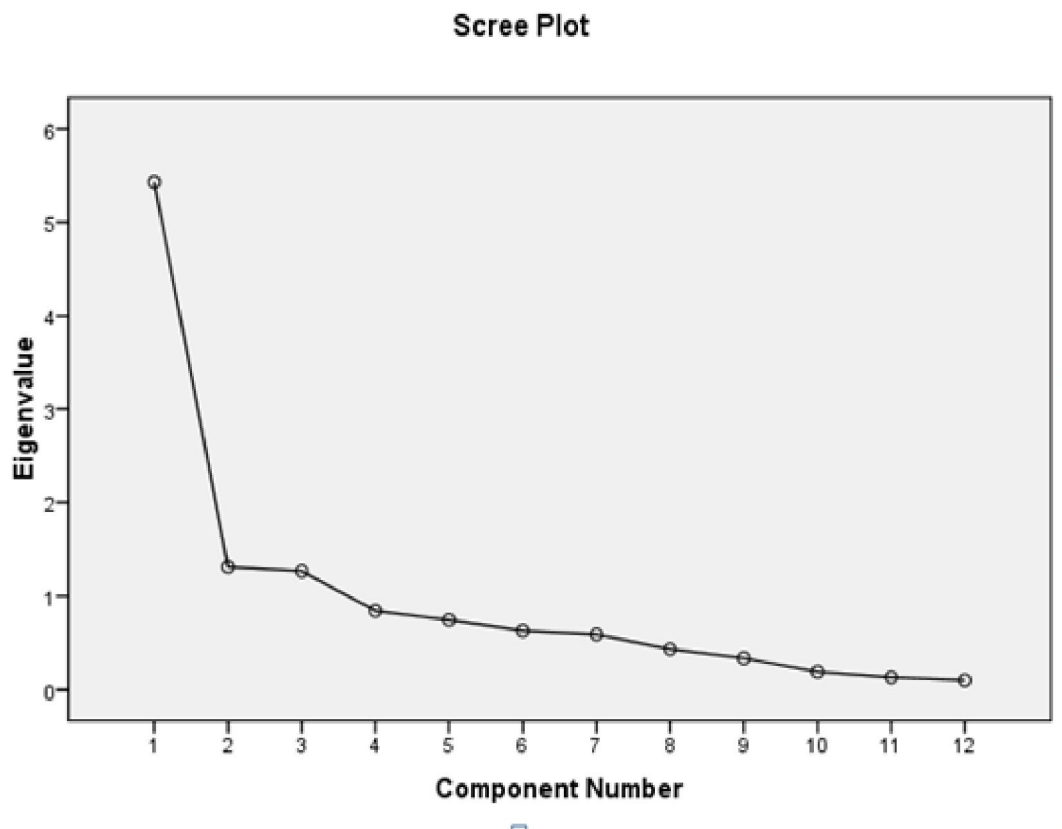


Figure 1: Scree plot done from factor analysis of the three measurement scales of three constructs

34/ Operationalization of green behavior at workplace...

Table 1: Rotated component matrix for each items of the scale used (Varimax rotation)

ITEMS OF DIFFERENT SCALE	FACTORS		
	1	2	3
I avoid doing unnecessary printing to save papers(VWGB1)	--	.745	--
I use personal cups instead of disposable cups(VWGB2).	.562	--	--
I use stairs instead of elevators when going from floor to floor in the building(VWGB3).	--	--	.632
I reuse papers to take notes in the office (VWGB4)	--	.826	--
I recycle reusable things in the workplace(VWGB5)	--	.676	--
I sort recyclable materials into their appropriate bins when other group members do not recycle them (VWGB6).	--	--	.844
In my daily activities, I weigh the environmental impact of my personal actions (OCB-E 1).	.559	--	--
I propose new practices that improve my facility's environmental performance (OCB-E 2).	.581	--	--
I perform voluntary environmental actions and initiatives in my daily activities (OCB-E 3).	.629	--	---
I took a chance to get actively involved in environmental protection at work(EGB1)	.791	---	---
I took initiative to act in environmentally-friendly ways at work (EGB2)	.864	---	---
I did more for the environment at work than I was expected to (EGB3).	.843	---	---

The result shows that on factor analysis of the items of three different constructs lead to formation of three factors. From the results of factor analysis it can seen the three constructs have formed same constructs. The items under each factor are shown in tabulated format in table 2

Table 2: The factors and respective items

Factor	Items
Daily pro-environmental activity (Factor 1)	I use personal cups instead of disposable cups (VWGB2).
	In my daily activities, I weigh the environmental impact of my personal actions. (OCB-E 1).
	I propose new practices that improve my facility's environmental performance. (OCB-E 2).
	I perform voluntary environmental actions and initiatives in my daily activities. (OCB-E 3)
	Today, I took a chance to get actively involved in environmental protection at work. (EGB1)
	Today, I took initiative to act in environmentally-friendly ways at work (EGB2)
	Today, I did more for the environment at work than I was expected to (EGB3).
Lesser consumption of resources (Factor 2)	I avoid doing unnecessary printing to save papers(VWGB1)
	I reuse papers to take notes in the office (VWGB4)
	I recycle reusable things in the workplace(VWGB5)
Alternative pro-environmental steps (Factor 3)	I use stairs instead of elevators when going from floor to floor in the building (VWGB3).
	I sort recyclable materials into their appropriate bins when other group members do not recycle them (VWGB6).

Three factors have come out from factor analysis and can be identified as daily pro-environmental activity, lesser consumption of resources and alternative pro-environmental steps. The result of the study clearly shows that first factor (daily pro-environmental activity) that has come out from the factor analysis includes items from all the three scale. The first factor clearly shows that there is single construct which is being measured from items of OCB-E as well as EGB and items from VWGB. The second factor identified as lesser consumption of resources contains three items of VWGB scale. The third factor identified as alternative pro-environmental steps contains two items both belonging to VWGB scale.

Discussion

Extensive studies done on each variable have been done which has been useful in measuring pro-environmental behavior at workplace. In the present research the similarities between the three major variables of pro-environmental behavior have been compared theoretically and then factor analysis has been done to see practical similarities among the three variables. The result of our present research clearly shows that the three constructs measures the same psychological variable. From result it can be clearly seen that first factor have items belonging to all the three scales. From the items that have loaded into single construct it can be seen that they form a single variable. If the constructs would have been different from each other, the factor loading for each scale would have been in different factors. The daily pro-environmental activity factor (first factor) includes all the items from both EGB and OCB-E and a single item from VWGB. This clearly shows that a same constructs is being measured when either of the variables is used. The lesser consumption of resources factor (second factor) which has come out after the factor analysis includes three items from the measurement scale of VWGB which attempts to measure the reusing behaviors of the employee. The alternative pro-environmental steps(third factor) includes two items from VWGB scale which seek to measure the alternative behavior that individual can do to save the environment.

Comprehensive tool can be used by the researcher for measurement of pro-environmental behavior comprising of all three scales. The number of items in the scale would be twelve and comprise of the three factors. The daily pro-environmental factor contains

items which are more related to individual action towards the environment. The 7 items of the first factor contains all the items of EGB scale, all the items of OCB-E scale and one item from VWGB scale. The item of VWGB scale that is included in the first factor talks about the daily action that employee does for betterment of the environment. The items of EGB scale loaded into the first factor because the items in the scale inquire about their action at workplace on a typical day at workplace. The items of OCB-E scale also talks about the daily activities done at the workplace. The seven items from three different scale talks about the varied daily environmental activities that an employee exhibit ranging from proposing new environmental policies to using personal cups. The second factor, lesser consumption of resources containing the three items reflects upon those behaviors which employees' exhibit to save the resources. The behavior stated in the items ranges from lesser use of paper for work to reusable things that are required in the workplace. The third factor reflects upon behavior which employee choose to do are for betterment of the environment. The employee does some alternative behaviors which will be better for the environment. The factor includes items with choices of doing environmental behavior instead of behavior which can be harmful for the environment.

The present research clearly shows that a single construct to measure pro-environmental behavior at work can be proposed instead of three different construct. The single construct should include the characteristics of all the three constructs. The new construct should include behavior which are both included as part of job description as well as those behaviours which are voluntary and initiated by the employee itself. Though the second and third factors which have come out of the factor analysis are from measurement scales of VWGB are different from other two variables; but it can be seen that they include specific behaviors like reusing and alternative behaviors. A single construct can be proposed which include characteristics of all three constructs and also include the specific behaviors which have not been measured by EGB as well as OCB-E but have been included in measurement scale of VWGB. A single measurement tool comprising of all the items of these three scales can be used to measure the pro-environmental behavior at workplace. The measurement tool comprising of all the items would be comprehensive in nature.

36/ Operationalization of green behavior at workplace...

Theoretical contribution and implication of the study

The present research contributes immensely towards the literature present in the context of the pro-environmental behavior at work. The present research compares among the three constructs which have been widely used. The present research proposes a single construct that can be made after amalgamating the constructs that have been used previously. The present research shows that even if the three constructs have different terminology but psychological constructs are clearly the same. Further research should be done to find out a comprehensive construct. The present research adds to the existing literature available as very few research have been done to see comparison between different variables used to measure same construct. The present research suggests to develop a comprehensive tool which could take care of these three different scales.

Future directions and limitation

The limitation of present study is only single measurement scales of each construct were used to collect data from the employees. The scale was particularly used taking into consideration the employees at managerial position from whom the data were collected. Future researchers can use the comprehensive scale comprising of all twelve items spread across the three factors.

Conclusion

Previous research on pro-environmental behavior have immensely talked about three different constructs- environmental green behavior, organizational citizenship behavior for environment and voluntary workplace green behavior. The present research compares the three constructs and concludes that a single construct can be formed which would be comprehensive. Thus, the present research contributes significantly to the literature of pro-environmental behavior at workplace.

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