The goal proximity of employee green behavior: validating and refining the Green Five taxonomy

Employee green behaviors (EGB) is a burgeoning subject, and recent reviews point to the need for conceptual and scale development. We present a new scale based on the goal proximity of EGB. This distinction is embedded within the Green Five, integrates conceptions around the complexity of EGB, and is more conceptually appropriate than the direct-indirect distinction. Using data from 455 participants across the UK and USA, we applied confirmatory factor analysis and multiple regression to evaluate construct validity and the strength of associations in the nomological network. This scale has good psychometric properties capturing the multidimensionality of EGB. The findings introduce a new way to distinguish EGB that focuses on the outcome of the behavior. This new perspective furthers the theoretical depth of EGB, through the combination of multiple conceptualizations.

Keywords: Employee green behavior, scale development, Green Five taxonomy, outcome expectancy, EGB

Introduction

A key component of environmental sustainability transitions in organizations is increasing the prevalence of EGB (Katz *et al.*, 2022). The plethora of studies that are now focusing on EGB point to the burgeoning state of this literature (Norton *et al.*, 2015; Yuriev *et al.*, 2018; Katz *et al.*, 2022; Tang *et al.*, 2023; Zacher, Rudolph and Katz, 2023). Reviews have found 22 separate EGB scales (Francoeur *et al.*, 2021), with some finding 30 different scales (Katz *et al.*, 2022). This plethora of scales is a positive development; however, most of these scales are one dimensional and generally lack any theoretical underpinning or justification and has led to the EGB literature suffering from jingle and jangle fallacies (Kelley, 1927; Zacher, Rudolph and Katz, 2023). Therefore, they do not add particularly to our theoretical understanding of EGB. This lack of consistency is an issue that

risks oversimplifying a complex arena where different EGB have unique characteristics addressing a range of organisational challenges.

Addressing these issues has been initiated by others (Francoeur *et al.*, 2021), who have reintroduced the Green Five, developed in 2012 (Ones and Dilchert, 2012). The most recent seminal review found the Green Five to be the only comprehensive taxonomy, with most research focusing only on the conserving category (Zacher, Rudolph and Katz, 2023). Importantly, Francoeur *et al.*'s (2021) review shows us that the items in this surfeit of one-dimensional scales filter into various categories of the Green Five haphazardly. EGB scales should base themselves first on the theoretical evidence hitherto. Similar to the construct clean-up of organizational citizenship behaviors performed by Organ (1997), this paper will build on the construct clean-up of EGB that was recently undertaken by Francoeur et al. (2021) and develop a scale within the Green Five.

There are different ways to classify types of EGB. Embedded within the Green Five is the distinction between direct and indirect EGB. The first three categories (conserving, avoiding harm and transforming) are 'direct', meaning these behaviors benefit the environment, and the latter two (influencing others and taking initiative) are 'indirect', and require an intermediate step of recruiting other people into behaving in a sustainable way (Ones and Dilchert, 2012). However, this distinction is somewhat problematic as some direct EGB (transforming) require collaboration and large time investment. For example, "I help create green processes and products" is considered 'direct' yet the outcome of this EGB is uncertain and would require working with many colleagues (e.g. achieving and implementing the new green process/product). Meaning that this 'direct' category (transforming) has many 'indirect' characteristics and conceptual clarity is required.

The contribution of this research is two-fold. First, we introduce a new EGB scale by testing the Green Five with items derived from Francoeur et al.'s review (2021), and suggest an alternative to the direct-indirect distinction embedded in the Green Five. Due to the high correlations between three of the Green Five factors, it was deemed appropriate to consider EGB as a two-factor construct. Through operationalizing the Green Five and consolidating the developments in the literature, we create and validate this new multidimensional EGB scale. Second, we concomitantly introduce a new

conceptualization that is delineated by the complexity around achieving the environmental outcome of the behavior, this outcome focused approach has not been addressed in the literature (Ones et al., 2018) and appears to be a novel way of conceptualising EGB. This is along the lines of Bandura's (1982) notion of outcome expectancy. This alternative distinction integrates the 'intensity' (Ciocirlan, 2017) and basic-advanced (Graves and Sarkis, 2018) nature of EGB, locating the importance on the outcome (goal) of EGB. This results in the transforming category being aligned with influencing others and taking initiative within the Green Five. The two-dimensional Goal Proximity EGB scale delineates between the 'low hanging fruit' of proximal EGB, and the more complex distal EGB. Collaboration, temporality, and uncertainty make up this complexity. This development builds on the work of others who recently called for the '*urgent progress'* needed on operationalization of this construct, due to the overabundance of conserving EGB (Francoeur et al., 2021, p.2).

The goal proximity of EGB

One of the first attempts to bring a coherent taxonomy to the concept of environmentally sustainable behaviors at work was Ones and Dilchert (2012), defining five categories of conserving, avoid harm, transforming, influencing others and taking initiative. Nearly half of all items found in the review of EGB by Francoeur et al. (2021) fall solely into the conserving category. There is a precedent to move beyond the overemphasis on conserving behaviors and capture the multidimensional construct of EGB. Particularly as some more commonly cited scales only measure EGB as a unidimensional construct (e.g. Graves, Sarkis and Zhu, 2013; Robertson and Barling, 2013). However multidimensionality is not a wholly new endeavour in EGB research, notably Boiral and Paillé (2012) splits EGB into eco-initiatives, eco-helping and eco-civic engagement (described as OCBE). These categories have strong similarities with the taking initiative category (eco-initiatives and eco-civic) and influencing others (eco-helping) categories, which were also filtered as such in the systematic review (Francoeur et al., 2021). These are useful developments of EGB measurement; however, we believe that a comprehensive multidimensional scale that captures the Green Five and builds upon the work on Francoeur et al. (2021) is required.

One key characteristic omitted from the Green Five are concepts around the complexity of performing EGB. Complexity has had some attention in the literature, Graves and Sarkis (2018) separates by 'basic EGB' (short-term, less arduous, and more common), compared to 'advanced EGB' (long-term, arduous, and less common). Others have theoretically developed a similar conceptualization, namely the 'intensity' of the EGB (Ciocirlan, 2017). The 'intensity' of EGB are crucially characterized by uncertainty regarding the outcome, where low-intensity EGB are "*low uncertainty*", conversely high-intensity EGB are considered having "*high uncertainty regarding outcomes"* (Ciocirlan, 2017, p.53). This uncertainty regarding the outcome is important, as employees behaving in green ways burnout due to lack of progress transitioning towards environmental sustainability (Wright, Nyberg and Grant, 2012). This burnout can be attributed to the high individual costs of performing high-intensity EGB (Ciocirlan, 2017). We believe that a multidimensional scale that captures the Green Five should also integrate these complexity conceptualizations. This will not only improve our understanding of EGB within the Green Five, but it also introduces a coherent Goal Proximity EGB scale that integrates these ideas of complexity surrounding green behaviors at work. We suggest that the best way to understand this complexity is by focusing on the outcome of the behavior, meaning the complexity derives from successfully achieving the goal of the EGB, rather than just performing it. This shifts the focus to the goal of the EGB and thus a major characterization of EGB is on the outcome expectancy.

Outcome expectancy is based around individuals belief that they can successfully achieve the goals of their behavior (Bandura, 1997). Individuals with high self-efficacy can still have low outcome expectations due to structurtheoretiallyal arrangements that ultimately have control over the outcomes (Bandura, 1982). In this case it would indicate the belief employees have regarding achieveing the environmental goal of their EGB. If an employee suggests a new green work process, they have 'performed' the EGB, however this may get rejected by management and therefore does not achieve any progress towards the environmental sustainability of the organization. This means we move the focus from not just high self-efficacy but also the need for a responsive environment (conditions) that can ultimately lead to higher EGB.

Proximal EGB are characterized by being individual, temporally short to complete, and have low uncertainty - which result in simplicity in achieving the goal (outcome) of the EGB. In comparison, distal EGB require collaboration, long time horizons, and contribution to substantial (uncertain) changes in their organization, leading to the goal (outcome) of distal EGB being complex to achieve. The number of employees required to collaborate to achieve the outcome of EGB would compound in complexity as more employees (particularly seniority of employee) are required, the perception of long-time horizons could affect the employee's commitment to perform EGB, and uncertainty would, inter alia, be affected by organizational receptiveness to employees' environmental initiatives (i.e. distal EGB). The fundamental difference is that proximal EGB are simpler to achieve their successful outcome due to the responsive environment (socially and materially), or lack of need for one. Notably, outcome expectancy is related to self-efficacy (Bandura, 1997), and low self-efficacy is one of the main barriers to EGB (Lo, Peters and Kok, 2012; Yuriev *et al.*, 2018). Thus, the outcome expectancy of the EGB would provide a theoretical underlay for the goal proximity distinction. It shifts the emphasis towards the outcome as a major defining characteristic of EGB. This has also been missing from researchers measurement of EGB. Thus, we argue that the direct-indirect categorization should be reframed as proximal-distal in which transforming is included in the latter category (Table 1).

Considering the outcome expectancy of EGB in relation to the Green Five framework would move the transforming category to align with influencing others and taking initiative, rather than being aligned with conserving and avoiding harm. Resulting in 'proximal EGB' (conserving and avoiding harm) and 'distal EGB' (transforming, influencing others, and taking initiative). The reason for this is that direct EGB are not all equal, "I recycle paper at work" (conserving) and "I help create green processes and products" (transforming) have unique characteristics through their complexity that are more important than whether they are direct or not. This direct-indirect distinciton is the current catgorization within the Green Five, yet we argue that transforming EGB have indirect characteristics and should be conceptualized slightly differently. We argue the goal proximity

distinction based on the outcome expectancy description fits transforming EGB above the previous distinction of being considered a direct EGB.

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RQ1: Is the goal proximity distinction a valid and reliable way to represent EGB?

To evaluate the nomological network we test known related constructs to EGB: green human resource management (GHRM), employee commitment to organizations environmental goals (EEC), and affective commitment to the organization (AC). EGB is strongly related to GHRM (Dumont, Shen and Deng, 2017; Chaudhary, 2020; Hameed *et al.*, 2020), as well as EEC (Raineri and Paillé, 2016; Pellegrini, Rizzi and Frey, 2018), and there is evidence for a relationship of EGB with AC, although it is weaker than the previous two factors (Paillé and Boiral, 2013; Temminck, Mearns and Fruhen, 2015; Saifulina, Carballo-Penela and Ruzo-Sanmartin, 2021). This is likely due to this commitment requiring other green factors such as the organization goals and values align with environmental sustainability (Temminck, Mearns and Fruhen, 2015).

RQ2: To what extent is the Goal Proximity EGB scale related to constructs in its nomological network – specifically the GHRM, EEC, and AC?

Methodology

The instrument was created to represent all of the subcategories of the Green Five (Ones and Dilchert, 2012). Using the 171-item catalogue of the Green Five scale created by Francoeur et al. (2021), a final set of 25 items was distilled with 5 items representing each of the Green Five categories. This process included removing items with a high degree of overlap, finding items that represented that category (and sub-categories) uniquely, and finally refining the wording to create consistency (see appendices). Content validity and robustness of the reduced 5 categories was checked via expert review by three organisational behaviour researchers at UEA who deemed the five categories to represent the construct comprehensively via the reduction process of the 171 item catalogue (Haynes, Richard and Kubany, 1995). Neuchxt, this 25-item instrument was tested via

confirmatory factor analysis and simplified by selecting the most appropriate items to construct the Goal Proximity EGB scale. Lastly, the nomological network validity was tested using GHRM, EEC, and AC.

Sample and Procedure

Participants comprised only full-time employees in the UK and USA (N=455). Participants were recruited through LinkedIn and Amazon Mechanical Turk. Convenience sampling is appropriate when the aims of the study are focused on underlying theoretical relationships (Highhouse and Gillespie, 2009), has some key advantages such as increasing sample heterogeneity (Demerouti and Rispens, 2014). Much of the sample was white (86%), and male (59%), with a mean age of 37 (SD = 11.15), and mean tenure 14 years (SD=13.8). Ethics approval from UEA-NBS Research Ethics Committee.

Measures

EGB was measured from 'never' to 'always' (1-5 Likert scale). The items and Cronbach's alpha can be found in Table 3. The Cronbach's alpha was 0.8 (Proximal), 0.92 (Distal).

GHRM was measured with six items measured using a 1-5 Likert scale (Dumont, Shen and Deng, 2017). The Cronbach's alpha was 0.94.

EEC was measured with seven items using a 1-7 Likert scale (Raineri and Paillé, 2016). The Cronbach's alpha was 0.92.

AC was measured with a reduced three-item scale (1-7 Likert), justified as an acceptable shortened version (Paillé, Boiral and Chen, 2013). The Cronbach's alpha was 0.86.

Results

Testing the model with the 25 items and the Green Five categories resulted in negative variances indicating structural misspecification (Kolenikov and Bollen, 2012). The culprits were two items in the avoiding harm and influencing others category which were removed from subsequent analyses. Analysis with 23 items showed the 5-factor model has better fit, however suffered from

potential multicollinearity (correlation between factors >0.9). The same issue was identified with the 2-factor model along the direct-indirect distinction. The goal proximity distinction reduced this multicollinearity issue while improving model fit from the direct-indirect distinction. We then simplified the goal proximity model to 10 items (5 per category). This was achieved by iteratively removing one item based on statistical criteria (modification indexes and the AIC) whilst retaining its rigorousness and meaning of the two subscales (Table 2). This content validity was maintained through expert review of items to ensure alignment of the item with the construct dimension and subcategories. The resulting 10-item version had a better fit than the 23-item version (ΔAIC=14151.20) and a better fit than a 1-factor model with the same items ($\Delta\chi^2$= 206.21; df =1, p<.001. Additional testing of alternative three-factor models revealed consistent multicollinearity of above 0.9 between factors in all variations of 3-factor model structures[1]. Attempts to estimate a hierarchical model also failed to converge.

--- Insert Table 2 here ---

Table 3 displays the 10 items used in the Goal Proximity EGB scale. Reported are their respective subfactor coefficients and standard errors.

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The correlation matrix for the Goal Proximity EGB scale and nomological network variables can be found in Table 4

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A multiple regression was also performed to test the nomological validity (Table 5), GHRM and EEC were significantly related to both categories of EGB. However, affective commitment was negatively related to proximal but not to distal EGB. This was due to a strong correlation between affective commitment and employee environmental commitment (r = 0.80, p <.001); their overlapping meaning and concomitant high correlation would interfere with the AC-EGB relationship.

[1] See supplementary material for a full breakdown of 3-factor model analysis

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Discussion

With this study we showed that the Goal Proximity EGB scale is a valid and reliable way to categorize and measure EGB within the Green Five. This was also found to be a better conceptualization of EGB than the previous direct-indirect distinction. It seems that whether EGB is (in)direct is not as prominent as the goal proximity of the behavior. We believe that our conceptualization including the goal proximity is the underlying reason for this. Importantly, the scale addresses a call for giving more emphasis to environmental outcomes of EGB that are outside of the individuals control (Ones *et al.*, 2018). Considering this in relation to the Green Five, transforming then is moved from 'direct' to 'distal' (Table 1). This does not dismiss the direct-indirect distinction but rather incorporates it with other conceptualizations into a more accurate outcome-based depiction of EGB categories.

The goal proximity distinction is founded on the desired goal of the behavior. This builds upon previous conceptual distinctions of direct-indirect (Ones and Dilchert, 2012), basic-advanced (Graves and Sarkis, 2018), and the intensity of EGB (Ciocirlan, 2017). The fact that we found, after the comprehensive item reduction, two dimensions of EGB based along the complexity distinction gives credence to these previous theoretical and empirical approaches to EGB. The desired goal of distal EGB are complex due to long-term commitment, uncertainty, and needing collaboration among employees. This is likely why transforming is more aligned with influencing others and taking initiative categories, as they contrast to the individually focused, immediate, and simpler to achieve proximal type behaviors. An important avenue for further research is to more clearly define these dimensions of complexity around EGB and also examine the dynamism of this complexity. It is unlikely these will be static categories, and that operationalizing time horizons, uncertainty, and collaboration is a much-needed endeavour to consolidate our understanding of the goal proximity of EGB.

As EGB proliferates into a larger research area, using the Green Five as a framework is a worthy and needed pursuit to bring clarity and direction to the construct and research in this area (Ones and Dilchert, 2012; Francoeur *et al.*, 2021; Zacher, Rudolph and Katz, 2023). The integration of the goal proximity of EGB into the Green Five framework furthers the conceptual development of this construct. It brings currently disparate ideas around difficult (intensity and basic-advanced) under one concept around the goal proximity and subsequently embeds this within the Green Five. This distinction helps move us towards the pressing need to focus on the outcomes of EGB that contribute to organizational environmental objectives (Zacher, Rudolph and Katz, 2023), as it is far more likely that distal EGB would do so, granting this needs to be tested.

The simplicity and brevity of the instrument makes it ideal for organizations to assess interventions on EGB, desired distal EGB outcomes could erroneously lead to proximal EGB outcomes if this distinction is not considered. The implications of the theoretical distinction of the goal proximity also encourages practitioners to create a responsive environment to EGB. If employees believe that the organization is receptive to EGB (particularly distal), they are likely to become more prevalent. As can be seen in the strong relationship between GHRM and distal EGB.

Due to this outcome-based distinction, future research should utilise the Goal Proximity EGB scale to further our understanding of unique types of EGB. It is likely that proximal EGB would be more related to individual or adjacent mechanisms e.g. self-efficacy (Bandura, 1997), self-determination theory (Graves, Sarkis and Gold, 2019; Hicklenton, Hine and Loi, 2019), or supervisory support (Paillé, Boiral and Chen, 2013). Conversely distal EGB would have a stronger relationship with social or higher level mechanisms e.g. normative conduct (Cialdini and Jacobson, 2021), organizational support (Paillé and Boiral, 2013), or collective efficacy (Bandura, 2000).

This study does not dismiss the Green Five or other distinctions but rather enhances our understanding by integrating multiple conceptual and empirical strains of EGB. This distinction may resolve the unclear relationship between supervisory support and EGB discussed by others (Paillé, Boiral and Chen, 2013), as the supervisor support may only be related to specific categories of EGB. The limited diversity in ethnicity, age, gender, and occupational background may constrain the

applicability of the results of this research beyond the studied demographic groups. Despite this limitation, the contribution of scale provides building blocks for future research, helping to consolidate previous conceptual work and demonstrating the utility of this approach moving forward. Further research should test this scale with other populations (countries, industries, cultures) to determine the reliability of this scale.

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